Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence

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Thesis presented for the Degree of Doctor of Philosophy in the Library and
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June 2018

Declaration

I, Patrick Mapulanga, hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work or any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Dedication

I dedicate this thesis to my wife Chikondi and children, Patience, Praise and Precious. Thank you for your perseverance in my absence and with this auspicious tour of academic duty.

Acknowledgements

I would like to express my heartfelt gratitude to my supervisor, A/Prof. Jaya Raju and Co-Supervisor, Dr Thomas Matingwina. I have learned a lot through your guidance and professional advice from proposal writing to this end. This research would have been an uphill task without your support. Many thanks too to the UCT Postgraduate Funding Office for funding towards this doctoral study through its International Student Awards in 2017 and 2018.

My thanks to the Malawi's National Commission for Science and Technology Research Ethics Committee for giving me the opportunity to conduct research in Malawi. Special thanks to academics and researchers of the College of Medicine and the Kamuzu College of Nursing for responding to the questionnaires administered. Special gratitude to KCN Management for the support towards my studies. I wish to express my gratitude to the Directors from the Ministry of Health and health partners in Malawi for accepting to be interviewed and for providing the critical mass of data needed for the research.

Many thanks to the Library and Information Studies Centre (UCT) for the time I worked as a part time lecturer at the Centre. I wish to thank Dr Ellen Moriah, Professor Sally Redman, Sian Rudge and Anna Williamson from the Sax Institute in Australia and Liz Drake from the Canadian Institutes of Health Research, for allowing me to use some of the questions from their data collecting instruments. My thanks too to Elsevier Customer Support for assisting me with articles for the review of health research in Malawi. A vote of thanks to Mr George Mwenye Phiri, Biostatistician, for his technical expertise in inferential statistical analysis and Messrs Jim Mtambo and Thomas Bello for Microsoft Word data document flow.

My thanks to local and foreign friends whom I have known and interacted with while in Cape Town, including the whole team of workmates at the Chancellor Oppeinheimer Library where I worked as an Evening Senior. It will be a remiss of me not to mention my Malawian brothers Thomas Taimu, Donald Malanga and sister Rose Matemba. Many thanks too to Zambian colleagues Kabaso Mulenga and Joachim Nyoni.

Abstract

Findings from health research ought to play a role in informing health policy formulation. Over the years much health research has been conducted both in developing and developed countries. However, little is known on how health research has informed health policy formulation. The study sought to review health research findings at the University of Malawi's College of Medicine and Kamuzu College of Nursing and health policies of the Ministry of Health in Malawi, and based on the results, develop a communication and dissemination strategy as indicated by the study objectives. The study focused on exploring the extent of research use in policy formulation by evaluating sampled policies. It established from both researchers and policy makers their views regarding communication of research findings to policy makers, and how the two work together during conceptualisation, carrying out research and disseminating the findings. It sought to identify ways that the translation of research findings into policy formulation could be facilitated. The study is informed by the Knowledge Translation theoretical framework. It adopted the pragmatism philosophical paradigm which advocates for 'what works'. The convergent parallel mixed method strategy was used to gather both qualitative and quantitative data for the study.

The population of the study comprised of researchers and academics at the University of Malawi, health research partners in Malawi and directors at the Ministry of Health in Malawi. Both qualitative and quantitative data were collected through self-administered questionnaires (246 academics and researchers), semi-structured interviews (17 directors from the Ministry of Health and relevant research institutes), a self-administered self-assessment tool (10 purposively selected directors from the Ministry of Health and from research institutes) and a health policy assessment tool. Qualitative data was analysed through content analysis while quantitative data was analysed using the *Statistical Package for the Social Sciences* (*SPSS*) for both descriptive and inferential analysis. The data were supplemented with a search strategy through *Scopus*.

The findings revealed that health researchers rarely interact with policy makers. Health researchers prefer publishing in journals, attending conferences and informally interacting with policy and decision makers. Policy makers rely on the use of Internet, reviews of previous policies, internal evaluations, data from the national statistical office, registries and information centres at the ministries for policy information. However, the study revealed in designing the communication and dissemination strategy based on 'what works', that researchers work in research groups while policy makers work in technical work groups. The interaction between researchers and policy makers in the technical working groups informs the transfer of health research into policy-making.

The study makes contributions to theory, practice and policy formulation. In terms of contribution towards the KTA framework, the study examined forms of formal interaction that may result in the transfer of health research information into policy and practice. The study indicates that formal interaction in the technical expert groups is one of such interactions that would facilitate the use of health research evidence in policy formulation. In terms of practice, the study recommends that there should be deliberate efforts by researchers in the research groups and policy makers at the technical working groups to formally engage each other. In terms of policy formulation, the study recommends that a proper interaction framework needs to be put in place for formal interactions between health researchers working in their research work groups and policy makers in the technical working groups.

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List of acronyms

AC	Action cycle
AFIDEP	African Institutes for Development Policy
AIDS	Acquired Immunodeficiency Syndrome
AMSTAR	Assessment of Multiple Systematic Reviews
ARIMA	Auto-Regressive Integrative Moving Average
BSc	Bachelor of Science
CHSRF	Canadian Health Services Research Foundation
CIFR	Consolidate Framework for Implementation Research
CIHR	Canadian Institutes of Health
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CoP	Communities of Practice
CSO	Civil Society Organisations
DOI	Diffusion of Innovations
EPPI	Evidence for Policy and Practice Information
HIV	Human Immunodeficiency Syndrome
KC	Knowledge Creation
KT	Knowledge Translation
KTA	Knowledge-To-Action
LCL	Lower Control Limit
LISC	Library and Information Studies Centre
M	Mean
MBBS	Bachelor of Medicine Bachelor of Surgery
MD	Doctor of Medicine
MeSH	Medical Subject Headings
MSc	Master of Science

ODI	Overseas Development Institute
OMRU	Ottawa Model of Research Use
ORACLe	Organisation, Research Access, Culture and Leadership
OVP	Office of the Vice President
PARIHS	Promoting Action on Research Implementation in Health Services Framework
PBRN	Practice Based Research Network
PICO	Population, Intervention, Comparators, Outcome
PIE	Populations Exposure Outcomes
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
RAPID	Research and Policy in Development
RD & U	Research Dissemination and Utilisation Model
RTA	Research to Action
SAGE	Staff Assessment of enGangement with Evidence from Research
SATORI	Self-Assessment Tool for Research Institutes
SD	Standard Deviation
SEER	Seeking, Engagement and Evaluating Research
SPIDER	Sample, Phenomenon of Interests, Design, Evaluation, Research Type
SPIRIT	Supporting Policy for Health with Research
SPSS	Statistical Package for Social Sciences
SUPPORT	Supporting Policy Relevant Reviews and Trials
UCL	Upper Control Limit
UCT	University of Cape Town
UK	United Kingdom
USA	United States of America
USAID	United States Agency for International Development
TWG	Technical Working Group
WHO	World Health Organisation

Chapter 1

INTRODUCTION TO THE STUDY

1.1 Introduction

The development of any country depends in the improved health status of its people. Therefore, it is assumed that findings from health research should play a role in informing policy-making. Over the last three decades, there has been increased health research expenditure worth of billions of dollars not matching its usage in policy-making (Grol & Grimshaw, 2003: 1225; Davis, 2006: 33; Graham & Tetroe, 2007: 20).

In developing countries, various recommendations have been made on levels of investment in health research using different strategies. The World Health Organisation has issued several ministerial summit reports on health research and development expenditure. These include: the Mexico 2004, the Bamako 2008 and the Algiers 2009 declarations on health research (World Health Organisation, 2004; 2008a; 2009). In part, the declarations state that developing countries would invest at least 2% of their national expenditures in health research capacity strengthening (World Health Organisation, 2004; 2008a; 2009).

In North America, over 100 billion dollars are spent yearly on health research (Brehaut & Eva, 2012: 114). The United States of America (USA) government alone invests nearly 32 billion United States dollars annually in medical research for the American people (National Institutes of Health, 2014). While the target of 2% of the Gross Domestic Product has been difficult for the least developing countries, the expenditure statistics on health budgets indicate that billions of dollars are spent on health research worldwide (Andermann et al., 2016: 7).

Globally because of clinical trials, it takes on average a decade or two before the research evidence is put into practice (Sussman et al., 2006: 8). This suggests that there exists a problem gap between health research evidence and policy-making. Andermann et al. (2016: 17) indicate that the highest quality evidence from health research has no impact unless it is used in policy-making. Evidence-based knowledge generated from research has little value unless it is put into practice (World Health Organisation, 2012: 5). Making use of research evidence in managing health systems, decision and policy-making promises to be a challenge not only for the present but also for centuries to come. This is partly because health care systems in many countries are facing challenges ranging from underutilisation to overutilisation of evidence-based research whose failures have resulted in risks to patient safety and quality of care (Bowen & Graham, 2013: 3). Walshe and Rundall (2001: 430) outline three categories of health research problems. Firstly, there is the overuse of some health research evidence where they are not very effective. Secondly, there is the underuse of health research evidence known to be effective but not applied appropriately. Thirdly, there is the misuse of health research evidence even when their effectiveness is unclear.

Parkhurst (2017: 3) argues that for decades, new parents were advised by medical professionals to place babies to sleep on their fronts. This was a means of reducing the risk of infant choking in their sleep if they vomit (Howick, 2017: 137). Evidence through systematic reviews indicates that in fact babies left to sleep on their fronts have almost three times the risk of sudden infant death syndrome than infant back sleepers (Parkhurst, 2017: 137). Gilbert et al. (2005: 874) further indicate that if such research evidence was implemented from the 1970s to date, sudden death of thousands of new born babies would have been prevented.

Evidence matters for health policy-making and use of evidence could avoid unnecessary harm and help achieve important health policy goals (Parkhurst, 2017: 4). The requirement for policy decisions to be based on solid evidence has received global acknowledgement (Schryer-Roy, 2005: 2007). Indications point to the fact that policy makers and researchers lack skills, tools and mechanisms to find and use health evidence to inform policy-making (Lavis et al., 2013: 5). Bartunek et al. (2003: 66) noted that the gap between researchers and policy makers has been widening partly because research has traditionally been the domain of the academics, many of whom lack knowledge on how to engage policy makers in their activities. Bartunek et al. (2003: 66) further noted that the gap has widened due to several factors; firstly, lack of incentives and time needed to establish partnerships; secondly, strict funding timelines that allows no engagement with policy makers; and thirdly, the complexity of activities associated with collaborative research.

Different authors have used different terms to describe the processes of putting health research knowledge into forms that can be adopted and used by policy makers. In the United Kingdom (UK) and Europe, the terms *implementation science* and *research utilisation* are used to refer to the transfer of health research evidence into policy-making. In the USA, the terms *research use*, *research dissemination*, *research uptake* and *knowledge transfer* have been used. Until 2004, in Canada, the terms commonly used were *knowledge transfer* or *knowledge exchange* (Straus, Tetroe & Graham., 2009a: 3). Regardless of the terminologies used, there exists a gap between the use of health research evidence in policy-making and this gap continues to widen. Straus, Tetroe and Graham (2009a: 4) emphasise that failure to use research evidence to inform health policy-making processes is apparent across all key decision-making groups such as informal carers, health managers, health care providers, primary and specialty care and health policy managers.

Straus, Tetroe and Graham (2009a: 4) define knowledge translation as ''… the exchange, synthesis and sound application of research findings within a complex set of interactions among researchers and knowledge users". Knowledge translation then refers to a set of activities taken to move research output from the academic journal or conference into the hands of policy makers ready to transform research evidence into practice by way of influencing policy change (Straus, Tetroe & Graham, 2009b: 4). Emphasis in the interactions points to improved communication across the health sector players (Lomas & Brown, 2009: 903). The definition of knowledge translation lists three key elements. First, is knowledge application, which indicates that research findings ought to be applied in the health sector to inform and improve health care (Bowen & Martens, 2006: 902; Graham & Tetroe, 2007: 20). The second element is interactions between researchers and users of the knowledge generated (Bowen & Martens, 2006: 902). The interaction suggests that knowledge ought to be transferred from researchers to policy makers and that the latter apply the knowledge when making policy decisions. The third element concerns improved health outcomes which suggest that the best evidence from health research ought to be applied with the intention of improving health care delivery systems and improving people's lives (Graham et al., 2006: 13–14).

Many strategies have been advocated to encourage the use of health research evidence in policy-making. Some research funders now require explanations on how research results may be applied in decision-making (Bowen & Graham, 2013: 3). In some cases, research funders are requesting that decision makers be part of the research teams (Goering et al., 2010: 91). However, explanations as to why knowledge has not sharpened policy-making points to the ineffective transferring of health research evidence to the intended audience (Bowen & Graham, 2013: 3).

The inability to use research evidence is partly due to lack of appropriate communication strategies (Bowen & Graham, 2013: 4).

The World Health Organisation (2012: 5) corroborates that barriers that have contributed to the inability to use health research evidence can be explained in five ways. Firstly, there are the inappropriate contextual issues in which health research is conducted. Secondly, there are concerns about poor relationships between researchers, policy makers, and stakeholders conducting health research. Thirdly, there is the untimely conduct of health research mostly irrelevant to the needs of policy makers. Fourthly, there are unclear jurisdictions of researchers and organisations that facilitate the use of health research evidence and its transfer to policy makers. Fifthly, there is the unclear distinction in functionalities between various stakeholders in health systems and their roles in facilitating the use of research evidence in policy-making.

Grimshaw et al. (2012: 14) suggest that one of the ways of translating knowledge into action is through interactions between researchers and knowledge users. Such interactions involve team work participation in determining research issues and questions (Grimshaw et al., 2012: 13). Through interactions researchers and knowledge users share time to develop relations and collaborative mechanisms (Bowen & Martens, 2006: 902). Through interactions, researchers and knowledge users share opportunities, respect and trust each other (Lomas, 2000: 239). Both researchers and knowledge users recognise costs other partners put into research (Bowen & Martens, 2006: 902). It is argued that interaction brings researchers and policy and decision makers together. By and large, researchers, policy or decision makers begin to develop strategies for arbitrating between diverse, conflicting views and perspectives on the use of health research evidence (Van de Ven & Johnson, 2006: 822).

Denis and Lomas (2003: 1) argue that four recognised streams in academic work have expressed a growing interest in transfer of health research evidence through collaborative research. These are *action research*, *participatory research*, *programme evaluation* and *knowledge translation*. Participatory research, action research, and programme evaluation have roots in social sciences, and are said to have failed to address the inclusion of policy makers in the actual research. Bowen and Graham (2013: 4) suggest that for knowledge to be transferred to policy makers several factors need to be considered. Firstly, research questions and the research process itself should address issues relevant to the policy-making process. Secondly, knowledge generated from the research should be readily made available to policy makers for immediate use. Thirdly, health research evidence generated should be sufficient to inform policy-making.

1.2 Background to the study

The background to the study section documents the nature and importance of the problem, establishes the knowledge gap, and demonstrates how the proposed study makes contributions in addressing the gap (Curry & Numez-Smith, 2015: 115). This section examines the way knowledge from research has been handled and gaps between health research and policy formulation in Malawi. Thereafter, the study proposes the use of a communication and dissemination strategy as one of the many ways of addressing the delink between health research evidence and policy-making in Malawi.

Malawi is southeastern Africa country formerly colonised by the British. It is wedged between three countries: Zambia to the northwest, Tanzania to the northeast and Mozambique to the south, southwest and southeast. Malawi has an area of 118,480 square kilometres of which 24,400 square kilometers consists of Lake Malawi. As of 2018, the population was estimated at 18.5 million people. In 2017, Malawi's estimated gross domestic product was around 6.26 billion United States dollars (Statistical Portal Online, 2018). Figure 1.1 shows the map of Malawi and its location in Southern Africa. The map also shows constituent colleges of the University of Malawi which is the site of this study. Malawi’s economy is largely agricultural, with about 90% of the population living in rural areas and is ranked by the World Bank and the International Monetary Fund as one of the least developed countries in the world (International Monetary Fund Online, 2017).

Despite its size, Malawi has done some quality health research through the University of Malawi which have been published in reputable local and international journals and presented at high profile scientific conferences. The University of Malawi, the first public university in Malawi, was established in 1965 and now has four constituent colleges. Each college is unique with its own faculties: Chancellor College established in 1965 (Faculties of Education, Humanities, Science, Social Science and Law); the Malawi Polytechnic established in 1965 (Faculties of Applied Studies, Commerce, Engineering, Education and Media Studies); Kamuzu College of Nursing

(Faculties of Nursing and Midwifery, Neonatal and Reproductive Health Studies, subsequently to be referred to as the Faculty of Midwifery), established in 1979; and, the College of Medicine (Faculties of Medicine, Biomedical Sciences and Health Professionals, subsequently to be referred to as the Faculty of Biomedical Sciences and the Faculty of Public Health and Family Medicine, subsequently to be referred to as the Faculty of Public Health).

The College of Medicine, a fourth constituent college of the University of Malawi, was established in 1991. Kamuzu College of Nursing, a third constituent college of the University of Malawi, was established in 1979. Apart from teaching, the major activities of the College of Medicine and Kamuzu College of Nursing include: conducting health research activities; supporting the conduct of clinical trials; disseminating health research results to faculty members; and, coordinating the dissemination of health research findings through different communication channels to various health stakeholders (College of Medicine, University of Malawi, 2015).

Generally, research that has influenced policy-making in Malawi has been generated from the College of Medicine, Kamuzu College of Nursing, National AIDS Commission, National Malaria Control Programme and the National Tuberculosis Control Programme (Hutchinson, 2011: 110). Health research is regulated by the National Commission for Science and Technology, formerly known as the National Research Council of Malawi, which has now delegated some of its responsibilities and powers to the National Health Sciences Research Committee and the College of Medicine Research and Ethics Committee (African Health Observatory Online, 2015). The National Health Sciences Research and the College of Medicine Research and Ethics Committees approve the conduct of health research in Malawi. Despite these review boards, the conduct of health research in Malawi lacks mechanisms for coordination, regulation and appropriate structures to support health research evidence (African Health Observatory, 2015). One of the weaknesses of the system has been weak linkages between various research data sources and lack of data triangulation centres (Kirigia et al., 2015: 2).

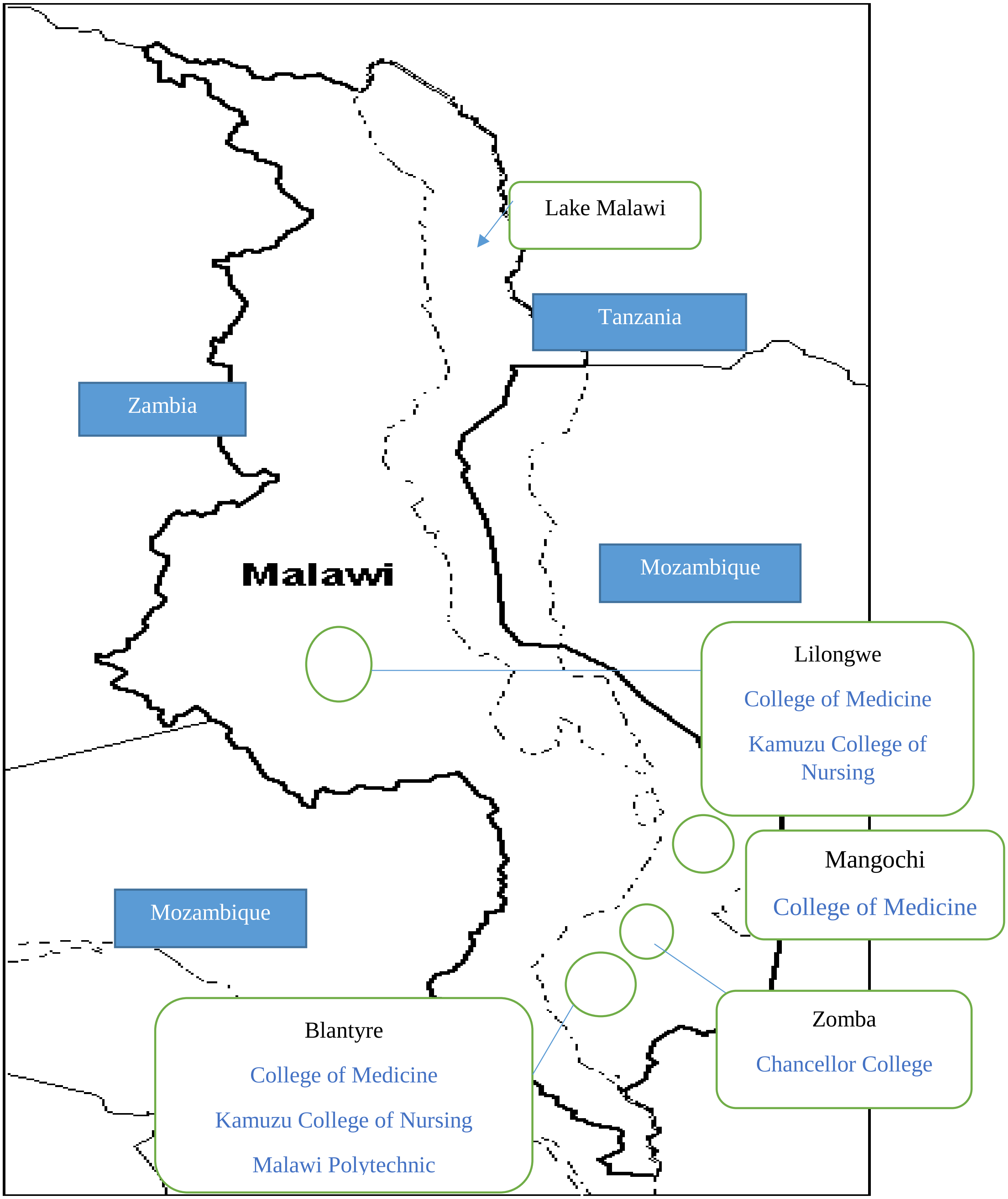

Figure 1.1: Map of Malawi showing its location in Southern Africa and the constituent colleges of the University of Malawi

Much health research has been conducted in Malawi and has been well documented and preserved internationally. For example, Kirigia et al. (2015: 8) document that between 2005 and 2012 the University of Malawi published in international journals, a total of 443 articles of which 215 (48.5%) were health research and 66% of the 215 were from the College of Medicine and Kamuzu College of Nursing. Similarly, between 1996 and 2005, indexed papers by PubMed indicated that Malawi had a total of 450 health research articles (Uthman & Uthman, 2007: 46). Gondwe and Kavinya (2008: 90) searched the Medline/PubMed database and found out that between 1996 and 2006, 489 health articles were from Malawi and about 20.9% of these papers had first authors from Malawi. Some of the health research has been indexed through the *World Health Organisation African Index Medicus* (Kirigia et al., 2015: 8).

While much research has taken place in Malawi, there is lack of collaboration in the way research findings are disseminated locally, nationally and internationally (Hennink & Stephenson, 2005: 163). Instead of the National Commission for Science and Technology organising research dissemination conferences as a national body mandated to handle all research issues, each of the public universities and their constituent colleges organise research conferences independent of the other.

Formally published health research information is disseminated in various websites for use by students, researchers, consultants and policy makers. Hennink and Stephenson (2005: 167) noted that health research commissioned by donors is often disseminated through donor funded workshops. The donor funders also suggest the audience and initiate the distribution of research outputs. Non-commissioned research is disseminated through peer-reviewed journals and conferences. Some health research is published in local journals such as the *Malawi Medical Journal* based at the College of Medicine, University of Malawi. However, Harle (2010: 12) observed that access to print journals is limited partly because of several reasons. Firstly, inadequate finances have resulted in low stocks in libraries, information and documentation centres. Secondly, because of few subscriptions there is limited access to online journal articles. Thirdly, high bandwidth costs have resulted in high traffic and poor Internet connectivity.

Consequently, many theses, dissertations, and technical reports in Malawi are kept as hard copies and are accessible as print copies in libraries, information and documentation centres. There have been some initiatives aimed at ensuring that unpublished literature is easily accessed. The Malawi Development Exchange Project has been supporting the creation of the National Digital Repository for research initiatives in Malawi (Malawi National Digital Repository, 2018). However, accessibility and use of such literature is limited due to unavailability of high-speed and reliable Internet connections to the repository (Harle, 2010: 12). Similarly, health research findings are disseminated through international journals, international fora and meetings. Limited health research is disseminated through publications such as the *Malawi Medical Journal* (College of Medicine, University of Malawi, 2015). Despite organising advocacy meetings aimed at engaging policy makers and parliamentarians, few policy makers participate in these fora. In most cases the dissemination process addresses the need of researchers ignoring policy makers (Oronje et al., 2015: A21).

The storage and diffusion of health research evidence in Malawi has always been challenging and there are large gaps between those that conduct and utilise health research findings for policy formulation and practice (African Health Observatory Online, 2015). This is due to weak links, lack of targeted information, policy briefs, summaries and dialogue between research institutions and policy makers (Hennink & Stephenson, 2005: 167). While there are multiple strategies of disseminating health research evidence, most data generated from studies in Malawi are presented at international meetings and published in international journals (African Health Observatory Online, 2015). Research outputs on health systems and policy research are available in different forms such as technical reports, theses and dissertations, many of which are hard copies (Salanje, 2011: 7).

1.3 Research problem

A research problem is concerned with an issue void in the literature (Creswell, 2014: 20). Bartunek et al. (2003: 66) long opined that the gap between researchers and policy makers has been widening partly because research has been the domain of academics, many of whom lack knowledge on how to engage policy makers in their activities. Grimshaw et al. (2012: 5) noted that despite the attention to the importance of using health research evidence to address major health issues, to date efforts to have policies grounded in research evidence have yielded limited positive impact.

However, underutilisation of health research evidence presents risks to patient safety and quality of care (Bowen & Graham, 2013: 3).

In Malawi, much health research has been done and results of which have been published and disseminated through local and international peer reviewed journals and fora (Kirigia et al., 2015: 2). Though considered critical in knowledge translation, Malawi has registered little progress in systematic reviews (Makaula et al., 2014: 3). Further, the research dissemination conferences lack meaningful interaction and, collaboration among the National Commission for Science and Technology, Ministry of Health, policy makers, policy implementers, health researchers from academic institutions, health sector organisations, and civil society groups (Kirigia et al., 2015: 2).

The interaction between health researchers and policy makers in Malawi is inadequate as it occurs informally at annual research dissemination conferences organised by the College of Medicine Research Support Centre or the National Commission for Science and Technology with support from donor partners. Attempts to interact and move research from journals into policy-making have yielded limited effects. For example, in 2012 with the support of the World Health Organisation's Evidence Informed Policy Network, knowledge translation platforms were formulated and developed in Africa to further the use of health research evidence and inform the formulation of national health policies (Berman et al., 2015: 2). The head of health research at the Ministry of Health's headquarters in Malawi formed a small multidisciplinary team comprising of health policy implementers, policy makers, multi-disciplinary researchers from health sector organisations, academic institutions and civil society members. The purpose of the multidisciplinary team was to begin discussions on how to enhance the use of health research evidence in national health policies (Berman et al., 2015: 2).

The Medical Department of Kamuzu Central Hospital, one of the country's referral hospitals in Malawi, began improving the quality of care it offers to sick people. Part of the initiative was also to establish the referral hospital as a recognised centre in teaching, operational research and clinical supervision of district hospitals (Agyeman-Duah et al., 2014: 1). In the past, such efforts were short-lived, unsuccessful and little has been documented on their effectiveness in improving the quality of care. Bowen et al. (2009: 93) noted that barriers to knowledge user participation often comes from the policy makers resistance to the use of health research evidence.

While research has not exhausted the problem link between evidence-based research and policy formulation, Oliver et al. (2012) suggest that policy makers' inability to use research evidence relate to costs of accessing research evidence; policy-makers inadequate research skills; policy-makers' lack of time to appraise research evidence; unreliability of research findings; and, the unavailability and lack of access to research. Nutley (2003: 12) posits that the interaction between policy makers and researchers is limited by the divergence of the two worldviews. Policy makers and researchers use different languages and have different priorities, agendas, timescales and reward systems (Sutcliffe & Court, 2006: 3).

In Malawi, policy makers lack supporting infrastructure such as the Internet connectivity, online databases, hardware and software for managing health research evidence (African Health Observatory Online, 2015). Much of the interaction that takes place between researchers and policy makers in Malawi borders on attending conferences, seminars and workshops. This has widened the delink between researchers and policy makers as the literature suggest that such forms of interaction only promotes the delink between research and policy makers partly because of ineffective communication, societal disconnection, inability to absorb research evidence into practice; and the accuracy of the research itself both in terms of the design and methodology (Straus, Tetroe & Graham., 2009a: 165). At these conferences, seminars and workshops much of the health research evidence is communicated in technical language and jargons. Consequently, a communication gap often exists. Sutcliffe and Court (2006: 3) postulate that a consensus among researchers, policy makers and practitioners is that more evidence-based approaches to policy and practice is a positive development. This study seeks to delve into this territory by developing an evidence-based communication and dissemination strategy that can enable the transfer of health research in Malawi from researchers to policy makers within the pragmatic credo of 'what works' in Malawi and not what 'has worked' somewhere else.

1.4 Research objectives

The broad objective of the study was to carry out a review of health research findings at the University of Malawi's College of Medicine and Kamuzu College of Nursing and health policies at the Ministry of Health in Malawi and based on the results, to develop a communication and dissemination strategy to facilitate the use of health research evidence for health policy formulation. The specific objectives of the study were:

1.4.1 To conduct a review of health research and health policies in Malawi;

1.4.2 To ascertain the relationship between health research evidence and policy formulation in Malawi; and,

1.4.3 To develop a communication and dissemination strategy to facilitate the use of health research evidence for health policy formulation in Malawi.

1.5 Research questions

To address the above objectives, the study was guided by the following research questions:

1.5.1 How much health research and what health policies are available in Malawi?

1.5.2 What relationship exists between health research evidence and policy formulation at national level in Malawi?

1.5.3 What communication and dissemination strategy can be developed to facilitate the use of health research evidence for health policy formulation in Malawi?

1.6 Overview of the theoretical framework

This study adopted the Knowledge-To-Action (KTA) theoretical framework. The KTA process has two parts: the knowledge creation cycle illustrating the process of knowledge creation; and the knowledge action cycle illustrating the process of knowledge application (Rycroft-Malone et al., 2016: 221). This framework was chosen because of three areas suggested by Best and Holmes (2010: 150) as being critical in knowledge to action processes, namely, the nature of evidence, leadership, organisational networks and communication. The KTA model emphasises the point of interaction between researchers and policy makers in the communication and dissemination of research results. Knowledge translation results from groups of researchers and policy makers who are connected in ways that facilitate the achievement of a common goal which is the transfer of research evidence into policy formulation. Researchers and policy makers are networked and linked by many types of connections and flows, such as information, materials, financial resources, services and social support (Best & Holmes, 2010: 150). However, KTA suggests that researchers and policy makers can foster research evidence-user adopt system change mainly through interaction that emphasises on the collaboration and co-production of knowledge throughout the knowledge creation–synthesis–application processes.

1.7 Overview of the methodology

This study adopted pragmatism as the underlying philosophical framework. This framework is based on ‘consequences of research’, the problem, and ‘what works’ in real-world practice (Creswell, 2015: 124). In this study the framework was informed by the mixed method approach in which both quantitative and qualitative data were collected. The mixed method approach was chosen in response to the research questions which required both types of data. The convergent parallel mixed method design was chosen as it allowed qualitative and quantitative data to be concurrently collected and the two datasets compared to determine any convergence, divergence or combinations (Creswell, 2014: 213). The study used the embedded or narrative data integration approach to merge qualitative and quantitative data (Teddlie & Tashakkori, 2009: 33; Creswell, 2014: 242). Quantitative data were collected through a closed questionnaire for academics/researchers and a literature search strategy on the *Scopus* database. Qualitative data were collected through interviews with directors at the Ministry of Health and other health research partners. Data were also collected through a self-assessment tool for health research centres and institutes, and a health policy assessment tool. Qualitative data were analysed through summative and narrative content analysis while quantitative data were analysed through inferential and descriptive statistics.

1.8 Contribution of the study

The contribution of the study conveys the importance of the study for different audiences that may profit from reading and using the study (Creswell, 2014: 248). The study seeks to, firstly, provide an assessment of academic output of health research evidence in Malawi. Secondly, the study seeks to gauge levels of health research evidence in formulating health policies. Thirdly, the study seeks to develop an evidence-based communication and dissemination strategy for the transferring health research into policy formulation in Malawi. The study offers reliable information to researchers and policy makers by identifying interventions that are effective for communicating and disseminating health evidence to policy makers in Malawi.

The study intervenes in the way health research findings are communicated and disseminated to policy makers for the purposes of formulating evidence-based health policies. The research seeks to bridges the gap between research and policy formulation by developing an evidence-based communication and dissemination strategy. The communication and dissemination strategy would act as a tool for disseminating health research evidence from researchers to policy makers.

In terms of contribution to the KTA theoretical framework, most of the studies using the theory have been conducted in Canada (Field et al., 2014: 6). Ninety percent of the studies that adopted the KTA theoretical framework were published in peer reviewed journal publications on broader topics such as public health, health promotion, clinical medicines and nurse education (Field et al., 2014: 5). The target audience for the research ranged from the public, health professionals, therapists, educationalists, policy makers, academicians and researchers in universities (Field et al., 2014: 5). The current research is the first of its kind in library and information studies and specifically targets academic health researchers and health policy makers in Malawi. The study ascertains the levels of interaction between health researchers and policy makers.

1.9 Assumptions of the study

An assumption is an accepted cause and effect relationship that estimates the existence of a fact from other existing facts (Leedy & Ormrod, 2010: 6). An assumption is believed to be true even though the direct evidence of its truth is either absent or limited (Pyrczak, 2005: 79). The study was influenced by some of the following theoretical and methodological assumptions:

1.9.1 Theoretical assumptions

The first assumption lies in the *paradigm pluralism,* the belief that a paradigm serves as the underlying philosophy for the use of mixed method in research (Teddlie & Tashakkori, 2010: 8). Paradigm pluralism assumes that the mixed method approach has a variety of philosophical and theoretical stances. The second theoretical assumption is the belief in *multidimensional set of continua, or synchesim,* which is defined as the tendency to regard the research process as continuous with no end (Johnson & Gray, 2010: 70; Teddlie & Tashakkori, 2010: 10). This assumption suggests that integrating numerous research methodologies help in discussing the nature of the research problem, drawing of research questions, research design, data analysis, validity of the inference quality of the research findings (Teddlie & Tashakkori, 2009: 33).

The study takes the ontological position of pluralism which assumes that the ultimate reality of knowledge translation consists of plurality of entities interacting throughout the research process. The study takes the epistemological position that there are multiple routes to translating knowledge from research findings into health policy formulation. Theories predict, explain and influence the desired change and incorporate values into the inquiry but there are multiple routes to embrace the use of health research evidence in health policy formulation. Multiple approaches offset the challenges inherent within one approach which when compared can result in well validated and substantiated approaches to communicating and disseminating health research findings to policy makers.

Theoretically, the KTA framework firstly assumes that there exists interactive research systems in perspective. In the health research systems, knowledge producers (researchers) and users (policy or decision makers) are responsive and adaptive to the research use and outcomes (Graham & Tetroe, 2007: 21). The KTA framework is considered iterative, dynamic and permeable in its approach to knowledge translation. Secondly, the KTA framework assumes that knowledge producers create the knowledge and users focus on the uptake of the new knowledge (Graham & Tetroe, 2007: 21). Throughout, different research users, independent of each other and at different times, try to activate the relationship between knowledge producers (researchers) and users (policy makers). Thirdly, the framework assumes that appropriate relationships exist between researchers and policy makers (Rycroft-Malone & Bucknall, 2010: 210). This assumption suggests that researchers and policy makers value their different roles in generating and using research evidence. This study assumes that knowledge translation results from person-to-environment interaction.

1.9.2 Methodological assumptions

This study adopts *methodological eclecticism* (Yanchar & Williams, 2006: 3; Teddlie & Tashakkori, 2011: 285; Patton, 2015: 153). This assumption suggests that researchers can combine research methods if they are the best tools for answering the research questions. The second assumption assumes that diversity in finding out the truth about something works at various levels of the research enterprise. Methodologically, no one overarching framework exists to guide use of health research evidence in health policy formulation. Instead, multiple methodological approaches to knowledge translation have expounded key and topical communication and dissemination strategies that are of interest to researchers and policy makers on how evidence-based health research can be transferred from researchers to policy makers. The mixed method approach offsets the shortfalls inherent within one method with capabilities of the other; transforms quantitative or qualitative data so that when the results are compared findings are validated and substantiated (Teddlie & Tashakkori, 2009: 33; Creswell & Plano Clark, 2011: 8–11; Creswell, 2014: 214).

1.10 Definition of terms

Definition of terms considers terminologies that the researcher conveys to the readers so that commonly both may understand research issues together (Creswell, 2014: 228). The following definitions are provided in the study to ensure uniformity and consistency of terms:

1.10.1 Communication and dissemination strategy

The phrase ‘communication and dissemination strategy’ is made up of three terms and their meanings as used in the dissertation are as follows:

1.10.1.1 Communication

Communication has been defined as the exchange of information between individuals by means of speaking, writing or using a common system of signs and behaviours (Shiavo, 2007: 3). Communication therefore refers to the use of strategies that inform and influence individuals in using research evidence to inform health policy formulation. Policy makers use limited health information for decision-making partly due to a communication gap between researchers and themselves (Hennink & Stephenson, 2005: 163). The communication and dissemination strategy seeks to explore how research evidence ought to be communicated to policy makers.

1.10.1.2 Dissemination

Dissemination refers to the targeted distribution of information and intervention materials to researchers and policy makers (Schillinger, 2010: 1). The World Health Organisation (2014: 149) observed that various dissemination tools are available to research teams pursuing the uptake of health research findings. The dissemination tools increase the likelihood that health research findings may reach key audiences and increase the chances of research uptake and use in policy-making (World Health Organisation, 2014: 149). The inclusion of the disseminating tool is aimed at guiding the strategy in which one dissemination tool informs the development of another tool.

1.10.1.3 Strategy

Strategy is the art of planning towards a desired end based on the rationality and interdependence of competing forces (*Shorter Oxford English dictionary,* 2007: 3052). A strategy sets out activities and operating structures that an organisation puts in place to deliver value to its clients. The development of a communication and dissemination strategy in this research seeks to consider users, sources, content and medium (Lavis et al., 2003: 222). The study seeks to adopt a strategy for communicating and disseminating health research evidence to inform health care decisions.

1.10.2 Health research evidence

Health research evidence is defined as evidence from qualitative and qualitative health research data assembled, reviewed, and presented by researchers based on some research analysis and recommendations (Brownson, Chriqui & Stamatakis., 2009: 1577). This research is interested in how health research evidence is communicated and disseminated to policy makers to inform health policy formulation.

1.10.3 Policy or decision makers

Policy or decision makers, also referred to as policy makers in this study, refer to individuals with authority to set the policy framework of an organisation and government (*Business dictionary,* 2018). In this research study, all individuals who contribute in health policy-making are considered as policy makers. Their contributions in terms of this study determine the levels of interaction between health research evidence and health policy formulation in Malawi.

1.10.4 Knowledge translation

Knowledge translation refers to a ‘‘… set of activities involved in moving research output from the laboratory, the research journal, and the academic conference into the hands of policy makers who can put it into practice by influencing policy change based on the available evidence’’ (Sharon, Tetroe & Graham., 2009: 165).

1.11 Limitations of the study

Study limitations refer to potential shortfalls identified which may allow other researchers to replicate or expand on the study (Creswell, 2005: 198; Pyrczak, 2005: 79). Study limitations help other researchers judge the extent to which the findings may or may not be generalised (Creswell, 2005: 198). This study was carried out at the College of Medicine, and Kamuzu College of Nursing, constituent colleges of the University of Malawi. By far they are the largest institutions carrying out health research on topical health issues in Malawi. As of the 2015/16 academic year, the College of Medicine had 1,262 government sponsored and undergraduate students, 423 self-sponsored undergraduate and postgraduate students of which only 21 of the 423 were PhD students (College of Medicine, University of Malawi, 2015). Majority of the 21 students are part of the 145 academic members of staff who are engaged in teaching, learning, research and consultancy. As of the 2016/2017 academic year, Kamuzu College of Nursing had 1,098 self sponsored undergraduate students, 72 Masters students and 15 PhD students (Kamuzu College of Nursing, University of Malawi, 2017). The figure of 266 researchers (145 from College of Medicine and 93 from Kamuzu College of Nursing) is relatively small and constitutes a limitation to the study. To mitigate against the limitations, this study adopted a census approach in which a complete enumeration of the population of the study were involved in the study.

Globally studies have indicated that the gap between health researchers and policy makers continues to widen worldwide (Hyder et al. 2010: 73; Uzochukwu et al., 2016: 67; Uneke et al., 2017: 706). Low and middle-income countries face related challenges in bridging the gap between health research and policy makers, coupled with resource constraints. Hence, while the findings from this study may not be generalisable outside of Malawi, they would have relevant implications for similar lower and middle-income countries in Africa and in the developing world, generally.

1.12 Delimitations of the study

Study delimitation is a boundary to which a study was confined (Pyrczak(2005: 79). Delimiting factors in research include: the choice of objectives, the research questions, variables of interest, theoretical perspectives, study location and many others. This study was confined to the Colleges of Medicine and the Kamuzu College of Nursing, University of Malawi. However, the College of Medicine and the Kamuzu College of Nursing, University of Malawi are not the only higher learning institution carrying out health research in Malawi. The Baylor College of Medicine, National AIDS Commission, Dignitas International, Parliament, Lighthouse Trust, the National Commission for Science and Technology are also conducting health research in Malawi. Hence, the study sought to engage Directors of some of the health research institutions to examine further how health research evidence has informed health policy formulation in Malawi.

1.13 Organisation of the research report

The research report is made up of seven chapters. Chapter One address the background to the study. This chapter provides the context of the problem by highlighting the gap between health research evidence and its applicability in health policy-making globally. The background to the study has provides the context in which health research evidence is conducted in Malawi, the challenges and opportunities available to move health research evidence into policy-making in the context of Malawi as a developing country. Chapter Two addresses the theoretical framework. The theoretical framework adopts the pragmatism paradigm which advocates for the credo on ‘what works’. Chapter two has further outlines and justifies the Knowledge-to-Action theoretical framework and how it informs the study. Chapter Three dwells on literature review. The first part of the literature review discusses the thematic areas as expounded by Lavis et al. (2003: 223). The second part of the literature review examines health policy frameworks, models and policy implementation approaches. The third part of the literature review examines the framework for health research dissemination and communication strategy. Chapter Four outlines the study’s research philosophy, design and methods, validity, reliability and ethical consideration issues for the study. Chapter Four also outlines the ontological and epistemological underpinnings of the study. The study adopts the mixed method approach in which the convergent parallel mixed method design is adopted as the anchoring framework design for the study. Chapter Five covers presentation of findings. Presentation of findings combines both qualitative and quantitative approaches as per the research objectives and corresponding research objectives. In the first part of the study, the study seeks to ascertain the existence of health research data and health policies in Malawi formulated parallel with the opening of the College of Medicine and Kamuzu College of Nursing, colleges of the University of Malawi. The chapter ascertains the relationship between health researchers and policy makers. Chapter Six dwells on the interpretation of results and discussion thereof based on the findings presented in Chapter Five, together with insights gleaned from the review of literature. In the final analysis, this chapter presents an evidence-based communication and dissemination strategy based on the findings of the study. Chapter Seven provides conclusions and recommendations, based on the main findings and discussions thereof and provides a general conclusion to the study.

1.14 Chapter summary

Chapter One has laid down the foundation of the study by introducing the concept of knowledge translation and how it has emerged since time immemorial. Critical in the introduction to the study is the fact that the gap between health researchers and policy makers continues to widen over time. Efforts to bridge the gap are needed sooner than later. The background to the study documented the knowledge gap and efforts to bridge the gap. The chapter also highlighted how much health research has been done in Malawi and the challenges the country has faced in this regard. Nonetheless, over the years much health policies have been formulated in Malawi. However, evidence of how much of the research has been used in health policy formulation is not known. The chapter introduced the problem statement, research objectives and research questions. The research was justified, operational terms defined and assumptions presented. Overview of the methodology and theoretical framework were presented and structure of the research report outlined. Contributions of the research to the theoretical framework have also been presented specifically by positioning that the study seeks to contribute new knowledge by way of developing an evidence-based communication and dissemination strategy that may inform the transfer of health research evidence from researchers to policy makers through a pragmatic credo of what works and not what has worked elsewhere. Chapter Two outlines and discusses the theoretical framework of the study.

Chapter 2

THEORETICAL FRAMEWORK

2.1 Introduction

Numerous frameworks, theories, and models have been proposed to explain the role of health research in health policy-making (Estabrooks et al., 2006: 25). The frameworks and theories are grounded in social sciences, organisational behaviour, public health, research utilisation, health policy and health promotion (World Health Organisation, 2012: 7). This chapter discusses the strengths and weaknesses of frameworks related to knowledge translation. The second part discusses the Knowledge-To-Action (KTA) theoretical framework. The last part of this theoretical framework chapter discusses change management models, social interaction theories, educational theories and organisational contexts and how they have informed the KTA theoretical framework.

2.2 Role of theory in research

Fawcett et al. (2001: 117) define a theory as a set of concepts and propositions that describe and link the research together. Coughlan, Cronin and Ryan (2013: 142) define a theoretical framework as an underlying theory pertaining to the specific topic that serves to contextualise the literature review. The research problem to be investigated has roots in several theories developed from different perspectives. The process of structuring a network of theories that directly and indirectly have a bearing on the research topic under study constitutes a theoretical framework (Kumar, 2014: 385). Rycroft-Malone and Bucknall (2010: 30) summarise the role of the theoretical framework in four ways. Firstly, theories inform the development of the research itself and the quality of the research questions. Secondly, theories facilitate the choice of tools, measurement devices and variables of interest to the research. Thirdly, theories guide the choice and the development of interventions during implementation. Lastly, theories facilitate the development of new knowledge, insights and new theories in the specific specialty under study.

2.3 Critical analysis of the knowledge translation models

Sections 2.3.1 to 2.3.7 present some of the strengths and weaknesses of the frameworks on knowledge translation and based on their inadequacies why they could not be adopted for this study.

2.3.1 Promoting Action on Research Implementation in Health Services Framework

According to the framework successful research implementation into practice tallies with the nature of the evidence, the context into which the research is placed, and the methods in which the process is facilitated (Kitson, Harvey & McCormack, 1998: 149). In terms of strengths, firstly, Promoting Action on Research Implementation in Health Services Framework (PARIHS) examines different dimensions of the context of research use that includes facilitation as a factor effecting health research evidence use in practice (World Health Organisation, 2012: 10). Secondly, the framework provides an expansive view of what constitutes health research evidence (Helfrich et al., 2010: 7). However, the World Health Organisation (2012: 10–11) argues that firstly, the framework is unclear on health research evidence use in day-to-day settings. Secondly, the framework does not provide specific tools for measuring variables. Thirdly, the framework does not address knowledge creation as an aspect of knowledge translation. Fourthly, the framework focuses more on clinical setting as opposed to decision and policy-making. Fifthly, few studies have used the framework to design prospective knowledge translation strategies (Helfrich et al., 2010: 7).

An analysis of the studies using PARIHS indicated that out of 24 published papers most of them used the framework as a heuristic tool (Helfrich et al., 2010: 7). Firstly, the PARIHS framework was adopted in the studies as an organising framework for reporting study findings. Secondly, the PARIHS framework was mostly used in framing of the survey instruments. Thirdly, the framework places greater emphasis on the role of the facilitator with less attention on the facilitation process. Rycroft-Malone et al. (2013: 2) further notes that regardless of more published papers using PARIHS, the framework does not acknowledge the role individuals play in the interaction with research evidence and context. Similarly, Ward et al. (2017: 2) identified that only two of the three PARIHS elements (context and facilitation) were important contributors to successful knowledge translation. This suggests that no meaningful studies have comprehensively addressed the implementation of the PARIHS framework.

2.3.2 Ottawa Model of Research Use Model

The Ottawa Model of Research Use (OMRU) consists of six elements, namely, evidence-based innovation, potential adopters, the practice environment, implementation of interventions, adoption of the innovation, and outcomes from innovations (Graham & Logan, 2004: 89). The model is applicable to all levels of the health system, namely, individual, professional, organisation and the national health system. Integral to the model is the assessment, monitoring and evaluation of knowledge translation processes (World Health Organisation, 2012: 12). The model is linear though it is viewed as unidirectional as all the elements influence each other (Graham & Logan, 2004: 89).

In terms of strengths, the model defines key elements in the process of research use (Estabrooks et al., 2006: 25). The World Health Organisation (2012: 12) adds that the model is easy to use. However, the OMRU model has several weaknesses. Firstly, the model focuses on the clinical practice setting and transferring innovations to health policy is challenging (Graham & Logan, 2004: 89). Secondly, the OMRU model requires the validation of data collecting instruments. Thirdly, the model does not provide implementation tools. Fourthly, the model does not address knowledge creation as part of knowledge translation (World Health Organisation, 2012: 12).

2.3.3 Framework for Research Dissemination and Utilisation Model

The Framework for Research Dissemination and Utilisation (RD&U) of health policy and health research evidence was developed to address the need for evidence-based research in public health units and to support public health policies (World Health Organisation, 2012: 14). The framework provides examples of potential types of research dissemination, evidence-based decision-making, research utilisation and outcomes (Dobbins et al., 2002: 149). The use of research in decision-making is influenced by four main factors: innovation, organisation, environment and individual characteristics (Dobbins et al., 2001: 467).

In terms of strengths, the World Health Organisation (2012: 14) states that firstly, the RD&U framework is geared towards policy makers. Secondly, the framework builds on the concepts of innovation, organisation, environment and individual characteristics (Dobbins et al., 2001: 467). Thirdly, the framework recognises the influence of different individual characteristics on the use of research in policy-making. The framework includes the role of researchers and research dissemination (World Health Organisation, 2012: 14). However, the framework has some weaknesses. Firstly, the framework has numerous factors ranging from innovation, organisation, environment and individual characteristics which are complex to integrate. Secondly, limited details are provided on each of the factors, namely, innovation, organisation, environment and individual characteristics (World Health Organisation, 2012: 14). Thirdly, the framework does not provide tools on the use of health research evidence in policy-making (World Health Organisation, 2012: 14).

The framework fell short of being adopted for the study partly because research dissemination has been criticised as a passive engagement with policy makers. Interaction in the form of dialogue or round table with policy makers informs knowledge translation of health research findings to policy makers.

2.3.4 The Consolidated Framework for Implementation Research Model

The Consolidated Framework for Implementation Research (CFIR) was developed to address the transfer of successful research intervention into practice (Damschroder et al., 2009: 1). The CFIR consists of five main domains (Varsi et al., 2015: 2). Firstly, there are the interventions needed to transfer and adapt research usage into an organisation. Secondly, there are the economic, political, and the social context within an organisation. Thirdly, research transfer into practice requires good organisational culture and leadership engagement. Fourthly, individual characteristics, their self-efficacy, knowledge and beliefs about the intervention itself counts towards research transfer into practice. Lastly, the processes of implementation in relation to planning, evaluation and reflective practices are useful in research to practice interventions.

CFIR has some strengths and weaknesses. The framework addresses components and factors on the use of research in policy-making (World Health Organisation, 2012: 16). The framework is grounded in theories that identify constructs based on empirical data. The framework provides definitions for each construct (World Health Organisation, 2012: 16). However, the CFIR framework is complex and the implementation plan is not outlined. The framework has not been widely tested and validated. The framework addresses the implementation of innovations but not the use of health research in policy-making. The framework focuses on implementation at the organisational level as opposed to the country level. The tools to facilitate implementation are not provided. A study by Varsi et al. (2015: 7–8) noted that CFIR is a helpful framework for illuminating barriers and facilitators influencing research evidence implementation. However, CFIR limits its usefulness as an implementation framework as it does not discriminate between the constructs (World Health Organisation, 2012: 16).

The framework identifies barriers to knowledge translation which were of interest to the study. However, other than barriers the framework is inappropriate for the study as knowledge translation goes beyond organisation culture and leadership engagement. Knowledge translation is about deliberate efforts to engage policy makers by way of interaction.

2.3.5 Assessing country level efforts linking Research To Action

Lavis (2006: 59) developed a framework to assess country-level efforts to Linking Research To Action (Linking RTA). Efforts to link research to action, has four elements (World Health Organisation, 2012: 20). Firstly, there are push efforts which involve tailoring the messages by researchers for policy makers (World Health Organisation, 2012: 20). These include: developing websites and databases dedicated to community-university partnerships. Secondly, there are pull efforts which involve developing rapid-response units such as integration of research evidence into strategic goals and values. Thirdly, there are exchange efforts in which researchers and research users build partnerships in setting research priorities, conduct research and link it to action. Fourthly, there are linkage efforts which involve conducting dialogues between researchers and policy-making (Lavis, 2006: 59; Lavis et al., 2006: 620).

The framework has the following strengths. It takes a holistic view of the use of research evidence in policy-making (World Health Organisation, 2012: 20). The framework provides examples from all types of country settings and contexts (World Health Organisation, 2012: 20). The framework provides interventions that policy makers can utilise to enhance the use of research evidence.

Linking RTA provides the support from the environment linking research to action, research production, ‘push’ strategies, and ‘user pull’ factors (Oxman et al., 2009: 2). Linking RTA provides an assessment tool that countries can use to identify areas that need improvement. The major weaknesses are that the framework lacks empirical support (Lavis et al., 2003: 621). Linking RTA does not indicate which of the elements provide the biggest influence on the use of research in policy-making. The framework does not provide specific tools to assist in implementing interventions.

The framework was only used to provide elements which were useful in the research centre/institutes assessment tools. The assessment tool identified the enabling environment in assessing the use of health research in policy-making. However, the emphasis in knowledge translation lies in deliberate efforts to interact with policy makers by way of engagement in problem identification, conducting research together and identifying outcomes that may influence policy-making.

2.3.6 The Canadian Health Services Research Foundation Self-assessment tool

The Canadian Health Services Research Foundation (CHSRF) developed an assessment tool that looks at organisational capacity for research use. CHSRF's assessment tool was developed based on focus groups. The tool assists in generating organisational discussions about how to use health research (World Health Organisation, 2012: 21). Thornhill, Judd and Clements (2009: 22) suggest that four areas in the tool are critical. These are: acquiring of research evidence; assessing the available evidence; format of presenting and adapting the research and; how to apply the research evidence in decision-making.

The strengths of the CHSRF framework are that the tool has been validated and demonstrates good usability and strong response variability (Kothari et al., 2009: 5). The tool provides a useful starting point for discussions in organisations about research use. The tool can serve as an overall guide utilising research evidence in decision-making. Major weaknesses of the CHSRF are that the user tool is less useful in the government sector, which affects applicability to policy makers and health systems (Kothari et al., 2009: 5). The tool does not provide interventions for organisations to address institutional gaps (World Health Organisation, 2012: 21).

In this research, only the assessment part of the tool was used as part of data triangulation. Parts of the assessment tool included the question of health research (how health research centres acquire research evidence); knowledge production (how research centres assessing the available evidence); knowledge translation (how research centres format and adapt the research evidence); and, promoting the use of health research evidence (how research centres apply the research evidence in decision-making).

2.3.7 The Research and Policy in Development Model

The Overseas Development Institute (ODI) developed the Research and Policy in Development (RAPID) model (Nash, Hudson & Luttrel, 2006: 2). The framework was developed to understand the dynamics of knowledge translation in the policy realm in developing countries (World Health Organisation, 2012: 18). Jones (2011: 10, 12) noted that the RAPID model includes four aspects: the political context, characteristics of the evidence, links between policy and research communities, and external influences.

The political context greatly influences the link between research and policy (World Health Organisation, 2012: 18). Factors to consider in the political context include: civil and political freedoms, institutional pressures, vested interests, power relations, attitudes and incentives (Jones, 2011: 10). The characteristics of the evidence centres around the quality of the research, the relevance of the topic, and the solutions associated with the research (World Health Organisation, 2012: 18). Other components emphasise the importance of network links between research and policy communities (Jones, 2011: 12). There are also external influences on research uptake bordering on socio-economic and cultural factors.

The framework is a useful analytical tool to understand the knowledge translation framework. Based on its strengths, the RAPID framework addressees the knowledge-to-action gap (World Health Organisation, 2012: 18). Examples and tools associated with this model have been developed and tested (Jones, 2011: 10). The RAPID model focuses on country level efforts to link research to action. The model is multidisciplinary in nature. However, the model and the supporting tools do not have a broader appeal to all types of contexts, climates, and countries.

The framework was very useful in identifying policy frameworks and the role of various vested interests such as civil society organisations, pharmaceutical industries, board members, and the role of politicians in health research evidence use and adoption. However, the framework could not be adopted for the study because it lacks the critical element which is the interface between health researchers and policy makers. Knowledge translation is about the interaction between researchers and policy makers.

2.4 The Knowledge-To-Action Theoretical Framework

The KTA framework was adopted for this study because it was intended to be used by a wider range of users of knowledge (White & Dudley-Brown, 2012: 36). Graham et al. (2006: 19) conceptualised the KTA process as complex and dynamic, with no definite boundaries between the two components and their phases. The phases may occur simultaneously, and may influence each other.

2.4.1 Justification for the Knowledge-To-Action Framework

KTA was developed to help in making sense of knowledge translation (Graham & Tetroe, 2007: 20). The framework integrates concepts of knowledge creation and action. The action component of the framework was derived from a synthesis of planned action models (Rycroft-Malone & Bucknall, 2010: 210). Synthesis of the literature indicates that the KTA framework originates from 31 planned action theories. Out of the 31 planned theories 27 (87%) target practice, 7 (22%) target research while 5 (16%) target theories (Graham & Tetroe, 2007: 20). The KTA framework is considered as a planned action theoretical framework as it directs most of its activities to action in moving research from theory to practice. Field et al. (2014: 5) highlighted that five taxonomies exists on how the KTA framework is used. Table 2.1 shows the five taxonomies on how the framework has been used.

Table 2.1: Taxonomies on how the KTA Framework is included in various studies

Category	**Definition**	**Quantity**	**Percentage**
Integrated	The KTA Framework was integrated in the design, delivery & evaluation of the implementation activities.	10	7%
Directed	The KTA Framework influenced the project design but with no specific examples given.	18	12%
Adapted	The KTA Framework had been modified or blended with another theoretical framework.	17	12%
Informed	The KTA Framework influenced the study in a general and in some cases part of the chapters	39	27%
Referenced	The KTA Framework was cited with little or no further explanation.	62	43%
Total		146	100%

Source: Adapted from Field et al. (2014: 4)

Table 2.1 summarises the way the framework has been integrated in various studies. The table indicates that various studies have used the KTA framework differently from simply referencing to full integration of the framework. However, 62 (43%) of the studies conducted simply cited the framework in their research papers. Many of the studies were conducted in Canada, one each in Africa and Denmark. This suggests that studies in Africa using the framework are rare and have not been well documented. This study bridges the gap on the use of the framework in Africa.

Field et al. (2014: 6) also noted that 90% of the studies were published in peer reviewed publications. Further, the implementation studies were different with two (20%) on public health or health promotion; three (30%) on clinical medicines or nurse education while the reset were on specific diseases such as stroke. Table 2.2 shows how the research focus, targeted audience and part of the framework was used.

Table 2.2: Characteristics of studies using the KTA Framework in the integrated way

Authors, date of publication	Country	Research focus	Targeted audience	Part of the framework
Bjork et al. (2013)	Denmark	Nursing education	Academic	KC[2]/AC
Claude et al. (2012)	DRC* [1]	Health promotion	Women in health clinics	AC[3]
Hua et al. (2012)	Canada	Public health	Health and policy makers	KC/AC
Petzold et al. (2010)	Canada	Occupational health	Occupational Therapists	KC/AC
Russell et al. (2010)	Canada	Health rehabilitation	Physiotherapists	AC
Stacey et al. (2009)	Canada	Nursing education	Academic	KC/AC
Straus et al. (2008)	Canada	Clinical mentorship	Academic mentors	KC/AC
Tugwell et al. (2007)	Canada	Clinical medicine	Health care consumers	KC/AC

Source: Adapted from Field et al. (2014: 6)

The target audience for the research ranged from the public, health professionals, educationalists, policy makers, academicians and researchers in universities. This suggests that the current study may be the first of its kind in library and information studies specifically targeting the use of health research evidence in health policy formulation in developing countries.

Critics of the KTA have argued that the framework is geared more towards the clinical setting and not the policy context (World Health Organisation, 2012: 13). Secondly, that the framework represents a decision-making process and builds on planned action theories as opposed to addressing efforts that a health system needs to support knowledge translation. Thirdly, that the framework does not portray the complexities to be considered when instituting a system change.

Regardless of the suggested shortfalls, the framework provides a review of the stages necessary for reviewing how research evidence knowledge can be transferred from research to practice. For example, the framework presents a picture of knowledge translation as it includes the knowledge creation process and the tailoring of new knowledge for different user groups (Graham et al., 2006: 20). Secondly, the framework is considered dynamic in nature and illustrates the process in which organisations make decisions and implement research-based knowledge. Thirdly, the framework considers the importance of adapting knowledge to the local context. Fourthly, the framework is considered easy to use in understanding the processes of research evidence use in practice.

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[1] DRC* refers to the Democratic Republic of Congo
[2] KC refers to the Knowledge Creation
[3] AC refers to the Action Cycle

2.4.2 Stages of the Knowledge-To-Action Theoretical Framework

The KTA process has two parts: the knowledge creation cycle illustrating the process of knowledge creation; and the action cycle illustrating the process of knowledge application (Graham et al., 2006: 19). The knowledge creation cycle is positioned within the action cycle. Figure 2.1 shows the KTA Cycle Model.

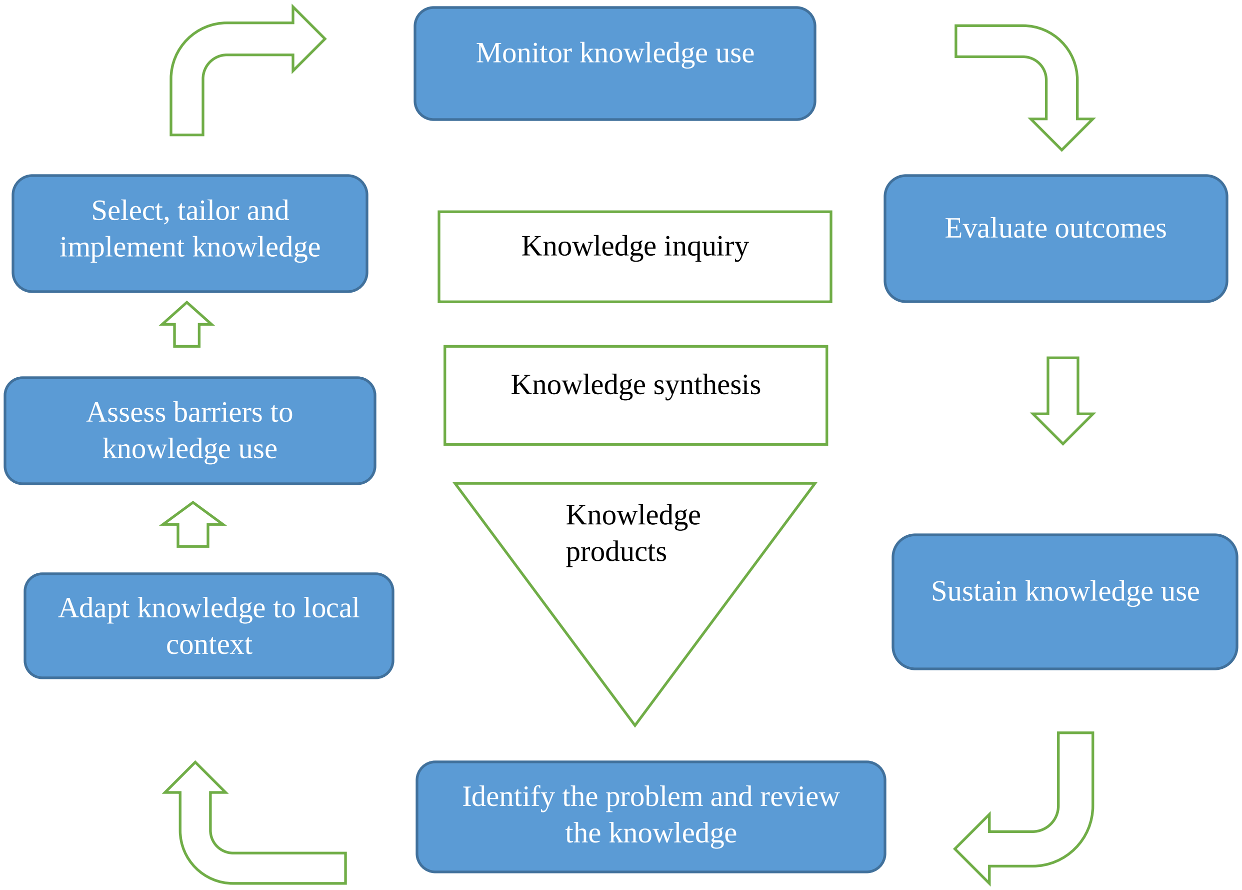

Figure 2.1: Knowledge-To-Action Cycle Model Graham et al. (2003: 9)

2.4.2.1 The knowledge creation cycle

Knowledge creation represents the process through which knowledge is refined, distilled, and tailored to the needs of end users such as policy makers (Straus, 2009: 13; Petzold et al., 2010: 169). Four processes are said to inform knowledge creation, namely, socialisation, internalisation, externalisation and combination (Alipour, Idris & Karim, 2011: 62). The processes of knowledge creation are embedded in several fields such as sociology, psychology, technology innovation, information technology and many others. Regardless of the processes, the knowledge creation triangle has three segments (Graham et al., 2006: 19). These are:

Step 1: Knowledge inquiry
Step 2: Knowledge synthesis
Step 3: Knowledge products

2.4.2.1.1 The knowledge inquiry

Much health research is produced every year and the majority of this research is stored in databases (Straus, Tetroe & Graham, 2009b: 3). In a quest to address an information need, knowledge inquiry directs users to databases. The critical shortfall lies with the inability for users to use research evidence to inform decision-making (Glasziou & Haynes, 2005: 5). Passive diffusion of research information through access to journal articles has over the years created awareness of the availability of health research evidence. However, the use of passive diffusion has been criticised as being ineffective when used for knowledge translation of health research evidence (World Health Organisation, 2006: 6).

The knowledge inquiry stage informs this study. The study sought to conduct a search for health research in both local and international databases. With support from Elsevier[4], the study searched health research evidence from the *Scopus*[5] database. *Scopu*s was opted for because it is fully subscribed to and supported by the University of Cape Town (UCT) where the study which is being reported on is registered. The purpose was to ascertain levels of health research production in Malawi.

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[4] Elsevier is a global information analytics and major provider of scientific, technical, and medical information (Elsevier, 2018).

[5] *Scopus* is Elsevier's abstract and citation database that covers nearly 36,377 titles from 11,678 publishers, of which 34,346 are peer reviewed journals in subject fields in Life Sciences, Social Sciences, Physical Sciences and Health Sciences (Elsevier, 2018).

2.4.2.1.2 The knowledge synthesis

Knowledge synthesis is concerned with the context and integration of research findings of individual studies on a topic such as systematic reviews (Grimshaw et al., 2012: 3). While systematic reviews have promoted the use of health research evidence their validity has continued to raise several scholarly debates. Systematic reviews provide health research evidence but do not determine its usage (Sharon, Tetroe & Graham, 2009: 165).

Knowledge synthesis through systematic reviews address many shortfalls some of which are highlighted by Young et al. (2014: 344–346). Knowledge synthesis addresses the risk of bias of the publications; the quality of research evidence by examining the directness of the research evidence and the precision of the results, and the involvement of stakeholders.

Young et al. (2014: 345–346) noted that knowledge synthesis processes have challenges. Grey literature is not published by many organisations and takes the form of reports, conference proceedings, theses and dissertations. Most of the grey literature is not peer reviewed and is time consuming to access and requires complex search queries often not available in Google. Knowledge synthesis products have language biases as many systematic reviews exclude non-English publications. The search strategy optimisation is complex for knowledge synthesis products because of the compromise between controlled vocabulary and natural language. There is lack of consensus on the best methodologies for determining updated knowledge syntheses products. The knowledge synthesis stage informs this study. This study examines the use of grey literature in policy documents by reviewing health polices in Malawi.

2.4.2.1.3 The knowledge products

The knowledge products consist of knowledge synopses such as working documents, research report and journals (Fisher et al., 2003: 17-18). Knowledge products provide recommendations to meet policy makers’ information needs. Knowledge products facilitate the uptake and application of research knowledge. Knowledge synthesis provides evidence for knowledge products such as policy briefs (Sharon, Tetroe & Graham., 2009: 166). The study seeks to examine the use of policy briefs in Malawi. The assessment tool in this study assessed the use of health research evidence in health policies. The goal was to identify the use of knowledge products such as policy briefs in knowledge translation.

2.4.2.2 The Knowledge action cycle

The KTA cycle encompasses processes needed to implement knowledge in health care settings (Graham et al., 2006: 18). These processes include:

Step 1: identifying problems and the relevant research
Step 2: adapting the research to local context
Step 3: assessing barriers and facilitators to knowledge use
Step 4: selecting, tailoring and implementing knowledge
Step 5: monitoring knowledge use
Step 6: evaluating the impacts of using the knowledge
Step 7: determining strategies for sustaining knowledge usage

2.4.2.2.1 Identifying the knowledge to action gaps

An assessment tool determines the gap between the current and the desirable outcomes (Watkins, Meiers & Visser, 2012: 5). An assessment tool determines the purpose, type of data, available resources and the methods of measuring data (Kitson & Straus, 2009: 61). Watkins, Meiers & Visser (2012: 25–26) argue that an assessment tool has several advantages. The tool provides a process which guides the decision-making processes. The tool provides a justification for decisions through priorities identified and the choice of actions selected. The tool provides a perspective of the decision-making and allows interdisciplinary solutions to the problems. However, an assessment tool has disadvantages as time constraints can limit the length and details obtained (Watkins, Meiers & Visser, 2012: 26). This study used an assessment tool to ascertain institutional readiness in translating knowledge from health research.

2.4.2.2.2 Adapting knowledge to local context

Local adaptation refers to the facts, concepts, beliefs and perceptions used by local people to reflect and interpret the world around them (Wu, 2014). Wu adds that local adaptation reflects the way local people observe, measure and reflect on their surroundings, solutions and coping strategies. Although systematic reviews and policy briefs provide evidence in a more usable form, their adaptation lies in identifying the skills and expertise to implement recommended actions (Harrison, Graham & Fervers, 2009: 73).

How health research knowledge is adapted to the local context informs the current study. Many countries now have National Health Service institutions to support health research, systematic reviews and policy briefs production. Through the use of a questionnaire for academics and researchers and interviews with policy makers, this study sought to examine how local context has enabled the use of health research evidence in the policy context.

2.4.2.2.3 Assessing barriers and facilitators to knowledge use

Grimshaw et al. (2012: 4) summarise barriers to knowledge translation as including financial disincentives; inappropriate skill mix; lack of facilities and equipment; lack of knowledge, attitudes, skills; and, inability to process information and interact with each other. Studies show that interventions in knowledge translation are more effective if they target determinants of behaviour such barriers and facilitators (Grimshaw et al., 2012: 5). Methods of assessing barriers and facilitators to knowledge include data collection through interviews, questionnaires and statistical analysis (Legare, 2009: 85). The current study assessed barriers to research knowledge use. The study used interviews, a questionnaire and a self-assessment tool to obtain information from researchers and policy makers on barriers to use of health research in health policy formulation.

2.4.2.2.4 Selecting, tailoring and implementing knowledge interventions

The aim of selecting, tailoring and implementing knowledge interventions is to increase research evidence use in health policy formulation. Systematic reviews show that passive dissemination of information has little effect in changing behaviour towards research evidence use (Grimshaw et al., 2001: II2). Makkar et al. (2016a: 321) present some reasons based on individual, external and organisation factors. Individually, there exist gaps in skills in accessing, appraising, interpreting and applying research evidence. Limited value is placed on using research evidence in policy-making. Externally, opinions and interests clash with recommendations proposed in evidence-based research. Similarly, most of the research recommendations are not actionable to be applied within the local context. Organisation arrangements suggest that there exists the absence of systems, resources and processes to help policy makers use research evidence in policy-making. Likewise, is the absence of a culture that values research use and skills supporting research use in policy-making

Wensing, Bosch and Grol (2009: 95) observed that knowledge interventions on the use of educational programmes, lectures, conferences, questionnaires have positively influenced the use of health research evidence. However, it is argued that passive dissemination of research evidence through written guidelines, workshops, lectures and conferences have little effect in transferring health research evidence (Wensing, Bosch & Grol, 2009: 95). Instead it is alleged that active interventions in the use of health research evidence such as the use of opinion leadership, educational outreach visits, self-study materials and interactive websites are more effective (Wensing, Bosch & Grol, 2009: 95). Professional interventions identified in literature suggests the use of reminders, decision support informatics, audit and feedback, and knowledge brokering (Grimshaw et al., 2012: 10-12). The current study identifies barriers to the use of health research evidence. It enquired from academics and researchers how effective have the interventions they use been in informing knowledge translation of health research findings into policy formulation. The outcome of various interventions informed the designing of the communication and dissemination strategy for the current study.

2.4.2.2.5 Monitoring knowledge use

Makkar et al. (2016a: 321) identify four levels of research use, namely, instrumental research use, conceptual research use, tactical research use and imposed research use. In instrumental use, the research is informed by the policy direction itself and policy makers make direct reference to the research that influenced the decision. In the conceptual use, policy makers make direct reference to the research evidence that informed their understanding of policy. In tactical research use, the research use is directed at the targeted and peripheral stakeholders. Lastly, in the imposed research use, research evidence is mandated by the organisation, and is regarded as the best practice for the organisation. Straus, Tetroe and Graham (2009a: 166) observed that strategies for evaluating knowledge include interviews, surveys, focus groups, clinical trials and many others. However, little has been documented on monitoring of health research evidence from researchers to policy makers. The current study explored research use in policy statement in Malawi.

2.4.2.2.6 Evaluating knowledge use

Lavis et al. (2006: 622) identify four models that have defined knowledge evaluation. Firstly, are push efforts in which the researchers act as purveyors pushing research use towards policy makers. Secondly, there are pull efforts in which policy makers act as purveyors pulling knowledge from researchers. Thirdly, there are exchange efforts in which researchers exchange their knowledge with policy makers through conferences, workshops and seminars. Fourthly, there are integrated efforts in which researchers and policy makers integrate their efforts in creating knowledge translation platforms for sharing of research information. Research suggests that pull efforts are being replaced by push, exchange and integrated as they place more emphasis on researchers and not policy makers to advocate for the use of health research evidence (Lavis et al., 2003: 223).

The evaluation of knowledge use informs this study. The researcher assumed that once health research has been disseminated the results are adopted and used in policy formulation. This study examined the role of health research evidence and how it has informed health policy formulation in Malawi.

2.4.2.2.7 Sustaining knowledge use

The process of sustaining knowledge use involves several aspects such as dissemination, communication, knowledge management, knowledge utilisation and interaction between researchers and policy makers. Sustained knowledge use depends on the ability of users and organisations to adapt to change. Davies and Edwards (2009: 240–241) identify six factors that may influence sustainability of health research, namely, health needs and expected benefits; effectiveness of the system to monitor progress; adaptability and alignment of the improved process; multi-level and collective leadership; financial and human resources; and, community stakeholder support. This study has looked for strategies adopted by researchers and policy makers to sustain the use of knowledge from health research and how knowledge from research is considered in the health policy formulation. It explored how knowledge generated from such studies has been sustained and continues to inform health policy in Malawi.

2.4.3 Knowledge-To-Action frameworks and models through change management

Theories of change have explained how knowledge translation is influenced by change management (White & Dudley-Brown, 2012: 50). Sections 2.4.3.1 to 2.4.3.4 outline how change management influences the use of health research evidence.

2.4.3.1 The Force Field Analysis Model

The Force Field Analysis views change as a dynamic balance of the driving and restraining forces working in opposite directions within an organisation (White & Dudley-Brown, 2012: 50). The driving forces promote change while the restraining forces inhibit change. In relation to knowledge translation, McConnell (2010: 365) describes two major categories of resistance to change in relation with knowledge translation. The first resistance concerns disturbance to the status quo especially when it leads decision makers to the unfamiliar territory of research evidence. The second concerns intellectual shortcomings to conceive possibilities beyond the boundaries of what is known. The Force Field Analysis model informs this study. The focus for change in health policy is to facilitate professional intervention that brings research evidence to the point of decision-making. Reminders, decision support, audit and feedback, and knowledge brokering are said to have facilitated linkage between researchers and decision makers (Grimshaw et al., 2012: 7-8). However, it is suggested that structural inertia, resistance from work groups, and inability to manage change have contributed to failure to use health research evidence.

2.4.3.2 The Change Model

Lippett's Model of Change concentrates on the role of the leadership in the change process. The model is concerned with developing the need for change; establishing change relationship; clarifying assessment for change and the required resources; establishing goals and action plans; examining the alternatives; transforming intentions into actual change; generalising and stabilising the change (White & Dudley-Brown, 2012: 51). In relation to knowledge translation, leadership bridges the knowledge to practice gap through "push," "pull," and "exchange" efforts (Lomas, 2000: 239). This model informed the current study. Straus, Tetroe and Graham (2009b: 3) suggest that there is need for a top down approach to revise the health and researchers' professional roles and develop a special purpose multidisciplinary team capable of implementing health research evidence. These approaches include encouraging feedback from rank and file staff in research evidence use (Straus, Tetroe & Graham, 2009b: 4–6). The model encompasses change management and develops cultural change and empowerment programmes to support knowledge translation of research findings into practice. However, it is suggested that poor communication of health research evidence has affected change management and knowledge translation in general.

2.4.3.3 The Transtheoretical Model of Change

The Transtheoretical Model of Change comprises of five stages (Prochaska & Velicer, 1997: 38). The first stage, precontemplation, indicates no plan to adopt health research evidence in the foreseeable future. The second stage, contemplation, suggests the intent to adopt in near future. The third stage, preparation, suggests intention to adopt within a short period. The fourth stage, action suggests that the organisation has been using behavior for the past few months. The last stage, maintenance, suggests that the researcher and policy maker have actively been working to maintain the behavior. This model informed this study. In relation to knowledge translation the model suggests that movement from precontemplation to contemplation involves changes in knowledge and attitudes guided by specific strategies such as continuing education, educational outreach, exposure to consensus statements, performance feedback, provision of resources, reminders and prompts (Straus, Tetroe & Graham, 2009b: 9). The model also suggests that there is need to involve change agents such as knowledge brokers, opinion leaders, social marketers and communication experts to transfer information between researchers and policy makers.

2.4.3.4 Research Implementation Model

Lomas (1993: 226) proposed the Research Implementation Model that outlines the overall practice to capture the competing factors of influence to the implementation processes. The model suggests that approaches used to translate knowledge should consider the views, activities, and available implementation instruments of at least four potential groups, namely, community interest groups, administrators, policy makers, and clinicians (Brindley et al., 2009: 2). Although the influences on the use of research from these groups are exerted through different venues, they form a system and the sum of their effects is greater than their parts. This model holds that individuals and groups can influence practitioners’ decisions. The model helps increase awareness of factors to be taken into consideration in the implementation effort within the knowledge translation processes

(Sudsawad, 2007: 1). The model informed the current study and explored the bottom up and the top down approaches to policy implementation in Malawi.

2.4.4 Knowledge-To-Action through social interaction

Cognitive theorists have suggested that determinants of health research behaviors include the understanding of the use of research evidence (Hutchinson & Estabrooks, 2009a: 289). Knowledge translation researchers are applying cognitive psychology theories to inform research design and interventions capable of influencing the adoption of health research evidence in health policy formulation. Knowledge translation as social interaction process and knowledge exchange between researchers and healthcare professionals happen within a social context (McWilliam et al., 2009: 2; Thomas et al., 2014: 3). Three theories have been suggested as contributing to the process of integrating health research evidence into practice, namely, the Social Constructive Theory, the Social Cognitive Theory and the Theory of Planned Behavior. Sections 2.4.4.1 to 2.4.4.3 discuss these theories.

2.4.4.1 Social Constructive Theory

The Social Constructive Theory suggests that the meaning of research is constructed by the user and casts the user as an active problem solver and a constructor of own knowledge, rather than a passive receptacle of information (Vygotsky, 1978: 98). The theory argues that knowledge is a human construction and that the learner is an active participant in the learning process. KTA framework is a social interaction framework grounded in the use of a local context and culture in translating knowledge. The Social Constructive Theory enhances the understanding of individuals and on how they integrate and apply new research knowledge in decision-making (Thomas et al., 2014: 3). The theory assumes that behaviour is determined by incentives and expectations are related to situational outcomes (Bandura, 2006: 164–165). The shortfall with the theory is that it has not been applied in knowledge translation. In relation to knowledge translation, the Social Constructive Theory informs the current study as learning is a social process that happens when individuals interact socially. However, knowledge claims are subjective as knowledge is a human construct (Berger & Luckmann, 1991: 154). Using a questionnaire, the current study sought to explore the levels of interaction between researchers and policy members.

2.4.4.2 Operant Conditioning Theory

The Operant Conditioning Theory suggests that positive feedback such as rewards and incentives encourage repetition of the respective behavior, while negative feedback discourages certain behaviours (Strohacker, Galarraga & Williams, 2014: 92). Interventions underpinned by operant conditioning theory include feedback mechanisms that encourage and discourage behaviour (Hutchinson & Estabrooks, 2009a: 288). The operant conditioning theory informed this study. The theory suggests that researchers and policy makers engage in research activities that are rewarding. Similarly, where policy-making is involved, researchers participate if there is a positive incentive attached. The shortfall with this theory is that the positive reinforcement cannot be a continuous process. The theory does not acknowledge active human agency such as intentionality, forethought and self-reactiveness to use research evidence (Bandura, 2006: 164–165). The theory does not explain how researchers and policy-makers make procedural decisions on the use of health research evidence (Hung, 2013: 365). This theory informed the current study. Researchers are influenced by incentives and rewards to conduct research and publish in peer reviewed journals. Similarly, researchers need rewards or incentives to perform knowledge translation activities. Through the self-assessment tool this study sought to explore the incentives and rewards associated with knowledge translation activities.

2.4.4.3 Cognitive Continuum Theory

The Cognitive Continuum Theory claims that decision-making exists on a continuum from analysis to intuition at opposite poles on the continuum and assumes that judgment is a joint function of task properties and cognitive processes (Hammond, 2000: 8–10). The theory is useful in knowledge translation as decision-making in situations of uncertainty improves when scientific evidence is equivocal. The theory guides this study. The learning style, learning conceptions, and the use of communication channels depend on the users' mental capacities and ability to sift information. The Cognitive Continuum Theory encourages the use of various information delivery methods to individual needs. The knowledge domain, knowledge innovation and cognitive competences require a lot of thinking and decision-making (Dhami & Thomson, 2012: 318). It is argued that a mix of professional skills in the organisation is critical to communicating health research evidence for the purposes of informing health policy formulation. The shortfall with the theory is that does not specify how a researcher and a policy maker ought to think intuitively and analytically in using knowledge from research evidence. The communication and dissemination strategy largely depends on researchers and policy makers learning styles, conceptions and use of communication and dissemination strategies. The questionnaire in this study engaged researchers on how they deliberately use certain channels of communication to inform policy makers of the new health research evidence.

2.4.5 Knowledge-To-Action through educational interventions

Knowledge deficits have been used to surround use of health research evidence. Educational theories are useful in moving knowledge to action (Hutchinson & Estabrooks, 2009: 206). Sections 2.4.5.1 to 2.4.5.2 discuss learning styles and learning theories.

2.4.5.1 Learning styles

Educational theories identify three broad areas of learning, namely, the cognitive, affective and the psychomotor domains (Adams, 2015: 152). The cognitive domain involves the acquisition of academic knowledge through training considered critical in the training of health researchers. Training in knowledge translation include didactic lectures, academic detailing and computer based modules (Stuart, Tondora & Hoge, 2004: 111). The affective domain involves the learning of attitudes, values and beliefs (Hutchinson & Estabrooks, 2009: 209). Critical in moving knowledge to action include role play, use of case studies, group interaction and simulation. The psychomotor domain involves skill acquisition, development and the use of interventions involving demonstrations to develop mastery skills (Stuart, Tondora & Hoge, 2004: 111).

Learning styles among health researchers involves activist, reflective, theoretical, and pragmatic styles (Lewis & Bolden, 1989: 187). Active learning stylists suggests that researchers and policy makers, for example, like new experiences but quickly abandon innovations. Reflective learning stylists suggest that researchers and policy makers consider all options available before accepting the change to the status quo. Theoretical learning stylists suggest that policy makers may require personal analysis and thought-making before accepting the suggested knowledge change. Pragmatic learning stylists may target research users, however the research users, prefer to adopt research evidence-based on practical experience with the evidence itself. It is argued that learning styles of health researchers ought to be considered when designing knowledge to action interventions.

KT Clearinghouse (2016) suggested some of them: the perception that the health research evidence cannot be experimented as the evidence lacks global basis; the perception that the health research evidence is not consistent with one’s own approach; the perception that the health research evidence is difficult to understand and to put into use; and, lack of visible results in using the research evidence. Learning styles informed the current study by exploring barriers that affect the use of health research evidence. This study weighed on the levels of research evidence trusted by the researchers and how they get to know about the evidence. The study also explored the use of local research evidence and how it has informed policy formulation in Malawi.

2.4.5.2 Learning theories

Merriam et al. (2007: 277) examined five perspectives of learning theories, namely, behaviourists, cognitivists, constructivists, humanists and social learning theorists. Mann (2004: 24) argues that learning theories relate to knowledge translation in three ways. Theories improve practice and outcomes in health research. Theories improve learning and support the maintenance of certain competences in knowledge translation.

Behaviourists have looked at learning as a change of behaviour, measurable in a form of a response to a stimulus in the environment. Behaviourists suggest that learning occurs through formal or informal training sessions. In contrast to behaviourism, the humanistic orientation emphasises human nature, potential, emotions and affect. Learning is looked at as the function of motivation, choice and responsibilities (Merriam et al., 2007: 294). In contrast to behaviourists, cognitivists interest is in how the mind makes sense out of the stimuli in the environment and process, store and retrieve research evidence. The social cognitive orientation focusses on learning that occurs through observations in the environment. Learning becomes the product of the interaction of the person, the environment and the behaviour (Merriam et al., 2007: 297). The processes of modelling and mentoring are critical elements of the social learning theories. Constructivism on the other end represents an array of perspectives and posits that the learner can construct own knowledge from their experiences. Learning theories informed this study.

2.4.6 Knowledge-To-Action through organisational context

Organisational context suggests that Knowledge-To-Action use increases through scholarly work and evidence informed management (Denis & Lehoux, 2009: 215). Sections 2.4.6.1 and 2.4.6.2 discuss organisational learning and organisational capabilities.

2.4.6.1 Organisational learning

Quinn, Anderson and Finkelstein (1996: 72) present four levels from which organisation learning is based: the cognitive knowledge surrounding the medical discipline achieved by health professionals through extensive training and certification; the advanced skill translated into execution of knowledge learned; systems understanding embedded in the cause and effect relationships underlying the medical discipline; and, the self-motivated creativity consisting of the will, motivation, and adaptability of health research evidence. It is suggested that researchers and policy makers lose their knowledge advantage through complacency.

Organisations can stimulate connections in decision-making and incorporation of research evidence in their daily business. Denis and Lehoux (2009: 216) postulate that many organisations underperform with respect to research knowledge use based on arguments that: experts and research knowledge use cannot be dissociated as each empowers the other; research knowledge is affected by internal and external factors; codified research knowledge plays a role in organisational change; knowledge translation occurs at individual, group and organisational level. The influence that individuals have at these levels matter in supporting the translation of research evidence into practice. Organisational learning influenced the study. The self-assessment tool identified questions that related on the institutional readiness to support knowledge translation through deliberate training that would enable researchers to learn through their workplaces about knowledge translation activities.

2.4.6.2 Organisational capabilities

Denis and Lehoux (2009: 217) examined exogenous and endogenous knowledge and their assumptions. Firstly, they argue that with endogenous knowledge, the challenge is to diffuse it to other units of the organisation. They also argue that with exogenous knowledge the challenge is to capture it and to translate it into innovative practices within the organisation. However, studies in identifying organisational capabilities suggest that open policies regarding access and use of knowledge increases the organisation's ability to use knowledge from research (Armstrong et al., 2013: 2). Passive and active learning provide different platforms for learning. However, active learning through seminars, consultants, benchmarking and competitor intelligence facilitate on the use of research evidence.

This aspect informed the current study. Many organisations are devising interventions capable of blending social processes, learning and knowledge use. Use of research evidence is contingent on the ability of users within the organisation agreeing to use and adapt research access policies in using research evidence to solve health problems while maintaining cooperation, interaction and communication (Denis & Lehoux, 2009: 220). This study explored the role of health regulatory bodies, parliamentary committee on health, national commission for science and technology have in codifying knowledge for easy access and use.

2.5 Chapter summary

This chapter introduced the theoretical framework and its role in research. The chapter has presented the possible theories and models of knowledge translation. The theories and models have been compared in terms of the strengths and weaknesses. The chapter showed that the concept of knowledge translation is not a new concept as efforts to link research evidence and practice has been a long and outstanding issue for decades.

This chapter presented the KTA theoretical framework adopted for this study and how it is influenced by change management, social interaction and networking aspects in research. The chapter has also justified the use of the KTA theoretical framework for the research. It also highlighted models that have an impact on the KTA theoretical framework. The chapter further presented the basis upon which the study sought to examine each stage of the theoretical framework, and how knowledge translation of health findings informs health policy formulation. The theoretical framework guided this study in the review of research evidence and policy briefs as yard sticks of knowledge translation of health research. The framework also provided health research and policy formulation linkages especially to barriers that exist, and to how knowledge from research evidence can be sustained and adapted for local use. The following chapter (Three) focusses on the literature review for the study.

Chapter 3

LITERATURE REVIEW

3.1 Introduction

This chapter examines the gap between health research and health policy-making. The first part explores thematic areas as expounded by Lavis et al. (2003: 223), namely, the message, the target audience, the messenger, knowledge transfer processes and supporting communication infrastructure, and evaluation. The second part of the literature review examines practical aspects of a health policy formulation and the role it plays in bridging the gap between research and policy-making. The third part examines aspects of developing a communication and dissemination strategy.

3.2 The place of literature review in research

A literature review constitutes an evaluative report of studies found in the literature related to the selected study area (Boote & Beile, 2005: 3). The literature review provides a synopsis in the form of a succinct, objective and logical summary of research on a topic (Coughlan, Cronin & Ryan, 2013: 2). The review describes, summarises, evaluates and clarifies the literature. A literature review identifies and articulates the relationships between the literature itself and the field of study (Neuman, 2011: 124). Coughlan, Cronin and Ryan (2013: 2) opine that a literature review provides a critical discussion on similarities and inconsistencies in literature.

3.3 Thematic areas of the literature review

Coughlan, Cronin and Ryan (2013: 142) conceptualise a theme as a unit of meaning that occurs regularly in data and informs the research. Notably, literature on knowledge translation is diverse and comes from various sources. The first part of this literature review explores the issue of knowledge translation through thematic questions as expounded by Lavis et al. (2003: 223), namely:

i. What knowledge should be transferred (the message)?
ii. To whom should research knowledge be transferred (the target audience)?
iii. By whom should research knowledge be transferred (the messenger)?

iv. How should research knowledge be transferred (the knowledge transfer processes and supporting communication infrastructure)?

v. With what effect should research knowledge be transferred (evaluation)?

3.3.1 What knowledge should be transferred (the message)?

Lavis et al. (2003: 223) argue that research ought to transfer actionable messages from a body of health research evidence. Grimshaw et al. (2012: 2) further argue that increased focus on knowledge translation has emphasised individual studies as the unit for knowledge translation. However, the primary targets for knowledge translation are researchers, funders and policy-makers. Individual studies rarely provide sufficient research evidence for practice and policy changes. Grimshaw et al. (2012: 2) suggest that individual studies need to be interpreted with the global evidence they possess. Therefore, the basic unit of knowledge synthesis are up-to-date systematic reviews. Grimshaw et al. (2012: 3) observed that systematic reviews target various audiences. Section 3.3.1.1 describes systematic reviews of health research.

3.3.1.1 Systematic reviews of health research and grey literature

Gough, Thomas and Oliver (2012: 2) conceptualise a systematic review as a set of clearly formulated questions that uses explicit methods to identify, select, critically appraise, extract and analyse data from relevant research. Sections 3.3.1.1.1 to 3.3.1.1.9 discuss key concepts in a systematic review.

3.3.1.1.1 Formulating the question, eligibility criteria and protocol

Developing a clear, concise and relevant question is the first step for a systematic review (Gough, Thomas & Oliver, 2012: 2). Various tools guide the formulation of eligibility criteria and protocol for systematic reviews. The Population, Intervention, Comparators, Outcome (PICO) and the Population Exposure Outcomes (PIE) are structured to facilitate the eligibility criteria (Bettany-Saltovok, 2012: 21; Stone, 2002: 197). The PICO and PIE formats are widely used to help manage, break down the research question, develop appropriate search terms and, describe the inclusion and exclusion criteria (Oliver, Dickson & Newman, 2012: 69). PICO is widely used in quantitative research while PIE is widely used in qualitative research (Bettany-Saltovok, 2012: 23). New tools have been developed to cater for the mixed method approach such as the Sample, Phenomenon of Interests, Design, Evaluation, Research Type (SPIDER) (Cooke, Smith & Booth, 2012: 1437).

An analytical study by Methley et al. (2014: 5–6) tested the efficiency of these tools across various databases. Results showed a greater number of hits from the PICO searches as compared to SPIDER searches. SPIDER searches showed greater specificity for every database. The study recommended the use of the PICO tool for fully comprehensive searches especially where time and resources are limited.

Similarly, Huang, Lin and Demner-Fushman (2006: 363) and Cooke, Smith and Booth (2012: 1436) assessed the value of the PICO framework as a method for structuring clinical questions. The study encountered many challenges in employing PICO frames as a representation for information needs. Firstly, natural language questions lacked elements that comprise a well-formed query. Secondly, there was the problem of poor indexing and use of key words. Thirdly, there was the issue of the use of titles that lack key-words and abstracts. This suggests that the PICO framework has limitations as lay persons use natural language.

3.3.1.1.2 Finding relevant studies

Bettany-Saltovok (2012: 24–25) states that there are two different types of research studies that are of interest in systematic reviews, namely, qualitative and qualitative types of studies. Commonly searched electronic databases for health research are Medline, Embase, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Cochrane Central Register (Methley et al., 2014: 5). To minimise bias for unpublished material, searching, multiple databases is highly recommended (Tricco et al., 2008: 422). Tetzlaff et al. (2009: 19) observed that studies for systematic reviews are found in designated databases. However, the challenge with the databases is that they tend to ignore grey literature. In this study, the searches were done largely in *Scopus* (Refer to Section 2.4.2.1.1). The searches were from 1992 to 2017 and the period coincided with the opening of the University of Malawi's College of Medicine in 1991 as Malawi's main health research institution. Incidentally, this study found that the first registered case of research was documented in 1992. The cut-off point for this study was December 2017 to allow for data analysis in 2018.

3.3.1.1.3 Selecting studies

Systematic reviewing separates the study selection process into two stages, namely, a broad screen of titles and citation abstracts, and a strict screen of full text articles used to select the final included studies (Tetzlaff, Tricco & Moher, 2009: 19). While this makes systematic reviews reliable, it is labour intensive and requires strictness in following details. Jonnalagadda, Goyal and Huffman (2015: 2) indicated that despite their widely-acknowledged usefulness, systematic reviews are time consuming and can take between two-and-a-half and six-and-a-half years before new primary publications are included in a new review. Further, within two years of the publication of the systematic review, on average 23% of the studies are mostly outdated as new evidence arises every day.

3.3.1.1.4 Assessment of risk of bias in studies

The validity of the results of a systematic review depends on the risk of bias in the individual studies. Many studies adopt the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (Oliver, Dickson & Newman, 2012: 80). According to Moher et al. (2009: 265), benefits of using PRISMA include: firstly, the ability to demonstrate quality of the review. Secondly, PRISMA allows readers to assess strengths and weaknesses. Thirdly, PRISMA replicates review methods. Fourthly, PRISMA shows the ability to structure and format the reviews. While the PRISMA checklist can demonstrate the quality of the review processes, the checklist is not a quality assessment instrument for a systematic review (Moher et al., 2009: 265).

3.3.1.1.5 Extracting data from individual studies

Data extraction is the process by which researchers obtain the necessary information about study characteristics from the likely-to-be-included studies. Elamin et al. (2009: 507–509) outline several techniques of data extraction using paper and pencil, spreadsheets (*Microsoft Excel*) and database software (*Microsoft Access*), review software (*RevMa*n), web based forms (*Survey Monkey*) and specialised systematic review applications (*Trialstat SRS* & *EPPI Centre Reviewer*). No single data extraction method is the best for all systematic reviews, instead, Elamin et al. (2009: 509) suggest that before selecting a tool for data extraction, reviewers ought to bear in mind the volume, nature and complexity of the data, the amount of search results generated, access to the results, ability to process and analyse the results generated. Secondly, data extraction tools facilitate double blind review of data collection (Elamin et al., 2009: 509). These include data collection methodologies and the quality of studies.

3.3.1.1.6 Analysing the data

Qualitative analytical approaches differ from quantitative methods. Qualitative data are usually put in matrices and tables. Van den Berg et al. (2013: 42) noted that quantitative data can be analysed using statistical methods such as regression coefficients, odds ratios and hazard ratios. They also observed that heterogeneity in systematic reviews is achieved by reporting differences in the study design and characteristics of the study population. Quantitative summaries assess the presence of statistical heterogeneity using I^2, Chi^2 *or* the Q statistic (Van den Berg et al., 2013: 42). Regardless of the methodology of analysing qualitative or quantitative data, systematic reviews demonstrate high levels of rigour in addressing risks of bias in the studies.

3.3.1.1.7 Presenting the results of the review

Results of knowledge synthesis are presented in a flow diagram to facilitate transparency (Tricco, Tetzlaff & Moher, 2011: 16). Qualitative data are presented in tabular form while quantitative data are presented as summarised data displaying means, standard deviations and confidence intervals (Tricco, Tetzlaff & Moher, 2011: 16).

3.3.1.1.8 Interpreting the systematic review results

Three critical characteristics used to interpret systematic reviews include: the quality, strength and applicability of the evidence (Seo & Kim, 2012: 2). Guyatt et al. (2008: 925) noted that no formal assessment approaches exist for interpreting systematic reviews. Critical aspects in interpreting systematic reviews rely in addressing publication biases. A study by Shea et al. (2007: 2) observed that more than 24 instruments have been developed to assess the quality of systematic reviews. However, many of the instruments are not used because they are lengthy with complicated instructions, language and publication biases.

Newer tools such as the Assessment of Multiple Systematic Reviews (AMSTAR) have higher inter-rater[6] reliability and construct validity (Tricco, Tetzlaff & Moher, 2011: 17). The AMSTAR tool addresses several interpretation issues, namely, the use of the protocol for the systematic review; the study selection; data extraction strategies; literature search strategies; and, the issue of unpublished materials as well as included and excluded studies. In a study of 22 systematic reviews using the AMSTAR tool in Korea, the study found that the quality of results ranged from low to moderate on a scale from low to high (Seo & Kim, 2012: 4). Regardless of the standardised tools, no formal standards appear to have been developed for interpreting systematic reviews. Relevance ought to consider the needs of the users such as policy makers, researchers and health care providers. Key in interpreting systematic reviews are considerations taken in the inclusion of grey literature, hand searching for additional materials and the searching of multiple databases (Tricco, Tetzlaff & Moher, 2011: 16).

3.3.1.1.9 Disseminating the results and increasing uptake of systematic reviews

The most common form of dissemination are publications in peer reviewed journals and policy brief reports for policy makers (Tricco, Tetzlaff & Moher, 2011: 17–18). Despite advances in the conduct and reporting of systematic reviews, evidence suggests that systematic reviews are not frequently being used by policy makers (Wallace, Byrne & Clarke, 2014: 1). A systematic review of physicians' information seeking behaviors found that many of them relied on textbooks, with little research evidence for their sources of information (Dawes & Sampson, 2003: 14). This suggests that while attention is paid in enhancing the quality of systematic reviews, little attention has been given to the format for the presentation of the reviews. This study sought to examine the use of systematic reviews in policy formulation.

3.3.2 To whom should research knowledge be transferred (the target audience)?

The relative importance of knowledge translation to different target audiences varies by the type of research being translated (Lavis et al., 2003: 222). Grimshaw et al. (2012: 3) posit that primary target audiences for knowledge translation of health research include: other researchers, administrators and policy makers. The messenger in knowledge translation includes an individual

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[6] In statistics, inter-rater reliability is an agreement in the degree of agreement among raters. The inter-rater gives a score of the level of homogeneity, or consensus that exists as judged by various raters (Chu, 2013; McKenzie, 2013).

in a form of a practitioner, researcher, consumer, group, organisation and a health system (Grimshaw et al., 2012: 4). Sections 3.3.2.1 to 3.3.2.9 outline some of the key messengers of health research evidence.

3.3.2.1 Consumers and health research evidence

Consumer use of health research evidence has become important in health care delivery systems. The interactive nature between health research evidence and its usage by consumers suggests that more consumers are now taking more responsibilities for their health care (Howard et al., 2011: 1283). They noted that consumers are constantly using e-health systems as a means of getting health research evidence in a number way: consumers are using peer to peer online support groups; they are using patient decision aids; consumers are using personal health records; and, they are using the Internet as a source of health research evidence. Sections 3.3.2.1.1. to 3.3.2.1.4 outline how consumers are using health research evidence.

3.3.2.1.1 Consumers and peer to peer online support groups

Medina, Loques Filho and Mesquita (2013: e39) observed that consumers of health research evidence have resorted to the use of online support groups for sharing health issues and concerns. The consumers disclose their experiences, provide support and re-assurance services to each other. The advantages of this arrangement have been the anonymity, heightened health research evidence empowerment, feelings of unity and reduced society loneliness (White & Dorman, 2001: 693). The disadvantages of the consumer use of health research evidence has been the absence of visual, oral and contextual signals typical in a clinical experience which have led to the misunderstanding of messages as conveyed by non-professionals (Dickerson, Flaig & Kennedy, 2000: 254).

3.3.2.1.2 Consumers and patient decision aids

Patient decision aids have facilitated consumers in making specific decisions based on the research evidence available. The advantage of patient decision aids in using health research evidence is that consumers' knowledge about values, choices and expectations are enhanced (O'Connor et al., 2001: 3). Patient decision aids have decreased the conflicting decisions that consumers face with health information (O'Connor et al., 2001: 3). Consumers have alternative sources of information about their health information needs. The disadvantage is that patients' decision aids can fail to convey non-verbal prompts that identify the needs and requirements of the consumers (Billings, 2004: 129). This suggests that consumers use of health research evidence cannot be met by non-personal interaction between gadgets and information sources only. Health policies on the use of patient decision aids are taking these shortfalls into account (Billings, 2004: 129).

3.3.2.1.3 Consumers and personal health records

Electronic tools allow consumers to have access, coordinate and control the use of health research evidence. Health research records combine data, knowledge and software that involve health information users in making decisions about their health care (Tang & Lansky, 2005: 1292). Richards (2007: 510) outlines three advantages that health information users get through personal health records informed by health research evidence, namely, health research records help users in understanding instructions from the medical practitioner; they help users avoid making medical mistakes; and, they reduce the geographical barriers between practitioners and users in times of needed care. However, concerns have risen about their value, privacy and security.

3.3.2.1.4 Internet use by users

Increased use of health information accessed through the Internet has facilitated a change in roles between users and practitioners. Health information users access health research evidence through the Internet (Dickerson, Flaig & Kennedy, 2000: 252; Calabretta, 2002: 32). The advantages of using health research evidence from the Internet suggests that health information users become more knowledgeable about their health care and problems (Sommerhalder et al., 2009: 266). Secondly, health information users share feelings and increased competence of the health care system with each other and the medical practitioners (Lemire, Sicotte & Pare, 2008: 131). However, there are concerns about the quality, quantity and accuracy of the health research evidence obtained via the Internet (Ahmad et al., 2006: 3).

3.3.2.2 Health professionals and health research evidence

Time constraints and informal communication channels for decision makers require attention on the use of health research innovations. The use of local opinion leaders is becoming essential in communicating health research evidence (Lomas, 1997: 41). Sections 3.3.2.2.1 and 3.3.2.2.2 outline a few concerns on the use of professionals in the use of health research evidence.

3.3.2.2.1 Health practitioners and health research evidence

In discussing the use of health research evidence in decision-making, Thompson et al. (2004: 70–71) noted that health care practitioners rely much on two sources of information for making decisions, namely, humans as sources of information and primary data sources. The human sources range from clinical nurse specialists, experienced colleagues to care team colleagues. Primary data sources included the British National Formulary, drug information sheets, and pharmacists in primary care. The study concluded that though primary and textual sources of information were readily available and accessible, the human sources of information were highly rated in terms of accessibility (Thompson et al., 2004: 71).

Orton et al. (2011: 4) conducted a systematic review of 18 studies involving 1063 public health decision makers, 72 researchers, and 174 health practitioners with overlapping roles. The study concluded that the decision-making processes varied widely between settings, and that a wide range of health research evidence were readily accessible. However, the study concluded that there was no reliable evidence on the extent of health research use. Secondly, the impact of the health research evidence often competed with other social and behavioural influences. The study also registered barriers to the use of research evidence. The study concluded that the there was little evidence of the use of health research evidence in decision-making.

3.3.2.2.2 Civil society organisations and health research evidence

Sanders et al. (2004: 758) observed that civil society organisations (CSOs) play a critical role in the use of health research evidence. CSOs act as funders of charitable health research organisations. CSOs act as users of health research evidence and raise the issue of the relevance of health research. They act as generators of health research through partnerships with university-based researchers. CSOs affect policy and broader social changes that improve health equity. Globally CSOs, such as Health Action International and Medicines Sans Frontiers, have played important roles in campaigning for domestic and international health policies to ensure access to essential drugs. However, literature suggests that CSO voices have little influence over health research priorities that are set (Sanders et al., 2004: 757; Beinare & McCarthy, 2011: 889; Knabe & McCarthy, 2012: 287). Therefore, the use of health research evidence to advocate for health policy formulation is minimal.

3.3.2.3 Local administrators and health research evidence

Hospital executives, administrators, insurers and board members use health research evidence to make decisions in areas such as facility allocation, programme design, human resource mix, budget allocations and quality improvement strategies (Lomas, 1997: 41). Synthesised knowledge in a written form is a useful and effective means of transferring health research information (Lomas & Brown, 2009: 911). Sections 3.3.2.3.1. to 3.3.2.3.3 outline how local administers use health research evidence.

3.3.2.3.1 Hospital executives and health research evidence

Walshe and Rundall (2001: 439) highlight that the ‘‘clinical culture is highly professionalised, with a formal body of knowledge that is shared by all members of the profession and acts as a frame of reference for intraprofessional dialogue and debate’’. This has helped to produce a disciplinary cadre of individuals’ coherence in knowledge, attitudes, and beliefs. In contrast, Walshe and Rundall (2001: 439) noted that health executives are a highly diverse group drawn from different professional and disciplinary backgrounds. Quite often they lack a shared language upon which they can be described. It is alleged that many health executives have qualifications in management and health care administration. It is argued that there is no specified formal body of knowledge, training, and registration required to become a health care executive. Many in the clinical culture take on health care management roles with little and no formal management training at all (Walshe & Rundall, 2001: 440).

In relation to use of research evidence, Walshe and Rundall (2001: 440) argue that health executives have ‘‘weak social sciences paradigm, with more use of qualitative methods and less empiricism’’. Their tendencies to health research evidence use are more subjective, contingent, and less generalisable. Health executives have poorly organised and indexed research literature, spreading across a wide spectrum of journals and grey literature with unclear boundaries (Walshe & Rundall, 2001: 440). They have heterogeneous and not easy to review decision-making routines. Usually, the decision-making is made in groups requiring negotiations and compromises within organisational constraints. The use of health research evidence in this context therefore, is highly constrained.

3.3.2.3.2 Insurance companies and the use of health research evidence

Steinwachs and Hughes (2008: 3) noted that the provision of high quality, affordable, health care services has become a serious challenge due to complexities of health care services and systems. The complexities are due to health research evidence costs, quality, accessibility, delivery, organisation and financing. As much as the changes have created innovations within the health care industry, they have also created huge disparities in access and care (Steinwachs & Hughes, 2008: 5). As health care insurance spending continues to rise, research evidence suggests that resources spent for health care insurance are not providing adequate quality and value (Steinwachs & Hughes, 2008: 5). Some of the reasons for variations and inconsistencies in the health care insurance points to lack of health research evidence in insurance benefit design, coverage, and reimbursement policies (Pearson & Bach, 2010: 1797–98).

3.3.2.3.3 Health boards and the use of health research evidence

Use of health research evidence can improve health outcomes and reduce the high disease burden. One of the ways of achieving this is by informing the formulation of robust policies, implementation plans, and the designing of effective health care interventions (African Institute for Development Policy Online, 2016). However, utilisation of health research evidence in policy-making processes in the health sector is limited due to various bottlenecks, ranging from inability to grasp technical medical language, large volumes of materials to be synthesised before the boards to financial matters. Millar et al. (2013: 764) conclude that despite growing pressures for boards to use health research evidence with higher quality of care, efforts to create effective governance for quality and safety are in their early stages. Many health research boards focus on financial performances of organisations they deal with.

3.3.2.4 National policy makers and health research evidence

Politicians and bureaucrats use research and analysed information to inform policy agenda and justify chosen courses of action. In most cases the decision-making is more about policy ideas, ways of framing issues and defining manageable problems than about selecting solutions (Liverani, Hawkins & Parkhurst, 2013: 1-2). Section 3.3.2.4.1 outlines how politicians use health research evidence.

3.3.2.4.1 Politicians and the use of health research evidence

Liverani, Hawkins and Parkhurst (2013: 4) conducted a systematic review on the influence of political systems and institutional mechanisms on the use of health research evidence. The study concluded that relevant political and institutional aspects affected the use of health research evidence. These were firstly, the level of centralisation and democratisation; secondly, the influence of donors and organisations; thirdly, the organisation and function of bureaucracies; and lastly, the framing of the research evidence in relation to social norms and values.

Liverani, Hawkins and Parkhurst (2013: 4) acknowledge the role of political systems and institutional mechanisms in the use of health research evidence. Thomson et al. (2007: 1) concluded that little is known about the use of research evidence especially for evidence-based health protecting laws. However, research evidence communicated via dense and jargon laden publications was felt to be less appropriate for legislative decision makers than person-to-person communications and brief memo formats (Lomas & Brown, 2009: 913; Patoko & Yazdanifard, 2014: 568).

3.3.2.5 The regulatory bodies and health research evidence

Liverani, Hawkins and Parkhurst (2013: 5-6) highlight the role of regulatory bodies in developing effective health policies. Key political system features studied included: centralised and federal systems; the degree of political pluralism and freedom; and, the role of bureaucracy. These were considered critical in terms of the degree of control over the policy advice given to decision makers. Sections 3.3.2.5.1 and 3.3.2.5.2 outline how regulatory systems use health research evidence.

3.3.2.5.1 National research commissions and the use of health research evidence

Liverani, Hawkins and Parkhurst (2013: 2) noted that in the UK the National Health Service, a centralised regulatory system, was more open to the uptake of research findings than the decentralised system. Similarly, Liverani, Hawkins and Parkhurst found out that a centralised system, in which government agencies controlled health expert advice, public oversight was more vulnerable to the pressure of exerting interest groups in decisions around health research evidence use.

Daniels and Lewin (2008: 2) in a study in South Africa reported that following the 1994 parliamentary democracy, many academic researchers were appointed to positions in the National Department of Health and new health research institutes. The governance system created more uptake of health research findings to support health policy-making. Some regulatory organs of the state in South Africa began to incorporate researchers on their boards. However, little it is known about their influence on the use of health research evidence.

3.3.2.5.2 National ethics councils and the use of health research evidence

Research on human participants require independent ethical reviews in a form of ethics committees and institutional review boards (Schroter et al., 2006: 718). Schroter adds that national ethical councils require information on objectives, methods, conflicts of interest, institutional affiliations of the researcher, anticipated benefits, potential risks of the study, the possible discomfort it may derive and the consent of the participants.

Morris, Wooding and Grant (2011: 510) in their research describe and quantify the time lags in health research translation processes before research is put into practice. They found that on average it took 17 years for health research evidence to reach clinical practice. Morris, Wooding and Grant (2011: 510) cited processes around grant awards, ethical approvals, publication, clinical trials, approval of drugs, post-marketing testing, and guideline preparation as contributing to the time lag. While there is no linkage between usage of research in policy and time lags, on average it takes over two decades before health research evidence is put into practice (Sussman et al., 2006: 8). Hence, one of the contributing factors for non-use of recent evidence in policy-making could be the time lag attributed to ethical approvals for medical research protocols.

3.3.2.6 Industries and health research evidence

Pharmaceutical companies and software manufacturers tend to be governed by profitability and marketability of their products as opposed to health research evidence findings (Lomas, 2000: 240). It is alleged that decision makers raise ethical issues that question the proprietary and objectives of health research (Lomas, 2000: 240). Although clinical and biomedical research is mostly of interest to them, health services research with software and system implications is of increasing importance to decision makers (Lomas & Brown, 2009: 910). The format for research for this type of audience can be raw research findings. Sections 3.3.2.6.1 and 3.3.2.6.2 outline how pharmaceutical and software manufacturers have reacted to the use health research evidence.

3.3.2.6.1 Pharmaceutical companies and health research evidence

While pharmaceutical products have the potential to improve health benefits to users, the magnitude of benefits to public health is difficult to quantify (Christmas, 2014: S12). Critics argue that the business element in pharmaceutical industries has led to some of the inadequate use of health research evidence. The industries focus on profits, sales, and marketing over genuine improvements in user benefits. In the USA alone, financial penalties imposed on pharmaceutical companies between 1991 and 2012 exceeded $30 billion (Christmas, 2014: S12). New developments affecting pharmaceutical industries include: the increasing attention on safety monitoring and regulation, efficacy, applicability, and convenience of administration, among others (Van Luijn, Gribnau & Leufkens, 2010: 445).

Further, it is alleged that pharmaceutical researchers choose parts of health research evidence to be used (Christmas, 2014: S14). Suggestions are that selected portions of research are aimed at maximising profits over a short period of time. It is alleged that pharmaceutical industries are leading in the suppression of concerns over risks associated with novel compounds. Partly, this could be because of the time lag and huge investment taken to accept a drug on the market. It is alleged that it takes between 10 to 15 years to develop a new drug and costs £550 million to do all the necessary work before a drug can be certified fit for human consumption (Christmas, 2014: S14).

This suggests that pharmaceutical industries use research evidence to downplay the risk of user harm by promoting new drugs that offer little benefits over existing drugs as a means to maximise return on investments (Van Luijn, Gribnau & Leufkens, 2010: 445). Rather than improving claims upon which to fund more health research evidence, the pharmaceutical industry covets claims through adverts and advocate for trade promotions (Christmas, 2014: 14). Indirectly, this is done at the expense of health research evidence capable of benefiting users, informing health policy and improving health systems delivery.

3.3.2.6.2 Software and device manufacturers and the use of health research evidence

Demske (2008: 1) observed that the development of new technologies and products, the interactions between software, device manufacturers and health care professionals, are valuable as physicians help in developing, testing medical devices such as heart valves, pacemakers, and medical lasers. Demske (2008: 1) further noted that in an environment where physicians received substantial compensation from medical device manufacturers such as royalty agreements, consulting agreements, research grants, and fellowships, evidence pointed to the fact that there was a significant risk that such compensation, and not health research evidence, influenced their medical decision-making in approving the devices.

Demske (2008) substantiated that in 2005 alone, in the orthopedic device market for hips and knees, domestic sales skyrocketed from $5.1 billion to more than $9.4 billion. It was found that between 2002 and 2006, manufacturers in the hip and knee replacement market remunerated health research consultants with over $800 million under the consultation agreements. It was alleged that industries made payments to health research consultants as a kickback designed to influence the health research consultants' medical decision-making (Demske, 2008: 1). This suggests that software and device manufacturers may have used health research evidence to suit their business interests at the expense of improving health service delivery.

3.3.2.7 Research funders and health research evidence

There is increased demand for return on investment in health research in the form of societal and health system benefits. Four major criteria have been suggested by funders as a means of leveraging their funding for supporting health research evidence (Holmes, Scarrow & Schellenberg, 2012: 6). Firstly, health research funders' interest is in building capacity through audience specific training. For example, they provide access to review databases and accrediting programmes for health professionals and researchers. Secondly, funders are becoming more involved in organising conferences for research dissemination; monitoring and evaluation; and, the use of discussion papers. Thirdly, health research funders provide resources to researchers through project grants, awards for research use and uptake. Fourthly, health research funders are advocating and influencing change using oral presentations, online publications, drafting of position papers, and calls to action on specific health system issues.

However, despite all these efforts, Kitson and Bisby (2008: 5) outline some challenges, namely, there is lack of policy makers involvement throughout the research cycle; researchers are not adequately communicating with policy makers research users; conferences and workshop are proving not to be adequate for the transfer of research evidence into policy-making; there is lack of translation plans for funded projects; and, lastly both researchers and policy makers lack training and support in knowledge translation.

3.3.3 By whom should research knowledge be transferred (the messenger)?

The usage of health research evidence does not operate in a vacuum. There must be the messenger to transfer knowledge from researchers to users (Lavis et al., 2003: 223). Sections 3.3.3.1 to 3.3.3.4 examine the role of the following messengers in knowledge translation: opinion leaders, facilitators, knowledge brokers and champions.

3.3.3.1 Role of opinion leaders in knowledge translation

The use of opinion leaders continues to be recommended because of their willingness and enthusiasm to share knowledge. Opinion leaders are said to be connected to a wide peer and social network. Studies on the use of opinion leaders suggest that they are recruited through peer nomination and sociometrist instrumentation (Barwick, Psych & Boydell, 2007: 13). Opinion leaders play critical roles in the use of health research evidence. It is alleged that opinion leaders influence attitudes, beliefs, and behaviours of listeners through their technical expertise, control of communication channels, and positions of authority (Howard et al., 2000: 1282). Studies on the type of opinion leaders refer to chiefs of surgery, heads of state and school heads (Howard et al., 2000: 1282). Systematic reviews on knowledge translation identified that 15 out of 41 reviews used opinion leaders (Grimshaw et al., 2001: II2). The study concluded that where opinion leaders were used, their interventions were effective in achieving the desired behaviour change among health care providers (Flodgren et al., 2011: 17).

3.3.3.2 Role of facilitators in knowledge translation

Thompson et al. (2004: 69) posit that knowledge translation occurs when the facilitator uses an active and dynamic working strategy that enables a group of people to work on a solution to a health problem. In knowledge translation, facilitators are said to be effective, dynamic and successful in moving research evidence to policy change. Eriksson et al. (2016: 2) report of a study in Vietnam which evaluated the role of community facilitators in reducing the neonatal mortality rate. Findings pointed to the fact that involving the role of a facilitator in knowledge translation moved health research evidence from researcher to users (Thompson et al., 2004; Eriksson et al., 2016).

3.3.3.3 Role of champions in knowledge translation

Champions in knowledge translation are individuals from within the organisation advocating for new ideas and products (Barwick, Psych & Boydell, 2007: 14). Williams (2012: 186) adds that champions define the organisational research concept and research outcomes. The role of champions is to support behavioral change in adopting new health interventions. Champions identify stakeholders necessary to implement a new intervention and overcome challenges of implementation (Howell, Higgins & Shea, 2005: 644).

Ploeg et al. (2007: 238), in a study on the role of local champions in the use of clinical practice guideline recommendations, noted some key strategies employed, such as: raising awareness and sharing information about best practices; working with the existing local committees and other networks of champions; participating in interdisciplinary team tasks; acting as role models, mentors and resource personnel; and, embedding best practices in documentation and policy reforms.

Ploeg et al. (2007: 245) noted that champions facilitating roles were enhanced by the support offered by top management, their education, and training expertise to engage research users. Despite their roles the study found that barriers existed on the transfer of research evidence to decision makers, namely, time constraints, inadequate financial resources to support best practices and staff resistance to change.

3.3.3.4 Role of knowledge brokers in knowledge translation

Knowledge brokers have emerged in the knowledge translation as a link between researchers and users of research knowledge. Knowledge brokers enable researchers and users to better understand research goals and professional cultures, influence work, forge new partnerships, and promote the use of research evidence in decision-making (Canadian Health Services Research Foundation Online, 2012). Knowledge brokers represent the human component of knowledge translation strategies. Brokers work with stakeholders to facilitate the transfer and exchange of information in diverse settings (Bornbaum et al., 2015: 2).

Knowledge brokering involves bringing players together where they create, sustain relationships and engage in collaborative problem solving (Canadian Health Services Research Foundation Online, 2012). Brokering increases evidence-based decision-making in the organisation, management, and delivery of health services. Knowledge brokers have wide communication networks, extensive knowledge of research, health care, and skills in social marketing. Dobbins, DeCorby and Twiddy (2004: 121), in their study on the role of knowledge brokers, noted that the incorporation of research evidence into public health policies and programmes was effective in public health institutions with a low organisational research culture. In contrast, Russell et al. (2010: 14) in another study on supporting the awareness and use of evidence-based assessment tools by physiotherapists, identified a strong research culture influenced by knowledge brokers especially on readiness for change and organisational research culture.

Overall, there are indications that knowledge brokers help in transferring knowledge from research to practice. However, it depends on both internal and external influences and the impact they have on the organisation (Bornbaum et al., 2015: 2). Suggestions point to the fact that inclusion of knowledge brokers is critical in designing intervention on the use of health research evidence. However, the real influence has not been quantified.

3.3.4 How should research knowledge be transferred?

Effective knowledge translation is developed through research knowledge infrastructure. Ellen et al. (2011: 2) define research infrastructure as programmes, tools, devices implemented in a healthcare system to facilitate access, dissemination, exchange and use health research evidence. Organisational components refer to processes of adaptation and use of health research findings (Meso & Smith, 2000; Ellen et al., 2011; Grimshaw et al., 2012). Sections 3.3.4.1 and 3.3.4.2 outline technological and organisation components in knowledge translation of health research findings.

3.3.4.1 Technological research infrastructure

One of the components of the research infrastructure is the technological infrastructure (Ellen et al., 2011: 4). Sections 3.3.4.1.1 to 3.3.4.1.8 discuss the technological research infrastructure.

3.3.4.1.1 Electronic databases

Knowledge tools such as systematic reviews are published and indexed in bibliographic databases such as Medline, CINAHL, Cochrane, Campbell Collaborations, the Joann Briggs Institute, UK Centre for Reviews and Dissemination (Kastner et al., 2012; MacLure et al., 2016). Electronic databases have several advantages. Firstly, they have increased searching speed. Secondly, they are flexible on data level. Thirdly, they have consistency and forced data harmonisation. Fourthly, they have archiving advantage.

Nonetheless, no electronic database contains all the information needed for the research evidence. Considerations such as subject, publication, date coverages, updates and timeliness are essential. Some databases cover specific subjects while others are general and cover a wide range of subjects. Electronic databases do not index each type of publication available. Some only index journal articles, whereas others index government documents, dissertations, conference proceedings and book chapters only.

Incidentally, up-to-date information is also affected by timeliness. For example, a database such as PsycINFO, although updated monthly, usually, has a four month to a year time lag from the time articles are published in the journal to the time that they are indexed in the database (Family Health International, 2012). This suggests that the time lag also affects the use of health research evidence.

3.3.4.1.2 Online academic journals

Schaffner (1994: 239) identified five distinct roles of journals in scholarly communities, namely, building a collective base of knowledge, communicating research information, building scientific research communities, validating the quality of research, distributing academic and research rewards. Over the decades, many publishers have changed from print to electronic. Scholarly communication has also changed from closed access to open access. Researchers believe that research should be visible and accessed by the users. However, Harter (1996: 6) long opined that the use of e-journals does not imply that there is a lot of reading and distribution of research results. Rather, researchers and policy makers ought to build on the findings available online to inform policy and improve health service delivery.

Paradoxically, researchers have always believed that the publication of research in peer reviewed journals is central to the scientific process and that until research is published then the research process is incomplete. However, knowledge translation assumes that if health research has been published but has not informed policy changes, the research done is of limited use. Grimshaw et al. (2012: 3) noted that globally millions of dollars are being spent on biomedical, clinical and health services research, the majority of which are online, yet there is failure to translate the research results into practice and influence policy formulation.

3.3.4.1.3 Online conferences, workshops and seminars

Lomas (1993: 226) long suggested that conferences, workshops and seminars are critical in research dissemination as they help in transferring research information from researchers to users. However, research dissemination has been categorised as either passive or active. Passive dissemination is horizontal, mediated by peers and users seek out information. Forms of passive research dissemination, include: publishing in peer reviewed journals, attending conferences, workshop and seminars. However, knowledge translation encourages active dissemination of research findings. Lomas (1993: 226) adds that active processes of communicating research results to potential users are targeted, tailored and packaged for a specific audience. Such strategies include: linkage and exchange events to share the research synthesis, developing a user driven dissemination strategy, media engagement, using a knowledge broker and developing knowledge user networks (Moore, Todd & Redman, 2009: 32–33).

3.3.4.1.4 Search engines

There are three compelling advantages of most search engines as suggested by several authors (Green, 2003: 195; Fujii, 2007: 41). Firstly, indexes of search engines are usually vast, representing significant portions of the Internet, offering a wide variety and quantity of information resources. Secondly, the growing sophistication of search engine software enables researchers and policy makers to precisely describe the information needed. Thirdly, the large number and variety of search engines enriches the Internet, making it appear more organised than manual search strategies.

However, Lewandowski (2008: 915) and Moskovitch et al. (2007: 164) indicated that search engines have several disadvantages, such as poor precision. Usually, the list of retrieved documents contains a high percentage of irrelevant documents. Secondly, search engines have poor recall as they consult databases using key words used in the documents themselves. Search engines provide numerous web pages containing irrelevant title tags and repetitions. Search engines have varied document quality as the spider[7] cannot discriminate between valuable documents and spams. Search engines have varied indexing depth as some spiders retrieve only the document's title while others retrieve full documents. This suggests that users of search engines need to have some retrieving skills to get the right research information. It is opined that many of the policy makers do not have the skills on the use of key words for searching of health research evidence.

3.3.4.1.5 Web 2.0: Wikis, Podcasts, Webinars

Increasingly Web 2.0 technologies have been used in knowledge creation as a critical component of the KTA theoretical framework. Wikis, for example, allow collaboration between researchers and build consensus through online dialogues (McKibbon et al., 2013: 2). Wikis as information technology tools have been used to design research publications as well as establish electronic research infrastructure (McKibbon et al., 2013: 2). Research by Lohan et al. (2015: 3) on men's levels of depression indicated that majority of the users were attracted to online facilities and as much as 73% of visits were registered within one year.

In terms of knowledge translation of health research findings, indications are that many medical research journal articles are offering their article services as added content via podcasts, webinars and websites (Barwick, Psych & Boydell, 2007: 21). Research by Mathieu (2007: 554) on medical students and doctors suggested that podcasts were popular as they tended to lessen the busy

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[7] A 'spider' is a program that visits websites, reads their pages as a way of creating entries for a search engine index (Shipley & Bowker, 2014: 300).

schedules they had in reading and accessing medical video materials. The only disadvantage lies with the fact that many of the Web 2.0 facilities are not well updated.

3.3.4.1.6 Reminders

Grimshaw et al. (2012: 4) noted that reminders serve as information provided verbally, on a paper or on a computer screen intended to remind a health professional to recall information. Research in knowledge translation suggests that computerised reminders have the average effect accounting for over 13% of the interventions in knowledge translation (Grol & Grimshaw, 2003: 1227). In a study on the impact and cost effectiveness of email reminders to home-based care nurses, Feldman et al. (2005: 866) noted that the use of email reminders improved the care interventions by home-care nurses and were effective in the adoption of evidence-based care. The study further noted that the email reminders also improved the behaviour of the nurses in changing the interventions on patient health outcomes.

The study also noted that the use of e-mail reminders was not expensive to implement. It was convenient for home-care organisations in enhancing service provision, patient self-management and improved health outcomes (Feldman et al., 2005: 867). In knowledge translation of health research, reminders have increased the use of health research evidence. It is not known to what levels reminders have intervened in bridging the gap between researchers and policy makers (Feldman et al., 2005: 865).

3.3.4.1.7 Patient self-management tools

Barret (2005: 4) observed that patient self-management tools enable patients' use of various web-based tools on their own. In a study on patients suffering from Osteoporosis, Kastner et al. (2014: 2) noted that the use of self-management tools improved the management of the disease. In a study by Holroyd-Leduc et al. (2011: 8), 64% of the patients reported that urinary incontinence was an issue of great concern. However, using an evidence-based modification tool, the level of leakage episodes decreased by about 50% and improved the efficacy and quality of life. Challis et al. (2010: 16) noted that self-management tools promise to improve physical functioning and patient confidence; reduce anxiety; reduce unplanned hospital admissions for chronic diseases; improve adherence to treatment and medication; and, reduce costs. Research in knowledge translation demonstrates that patient self-management tools can lower healthcare service costs by between 7–17% (Stearns et al., 2000: 1610).

3.3.4.1.8 Clinical decision support systems

Clinical decision support systems are systems designed to aid in clinical decision-making in which users generate specific assessment and present them to clinicians for considerations (Barwick, Psych & Boydell, 2007: 23). Studies on clinical decision support tools suggest that context and environment plays a critical role in workflow, cultural interaction, organisation behaviour and motivation for their usage (Wears & Berg, 2005: 1262).

Research indicates that clinical decision support systems improved practitioner's performance by 64% (Garg et al., 2005: 1225) and 50% (Kawamoto et al., 2005: 765), respectively. Kawamoto et al. also noted that successful use of clinical decision support systems was based on four factors: the provision of recommendations on top of assessments; the provision of decision support system at the time and place of decision-making; the provision of decision support system by clinicians; and, the use of computerised clinical support systems made it easy to adopt and use the technology. However, in terms of knowledge translation, decision-making support systems require effort and commitment to embrace the overall objectives. Critics have also argued that failure to align the information systems can result in wasted resources and underperformance detrimental to the users (Bush et al., 2009: 447).

3.3.4.2 Organisational research infrastructure

Organisational research infrastructure relates to learning organisations, the leadership element in and the role research infrastructure plays in knowledge translation. Knowledge translation is best facilitated within learning organisations shared across organisational and professional boundaries (Barwick, Psych & Boydell, 2007: 15). Lemieux-Charles et al. (2002: 56) noted that as individuals interact, share knowledge, develop shared concepts and strategies, knowledge is transformed. Sections 3.3.4.2.1 to 3.3.4.2.7 outline some of the learning strategies and how they have influenced knowledge translation interventions.

3.3.4.2.1 Continuing medical education

Thomas et al. (2006: 1610) posit that continuous medical education recognises active learning as the best model in integrating knowledge translation from researchers to users. Active learning relies on interactive, targeted, and multifaceted techniques. Continuous medical education includes the use of educational materials, workshops, traineeships, outreach visits, local opinion leaders, patient education, audit and feedback, reminders and other activities (Oxman et al., 1995: 1424–25). The effectiveness of continuous medical education cannot be overemphasised as majority of research evidence is disseminated through conferences, seminars and workshops.

Despite their popularity most passive educational activities such as workshops, seminars and conferences are said to be poor at changing health researchers and policy makers’ behavior (Davis et al., 2003: 33). Davis et al. further noted that the most effective strategies such as reminders and educational outreach visits tend to be ignored. Overall, continuous medical education offers little hope in terms of knowledge translation.

3.3.4.2.2 Audit and feedback

The gap between the ideal and actual in medical care has posed serious challenges over the years. Barwick, Psych and Boydell (2007: 17) define audit and feedback as the creation of a summary of clinical performance for a particular health care behaviour over a specified period. The summary is provided back to the practitioner in a written, electronic, or verbal format (Grimshaw et al., 2012: 12). Audit and feedback are implemented to help providers identify gaps and to improve quality of care.

Grimshaw et al. (2012: 6) argue that audit and feedback target healthcare providers as well as peer groups’ perceptions to gauge their current performance levels. In terms of knowledge translation, audit and feedback have been used to intervene in the use of health research evidence. A review of 140 clinical trials found that audit and feedback worked better when the information sources were from the supervisor; and when the information was provided both verbally and in written formats (Ivers, 2014: ii).

3.3.4.2.3 Interactive workshops

An interactive workshop has been defined as a structured set of facilitated activities for groups of participants working together to explore a problem and its solutions over a specific period (Pavelin et al., 2014: 1). Participants include researchers, policy makers, customers, and interested stakeholders. Rushmer et al. (2014: 552) noted that research usage and uptake have not been a straightforward, logical and guaranteed process. However, interactive workshops have mechanisms for sharing knowledge across professional and sectoral boundaries.

In a study of 191 participants in an interactive workshop comprising of local authority, academia, national health service commissioners and other interested parties in knowledge translation, Rushmer et al. (2014: 553) concluded that the use of health research evidence summaries, coupled with input from academia as well as practice experts, created enthusiasm on the use of evidence available. However, the study further noted that the enthusiasm to use health research evidence was insufficient to prompt change in the medium and long-term usage.

3.3.4.2.4 Practice Based Research Networks

The need for interactive dissemination approaches such as meetings, skill-building, resources, collaborations, networking, feedback to facilitate capacity building and implementation of research knowledge are being encouraged (Barwick, Psych & Boydell, 2007: 27). Practice Based Research Networks (PBRN) provides an opportunity for the interaction of researchers from various disciplines (Calmbach et al., 2012: 572; Werner, 2012: 557). Nagykaldi et al. (2006: 506) noted that health care professionals assist primary care practices in research and quality improvement activities. Health care professionals provide various frameworks for translating research into practice by building relationships, improving communication, facilitating change, and sharing resources.

The challenge with PBRN lies in funding and infrastructure development (Calmbach et al., 2012: 507; Werner, 2012: 557). Lindbloom, Ewigman and Hickner (2004: III45) noted that PBRNs have received little attention in clinical and health services research. Yet, in as far as key healthcare delivery is concerned, PBRNs have reported a variety of useful health research findings that have addressed key health issues.

3.3.4.2.5 Communities of Practice

Bezyak et al. (2013: 93) postulate communities of practice (CoP) as a ‘social construction of knowledge.’ CoP have now adopted transnational boundaries and allow domains of health research to be applied with a global perspective (Bertone et al., 2013: 1). CoP assess the use of online knowledge transfer service, and improve policy and practitioner’s access to evidence. Through an online social network, they allow for the development of relationships between researchers and policy makers (Kothari et al., 2015: 1). CoP enhance communication and dissemination of research findings, by cultivating dialogue among researchers, practitioners, consumers and policy makers (Kothari et al., 2015: 3). CoP anticipate questions, concerns, create dialogue with stakeholders, engage the media, develops policy briefs, organise research dissemination conferences, produce and publish research summary reports (Bezyak et al., 2013: 93).

Kothari et al. (2015: 4) note that CoP support health care practice but there remains a weak understanding on how they can assist in transferring health research findings across different levels of the health delivery system. Li et al. (2009: 1) in their systematic review noted that CoP groups facilitated social interaction, knowledge creation and sharing, and identity building. However, the groups lacked consistence, clarity in responsibilities and how power dynamics were to be controlled (Li et al., 2009: 6–8). In their systematic review, no study examined the effectiveness of CoP in knowledge translation of health research findings.

3.3.4.2.6 Participatory research

Barwick, Psych and Boydell (2007: 27) posit that methodologies in health research and knowledge translation have concentrated on biomedical and clinical trials. The greater emphasis has been on what works with specific audiences. However, the disadvantage of research of biomedical and clinical trials is that they emphasise the causal effect relationships between variables and are rooted in scientific research.

It is alleged that scientific research has disregarded the social context and environment in which research is conducted (Waterman et al., 2007: 374). Much of health research has lost opportunities to integrate local resources, power relationships, leadership and various effective communication methodologies (Barwick, Psych & Boydell, 2007: 27). Waterman et al. (2007: 374) argue that action research as an isolated case enhances innovation. Knowledge is translated through user involvement, partnerships, shared research goals, active communication and knowledge exchange (Barwick, Psych & Boydell, 2007: 27). Jagosh et al. (2012: 312–313), in their research on the role of the participatory approach in research, concluded that it supports research through quality, empowerment, capacity building, sustainability, program extension, and in many other ways. However, critics argue that participatory research is time consuming, requires new measuring tools and methodologies capable of informing the understanding and evaluation of the research itself (Jagosh et al., 2012: 313).

3.3.4.2.7 Social marketing

Social marketing is an attempt from commercial marketing to apply behavioral change techniques to social outcomes (Morris & Clarkson, 2009: 136). Theatre as a social marketing tool has played a critical role in knowledge translation of health research evidence and has informed behavioural change. Through social marketing, health practitioners are now accepting the use of clinical guidelines when doing their work (Morris & Clarkson, 2009: 136). Wharf Higgins (2011: 4) argued that social marketing has played several roles in health intervention issues such as blood donation, organ donation, increased immunisation rates, good health eating habits and many others. Social marketing has also played a critical role in prevention of sexually transmitted diseases, communicable diseases and malaria.

Researchers in knowledge translation argue that social marketing has a potential to change behaviours, beliefs, attitudes especially in health research designing. It is believed that through social marketing, researchers can implement challenging interventions using evidence-based research in practice.

3.3.5 With what effect should research knowledge be transferred (evaluation)?

Stufflebeam and Coryn (2014: 8) define evaluation as the systematic assessment of the worthiness of an object. Evaluation can therefore be defined as the process of determining the merit, worth, and significance of the product of that process. Two forms of evaluation have been defined, namely, formative evaluation and summative evaluation. Formative evaluation is conducted during the development of the programme while summative evaluation involves making judgments about the efficacy of a programme at its conclusion (Stufflebeam & Coryn, 2014: 8). Research findings can be evaluated depending on the form of research findings (instrumental), ideas and criticism (conceptual), briefs and arguments for action (symbolic). Sections 3.3.5.1 to 3.3.5.4 discuss the concept of research use and its evaluation.

3.3.5.1 Instrumental use of health research evidence

Instrumental research use involves the use of research findings directly in policy formulation (Beyer, 2011: 385; Walugembe et al., 2015: 2). Vargas et al. (2016: 5) suggest that instrumental use of research occurs when research is tailored to answer to a health need. The influence of the research results is seen in the formulation, planning, and implementation of a policy or programme. Researchers identify a need and the uptake of the research work is decided by decision makers (Beyer, 2011: 385). In turn, decision makers demand the assistance of researchers to look for answers that may support the designing of an intervention (Walugembe et al., 2015: 2). However, the instrumental use of health research has been criticised for its lack of realism on the basis that health research evidence performs other functions not directly related to decision or policy-making only (Amara et al., 2004: 78).

3.3.5.2 Conceptual use of health research evidence

Conceptual use of research findings involves the use of research findings as a gradual process of using insights, theories, concepts and perspectives from research (Vargas et al., 2016: 5). Concepts from research serve to strengthen the formulation of an already made decision. Ideas and criticism are used to enhance the use of research findings (Walugembe et al., 2015: 2). Critics have argued that the conceptual use involves using health research whose results influence actions indirectly and in less specific terms (Hanney et al., 2003: 10).

3.3.5.3 Tactical use of health research evidence

Tactical use of research results include the use of decisions, policies or programmes based on arguments that are not linked to research, but research results justify their use (Vargas et al., 2016: 5). The research results, concepts, theories and ideas serve to inform the policy or programme of action based on the scientific aura of research findings (Vargas et al., 2016: 5). Generally, tactical use of health research evidence involves the use of strategic and symbolic actions, such as calling on the use of research evidence to support a programme, a legislative proposal or a health reform (National Research Council, 2012).

While it is recognised that tactical use of research is appropriate to address the gap between health research and evidence, Saloojee and Dagli (2000: 902) postulate that it has been overtaken by events, especially in the tobacco industry, and there are several reasons, namely, the tobacco industry has the buying power for health research evidence and technical human expertise capable of creating controversy about established health research facts including concerns on known health problems like cancer; the tobacco industry has funding for political parties and governments including the hiring of lobbyists and opinion leaders capable of influencing health policy. The lobbyists oppose tobacco control measures, suppressing legislation towards the adoption of weaker laws (Saloojee & Dagli, 2000: 902).

3.3.5.4 Imposed use of health research evidence

The imposed use of health research evidence entails instituting mandates to apply health research evidence as a requirement for the implementation of a programme (National Research Council, 2012). Through imposed use of health research evidence funders are now requesting researchers to demonstrate how the research evidence generated may influence policy-making.

However, existing evidence foretells that different health researchers and policy makers have responded differently to the same research evidence (Killoran & Kelly, 2004: 10–11). Similarly, while research evidence foretells improved health it has also created inequalities between health experts and between geographical regions (Orton et al., 2011: 4). Research further suggests that research evidence is not only for health policy formulation but to improve immediate health challenges such as disease outbreak and reduce inequalities such as access to services (Tugwell et al., 2007: 358).

3.4 Framework for evidence-based health policy-making

Ten of the most public health policies such as seat belt laws, tobacco control and antismoking lobby were achievements through research-based evidence (White, 2012: 131). The role of health policy is to establish an agreement on health issues, goals, and objectives to be addressed (White, 2012: 132). However, Brownson, Chriqui and Stamatakis (2009: 1575) noted that only 6.5% of public health policies are based on health research evidence.

A review of the various frameworks by the World Health Organisation (2007: 39) suggests that there is no linear relationship between the generation of health research evidence and policy-making. Instead the World Health Organisation (2007: 38) showed that there are many factors involved in the relationship between the generation of health research evidence and policy-making, namely, how health research priorities are set; how health research evidence and the knowledge is generated and disseminated; how research evidence is filtered and evidence amplified for national and global application; and, how interactive the policy-making processes are. Section 3.4.1 discusses frameworks[8] of health policy-making, while Section 3.4.2 discusses models[9] of public health policies.

3.4.1 Frameworks in health policy-making

Several frameworks in health policy have been suggested. Sections 3.4.1.1 to 3.4.1.3 offer an overview of the frameworks, namely, the Multiple Streams Framework, the Advocacy Coalition Framework, and the Punctuated Equilibrium Framework (Sabatier, 2007: 9).

3.4.1.1 The Multiple Streams Framework

The agenda setting constitutes the initial stage in the policy process. Figure 3.1 shows the steps in the Multiple Streams Framework. The policy agenda is guided by three critical processes, namely, the problems, proposals, and politics (Kingdon, 2014: 16–17). The policy agenda are issues in a form of problems to be addressed usually led by government policy makers. Policy proposals are proposed by various stakeholders including researchers while politics is pushed by elected officials and advocacy groups (Kingdon, 2014: 17).

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[8] A framework is a structure that can hold or support a theory of a research study (Abend, 2008: 173; Swanson & Chermack, 2013).

[9] A model is an abstracted way of schematising a process and is not testable because it is descriptive (Abend, 2008: 173; Swanson & Chermack, 2013).

Critics of the framework have argued that it possesses serious challenges. For example, the three elements, problem, policy stream and politics, act independent of each other (Kingdon, 2014: 17). Indirectly, it does suggest that for a policy agenda to be successful at least two elements should come into play for the policy window to be opened. Kingdon further argues that policy makers may develop a policy proposal which does not get onto the policy agenda. Also, researchers may identify a problem which many not get onto the policy agenda. Similarly, researchers may conduct research which does not come into the policy agenda (Kingdon, 2014: 16–17). As a result of powershift, the Multiple Streams Framework alone does not inform the use of health research evidence in policy formulation (Kingdon, 2014: 16–17).

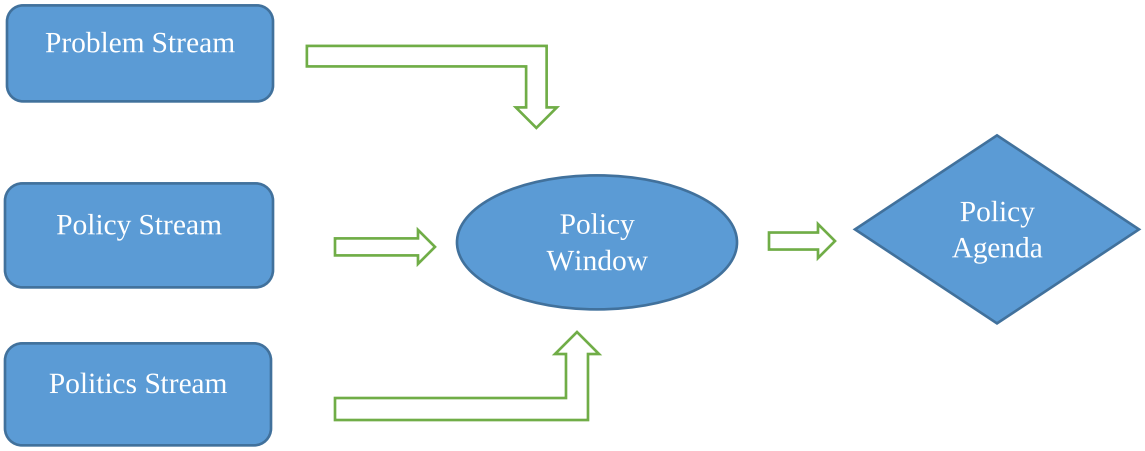

Figure 3.1: The Multiple Streams Framework Source: Kingdon (2014: 16–17)

3.4.1.2 The Advocacy Coalition Framework

The Advocacy Coalition Framework was developed as a response to intense policy problems. The framework addresses goal disagreement and technical disputes emanating from multiple actors such as government, interest groups, research institutions, and the media (Weible & Sabatier, 2006: 123).

Weible and Sabatier (2006: 132–133) highlight strengths of the Advocacy Coalition Framework. Firstly, the framework provides an alternative policy-making in problem identification, agenda setting, adoption, implementation and monitoring. Secondly, the framework highlights the nature of political conflicts. Thirdly, the framework provides a new assumption that suggests that policy-making is about reducing conflict between advocacy coalitions. Fourthly, the framework highlights the role of research evidence in policy and political disputes.

However, Weible and Sabatier (2006: 132–133) suggest that the framework has hanging limitations, namely, the framework requires data collection which is time consuming and costly; the framework is highly bedded in policy subsystems with no clear definition of coalitions in policy-making; it relies on coalition membership and their activities; the framework fails to define coalitions and their effects in terms of cross coalition interactions within the policy subsystems; and, it does not highlight structural policy subsystems that favour advocacy coalitions and their linkages.

3.4.1.3 The Punctuated Equilibrium Framework

The Punctuated Equilibrium Framework was derived because of grievances with the policy process models that emphasise incremental judgement in policy-making (Cerna, 2013: 9). The Punctuated Equilibrium Framework has looked at the process of interaction as being composed of beliefs, values on policy images and policy action (Cerna, 2013: 9). In terms of strengths, the idea of policy images has helped to explain how policies are framed and actions are taken.

However, Cerna (2013: 10) also noted that the framework has limitations, for example: the methodology on how policy frames are defined and change over time is unclear; the determination of changes in policy-making may have less evidence and suffers relative challenges with other frameworks (Sabatier, 2007: 86).

3.4.2 Models for public health policies

There are also several models for policy-making, health policies inclusive. These are: the Institutional Rational Choice Model, the Incremental Model and Garbage-Can Model (Cerna, 2013: 10). Sections 3.4.2.1 to 3.4.2.3 discuss these models.

3.4.2.1 Institutional Rational Choice Model

The Institutional Rational Choice Model has a logical and linear sequence and assumes full information by comparing all possible alternative to a policy problem (White, 2012: 132). The model has been applied across a wide range of institutions. It distinguishes different types of change, and their impacts in the system (Cerna, 2013: 11). Its limitations are that it requires a lot of time, cost and benefit analysis to every possible alternatives when dealing with a policy problem (White, 2012: 132). The model applies mainly to institutions. However, beyond an institution, policy issues address national and international challenges to health issues (Cerna, 2013: 11).

3.4.2.2 Incremental Model

The Incremental Model to policy suggests that a policy goes through steps before initialising change (White, 2012: 132). Instead of looking at issues afresh, policy makers use what is available and make small, incremental, marginal adjustments (Kingdon, 2014: 79). Policy makers do not canvass formidable changes, and spend inordinate time defining their goals. As a result, comparisons between the current situation and the former only allow small adjustments. Proponents of the Incremental Model to policy are reluctant about sudden policy changes. Policies are tweaked over time and the result and changes are always small in nature. The disadvantage of this model is that many alternatives are rejected and only a few are accepted. Hence, policy changes are only done at the margins rather than being radical innovations informed by research evidence (White, 2012: 132).

3.4.2.3 The Garbage-Can-Model

Kingdon (2014: 83–84) indicates that the Garbage-Can-Model to policy assumes that at any point in time there exists a mix of problems and possible solutions. The Garbage-Can-Model assumes that there exists, namely, a collection of choices for dealing with problems; issues looking for situations where decisions must be made; solutions that are available for issues which require answers; and, policy makers looking for solutions that might work only at that point in time. Problems, solutions, choice opportunities flow in and out of a Garbage-Can-Model. Problems tend to be attached to solutions by chance. The mix to the problems and solutions determines the policy outcome. The problem with this approach is that an incorrect solution may be suggested for a problem (White, 2012: 133).

3.4.3 Research evidence in the context of health policies

Fundamental components of knowledge translation encompass health research evidence and the context in which the research evidence is applied. In sections 3.4.3.1 and 3.4.3.2 the current study discusses the context of health research evidence.

3.4.3.1 Philosophical-normative orientation of health research evidence

Dobrow, Goel and Upshur (2004: 208) argue that what constitutes evidence is philosophical, epistemological and ontological. Evidence in this case is how individuals relate to the word in terms of the creation, interpretation and evaluation of information and knowledge. The philosophical-normative orientation suggests that evidence is unconstrained by context. The orientation focuses on tools of evidence as rooted in research validity and reliability. These tools are employed to support the appropriateness and credibility of the type of evidentiary sources available. With this approach, what constitutes research evidence is largely a function of the quality of the research evidence with the supposition that higher quality evidence relates to higher quality of decision (Dobrow, Goel & Upshur, 2004: 208). Such type of evidentiary sources includes peer reviewed articles, journals, systematic reviews and many others.

3.4.3.2 Practical-operational orientation of health research evidence

Dobrow, Goel and Upshur (2004: 209) also argue that the practical-operational orientation is embedded in the fundamental process of decision-making, explicating support and justification for the decisions people make. The practical operational orientation to research evidence suggests that what constitutes evidence is context based and research evidence follows an already defined root. This orientation suggests that variation influences the determination of research evidence. The orientation also suggests that research evidence is subjective with different perspectives producing different explanations (Dobrow, Goel & Upshur, 2004: 210). The practical operational orientation defines evidence by its relevance, applicability and generalisability to a specific context. Examples of such evidence include randomised controlled trials.

3.4.4 Domains of evidence-based policies

There are three domains of evidence-based policies. These are the policy process, policy content and policy outcome. In sections 3.4.4.1 to 3.4.4.3 the current study discusses the policy domains.

3.4.4.1 Policy process

Brownson, Chriqui and Stamatakis (2009: 1578) suggest that the policy process has three critical streams: the problem agenda in which the problem is set; the polity in which an alternative policy approach is taken to address the problem; and, politics which represents the power shift. Anderson (2011: 27) further suggests that the policy process has five steps, namely, the problem identification and getting the agenda; the policy formulation; the policy adoption; the policy implementation; and, the policy evaluation.

Studies in public policy formulation suggest that politics largely influences the policy-making process. Certain factors within the political angle, such as the national mood, interest groups, lobbyists, affect the policy process (Kingdon, 2014: 8). Policy is also affected by changes in government participants due to legislative or administrative turnovers.

3.4.4.2 Policy content

Policy content focuses on identifying specific policy elements likely to be effective in addressing the policy agenda or policy problem identified. In this regard, both quantitative and qualitative evidence apply in determining the policy intervention. Best sources of information include data gleaned from systematic reviews and other scientific research including content analysis (Brownson, Chriqui & Stamatakis., 2009: 1578).

3.4.4.3 Policy outcome

Brownson, Chriqui and Stamatakis (2009: 1579) suggest that policy outcome documents the effects of the implemented policies on the problem identified. Jilcott et al. (2007: 106) identified five dimensions of policy outcome evaluation: firstly, horizon which defines how many subjects are likely to be affected by the policy; secondly, effectiveness which defines the impacts and unintended consequences; thirdly, adoption which examines the polity diffusion and participation level; fourthly, implementation which examines costs, enforcement mechanism as well as compliance; and, maintenance which addresses the institutionalisation of the policy.

3.4.5 Framework for evidence-based policy-making

Figure 3.2 shows the framework for the evidence-based policy-making. Lavis et al. (2009a: S3) suggest that evidence-based policy formulation has the following steps, namely:

i. Supporting evidence-based policy-making;
ii. Identifying needs for research evidence;

iii. Finding and assessing systematic reviews and other types of evidence; and,

iv. Going from research evidence to decisions.

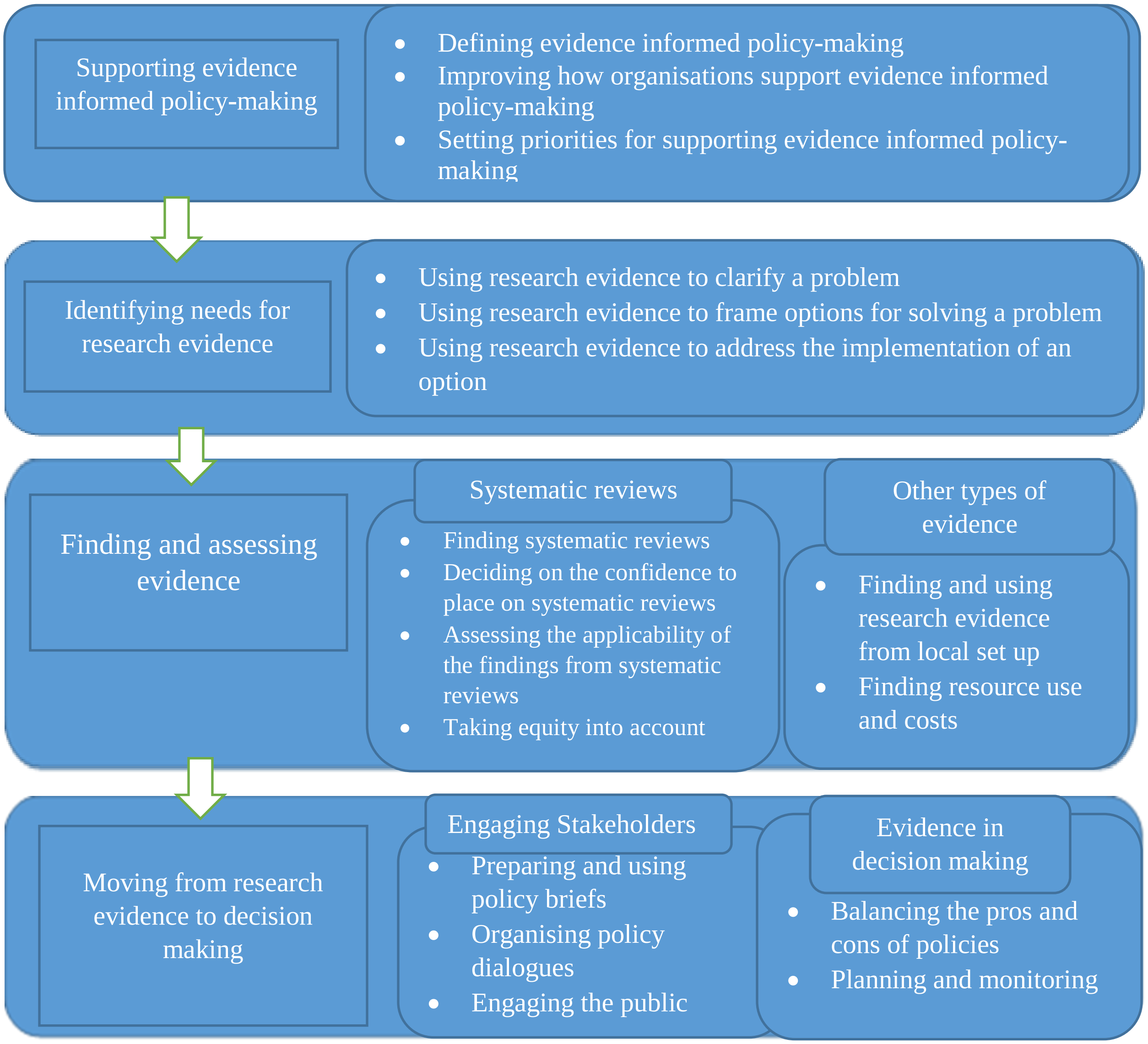

Figure 3.2: Framework for evidence-based policy-making Source: Lavis et al. (2009a: S3)

3.4.6 Supporting evidence-based policy-making

Health research evidence is concerned with facts intended to support a conclusion to a subject matter (Lavis et al., 2009a: S2). Oxman et al. (2009a: S3) suggest that evidence has several, dimensions: expert opinion constitutes evidence if it allows the interpretation of facts in support of an argument to the subject matter; health research evidence uses systematic methods to collect and analyse data; the quality of health research evidence is judged by the ability to reduce errors, resolve agreements, facilitate critical appraisal, and communicate agreed information; health research evidence is context sensitive and the applicability of the generated evidence goes beyond the original context; and, global evidence is the starting point of judgment on policies. There are many types of research evidence in health policies. Sections 3.4.5.1.1. and 3.4.5.1.2 discuss the qualitative and quantitative sources of health research evidence.

3.4.6.1.1 Quantitative evidence

Brownson, Chriqui and Stamatakis (2009: 1576–77) suggest that evidence may be in numerical quantities made available through: publications in peer-reviewed journals; data from public health surveillance systems; and, programme evaluations. Much of the quantitative evidence comes from systematic reviews and is rated highly amongst the sources of health research evidence (Brownson, Chriqui & Stamatakis, 2009: 1577).

In a study by Moulton et al. (2009: 18), out of 65 systematic reviews of studies on the effectiveness of public health laws, 27 (42 %) of the public health laws were found evidence effective, 23 (37%) had insufficient evidence. Surprisingly, Moulton et al. (2009: 18) also discovered that no systematic reviews of primary studies were found in the public health policies. Single studies were commonly used to support policy rather than systematic reviews.

3.4.6.1.2 Qualitative evidence

Moulton et al. (2009: 19) describe the second source of research evidence as qualitative evidence and this involves non-numerical observations. These are usually collected through observations, group interviews and focus groups. Some qualitative evidence uses narrative forms as a means of setting policy priorities. Such narratives propose policy solutions by way of telling persuasive stories that have an emotional hook and intuitive appeal (Moulton et al., 2009: 19).

Moulton et al. (2009: 18) further allude that in studying the impact of health research evidence on health policy disparities, qualitative data has been more persuasive than quantitative data in shaping the health policy agenda. The persuasive communication has shown that, although quantitative evidence alone has a stronger persuasive effect than qualitative evidence, the combination of the two types of research evidence appears to have a stronger persuasive impact than either type of evidence alone (Moulton et al., 2009: 18).

In discussing the role of health research evidence in informing health policy discussions, what constitutes reliable evidence from health research is unclear (Lavis et al., 2005: 35; Oxman et al., 2007: 1883). However, policy decisions seem to be influenced by other factors beyond health research evidence, such as: institutional constraints, individual interests, ideas, values, economic factors, among others. Innvaer et al. (2002: 239) noted some challenges beyond use of health research evidence in policy-making, namely, bad attitude, poor timing, lack of skills and expertise, lack of perceived relevance and use of jargons when communicating health research evidence. Figure 3.3 illustrates the need to integrate systematic reviews with local evidence to inform health policy decisions.

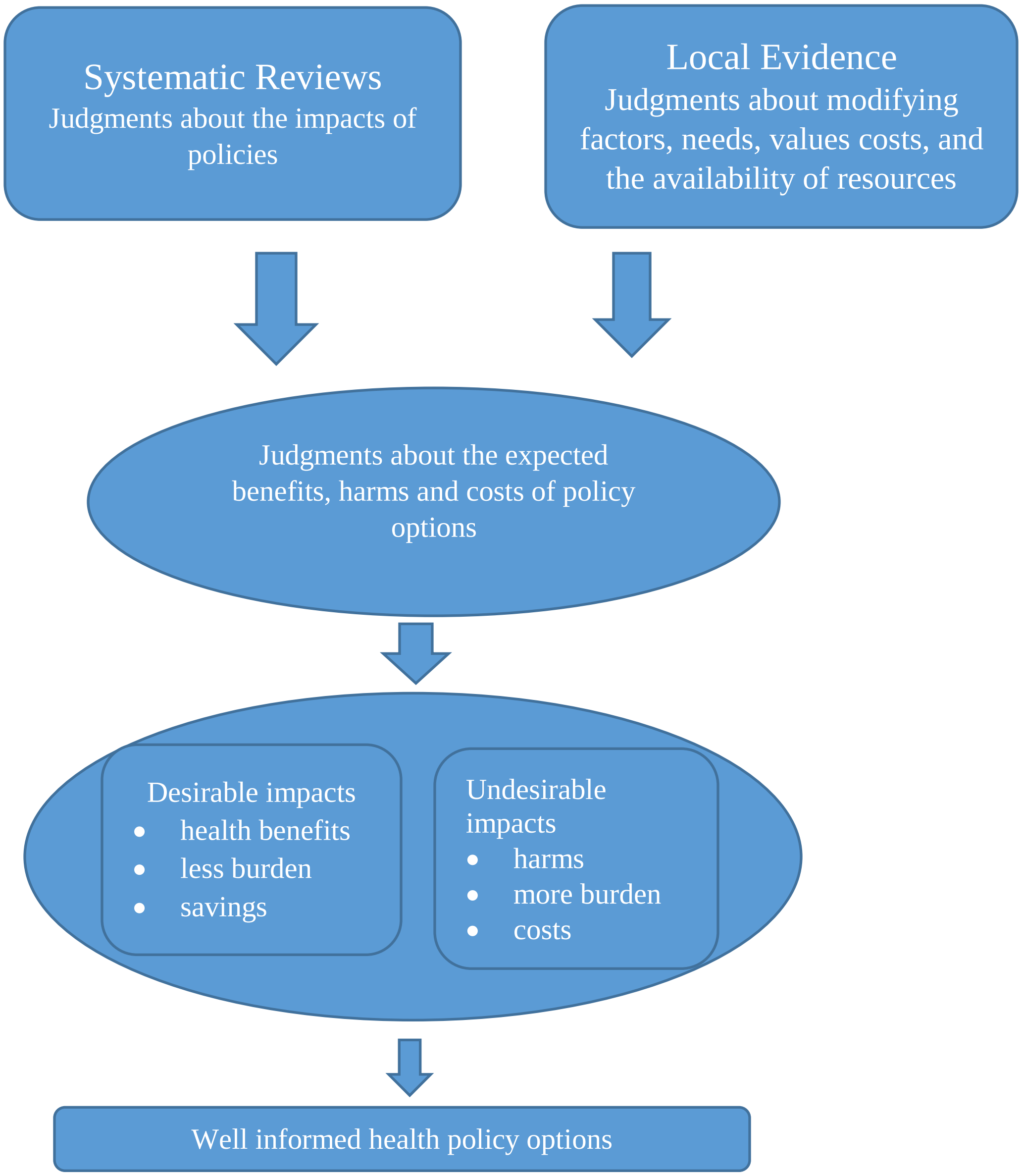

Figure 3.3: Integration of systematic reviews and local evidence in health policy formulation Source: Oxman et al. (2009a: 4)

Different types of research questions, and legitimate differences exist on what constitutes the best available research evidence (Oxman et al., 2006: 1). However, judgments about relevance, reliability and applicability of health research evidence lay with transparent systems and tools for generating research (Lavis et al., 2009b: S4). The purpose of various systems and tools are to reduce conflicts of interest. Figure 3.4 illustrates common policy-making challenges and how health research evidence has addressed them.

Elements of evidence informed policy-making	Common policy problems	How evidence informed policy can address the problems
Supporting evidence informed policy	Lack of organisational arrangement and processes to support the use of research evidence	Set organisational arrangement and processes to support the use of research evidence
Identifying needs for research evidence	Lack of clarity over needs for research evidence	Clarification of research evidence needs to define problems, frame policy options & address, policy options implementation
Finding and assessing evidence	Haphazard or biased use of research evidence	Approaches to finding and assessing research evidence
Going from research evidence to decisions	Inadequate engagement of stakeholders and decisions that are not informed by research evidence	Approaches to engaging and informing stakeholders and using research evidence to inform decisions

Figure 3.4: Common policy-making problems and use of evidence in health policy formulation Source: Oxman et al. (2009a: 4)

3.4.6.2 Identifying needs for research evidence

Identifying needs for research evidence involves three steps, namely, problem clarification, options framing, and implementation. Figure 3.5 illustrates the framework process of identifying needs for health research evidence.

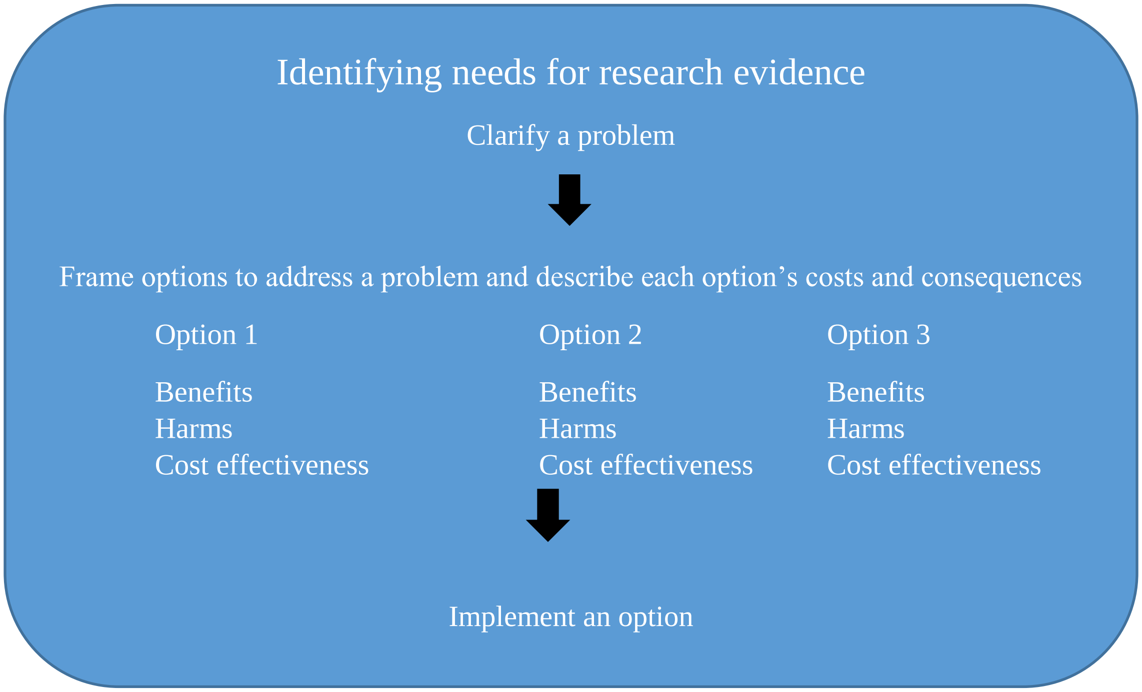

Figure 3.5: The process of identifying needs for health-related research evidence Source: Lavis et al. (2005: 35)

In an interview with policy makers, Lavis et al. (2005: 35) confirmed that policy makers placed high value on health research evidence that considered the benefits, harm, cost implications and effectiveness of the interventions.

3.4.6.3 Finding and assessing types of health research evidence

Systematic reviews are a key source of information for policy briefs especially in framing options and arriving at the impact of the interventions (Lavis et al., 2004: 1615). Lavis et al. (2009c: 4) present several advantages of systematic reviews over single studies. Firstly, systematic reviews reduce the bias available in the identification, selection, appraisal and synthesis of studies. Secondly, systematic reviews increase the number of units per study. Thirdly, systematic reviews allow the applicability of findings to the local context.

Many approaches have also been suggested on assessing and enhancing the use of systematic reviews ranging from narrative summary, thematic analysis, grounded theory, meta-ethnography, meta-analysis, cross case techniques, content analysis and qualitative comparative analysis (Dixon-Woods et al., 2005: 45; Mays, Pope & Popay, 2005: 6). Despite their richness in informing evidence-based policy-making, wider use of systematic reviews has faced constraints (Lavis, et al., 2009b: S4); because, firstly, the limited awareness of their value; secondly, the language option used; and thirdly, the degree to which the systematic reviews can easily be understood and interpreted. Policy makers require that systematic reviews be presented in their natural language and not technical jargon.

A systematic review of the factors that influence the use of research evidence in policy-making revealed that timing increased the likelihood of research being used in policy-making (Innvaer et al., 2002: 239; Lavis et al., 2005: 35). The longer it took to identify health research evidence the lesser the chances of evidence being used to inform health policy.

3.4.6.4 Going from research evidence to decisions

Major shifts have changed the way research information is packaged and three approaches have been identified by (Lavis et al., 2009c: S3). Firstly, there has been a shift from packaging single health research studies into packaging systematic reviews. Rosenbaum et al. (2011: 54) highlight efforts by research organisations to produce policy summaries highlighting key messages from systematic reviews. Secondly, systematic reviews have been packaged into policy briefs mobilising the best available health research evidence on health research priority areas (Colby et al., 2008: 1177).

Policy briefs have been developed in response to findings from systematic reviews. Three critical factors have contributed to the significance of policy briefs as a means of communicating health research evidence (Lavis et al., 2005: 35), namely, policy briefs have reduced the time frame for reporting research evidence as they are brief and to the point; the inclusion of local evidence suggests that policy briefs consider policy makers' values, interests, goals and strategies; policy briefs encourage interactions between researchers and policy makers, a key feature of knowledge translation; and, they are used as an input into policy dialogues involving researchers and policy makers. Canadian Health Services Research Foundation Online (2012) suggests that a 1:3:25 approach for a policy brief is appropriate translating into a one-paged take home message, three-paged executive summaries and a twenty-five-paged report.

Benefits associated with policy briefs lies in the interactive mechanisms which allow research evidence to be put into use. However, the issue of policy dialogues has several concerns. Firstly, policy dialogues lack local context issues for policy makers (Lavis et al., 2006: 59; Lomas, 2007: 16). Secondly, policy dialogues lack decision-making processes (Hanney et al., 2003: 10; Lavis et al., 2004: 1615). Thirdly, policy dialogues assume that health research can add value to the policy processes (Gregory, Hartz-Karp & Watson, 2008: 1). However, critics argue that the use of research evidence requires a multi-sectoral approach.

A systematic review by Lavis et al. (2005: 35) on the impact of interaction on the use of health research evidence suggested several findings. The higher-level interactions between researchers and policy makers increased the probability of health research evidence use. Timeliness increased the probability of health research evidence use in health policy-making. The policy dialogues accorded the researchers and policy makers with opportunities to share ideas.

3.4.7 Strategies to increase research uptake into health policy

Lavis et al. (2002: 125) suggest that research evidence is used in the context of other competing influences in the policy-making processes. Brownson, Chriqui and Stamatakis (2009: 1575) suggest the use of several research actions to bridge the research policy chasm targeting researchers, namely: firstly, understanding the complexity of the decision-making processes; secondly, understand how involving the policy processes are; thirdly, understand how involving it is to communicate research evidence; and fourthly, understand better use of analytic tools and develop systems for policy surveillance. However, regardless of the levels of understanding needed to increase evidence use in health policy formulation, the challenge has been that the research processes leave out policy makers.

Mercer et al. (2010: 412) reported that translation of evidence to policy requires some of the following: health problem and policy intervention; use of systematic reviews; credibility of assessing evidence; development of evidence-based policy recommendations; active participation of key stakeholders through all stages of the process; use of personalised dissemination channels and targeted research output formats; and, involvement of multiple stakeholders, among other suggestions. However, it is recognised that the majority of the health research evidence is not being used in health policy-making (Brownson, Chriqui & Stamatakis., 2009: 1575; Brownson & Jones, 2009: 313; White & Dudley-Brown, 2012: 50).

3.4.8 Approaches to health policy implementation

The transfer of research evidence lacks the distinction between what causes health policy change and how to influence the causes. Evidence-based policy formulation goes hand-in-hand with policy implementation (Cerna, 2013: 17). Political, economic and social factors are suggested as contributing to policy coherence during policy formulation, stability, peer support, training and the level of engagement. Generally, two approaches are suggested in policy implementation. Sections 3.4.7.1 and 3.4.7.2 discuss the top-down and the bottom-up approaches to research implementation.

3.4.8.1 The top-down approach

In the top-down approach, policy designers act as central actors influenced by legal and political arms (Cerna, 2013: 17). Sabatier (2005: 19) suggests that six factors contribute to the successful policy implementation approach in the top-down approach, namely, clarity of policy objectives, causal theory, legal structure of the process, commitment by officials, supportive interests and pressure groups affected by the policy.

One of the strengths of the top-down approach is the consistent approach patterns. The approach has political and legal support (Matland, 1995: 146). However, the approach has been criticised for the statutory, legal language, administrative bureaucracies, political, civil society interests and the ignorance of key policy actors especially the role of researchers in policy implementation (Cerna, 2013: 18).

3.4.8.2 The bottom-up approach

The bottom-up approach targets local level researchers and service providers (Matland, 1995: 146). Proponents of the bottom-up approach look at the policy implementation process from the viewpoint of local networks in which research co-exist with researchers’ goals, strategies and activities (Cerna, 2013: 18). Contacts are used for developing programmes for policy implementation and mechanisms for reporting to top policy makers (Sabatier, 2005: 23).

The strengths of the approach is that its focus centres around researchers who are considered key in knowledge translation (Cerna, 2013: 18). However, policy implementation is exercised by actors who are not researchers but derive power from voters and indirectly require their accountability (Cerna, 2013: 19).

Suggest (2011: 8) developed a framework that combined the two approaches using strategies from both. Strategies that used the Bottom-Up Approach such as networks were more common in low conflict areas of policy implementation but had high uncertainty because they lacked consensus in arriving at a decision or goal. Similarly, strategies that adopted the top-down approach had strong political direction, sound governance but had high conflict on goals and uncertainty in implementation (Suggest, 2011: 10). It does suggest that policy implementation varies with context and type of policy and that there is no 'one size fits all' in terms of policy implementation. Regardless of the approaches to policy implementation, the current study sought to examine the levels of interaction between researchers and policy makers.

3.5 Tools for assessing the use of health research evidence in policy formulation

The growing emphasis on the use of research evidence to inform health policy development suggests that a gap exists between evidence available, effective strategies for transferring the evidence and the development and implementation of health policies (Makkar et al., 2016b: 4). Policy-making involves many contributing factors such as political masters, stakeholders and sources of evidence (Brownson, Chriqui & Stamatakis, 2009: 1575).

Lavis et al. (2003: 222) formulated an evidence-based policy-making process called the Supporting Policy Relevant Reviews and Trials (SUPPORT) using research evidence to support evidence-informed health policy-making (Lavis et al., 2003: 223; Oxman et al., 2009b: 2). In terms of strengths, the World Health Organisation (2012: 23) postulates that firstly, the SUPPORT tool provides a holistic view for policy makers' use of health research evidence. Secondly, the SUPPORT tool provides practical capacity assessment and initiatives in using health research evidence. Thirdly, the tool enables researchers to use health research evidence to support evidence-informed health policy-making and to implement practical initiatives. Fourthly, the tool is applicable to the organisational and health system levels in both developed and developing countries. Lastly, the tool is easy to use, clearly states the purpose and objective, and is simple to implement. However, no empirical data has been generated on the practicality of using the SUPPORT tool.

The Supporting Policy in Health with Research (SPIRIT) points to the fact that policy makers' attitude, culture and resources can support research use (Makkar et al., 2016b: 2). The SPIRIT intervention has developed an Organisational Research Access, Culture and Leadership (ORACLe) tool as an evaluative tool designed to assess the organisation's research use of evidence (Makkar et al., 2016b: 3, 11). The SPIRIT intervention also has a tool called Seeking, Engaging, and Evaluating Research (SEER) that assesses policy makers' self-reported capacity, use, and engagement with research evidence (Makkar et al., 2016b: 11). The SPIRIT intervention has further developed a Staff Assessment of enGagement with Evidence from Research (SAGE) tool (Makkar et al., 2016a: 2). The current study blended the SUPPORT and SPIRIT tools through the development of a self-assessment tool.

3.6 Communication and dissemination strategy for knowledge translation

Tabak et al. (2012: 337) argue that resources are invested in the development of health interventions, yet only a fraction of the research products are translated into policy. Communication and dissemination strategies can facilitate the deployment and utilisation of health research evidence to inform health policy. Communication and dissemination models go beyond the use of press releases, policy briefs, peer reviewed publications and research dissemination conferences. Communication and dissemination strategies seek to spread research ideas across the multiple levels of the socio ecological framework such as the system, community, organisation and individuals (Tabak et al., 2012: 337).

In a study of models for dissemination and implementation research, Tabak et al. (2012: 337) noted that models either emphasised dissemination or implementation only or both. In this section, this study seeks to examine theoretical frameworks that have guided research communication and dissemination strategies. Section 3.6.1 provides details for the proposed communication and dissemination strategy for the current study.

3.6.1 Theoretical underpinnings of communication and dissemination strategies for knowledge translation

Wilson et al. (2010: 2) reviewed communication and dissemination frameworks and identified three theoretical frameworks, namely, the Persuasive Communication Matrix, the Diffusion of Innovations Theory and the Social Marketing. Sections 3.6.1.1 to 3.6.1.3 discuss these theoretical frameworks.

3.6.1.1 The Persuasion Communication Matrix

Wilson et al. (2010: 2), in a study on the use of frameworks for communicating and disseminating research evidence, noted that disseminating strategies pinned their theoretical underpinnings on McGuire's five attributes of persuasive communication, namely, the source of communication, the message to be communicated, the channels of communication, the characteristics of the audience, and the setting. However, in an analysis of the frameworks it was noted that only one study acknowledged full use of the underpinnings.

3.6.1.2 The Diffusion of Innovations Theory

The Diffusion of Innovations Theory (DOI) is premised on five principles, namely, knowledge, persuasion, decision, implementation and confirmation (Wilson et al., 2010: 2). Wilson further noted that the DOI was cited by eight cases of dissemination frameworks. The shortfall was that almost all of the eight cases of dissemination frameworks focused only on the knowledge and persuasion stages of the theory. This again suggests that the eight cases of dissemination frameworks ignored key steps of the DOI, namely, implementation, confirmation and decision-making, which are critical in knowledge translation.

3.6.1.3 Social marketing

Social marketing involves the design, implementation, and control of programmes aimed at increasing the acceptability of a social idea by a targeted audience and has roots in the 4 Ps of commerce, namely, product, price, place and promotion (Morris & Clarkson, 2009: 136). Social marketing involves the application of marketing technologies in the analysis, planning, execution and evaluation of behaviour designed to influence change of the targeted audience (Storey, Safittz & Rimon, 2008: 436). Social marketing draws attention beyond behavioural change and has influenced policy changes in water fluoridation, salt iodisation, seat-belt legislation and social normative behaviours in reducing stigma against HIV/AIDS (Storey, Safittz & Rimon, 2008: 461). Despite its popularity in disseminating messages, there are contrary views on its overuse (Morris & Clarkson, 2009: 136). Critics argue that social marketing is highly imaginative and relies on behavioural change even if the evidence is not substantial (Storey, Safittz & Rimon, 2008: 461).

3.6.2 Disseminating elements in knowledge translation

Winkler, Lohr and Brook (1985: 315) developed a model for disseminating research information based on five elements, namely, the source, the channel, the message, the audience and the setting. The basis of this model is that dissemination entails use of both formal and informal interactions. The Centre for Reviews and Dissemination (2009) presented a framework that highlights: the topic, the message, the audience, the source, the setting, the channel, the implementation channel, feedback and evaluation. Scullion (2002: 65) examined examples of effective dissemination strategies and noted that they contained the following: the source, the message, the medium and the users. Jacobson et al. (2003: 94) identified the following elements: the user, the issue, the research, the researcher-user relationship and the dissemination strategies. The Canadian Health Services Research Foundation Online (2012) suggested the following: goals, the targeted audience, key messages, sources, activities, tools, timing, budget and evaluation. Dobbins et al. (2002: 149) suggested interactions between the individual, the organisation, the environment and the innovation. Lavis et al. (2013: 223) suggested five elements, namely, the message, the target audience, the messenger, the knowledge transfers and the evaluation process. Lavis et al. (2003: 224) further suggested that there are four key targets for research, namely, public, service providers, managerial decision makers and policy decision makers. Overall there seems to be a consensus that the framework should include: the topic, message, audience, source, setting, channel, implementation, feedback and evaluation.

3.6.3 Challenges of communication and dissemination strategies in knowledge translation

White (2012: 133) reports on 24 systematic reviews on use of health research evidence by policy makers. The study concluded that the use of evidence was largely descriptive and qualitative and provided limited support to health research evidence. For example, out of the 24 reviews: 11 (46%) lacked any contact between researchers and policy makers; 9 (38%) showed lack of timeliness of the relevance of the research; 8 (33%) indicated mistrust and perceived naivety of researchers and policy makers; 7 (29%) showed power and budget struggles; 6 (25%) showed poor quality of research and policy makers were not willing to adopt the results; 5 (21%) showed that political instability contributed to higher staff turnover in policy-making bodies.

Brownson, Chriqui and Stamatakis (2009: 1575) also identified challenges to translation of health research evidence to health policy. These included clashes of cultures between researchers and policy makers; poor timing, ambiguous findings; balancing objectivity and advocacy; lack of time against personal demands, among other factors. The review by White (2012: 133) identified five strategies to increase policy makers' use of health research evidence in policy-making. These were timely and high-quality research; effective data presentation and analysis; relevance of the research to policy makers; policy recommendations reported along with technical research reports.

3.7 A communication and dissemination strategy

Barnett and Gregorowski (2013: 2) argue that no one approach increases the likelihood of health research evidence use in health policy formulation. Instead a communication and dissemination strategy should be premised on steps as expounded by McCormack et al. (2013: ES1).

Firstly, are techniques premised on the assumption that communicating health research evidence in various format increases the likelihood that the evidence may be used by the health policy makers. No single overarching framework of communicating strategies has addressed the issue of communicating health research evidence from researchers to policy makers (Lavis et al., 2003: 223; Grimshaw et al., 2012: 4). However, multiple reviews have explicated various communication strategies as critical in developing communication techniques for health research evidence.

Secondly, are techniques premised on the assumption that a variety of approaches for disseminating health research evidence increases the likelihood that the research evidence may be adopted by policy makers. This entails the dissemination of health research evidence information via specific channels using planned strategies for specific audiences (Rabin et al., 2008: 118).

Thirdly, barriers and uncertainties in communicating health research evidence reduces the likelihood that health research evidence may be used by policy makers. Noar et al. (2007: 684) observed that barriers stem from multiple sources, including imperfect health research evidence, wrong attitudes, personal preferences and inefficiencies of judgment in decision-making (Noar et al., 2009: 35; Lustria et al., 2013: 1041). Therefore, barriers and uncertainties need to be dealt with in the communication and dissemination strategies. With these three factors in mind, a communication and dissemination strategy is described in Sections 3.7.1 to 3.7.9.

3.7.1 Goal of the communication and dissemination strategy

Two major domains of evidence have been highlighted, namely, qualitative and quantitative evidence (Dixon-Woods et al., 2005: 45). The goal of the communication and dissemination is to ensure that health policy decision-making processes are informed by the available health research evidence. McCormack et al. (2013: ES1) highlight three of such goals: firstly, to increase the reach of health research evidence; secondly, to increase targeted audiences' motivation to use health research evidence; and thirdly, to increase targeted audiences' ability to apply evidence. Regardless of such clear goals, health research evidence is not being transferred to healthy policy-making processes (Strydom et al., 2010: 18; Van de Goor et al., 2017: 273).

3.7.2 Objectives of the communication and dissemination strategy

McCormack et al. (2013: ES1) identified three objectives related to communication and dissemination strategy for health research evidence into policy formulation. The first set of objectives seeks to examine several health research communications. Within the first set are sub-objectives targeting tailored communication; targeting audience; use of narratives and anecdotal evidence; and, message framing. Regardless of the communicating channels, research evidence is not being communicated to policy makers (Strydom et al., 2010: 18; Van de Goor et al., 2017: 273). Strydom et al. (2010: 18) suggest that one of the reasons is because of poor communication and lack of engagement.

The second set of objectives relate to the dissemination aspect and four objectives emerge (McCormack et al., 2013: ES1). The objective relates to active dissemination strategies aimed at spreading the health research evidence through specific channels identified; increasing the reach of information; targeted audience motivation to use and apply health research evidence; and, communicating the uncertainties. Regardless of the dissemination channels, evidence suggests that there is lack of partnerships among researchers, knowledge brokers and policy makers (Ward et al. 2017:2-3). The partnerships are aimed at providing an authoritative seal of approval for the application of research evidence in policy-making. This is achieved by way of identifying influential groups and communities demanding the use health research evidence (Titler, 2008: 144).

3.7.3 Strategies of communicating and disseminating health research evidence

Sandelowski (1998: 375) noted that in developing a communicating and dissemination strategy qualitative approaches have an array of styles and formats to choose from that best fit research purposes. The styles and formats include the use of dances, drama, songs, poetry, diagrams, animation, electronics, websites, films, photographs, videos, recordings and media. Regardless of these array of styles and formats for developing a communication and dissemination strategy, five elements, namely, the message, the target audience, the messenger, the knowledge transfers and the evaluation process have been suggested (Lavis et al., 2003: 224). Within the strategies are: firstly, strategies targeting the message (evidence assessment); secondly, strategies for audience identification (the targeted audience); thirdly, strategies for communication and disseminating evidence (the messenger); fourthly, strategies for policy implementation (knowledge translation); and lastly, strategies for monitoring and evaluation (evaluation process).

3.7.4 Activities of the communication and dissemination strategy

Health research evidence is communicated and disseminated through four common forms of publications (Grimshaw et al., 2006: 13): firstly, scientific publications in journals, books, magazines; secondly, scientific publications through conferences and workshops; thirdly, articles published in popular press and online magazines; and fourthly, press releases sent out to diverse media. Oxman et al. (2009: S2) identified activities for policy formulation as including structured press releases, fact boxes, press conferences, stories, training and disseminating parts through scientific and technical presentations in international fora. Health research presentations in conferences and workshops are considered an efficient way for researchers to present the concrete results of health research to a wider audience (Grimshaw et al., 2012: 13). These types of presentations include: workshops, conferences, seminars, trials, exhibitions, and many others (Oxman et al., 2009: S2). Critics suggest that publishing in whatever form does not imply that health research is available for health policy formulation. Knowledge translation authors suggest that the use of health research evidence requires interaction between researchers and users of health research information (Grimshaw et al., 2012: 13).

3.7.5 Outcomes

Outcomes are products, goods and services provided to research users. Systematic reviews and policy briefs as outcomes are based on health research evidence. Outcomes are characterised as benefits resulting from activities and outputs and are of three forms (McLaughlin & Jordan, 1999: 5). Firstly, there are short term outcomes resulting from the application of the research results. Secondly, there are outcomes resulting from the application of outcomes such as systematic reviews and policy briefs and these may generate best practices and new drugs. Long term outcomes are benefits accrued from results from best practices and include improved health and long life. Regardless of the research evidence outcomes, systematic reviews and policy briefs have been criticised because often they are written using technical language, they lack important contextual information, and they can be quite long (Petkovic et al., 2016: 162).

3.7.6 Designing the actual framework

McLaughlin and Jordan (1999: 65) posit that a communication and dissemination strategy is supposed to have the following:

i. Goal: a general statement about the purpose of an activity;
ii. Objectives: the specific steps taken to achieve a goal;
iii. Strategies: the approach taken to achieve an objective;
iv. Activities: measurable amount of work performed to achieve certain outputs;
v. Outcomes: a possible result of the strategy;
vi. Action plan: a record of the activities a group has agreed to do to reach its goals. It includes the specifics of who will do what, by when, and at what cost;
vii. Implementation plan: a tool designed to illustrate, in detail, the critical steps in developing a communication and dissemination strategy; and,

viii. Evaluation plan: a comparison of what was expected to happen with what happened during a project.

3.7.7 Logic Model

Programme evaluators suggests that the logic models are useful, plausible and sensible for evaluating strategies (McLaughlin & Jordan, 1999: 65). Figure 3.6 illustrates the strategy logic frame.

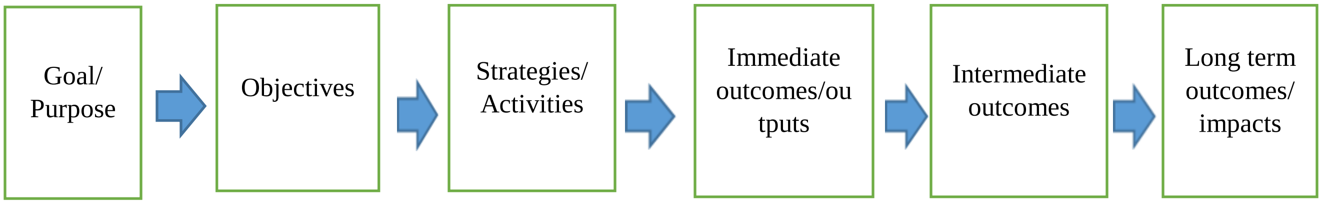

Figure 3.6: Logic frame for the communication and dissemination strategy Adapted from: McLaughlin & Jordan (1999: 65).

Suggestions point to the fact that logic models present a convincing story of the strategy's expected performance in the short, intermediate and long term. Logic models highlight activities, outputs, target audience, outcomes, and external influences and have many benefits (McLaughlin & Jordan, 1999: 65). A logic model builds on a common understanding of the strategy and expectations for resources; provides an easier platform for sharing ideas, identifying assumptions, and communication; helps in strategy design and improvement; identifies barriers to goal attainment, inconsistencies among strategic elements; communicates the place of strategy through logic charts at various levels; and, points to key performance measurement points and evaluation issues. However, critics argue that a logic model looks at research aspects from a linear point of view. Research evidence use cannot be a linear process (Monaghan, 2011: 137). Rather, the use of research evidence in policy-making is influenced by values, opinions, and actions which move decisions in certain directions within the political, social, and economic arenas (Almeida & Báscolo, 2006: S9).

3.7.8 Monitoring plan

Monitoring is critical in communication and dissemination strategy. The monitoring plan helps quantify the attainment of goals and sub-goals by estimating the levels of actions where the implementation was planned and conducted. Monitoring helps to correct assumptions that were made and problems are identified, risks encountered and any new information that requires modifications to change the course of the actions, are taken into considerations. Regardless of the processes, critics argue that research evidence use lacks monitoring as researchers and policy makers do not regularly interact and they seem socially far from each other (Grimshaw et al., 2012: 8).

3.7.9 Evaluation plan

An evaluation plan is critical in a communication and dissemination strategy. An evaluation plan provides feedback on the effectives of the strategy and helps to determine its appropriateness. United States Aid for International Development (2016) highlights three forms of evaluation, namely, process evaluation, outcome evaluation, and impact evaluation. Process evaluation examines interventions that have proven effective in a specific context. The outcome evaluation explores the workability of interventions. Impact evaluation explores the combined effort affecting a wider community. Critics have argued that for so long research has not been transferred to policy makers partly because there are no evaluating mechanisms on how research ought to inform policy-making (Grimshaw et al., 2012: 17). Lavis et al. (2003: 224) suggests that this is because of lack of research evidence (message), targeted audience, messenger and evaluation of intended objectives of the research.

3.7.9.1 Action Plan

Nagy and Fawcett (1998) define an action plan as the means of concretising the vision of the strategy. An action plan contains some of the following: What actions will occur (message)?; Who will carry out these changes (messenger)?; By when they will take place?; and, For how long (period)?; What resources are needed to carry out these changes (evaluation)?; and, Who should know what (targeted audience)? (Lavis et al., 2003: 223).

Regardless of defined action plans, majority of research evidence is not reaching out to policy makers. Brownson and Jones (2009: 313) identified barriers, namely, lack of value placed on research evidence; insufficient scientific base; mismatched time horizons; vested power interest; researchers isolated from policy process; complex and messy policy processes; mismatch of disciplines and lack of skills to influence evidence-based policy.

3.7.9.2 Implementation plan

Gomez (2013: 33) describes an implementation plan as activities required, the sequence, the assignment, and estimate of efforts required with due dates. A study by Lavis et al. (2006: 622) identified four challenges to implementing new health research evidence, into practice and policy. Firstly, it was noted that health research was competing with other ideas in the policy-making process. Secondly, that decision makers were not valuing research evidence. Thirdly, that new research evidence was not relevant to policy-making. Fourthly, that research evidence was not easy to understand.

3.8 Chapter summary

This chapter introduced the literature review and the place of literature review in research. The chapter also explored issues of knowledge translation by exploring key thematic areas as expounded by Lavis et al. (2003: 223), namely, the message, the target audience, the messenger, the knowledge-transfer processes and supporting communication infrastructure; and evaluation. The chapter then examined evidence-based health policy formulation and the role they play in bridging the gap between researchers and policy makers. Lavis et al. (2009c: S4) postulate that generally health research policies are not informed by health research evidence. Through the SUPPORT and SPIRIT tools, efforts seek to develop strategies to move health research evidence into practice. These include identifying needs for research evidence, finding and assessing types of health research evidence, and moving from research evidence into decision-making (Lavis et al., 2009d: S14). The chapter also examined literature on the development of a communication and dissemination strategy. It reviewed literature on goals, objectives, strategies of communication and disseminating research evidence, activities, outcomes, action plan, monitoring and evaluation of the communication and dissemination strategy. The next chapter discusses the study's research design and methods.

Chapter 4

RESEARCH DESIGN AND METHODS

4.1 Introduction

A research approach is a plan that describes the detailed methods of data collection, presentation and analysis (Creswell, 2014: 247). There are generally three approaches, namely, qualitative, quantitative and mixed method. Research design provides a specific direction for procedures in a research study (Creswell, 2014: 247). Researchers propose various research methods involving various forms of data collection, analysis and interpretation. A philosophical worldview or paradigm defines a basic set of beliefs that guide the research action (Lincoln, Lynham & & Guba, 2011: 97). This chapter describes the underlying research paradigm, research design and methodology, the process of data collection, analysis of data and presentation of findings for the study. The chapter also addresses ethical considerations in relation to the study.

4.2 Ontological, epistemological and philosophical underpinnings of the research study

Three attributes set the basic philosophical beliefs related to the nature of the social world (ontology), the nature of the social knowledge (epistemology) and the way in which knowledge is constructed (methodology) (Greene, 2007: 52). This study adopts the pragmatism philosophical stance. The pragmatism stance draws its ideas from John Dewey who was interested in the concept of inquiry as a form of experience to truth and knowledge in the quest for resolving uncertainties (Misak, 2013: 107). Inquiry serves as a conscious response to situations (Morgan, 2014: 28–29).

Greene (2007: 83) presents some characteristics of the pragmatism worldview. Firstly, pragmatism recognises the existence of an emergent world with its languages, culture, human institutions and diverging thoughts. Secondly, pragmatism places high regard for the reality and influence of the inner world of human experience to action. Thirdly, pragmatism views knowledge as being constructed and based on reality of the world as experienced and lived. Fourthly, pragmatism replaces the epistemic distinction between subject and object with the human and environmental transaction. Fifthly, pragmatists' justification is embedded in the warranted assertability of facts.
Patton (2015: 153) highlights three principles upon which pragmatism demonstrates itself as a unique philosophical worldview. Firstly, in contrast to other philosophical overviews, pragmatism

emphasises the nature of reality in shaping experiences. Secondly, in place of questions about the nature of truth, pragmatism focuses on outcomes of action. Thirdly, instead of concentrating on individuals as isolated sources of beliefs, pragmatism examines shared beliefs.

In discussing pragmatism, Johnson, Onwuegbuzie and Turner (2007: 125) describe three forms: firstly, pragmatism of the right which is moderately strong in realism and weak in pluralism; secondly, pragmatism of the left which is based on antirealism and strong pluralism; and thirdly, pragmatism of the middle which reconciles the two worldviews of realism and pluralism. This study is based on pragmatism of the middle. This is pragmatism with epistemological justification in standards, value and logic using mixed method to best frame, address and provide tentative answers to research questions.

Goldkuhl (2008: 2) further posits that there are three kinds of pragmatism, namely, functional, referential and methodological pragmatism. Functional pragmativism believes that knowledge is created and used for action. This is referred to as *knowledge for action* and answers the question *why knowledge? Action is the purpose!* Referential pragmatism believes that knowledge is about actions. This belief has led to the development of theories on actions, activities and practices. This is referred to as *knowledge about action* and answers the question *what knowledge*? *Action is the object!* Methodological pragmatism believes in action as the source of knowledge. The methodological pragmatism suggests that to reach knowledge, actions need to be arranged, conducted and studied. This is referred to as *knowledge through action* and answers the question *How knowledge*? *Action is the source and medium!*

This study is associated with both functional and methodological pragmatism. Functional pragmatism suggests that knowledge should be useful for action and change. Functional pragmatism also entails that knowledge should be useful and applicable in actions. Methodological pragmatism suggests that individuals learn about the world through actions (Goldkuhl, 2008: 2; Goldkuhl, 2012: 135). This form of pragmatism also suggests that the development of knowledge is based on continuous interaction between knowing (research) and acting (practice). Methodological pragmatism suggests that knowledge is based on actions, experiences and reflections on actions. Methodological pragmatism suggests that interventions in the world are derived with the intention of applying, testing strategies and tactics. This belief indicates that in paying attention to the conduct of actions, the resultant may be a success or a failure (Goldkuhl, 2012: 135). Therefore, inductive articulation of tactics is important to arrive at new knowledge on actions.

Various authors collaborate on the pragmatism approach as a worldview arising out of actions, situations, consequences rather than antecedent conditions on what works (Hanson et al., 2005: 227; Happ et al., 2006: 43; Morgan, 2007: 54; Creswell, 2014: 10). Morgan (2014: 26–27) shares three elements of pragmatism: firstly, that actions cannot be separated from situations and the context in which they occur; secondly, that actions are linked to consequences in ways that are open to change; and thirdly, that actions depend on worldviews with socially shared sets of beliefs.

4.3 Pragmatism philosophy and its justification in relation to the study

Pragmatism supports the use of both qualitative and quantitative approaches in the same study; it views knowledge as both constructed and resulting from empirical discovery (Tashakkori & Teddlie, 2003: 21; Johnson & Gray, 2010: 88). Instead of focusing on methods, Creswell (2014: 10) argues that the pragmatist emphasises the research problem and uses all approaches available to understand the problem. This is a philosophical underpinning for mixed method studies and conveys its importance of the research problem and the use of pluralistic approaches to derive knowledge about the problem (Hanson et al., 2005: 227). Pragmatism occurs in multiple environments and opens the door to mixed method, different worldviews, assumptions, forms of data collection and analysis (Hanson et al., 2005: 227; Creswell, 2014: 11).

Johnson and Gray's (2010: 88) seven principles of pragmatism have shaped the pragmatism philosophical assumptions and mixed method for this study. Firstly, pragmatism embraces an understanding of the world grounded in relational processes from theory to practice (Glaveanu, 2012: 84). Secondly, pragmatists acknowledge that knowledge comes through person to environment interaction (Johnson & Gray, 2010: 88). Thirdly, pragmatists believe that knowledge is both constructed and results from empirical discovery. Fourthly, pragmatism takes the ontological position of pluralism of realities that reflect the different experiences and beliefs of people (Morgan, 2014: 38). Fifthly, the pragmatist takes the epistemological position of multiple routes to knowledge. Sixthly, pragmatists argue that theories predict, explain or influence the desired change. Seventhly, pragmatism incorporates values into the inquiry (Johnson & Gray, 2010: 88). Researchers can learn experiences, beliefs and provide interpretation of the data in the form of theories (Morgan, 2014: 38).

Tashakkori and Teddlie (2003: 23) also noted that firstly, pragmatism supports the use of both qualitative and quantitative methods in the same study. Secondly, pragmatism considers the research question to be more important than the method as research methods are biased towards qualitative or quantitative approaches. Thirdly, pragmatism as an epistemological approach emphasises the justification of theories, examines consequences, goals, values of interest to the researchers. Fourthly, decisions on the use of qualitative or qualitative methods largely depend on the research questions posed and the data to be collected, analysed and interpreted.

4.4 Research approach: mixed method in context

Mixed method research has many assumptions methodologically. This study adopts *methodological eclecticism* (Yanchar & Williams, 2006: 3; Teddlie & Tashakkori, 2011: 286; Patton, 2015: 153). Methodological eclecticism assumes that research questions can be addressed by any methodological tool using the pragmatic credo of '*what works*' (Teddlie & Tashakkori, 2010: 21). Teddlie and Tashakkori (2010: 8) extend the researcher's role as a *connoisseur of methods* selecting best techniques available to answering research questions that frequently evolve as the study unfolds. This assumption suggests that researchers are free to combine research methods if they are the best tools for answering the research questions.

The second assumption is that the methodology assumes that diversity works at all levels of the research enterprise. This assumption suggests that mixed method research can address a diverse range of confirmatory, exploratory questions and provides the opportunity for an assortment of divergent conclusions and inferences (Teddlie & Tashakkori, 2010: 9). Mixed method research looks at many approaches for collecting and analysing data and provides the best possible understanding of a research problem (Bwalya & Mutula, 2016: 1187; Ngulube & Ngulube, 2015: 1; Mokwatlo, Ndwandwe & Ngulube, 2009: 106-107). The rationale for using mixed method in this study are summarised in Table 4.1.

Table 4.1: Rationale for using mixed method in this research

Greene, Caracelli and Graham (1989: 259)	**Triangulation**: the study seeks to converge, corroborate and correspond from different research methods **Complementarity**: the study seeks to elaborate, illustrate and clarify results from quantitative method with the results from the qualitative method **Development**: the study seeks to use results from one method to help develop the another method **Expansion**: the study seeks to extend the breadth and range of inquiry by using different inquiry components
Creswell and Plano Clark (2011: 8–11)	A need in the study where one data source may be insufficient to: Explain initial results Generalise exploratory findings Enhance it with a second method Understand a research objective through multiple research phases
Morse and Niehaus (2009: 31)	Elicit in the study another perspective or dimension Obtain data in the study that the first method cannot access Enhance description in the study Enable the testing of an emerging conjecture in the study Obtain description from another method in the study Add a second layer of description in the study Provide supplementary evidence in the study
Teddlie and Tashakkori (2009: 33)	Simultaneously address a range of confirmatory and exploratory questions in the study with both qualitative and quantitative approaches Provide better inferences in the study Provide a greater assortment of divergent views in the study

Adapted from: Ivankova (2015: 11)

Overall, Teddlie and Tashakkori (2011: 286–287) summarise eight characteristics of mixed method and which are associated with this study. These are methodological eclecticism; paradigm pluralism; diversity at all levels of the research processes; continuity of the research processes; iterative and, cyclical approach to research; a focus on the research question in determining the research methodology; set of basic research designs and data analytical processes; and, the compromise implicit in mixed method. Table 4.2 summarises the key methodological characteristics of the mixed method approach derived from the pragmatism worldview.

Table 4.2: Mixed method approach from the pragmatism philosophical worldview

Strand	The study adopts the mixed method approach with at least one quantitative and one qualitative strand
Sequence or timing	The study adopts two approaches of the sequences: ○ **Concurrent**: collecting and analysing both qualitative and quantitative data at the same point in time (primary approach) ○ **Sequential**: collecting and analysing quantitative data first, followed by qualitative data (secondary approach)
Priority or weighting	The study adopts the following combination: ○ **Quantitative priority**: greater emphasis placed on quantitative methods and qualitative methods perform a secondary role
Integration or mixing	The study adopts mainly the following: ○ **Merging**: integrating quantitative and qualitative methods during data analysis (primary approach) ○ **Combining**: integrating quantitative and qualitative methods during the interpretation of both quantitative and qualitative results (secondary approach) ○ **Connecting**: integrating quantitative and qualitative methods during data collection whereby qualitative data would be collected based on the results of data analysis in the quantitative strand (secondary approach)

Adapted from: Teddlie & Tashakkori (2009: 33); Creswell & Plano Clark (2011: 222–237)

4.4.1 The Convergent Parallel Mixed Method Design

There are mainly three basic mixed method designs, namely, the Exploratory Sequential Mixed Method Design, the Explanatory Sequential Mixed Method Design and the Convergent Parallel Mixed Method Design (Curry & Numez-Smith, 2015: 14). The Exploratory Sequential Mixed Method is a design in which the quantitative component occurs first and is followed by the qualitative component (Curry & Numez-Smith, 2015: 15). The qualitative component generates data which may inform the quantitative component. The qualitative data may also serve as the secondary data to support the primary quantitative data. Data may be integrated as embedded[10] or connected[11] data.

The Explanatory Sequential Mixed Method is a design in which the quantitative component is followed by the qualitative component (Curry & Numez-Smith, 2015: 16). In the design, the quantitative component is followed by the qualitative component. The explanatory is chosen when the researcher anticipates that the quantitative data may not be sufficient to address the research question. The data collection and analysis for the quantitative aspect is completed and may generate findings incomplete to interpret. Therefore, qualitative data is collected to generate further insights that may assist in explaining the quantitative findings. Data may also be integrated as embedded or connected data.

The Convergent Parallel Mixed Method design adopted for this study suggests that the researcher converged qualitative and quantitative data to provide a comprehensive analysis of the research problem (Happ et al., 2006: 43; Creswell, 2014: 14). The Convergent Parallel Mixed Method design allowed the freedom to choose methods, techniques, and procedures for the research that best meet the needs and the purpose of the design. The Convergent Parallel Mixed Method is a design in which both qualitative and quantitative data components are conducted simultaneously (Curry & Numez-Smith, 2015: 14). Although data collection for each component was done at the same time, data was not collected from the same study participants. Data was integrated as merged or embedded data. Embedding occurred when the data collection and analysis were linked at multiple points during the study and different methods were employed to address each research question (Curry & Numez-Smith, 2015: 236). Embedding occurs when the secondary method is intended to support the work of the primary method (Greene, 2007: 127) and the nested information is placed within the framework of the primary method (Creswell & Plano Clark, 2011: 190–194).

In integrating data from different components, the aim is to balance respective strengths and weaknesses and maximise the yield of complementary sources of evidence (Curry & Numez-

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[10] Embedded is the type of integration in which findings from the secondary data set support the primary data set through multiple points in the study (Curry & Numez-Smith, 2015: 14).

[11] Connected is the type of integration in which one data set is used to define the other data set at anyone point in the study (Curry & Numez-Smith, 2015: 14).

Smith, 2015: 14). The study benefited from the triangulation aspect. Triangulation refers to the process in which multiple data sources are used to generate a more comprehensive understanding of the research phenomena.

Quantitative and qualitative data were collected through a narrative synthesis or joint displays to identify, appraise and synthesise health research evidence in Malawi from indexed local and international databases (Curry & Numez-Smith, 2015: 235). The Convergent Parallel Mixed Method was chosen because it offsets the weaknesses inherent within one method with strengths of the other; transforms quantitative type of data with qualitative type of data so that when they are compared their result can be validated and findings substantiated (Teddlie & Tashakkori, 2009: 33; Creswell & Plano Clark, 2011: 8–11; Creswell, 2014: 214).

4.4.2 Validity and reliability of the research approach

Validity refers to the degree in which data in a research study is accurate and credible (Gray, 2014: 692; Babbie, 2007: 146; Leedy & Ormrod, 2010: 28). On the other hand, reliability refers to the degree in which the research instruments produce similar results at different periods (Gray, 2014: 690; Salkind, 2011: 115). The validity of this study relied on three components. The first component was data integration (Greene, Caracelli & Graham, 1989: 256). The second component was on inference quality (Tashakkori & Teddlie, 2010: 27–29). The third component was on legitimation (Onwuegbuzie & Johnson, 2006: 56–59).

4.4.2.1 Validity through data integration

Data integration in mixed method is regarded as a big challenge as opposed to it in qualitative and quantitative approaches. This research adopted the four strategies suggested by Greene, Caracelli and Graham (1989: 259), namely, triangulation, complementarity, development, and expansion. Validity through complementarity was achieved through seeking elaboration, illustration, enhancement of the findings from quantitative data to qualitative data methods (Greene, 2007: 101). Validity through development was achieved using the findings from qualitative to help inform the quantitative data (Greene, 2007: 102). Expansion expanded the breadth and range of inquiry by using other players (Greene, 2007: 103–104). In this research, other players in the health sector provided useful insights into the use of health research evidence in health policy formulation (see Table 4.6 on the list of purposively sampled directors in Malawi). Triangulation converged and substantiated findings from different qualitative and quantitative methods.

4.4.2.2 Validity through triangulation

Triangulation occurs in four categories: firstly, the use of a variety of data sources (data triangulation); secondly, the use of several different researchers (investigator triangulation); thirdly, the use of multiple perspectives to interpret the results (theory triangulation); and fourthly, the use of multiple methods to study a research problem (methodological triangulation) (Flick, 2014: 183). This study adopted methodological triangulation which allowed for the collection of both quantitative and qualitative data (Patton, 2015: 662). The study also adopted data triangulation in which data were collected through open-ended interviews, a self-administered questionnaire with fewer open-ended questions, a self-administered assessment tool and a search strategy for review of health research evidence in Malawi.

4.4.2.3 Validity through inference quality

Validity can be achieved through inference quality. The inference quality is in two parts (Teddlie & Tashakkori, 2010: 28–29). Firstly, there is the design quality in which various standards are used for evaluating the methodological rigour. Secondly, there is the interpretative rigour which checks the standards of evaluation. Table 4.3 summarises common inference quality and interpretative rigour for mixed method. This study adopted both the methodological and the interpretative rigour.

Table 4.3: Inference quality and interpretive rigour for mixed method

Standard	Qualitative	Quantitative
Veracity	**Credibility-**the degree to which the findings explain the phenomenon of interest	**Internal validity-**the degree to which the findings represent a true reflection causal relationship
Consistency	**Dependability-**the degree to which the study account for changing contexts during the study	**Reliability-**the degree to which results can be replicated
Applicability	**Transferability-**the degree to which findings can be transferred to other settings	**Generalisability-**the degree to which the study results hold true for other settings
Neutrality	**Confirmability-**the degree to which the findings are shaped by the findings and not bias, motivation or interest	**Objectivity-**the degree to which the researcher stands distanced from the study findings

Adapted from: Curry & Numez-Smith (2015: 174); Trochim & Donnelly (2007: 162–163)

4.4.2.4 Inference quality through veracity

Veracity is concerned with the degree to which the results accurately and precisely represent the findings from the study (Curry & Numez-Smith, 2015: 174; Lincoln, Lynham & Guba, 2011: 97). In the qualitative approach, this is achieved through credibility. One of the techniques of achieving credibility is triangulation. The second technique is data saturation. With the study's quantitative data, this was achieved through internal validity which refers to the degree to which the findings represent a true reflection of the causal relationship between variables. In the case of this study the variables being faculty members (independent variable) and their interaction with health research evidence through involvement, communication, dissemination of health research evidence (dependent variables).

4.4.2.5 Inference quality through consistency

Consistency in the qualitative part of this study was achieved through external audit on search strategies and independent evaluation of the search strategies to ensure that search results were consistent (Curry & Numez-Smith, 2015: 176). The study involved Elsevier experts who guided the search strategy to generate the quantitative results presented in Chapter Five (see Section

5.5.1.1) The quantitative data was analysed through statistical tests such as Chi-square and Kruskal-Wallis H test and these tests allowed for data cleaning and reduced statistical errors. The challenge with qualitative data was addressed through pre-testing of the data collecting instruments. In this study, the first 10 questionnaires were distributed to senior researchers from the rank of senior lecturers to professors who suggested improvements to the data collecting tools.

4.4.2.6 Inference quality through applicability

Applicability in qualitative research involves a thorough check of the procedures in sampling, participants' inclusion, triangulation of data collection, analysis, transcription and coding (Curry & Numez-Smith, 2015: 176). The qualitative aspect involved the use of validated instruments such as the SUPPORT and SPIRIT tools (see Appendix C). The quantitative aspect involved the description of statistical procedures and confidence intervals - see Sections 5.2 and 5.3.1 for more details.

4.4.2.7 Inference quality through neutrality

Neutrality in qualitative data was achieved through use of other resource personnel such as librarians to review the search strategies for the systematic reviews. In quantitative aspect of the study, the approach gathered data by applying explicit tools developed by SUPPORT and SPIRIT for assessing health policies (see Appendix C) (Curry & Numez-Smith, 2015: 176). Further, the search strategy used in the study was confirmed to be appropriate by Elsevier customer service staff, courtesy of the University of Cape Town Library electronic resources subscription.

4.4.2.8 Validity through legitimation

Greene (2007: 168) argues that legitimation ensures the quality of both method and inference as an outcome and a research process. Onwuegbuzie and Johnson (2006: 56–59) outline components that ensure the validity of mixed method. Firstly, statistical generalisations for quantitative data should start from samples to populations. Secondly, qualitative methods should consider the weaknesses in quantitative methods. Thirdly, inferences in a sequential design should not be from a single sequence but from multiple sequences. Fourthly, data conversion or transformation should be from qualitative to quantitative and vice versa. Fifthly, there should be cognitive commensurability of different worldviews. Sixthly, the methodological soundness of each method used should be enhanced. Lastly, there should be flexibility of the paradigm assumptions being included in the study. This study confirms that legitimation principles were followed.

4.5 Population

Population refers to all units with common defining characteristics (Salkind, 2011: 95; Polit & Beck, 2014: 51). The population for this study was made up of researchers and academic members of staff at the College of Medicine and Kamuzu College of Nursing of the University of Malawi. According to the 2016/2017 academic calendars, the College of Medicine had 145 researchers and academic members of staff while the Kamuzu College of Nursing had 73 researchers and academics. Table 4.4 shows the distribution of academic members of staff in various faculties of the College of Medicine and the Kamuzu College of Nursing, University of Malawi.

Table 4.4: Distribution of academics in the health-related faculties of the University of Malawi

Faculty	Number of academics/ researchers	Relative frequency of faculty to the total survey
Faculty of Medicine	75	30.5%
Faculty of Biomedical Sciences	69	28.0%
Faculty of Nursing	52	21.1%
Faculty of Public Health	29	11.8%
Faculty of Midwifery	21	8.6%
Total	**246**	**100%**

Source: University of Malawi Register (2016)

4.6 Sample and sampling procedures

Kumar (2014: 382) defines a sample as ‘‘a subgroup of the population within the research enquiry selected to represent the study population’’. Sampling is an act of selecting a portion of the population to represent the population (Polit & Beck, 2014: 177). To increase the confidence intervals in the study a *census* was conducted. The advantages of conducting a census are, firstly, to provide a true measure of the population and ensure that there exist no sampling errors. Secondly, to benchmark data for future studies. Thirdly, to obtain detailed information about small subgroups within the population. The Australian Bureau of Statistics (2013) notes several disadvantages with the census approach. Firstly, it is difficult to enumerate all units of the population within the available time. Secondly, census is associated with higher costs. Thirdly, a census takes longer to collect, process, and release data than from a sample. In this study a census was adopted and multiple methods of data collection were used ranging from: the use of research assistants (students to assist with data collection); departmental presentations (by the researcher); use of Google docs for far and distanced researchers and the use of print copies of the questionnaire. Table 4.5 shows the surveying frame of the study.

Table 4.5: Survey frame

Faculty	**Population**	**Census size**	**% to the total survey population**
Faculty of Medicine	75	75	30.5%
Faculty Biomedical Sciences	69	69	28.0%
Faculty of Nursing	52	52	21.1%
Faculty of Public Health	29	29	11.8%
Faculty of Midwifery	21	21	8.6%
Total	**246**	**246**	**100%**

Polit and Beck (2014: 285) state that purposive sampling allows the researcher to choose participants that can best contribute to the study. Purposive sampling was used for Directors in the Ministry of Health and other partners in health research institutions who were considered key in health policy formulation in Malawi. The Directors assisted in highlighting the existing linkages between health researchers and policy makers in Malawi. They also provided information for developing the communication and dissemination strategy framework. Table 4.6 shows the list of Directors purposively selected as key informants for the study.

Table 4.6: List of purposively selected Directors in various health and research institutions in Malawi

No.	**Organisation**	**Personnel**	**No.**
1.	College of Medicine	Dean of Postgraduate Studies and Research Director of Centre for Reproductive Health Director of Wellcome Trust Research Centre Director Malaria Alert Centre Director of Research Support Centre	1 1 1 1 1
2	Kamuzu College of Nursing	Dean of Postgraduate Studies and Research Dean of Research	1 1
3.	Ministry of Health	Director of Reproductive Health Director of Clinical Services Director of Preventive Health Services	1 1 1
4.	Baylor College of Medicine	Director	1
5.	National AIDS Commission	Director	1
6.	Dignitas International	Director	1
7.	Lighthouse Trust	Director	1
8.	Parliament	Research Directorate	1
9.	University of North Carolina Malawi Project	Director	1
10.	National Commission for Science and Technology	Director	1
	Total		**17**

4.7 Research instruments

Research instruments are tools for obtaining data on a topic of interest from research subjects (Parahoo, 2014: 52). In this research, data were collected through self-administered structured questionnaires (246 academics and researchers)(see Appendix A), semi-structured interviews (17 Directors from the Ministry of Health and various research institutes)(see Appendix B) and a self-administered, semi-structured research centre/institute assessment tool (ten purposively selected Directors from the Ministry of Health and research institutes)(see Appendix C) and a health policy assessment tool (see Appendix D). Primary and secondary sources such as grey literature in the form of research reports, theses and dissertations from institutional repositories, copies of physical research reports in the library were not examined and included in the review. They are not visible in such databases as *Scopus*.

4.7.1 Questionnaires

The study used a self-administered structured questionnaire (see Appendix A) in both print and online forms (using Google Docs) for the academics and researchers. The use of both print and online forms was to counter the sometimes unresponsive nature of electronic platforms. Bryman (2012: 233) points out that self-administered structured questionnaires have fewer open-ended questions. Questionnaires when properly designed have easy-to-follow instructions that minimise the risk of respondents failing to follow questions or inadvertently omitting a question. The researcher used structured questionnaires, firstly, because they are relatively cheap to administer. Secondly, questionnaires are convenient as they may be completed when the respondents are free and at their own pace. However, structured questionnaires have disadvantages such as inability to prompt; questionnaires cannot probe; questionnaires cannot collect additional data from the respondents (Bryman, 2012: 235). These limitations were addressed through pre-testing with seasoned researchers.

4.7.2 Key informant semi-structured interviews

Yin (2014: 239) defines an interview as the mode of data collection involving verbal information from the participants, usually conversational in nature and guided by the researcher. Yin (2014: 239) also goes on to define an informant as a participant in a research enquiry who provides critical information about the case and who may also suggest other sources of evidence for the research. Bryman (2012: 209) adds that the aim of an interview is to elicit from the respondents all manner of information including their attitudes, norms, beliefs and values. The interview method was used to gather data from purposefully identified key informants (see Appendix B). Yin (2014: 106) argues that interviews have several strengths. Firstly, interviews are targeted in that they focus on study topics. Secondly, interviews provide insight as respondents provide explanations. Thirdly, more information is obtained in greater depth. However, interviews also have weaknesses. They can be biased due to poorly articulated questions or the responses may be biased. Secondly, there can be inaccuracies due to poor recall. Thirdly, they show reflexivity in that respondents quite often give researchers what they want. Limitations of interviews as a data collection instrument were addressed through pre-testing the data collecting tools.

4.7.3 Self-assessment tool

A self-assessment tool helps a research centre or institute determine: firstly, how the centre or institute is currently using health research evidence; secondly, where the research is located; thirdly, the capacity within the organisation to locate and use the research evidence; fourthly, ideas on how best to use health research evidence (Canadian Health Services Research Foundation Online, 2012). In terms of knowledge translation, a self-assessment tool for a research organisation and research centre assessed for four critical areas: firstly, how to acquire or obtain health research evidence; secondly, how to assess the available health research evidence to ensure it reliability, relevancy and applicability; thirdly, how to adapt the evidence so that it is used for decision-making or policy-making; fourthly, how to apply the research evidence so that it is internalised and becomes part of the organisational skills, structures, processes, and organisation culture in using research for decision-making (Canadian Health Services Research Foundation Online, 2012).

In the current study the self-assessment tool was adopted as part of the methodological triangulation and was associated with four characteristics of health research evidence and how it applies to health research centres and institutes, namely, the question of research; the knowledge production; the knowledge transfer; and, promoting the use of health research evidence (Gholami et al., 2011: 1) (see Appendix C). In terms of its reliability, as also observed in the study by Gholami et al. (2011: 2), internal consistency with the Cronbach Alpha for ‘question of research’; ‘knowledge production’; and, ‘knowledge transfer was higher than 0.7 while ‘promoting research evidence’ was less than 0.7 (see Section 4.8.4). Therefore, to enhance the assessment tool’s reliability in this study, an explanation was sourced from the interviewees for each aspect of the questions in the assessment tool (see Appendix C).

4.7.4 Health Policy Assessment tool

Lavis et al. (2003: 222) formulated an evidence-based policy-making process called the Supporting Policy Relevant Reviews and Trials (SUPPORT) using research evidence to support evidence-informed health policy-making (Lavis et al., 2003: 223; Oxman et al., 2009b: 2). World Health

Organisation (2012: 23) postulates that firstly, the SUPPORT tool provides a holistic view for policy makers' use of health research evidence. Secondly, the SUPPORT tool provides practical capacity assessment and initiatives in using health research evidence. Thirdly, the tool enables researchers to use health research evidence to support evidence-informed health policy-making and to implement practical initiatives. Fourthly, the tool is applicable to the organisational and health system levels in both developed and developing countries. Lastly, the tool is easy to use, clearly states the purpose and objective, and is simple to implement. However, no empirical data has been generated on the practicality of using the SUPPORT tool. The Supporting Policy in Health with Research (SPIRIT) points to the fact that policy makers' attitude, culture and resources can support research use (Makkar et al., 2016b: 2). The SPIRIT intervention developed a Staff Assessment of enGagement with Evidence from Research (SAGE) tool (Makkar et al., 2016a: 2). The current study blended the SUPPORT and SPIRIT tools through the development of a self-assessment tool. The research adopted and revised the Staff Assessment of engagement with Evidence Tool devised by the SPIRIT team under the Cipher Investigations (Makkar et al., 2016a, 2016b). The tool has 16 reconstructed items ranging from the role of the ministry, nature of research evidence, types of research found, relevance of the research, assessment of the research evidence, consultations done, quality and reliability of the research evidence etc (see Appendix D4). Under each construct (Makkar et al., 2016a) provides a clue how the use of research evidence can derived at following a scale similar to the Likert scale from low to high use of evidence.

4.7.5 Primary literature

The study utilised primary literature (journal articles published by academics and researchers from the University of Malawi) to inform and enrich the study findings. Yin (2014: 106) adds that primary literature can be viewed repeatedly; unobtrusively; contain specific details of an event; and, can cover a long span of time. However, Yin (2014: 106) also noted that primary literature has the following weaknesses: retrievability can be difficult; are biased selectively if collection is incomplete; and, access may be deliberately withheld. These issues were addressed through careful consideration of the search strategy which was verified by Elsevier. Primary and secondary data were collected as follows:

4.7.5.1 Search strategy of research evidence from peer reviewed and referred sources

The researcher searched the *Scopus* database because of its technical support as provided through subscription services at the University of Cape Town where this study was registered. The search strategy was composed of following parts:

4.7.5.1.1 Terms representing study types (1)

Abstract OR Address OR Analysis OR Assessment OR Case OR Cases OR Cohort OR comparative OR Comparison OR Conference OR Congresses OR consensus OR Correlation OR Correlational OR cross-sectional OR Description OR Design OR diagnostic OR diagnosis OR Dissertation OR ethnography OR Evaluation OR Experiment OR Experimental OR Experimentation OR Guideline OR Guidelines OR Inquiry OR Intervention OR Lecture OR meta-analysis OR methods OR multi-centre OR Observation OR Observational OR outcome OR Outline OR Overview OR pilot OR Preventive OR Proceedings OR Prognosis OR prognostic OR Qualitative OR Quantitative OR quasi-experimental OR Random OR randomised OR Report OR reports OR Research OR Review OR Reviews OR Studies OR Study OR Summary OR Survey OR Surveys OR Synthesis OR theory OR Therapy OR therapeutic OR Thesis OR Trend OR Trial OR Trials OR Twin OR Validation.

4.7.5.1.2 Terms representing health or related topics (2)

(((((((((((((((((best practice) OR evidence-based) OR evidence-based) OR evidence uptake) OR guideline) OR guidelines) OR knowledge transfer) OR knowledge translation) OR policy) OR research evidence) OR strategy) OR translational medical sciences) OR translational medicine) OR translational research)) OR (((((((‘‘Clinical Decision-Making’’[Mesh]) OR "Evidence-Based Practice"[Mesh]) OR ‘‘Guideline’’ [Publication Type]) OR ‘‘Health Policy’’[Mesh]) OR ‘‘Information Dissemination’’[Mesh]) OR ‘‘Policy-making’’[Mesh]) OR ‘‘Translational Medical Research’’[Mesh]))).

4.7.5.1.3 Terms representing health policy (3)

Clinical Decision Making [MeSH] OR Evidence-based OR Evidence-based OR Evidence-based Practice [MeSH] OR Evidence uptake OR Guideline [Publication Type] OR guideline OR Guidelines OR Health policy [MeSH] OR Information dissemination [MeSH] OR Knowledge transfer OR Knowledge Translation OR Policy OR Policy adoption OR Policy analysis OR

Policy-making [MeSH] OR Policy transfer OR Research evidence OR strategy OR Translational Medical Research [MeSH] OR Translational medical sciences OR Translational medicine OR Translational research.

4.7.5.1.4 Terms representing geographical region or country (4)

Malawi OR Malawian OR Malawi [MeSH]

4.7.5.1.5 Term representing institution (5)

“College of Medicine OR Kamuzu College of Nursing OR University of Malawi”

4.7.5.1.6 Overall search strategy

The combination of 1 AND 2 AND 5 represents health research from University of Malawi (or 1 AND 5) Or Combination 3 AND 4 gives a policy-making and policy transfer in Malawi. This means that the combination below gives as much clue of all the research that has taken place in Malawi on health research and health policy formulation:

((((‘‘Malawi’’[Mesh]) OR Malawi) OR Malawian OR College of Medicine OR Kamuzu College of Nursing)) AND ((((Abstract OR Address OR Analysis OR Assessment OR Case OR Cases OR Cohort OR comparative OR Comparison OR Conference OR Congresses OR consensus OR Correlation OR Correlational OR cross-sectional OR Description OR Design OR diagnostic OR diagnosis OR Dissertation OR ethnography OR Evaluation OR Experiment OR Experimental OR Experimentation OR Guideline OR Guidelines OR Inquiry OR Intervention OR Lecture OR meta-analysis OR methods OR multi-centre OR Observation OR Observational OR outcome OR Outline OR Overview OR pilot OR Preventive OR Proceedings OR Prognosis OR prognostic OR Qualitative OR Quantitative OR quasi-experimental OR Random OR randomised OR Report OR reports OR Research OR Review OR Reviews OR Studies OR Study OR Summary OR Survey OR Surveys OR Synthesis OR theory OR Therapy OR therapeutic OR Thesis OR Trend OR Trial OR Trials OR Twin OR Validation))) AND ((((((((((((((((behavioural) OR biomedical) OR clinical) OR community health) OR epidemiology) OR epidemiologic) OR health) OR medical) OR population) OR public health)) OR ‘‘Public Health’’[Mesh]) OR "Nursing"[Mesh]) OR ‘‘Health Services’’[Mesh]) OR ‘‘Epidemiology’’[Mesh]) OR ‘‘Behavioral Sciences’’[Mesh]) OR ‘‘Social Sciences’’[Mesh])).

4.7.5.2 Reviewing health evidence in health policies at the Malawi Ministry of Health

The search strategies identified a sample of health policies in the Ministry of Health, the use of health research evidence, and the circumstances in which health research evidence is used in policy formulation (see Table 5.6). In identifying factors that influence the policy-making process, Lavis et al. (2002: 142) argue that policy makers describe factors that influence the policy-making processes as follows: firsly, the policy agenda; secondly, the policy development or policy implementation stages in the policy-making process; thirdly, roles and influences of the policy-making process; fourthly, documents produced and sources consulted in the stages of policy-making; and, lastly, how health research evidence influences the health policy-making processes. Table 4.7 captures the process that the researcher followed when reviewing the use of research evidence in the policy-making process. Research suggests that health research evidence is transferred to policy makers through systematic reviews and policy briefs (Grimshaw et al. (2012: 14).

Table 4.7: Role of health services research evidence in Malawian health policy-making

1. Identification of a sample of health policies in Malawi	• Selected or created a typology of policies • Identified policies from each policy category using available sources • Selected policies in each category • Assessed the representativeness of the selected policies across dimensions not covered by the typology
2. Identification of health research use by stage of the health policy-making process in Malawi	• Determined what constitutes research evidence • Identified explicit uses of citable research evidence • Assessed explicit uses of citable research evidence • Identified explicit uses of other types of information (which may or may not be based on research)
3. Identification of circumstances under which health research evidence is used (by stage of the policy-making process)	• Identified non-explicit uses of research • Identified factors that influence the policymaking process • Identified factors that exert a major influence on the policy-making process

Adapted from: Lavis et al. (2002: 128–129)

4.8 Validity and reliability of the research instruments

The concept of validity applies to every step of the research process. However, in its simplest form, validity refers to the appropriateness of each step in the research process. Therefore, the concept of validity is more associated with measuring procedures and the ability of an instrument to measure what is designed to be measured (Kumar, 2014: 386). Sections 4.8.1 and 4.8.6 discuss the various reliability and validity issues concerned with research instruments. Face validity is concerned with the linking of each research question with the objectives of the study (Babbie, 2007: 147). It is essential to examine whether the research instruments cover all the areas of interest to the study (Punch, 2005: 97). On the other hand, content validity examines questions of a research instrument to establish the extent of the coverage of areas under study (Kumar, 2014: 367). The judgement that an instrument is measuring what it is supposed to measure is based on the logical link between the questions and objectives of the study (Kumar, 2014: 214). Further than that, construct validity is based upon statistical procedures ascertaining the contribution of each construct to the total variance as observed in a phenomenon (Babbie, 2007: 17; Salkind, 2011: 125; Kumar, 2014: 215). The disadvantage with construct validity is that the researcher needs to know in advance about the required statistical procedures.

Reliability refers to the ability for a research instrument to produce consistent, dependable, predictable, stable and honest measurements (Kumar, 2014: 215). There are four types of reliability: test-retest reliability, equivalent forms, internal consistency and interrater reliability (Christensen, Johnston & Turner, 2011: 142). Test-retest reliability refers to the consistency of scores over a period of time (Kumar, 2016: 216). Equivalent forms reliability refers to the consistency of scores obtained on two equivalent forms of the research instrument. Internal consistency reliability refers to the consistency with which items on the data collecting instrument accurately measure a single construct (Christensen, Johnston & Turner, 2011: 144). Interrater reliability refers to the degree of agreement between two or more observers or raters (Christensen, Johnston & Turner, 2011: 144).

In this study validity and reliability were achieved by ensuring that the research questions reflected the research objectives, questions, the theoretical framework, data collecting tools, analysis and interpretation. Data collecting items and questions covered all the aspects of the research questions and objectives. However, judgement is based upon subjective logic hence no definite conclusions can be drawn about the face and content validity (Kumar, 2014: 214). This is partly because different researchers have different opinions about the validity and reliability of research instruments. Sections 4.8.1 to 4.8.5 address some of the issues adopted to ensure validity and reliability of the data collecting instruments.

4.8.1 Pre-testing of data collecting tools

A pre-testing survey refers to a survey in which the research instruments such as questionnaires and interview guides are distributed to possible respondents to evaluate processes and research tools (Gray, 2014: 688). Bowden et al. (2002: 323) argue that pre-testing, firstly, involves establishing the connotative meaning of the questions. Secondly, pre-testing sets criteria to judge the appropriateness of the questions. Thirdly, pre-testing selects methods for judging the appropriateness of the questions; reviewing questions for inclusion; and, revising the questionnaire or interview guide. Leman (2010: 181) further argues that the purpose of the pre-testing is, firstly, to gauge the respondents on the questions in general. Secondly, to get the respondent's opinion on the order of questions. Thirdly, to determine the appropriateness of the possible response categories. Fourthly, to test whether questions should be asked or not in the study. Fifthly, to diagnose problems that may arise with the related questions. Lastly, to get opinions on how to improve the data collecting tools.

Leman (2010: 181) adds that pre-testing ensures that questions are worded correctly and that respondents are able to navigate the questionnaire. Secondly, pre-testing ensures that all respondents navigate the questions in the same way (reliability) and that their responses mean the same thing (validity). The literature is silent on the number of interviews and assessment tools to be considered appropriate for pre-testing. However, in pre-testing of qualitative data collecting tools, Hurst et al. (2015: 55) considered one interview with the hospital administrator and three interviews with the health care professionals. In this study pre-testing was done with eight senior researchers[12] at the University of Malawi College of Medicine and Kamuzu College of Nursing who assisted the researcher to refine the data collecting instruments. While generally in research

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[12] Senior researchers are researchers who have risen from the rank of senior lecturer to professor

pre-tested respondents are not included in the main survey, the adoption of the census approach for reasons already explained precluded this option. The researcher, however, felt confident that the this small inclusion of the pre-test respondents would not negatively affect the outcome of the study, especially that there was a good chance that all 246 academics and researchers were unlikely to respond to the questionnaire.

4.8.2 Adapting data collecting tools from researchers/research institutions

In the study, much questionnaire design information were obtained from well-known and established research institutions on knowledge translation. These include: the Gertner Institute's Israeli Centre for Technology Assessment in Health Care in Israel, Sax Institute in Australia, Knowledge Translation and Ethics at the Canadian Institutes of Health Research, Knowledge Translation Self-Assessment Tool for Research Institutes (SATORI) from the Tehran University of Medical Sciences. All data collecting tools were used with permissions from these institutions. The validity and reliability of such data collecting tools lies in the fact that the tools have been tested and have been efficient in other related research circles. The disadvantage of using these data collecting tools is that they may not apply in all research centres and institutions. For example, the SATORI tool has an Intraclass Correlation Coefficient (ICC) of less than 0.7 in the reliability assessment. It is therefore recommended that in its adoption and usage an explanation is needed for every question asked. This study allowed for such explanations in the self-assessment tool (see Appendix C).

4.8.3 Respondent validation

In the case of qualitative data, respondent validation is used to validate, verify or assess the trustworthiness of interviews (Lincoln & Guba, 1985: 314–15; Goldblatt, Karnieli-Miller & Neumann, 2011: 389–90). Respondent validation needs to be treated carefully as it has some disadvantages. Firstly, there is the issue of the changing nature of data with the passage of time. Secondly, there is the ethical issue of returning to the interviewees. Thirdly, there is the dilemma of anticipating and assimilating the disconfirming voices.

Birt et al. (2016: 1803) argue that within the objectivist epistemology, asking an interviewee to check the transcript from an interview enhances the accuracy of the data. Unavoidably, and within the constructionist epistemology it can be used to reconstruct the narratives that do not represent the interviewees well. While this may result in more accurate data being obtained, caution suggests that respondent validation compromises the trustworthiness of the new data and the data to be analysed (Birt et al., 2016: 1803). In this study, some transcribed interview scripts were returned to the participants to ascertain their correctness depending on the prior arrangement to do so or not. No transcript data were changed by the interviewees.

4.8.4 The Cronbach Alpha

In the case of quantitative data, three attributes which treat reliability of quantitative data collection instruments include: homogeneity (the extent to which all the items on a scale measure one construct); stability (the consistency of results using an instrument with repeated testing); and, equivalence (consistency among responses of multiple users of an instrument) (Heale & Twycross, 2015: 67). Corresponding to the three attributes are several tests such as test-retest, split-half technique, and internal consistency (Heale & Twycross, 2015: 66; Kumar, 2014: 217; Trochim & Donnelly, 2007: 96). Stability is tested using test-retest, parallel or alternative form reliability. Test-retest reliability is assessed when an instrument is given to same participants more than once under similar circumstances (Trochim & Donnelly, 2007: 97–98). The advantage with the test-retest is that it permits the instrument to be compared with itself (Kumar, 2014: 217). The disadvantage is that the test-retest may allow respondents to recall responses given in the first round and that affects the reliability of the instrument (Kumar, 2014: 217). Parallel form reliability is when different forms of the original instrument are given to the participants in subsequent tests (Trochim & Donnelly, 2007: 99). The advantage of the parallel form tests is that it does not suffer from recall responses (Kumar, 2014: 217). Its disadvantage is that the researcher needs to construct two instruments instead of one which is time consuming (Kumar, 2014: 217). A correlation of less than 0.3 is considered weak, 0.3 to 0.5 is considered moderate while more than 0.5 is considered strong. In this research, no reliability tests were conducted. The data collecting tools were adapted from various research institutes and hence their reliability and validity were already tested and proven to be reliable. For example, questions on a Likert Scale use the Cronbach Alpha test which is the most commonly used test employed to determine internal consistency of the quantitative instrument (Salkind, 2011: 122; Heale & Twycross, 2015: 67). The results of a Cronbach Alpha test are between 0 and 1 in which an acceptable reliability score is 0.7 and higher.

4.8.5 The SUPPORT tool for evaluating policy briefs

Researchers ought to provide research-based evidence to policy makers to facilitate knowledge transfer for policy-making (Rajabi, 2012: 598). In this research, the study reviewed a sample of policies in health policy formulation in Malawi. The SUPPORT/SPIRIT tools were used to assess the use of health research evidence in health policy formulation in Malawi (see Appendix C).

4.9 Data collection and integration procedures

Data were collected using a questionnaire, an interview schedule, a self-assessment tool, a health policy assessment tool and a literature search strategy. The semi-structured questionnaires (see Appendix A) targeted academic staff and researchers at the College of Medicine and Kamuzu College of Nursing, University of Malawi. The semi-structured interviews (Appendix B) targeted Directors (see Table 4.6). The interviews with the Directors complemented the quantitative data obtained through the questionnaires. A self-assessment tool targeted research centres or institutes (see Appendix C). A health policy assessment tool was also used to assess the use of health research evidence in health policy formulation at the Ministry of Health in Malawi (see Appendix D). A search strategy on *Scopus* completed all the data collecting tools. All the datasets were collected between November 2017 and January 2018 (3 months).

The point of data integration has been addressed by Curry and Numez-Smith (2015: 233–34) and they suggest four approaches, namely, integration at sample selection, data collection, data analysis and data interpretation. The integration of data at sample selection involves using the results of quantitative data to inform participants for the qualitative data or vice versa. Integration during data collection involves using qualitative data to answer unique research questions by developing data collection tools or protocols for the quantitative data. Integration at data analysis requires creating a single combined data set after the initial independent analysis of each component. The integration during data interpretation determines the conclusions that result from analysing research findings across qualitative and quantitative components. This research adopted three approaches, namely: data integration at collection, analysis and presentation stages. Sections 4.9.1 to 4.9.3 discuss the data integration points.

4.9.1 Data integration through embedding

Embedding occurs when data collection and analysis are linked at different levels. If qualitative data is intended to support the work of the quantitative data, then qualitative data is nested within the framework of the quantitative data (Greene, 2007: 127). In this research, the embedding played a primary role albeit being cautious about the subsuming of one method by another especially when qualitative supports quantitative data (Morse & Niehaus, 2009: 11).

4.9.2 Data integration through merging

The research findings are compared to identify complementarity, convergence and divergence among data sets (Curry & Numez-Smith, 2015: 228–34). In this study, the merging was used alongside merged data analysis including narrative comparisons, joint displays and data transformation (Creswell & Plano Clark, 2011: 226–31).

4.9.3 Data integration through connecting

Connecting occurs when qualitative data builds on quantitative data or vice versa. It occurs in relation to the sampling and the content of the data collected (Creswell & Plano Clark, 2011: 233–38). In connecting through sampling, the data developed in the quantitative is used to define the sampling in the qualitative phase (Curry & Numez-Smith, 2015: 238). In the connecting through content of the data, integration occurs when quantitative data procedure informs qualitative data collection. As such the quantitative phase informs the development of a tool for the qualitative data. When analysed, the aim is to develop common conceptual domains of the phenomenon under study (Onwuegbuzie et al., 2010: 58–59). In this study, the data connection was used as secondary tool in the development of data collecting instruments.

4.10 Presentation and interpretation procedures

Data presentation refers to the methodology of summarising, organising and communicating information using a variety of tools, such as diagrams, distribution charts, histograms and graphs (Kumar, 2014: 332–340). Table 4.8 shows the general approaches that were used for presenting the integrated data.

Table 4.8: General approaches for interpreting and presenting integrated data

Data presentation	Specific target	Presentation Format
Narrative approaches	Weaving	Present qualitative and quantitative data together within thematic categories within a manuscript
	Contiguous	Present qualitative and quantitative data in separate finding sections of a single manuscript
Joint displays	Matrices	Include qualitative and quantitative data in tabular form with cells for each data type to facilitate comparisons across the data
	Figures and graphs	Create schematic representations such as social network diagrams and plot charts
Data transformation	Qualitative to Quantitative	Convert narrative data into numeric data and merge with quantitative data
	Quantitative to qualitative	Convert numeric data into narrative data and merge with qualitative data

Adapted from: Curry & Numez-Smith (2015: 248); Fetters et al. (2013, 2142–2143)

4.10.1 Narrative approaches

Narrative forms of integration are the most common approaches in the health sciences research and include weaving, contiguous and staged techniques (Curry & Numez-Smith, 2015: 248–249). There are no preferred techniques most favourable to health research studies. However, indications suggest that the choices of presentation formats are determined by the nature of the data and needs and preferences of the audiences. Lim, Baik and Ashing-Giwa (2012: 392) show that weaving can be accomplished through organising the quantitative and qualitative findings as per a unifying and recurrent theme. Bradley, Curry and Devers (2007: 1763) used the contiguous approach in which qualitative and quantitative findings were presented in separate sections in a single manuscript with narrative commentary linking major elements of qualitative and quantitative data. In this study, the weaving was adopted and applied through themes identified in the research agenda and content analysis of the interviews. In this study, data has been presented using the contiguous approach as a secondary tool to the weaving approach.

4.10.2 Joint displays

Joint displays combine qualitative and quantitative data through visual means designed to provide insights into how the data fit together and take the following forms: matrices, figures and graphs

(Wendler, 2001: 523 ; O’Cathain et al., 2010: 1149). In this study there is bias towards joint displays in which both qualitative and quantitative data are presented in tabular form or in a schematic representation with network diagrams and charts.

4.10.3 Data transformation

Data transformation takes two forms (Curry & Numez-Smith, 2015: 251). The first form is where qualitative data are converted into quantitative through what is known as *quantitizing* and then integrated with illustrative examples from the original qualitative set. The second form is where quantitative data was converted into qualitative through *qualitizing*. While several authors suggest that data transformation is not the best approach in mixed method, the potential of data transformation has contributed to the advancement of the mixed method approach in research studies (Curry & Numez-Smith, 2015: 252). Zickmund et al. (2013: 2217) using a convergent mixed method design and the quasi-statistics approach assigned textual data to categories and examined them statistically. In this research, data transformation was used sparingly because of the caution and risks of bias of sacrificing the richness and nuance of the qualitative data (Curry & Numez-Smith, 2015: 252).

4.11 Data analysis procedures

The integration of qualitative and quantitative data is a unique feature of the mixed method approach (Creswell & Plano Clark, 2011: 239–243). The effective integration of qualitative and quantitative data provides a comprehensive set of insights than possible and enriches findings from discrete components (O’Cathain, Murphy & Nicholl, 2010: 1147). Research suggests that qualitative and quantitative components may not have equal weight in the overall study and three possible scenarios have been presented by Curry and Numez-Smith (2015: 232). The first scenario is where the qualitative and quantitative data components are of equal priority. The second scenario is where the qualitative component is emphasised more than the quantitative component. The third scenario is where the quantitative component is emphasised more than the qualitative component. Experts in mixed method suggests that even if a component has a supplemental role, it ought to be carried out in accordance with the methodological and interpretative rigour (Morse, 2010: 348–351).

In this study data analysis served three purposes as expounded by Greene (2007: 144). Firstly, it was to reduce and organise the raw data into a manageable form that enabled descriptive reporting and further analysis. Secondly, it was to assess patterns of interrelationships, connections, or trends and differences in the data. Thirdly, it was to support and validate conclusions and inferences. The phases of data analysis include: data cleaning, data reduction, data transformation, data correlation, comparison, analysis of inquiry conclusions and inferences. Greene (2007: 144-145) outlines the procedures for data analysis as explained in Sections 4.11.1 to 4.11.5.

4.11.1 Data cleaning

In data cleaning, data from interviews and questionnaires were reviewed for indicators of variability and range.

4.11.2 Data reduction

The data from reviews, interviews and questionnaires were analysed to reduced descriptive form. These could include descriptive statistics, factors, case summaries, descriptive forms, or other reduced displays of descriptive information.

4.11.3 Data transformation

In this phase data from reviews, interviews and questionnaires were consolidated. The approach was to transform qualitative into quantitative or vice versa and consolidate different forms of data into one merged data set.

4.11.4 Data correlation and comparison

This phase investigated patterns of relationships in the data sets, themes, or policies that appear to go together with the data. Qualitative analyses in this phase included cross tabulation of themes, contexts, critical incidents, and narratives as well as comparative analyses across case or contexts or narratives.

4.11.5 Analyses for inquiry conclusions and inferences

In this final phase of analysis, higher order data analysis was conducted in support of study conclusions or inferences. For quantitative data, it included the use of the *Statistical Package for the Social Sciences* (SPSS) version 24 for statistical inferences. For qualitative data, the analyses used content analysis. Data presentation was aided by graphs, tables and charts.

4.12 Ethical considerations

Sieber (2009: 109) summarises three principles governing human research: firstly, beneficence, which entails maximising good research outcomes while avoiding or minimising unnecessary risks, harm or wrong; secondly, respect for participants, which entails protecting the autonomy of persons, and treating the non-autonomous with respect and special protections; thirdly, justice, which entails ensuring that reasonable non-exploitative and carefully considered procedures are adhered to and fairly administered. Sieber (2009: 117) further summarises ethical considerations to be considered as including: privacy which is about people; confidentiality which is about data; and anonymity which entails no identifiers. This section addresses the following ethical considerations:

4.12.1 Institutional approval

This research involved data collection from human subjects. Hence, it was important to seek informed consent from individuals or organisations to be interviewed, questioned, observed or take information from (Bell & Waters, 2014: 43). Firstly, the researcher obtained ethics clearance from the University of Cape Town (UCT - where the study was registered) and from the National Commission for Science and Technology, Malawi (NCST - to collect data from various health research institutions/institutes in Malawi). Over and above this, based on the ethics clearance from UCT (see Appendix E) and NCST (see Appendix F), a series of letters permissions were obtained, from the College of Medicine and Kamuzu College of Nursing (University of Malawi), Ministry of Health (Malawi) and seven other health partners (Malawi). The intention of the letters (see Appendices G to I) was to inform the participating institutions of the study (see Table 4.6 for the list of these institutions).

4.12.2 Informed consent

Privacy is protected by the right to refuse to participate in a study and is guided by the informed consent (Sieber, 2009: 117–119). Potential research participants need to be given information that would enable them to make informed decisions on whether to participate in a study or not (Neuman, 2011: 149; Bryman, 2012: 138). Informed consent implies that subjects are made aware of the type of information the researcher requires from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study and how it will directly or indirectly affect them (Kumar, 2014: 285). Academics and researchers from the College of Medicine, Kamuzu College of Nursing, Directors from Ministry of Health and health research partners in Malawi were requested to consent to participate in the study (see Appendices A & B). Participants were informed in writing that the study was in fulfilment of a PhD at the University of Cape Town and that it sought their experiences on how health research has informed health policy formulation in Malawi. Participants were also informed that information provided would be used for the stated study only and not for any other purpose; they were not obliged to participate in the study; and, they were free to withdraw at any time without providing reasons. No incentives were provided for participating in the study. No harm in any form to participants, was anticipated.

4.12.3 Confidentiality and anonymity

Confidentiality is concerned with data about the participant. An agreement is sought as to how data would be handled in keeping with the participant's interest and controlling access of the data from unauthorised users (Sieber, 2009: 117). Anonymity is an assurance that data would not be traceable to the participants in a research subject (Gray, 2014: 679). Anonymity means that the names and other unique identifiers of the subjects would not be attached to the data (Sieber, 2009: 117). In this research, the confidentiality and anonymity agreements were enclosed in the informed consent (see Appendices A & B) and all participants were assured of anonymity as well as confidentiality of the information they provided, during the reporting of findings.

4.13 Chapter summary

The chapter presented pragmatism as the underlying philosophical framework for the study. The pragmatism paradigm subscribes to the concept of inquiry as a form of experience to resolve uncertainties. The chapter also presented the mixed method research approach. Specifically, it presented the convergent parallel mixed method design as the overarching design for the study. The chapter outlined the process of data collection, analysis and presentation for the study. Data was collected through questionnaires, interviews, a research centre/institute assessment tool, health policy assessment tool and search strategy. The chapter further indicated how validity and reliability issues were addressed. The closing sections addressed data analysis, ethical considerations and evaluation of the research methodology in relation to the study. The next chapter presents findings based on the analysis of data collected for the study.

Chapter 5

PRESENTATION OF RESEARCH FINDINGS

5.1 Introduction

The objectives of this study were: to conduct a review of health research and health policies in Malawi; to ascertain the relationship between the use of health research evidence as generated by health research institutions (mainly the College of Medicine and Kamuzu College of Nursing in Malawi) and policy formulation mainly by the Ministry of Health (as a leading health policy-making body in Malawi); and, as an intervention to develop a research-based communication and dissemination strategy for disseminating health research evidence for health policy formulation in Malawi.

Qualitative data were collected through open-ended interviews and a self-administered assessment tool for directors of research institutions and the Ministry of Health. Quantitative data were collected from health researchers and academics through a self-administered questionnaire with fewer open-ended questions, and a health policy assessment tool. A literature search strategy applied to *Scopus* yielded some results that were used for the publication projections up to 2030, using auto regression analysis. Qualitative data were analysed through content analysis while quantitative data were analysed using *SPSS* version 24 for descriptive and inferential statistics. The presentation of findings resulting from the analysis of data collected for the study has been aided by graphs, charts, tables and figures. Qualitative findings are presented in the form of narratives.

5.2 Response rate

A response rate refers to the degree of success in obtaining completed responses from a sample (Lavrakas, 2008: 758), and refers to the number of returned responses against the total number of respondents eligible in the study (Fincham, 2008: 44). Non-response rate affects the reliability and validity of study findings. In a study in the social sciences, Baruch and Holtom (2008: 1139) observed that the average response rate for data collected from individuals was 52.7% with a standard deviation[13] of 20.4, while the average response rate for data collected from organisations was 35.7% with a standard deviation of 18.8. In a mixed method study, that involves both qualitative and quantitative data, there is no consensus on what constitutes an adequate response rate. The current study suggested 50+1% over both quantitative and qualitative data sources.

In the current study, a census approach was used and targeted all possible researchers/academics at the College of Medicine and the Kamuzu College of Nursing. Using a confidence level[14] of 95% with a 5% margin of error[15], of the possible 246 respondents, the cut-off point calculated for significant statistical analysis using descriptive or inferential statistics was 151 respondents. However, study yielded 166 respondents out of the 246, representing 67.5% of the identified population of researchers/academics. Out of the ten institutions proposed for the self-assessment tool, nine representing 90% responded to the tool. Further, out of the 17 interviews with the directors of research institutes/centres and the Ministry of Health, nine were granted representing 52.9% of the interviewees. A total of 30 health-related polices were examined out of a typology

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[13] Standard deviation refers to the quantity expressing by how much the members of an particular population differs from the mean value for the population (Chu, 2013; McKenzie, 2013).

[14] Confidence level refers to the amount of uncertainty that can be tolerated. Usually it is expressed as a percentage and shows how often the true percentage of the population lies within the confidence interval. A 95% confidence level means one can be 95% certain; a 99% confidence level means one can be 99% certain (Chu, 2013; McKenzie, 2013).

[15] Margin of error refers to the amount of error that can be tolerated. Usually, a large margin of error entails less confidence in the source of data. A small margin of error means more confidence in the sources of data (Chu, 2013; McKenzie, 2013).

of many health policies from 1992 to 2017. The availability of the health polices in both print and electronic determined their inclusion in the study. Only health polices from 2002 were readily available from various resource centres consulted. It was easy to find latest policy documents as opposed to past policies as any policy older than 10 years is discarded (according to a personal interview with the Librarian, Ministry of Health Library and Resource Centre). A search strategy of health research results from various databases yielded 3985 documents which were related to health research conducted in Malawi and associated with the College of Medicine and Kamuzu College of Nursing and other health-related institutions in Malawi.

5.3 Data analysis

Data analysis in this study involved both qualitative and quantitative analysis. Greater emphasis was placed on quantitative methods while qualitative methods performed a secondary role **(**See Table 4.2).

5.3.1 Quantitative data analysis

The study used both descriptive and inferential statistics for the analysis of quantitative data. The use of descriptive statistics to present the results of these analyses has been aided by graphs, charts and tables. Inferential statistics were used to carry out certain statistical tests. Firstly, the Pearson Chi-Square Test was adopted to establish the relationship between categorical data and evaluate how likely it is that any observed difference between the sets arose by chance. Statistical significance is realised when the calculated value is lower than the universally accepted level of significance of $p = 005$ (Chu, 2013; McKenzie, 2013). Secondly, the Kruskal-Wallis H test was used to determine if there were statistically significant differences between two or more groups of an independent variable as analysed against a continuous or ordinal dependent variable. The following assumptions guided the use of the Kruskal-Wallis H test: the dependent variables were measured at the ordinal or continuous level (Likert Scale); independent variables (faculties) consisted of two or more categorical groups (five faculties); and, that there were different researchers in each group with no participant being in more than one group (all five faculties comprised of different researchers with no participant in two faculties).

5.3.2 Qualitative data analysis

Qualitative data in this study were analysed using content analysis. The study specifically adopted the summative content analysis which involves examining the data content from interviews and interpreting the underlying context or meaning (Hsieh & Shannon, 2005: 1227).

5.4 Demographic features of the study

The term demographic features refer to characteristics of a population and include: age, race, gender, ethnicity, religion, income, education, marital status and family size (Salkind, 2010: 346). Demographic information provides data regarding research participants and determines whether individuals in a study are a representative sample of the target population for generalisation purposes (Salkind, 2010: 346). Demographic characteristics are reported in a study as independent variables in the research design (Salkind, 2010: 346). In this study respondents were academic members of staff, researchers and directors of health-related organisations (that is, assistant lecturer to professor, director or deputy director or chief research officers). The demographic features of interests were: their qualifications (undergraduate to doctoral degrees), their departments, their faculties, and their affiliations to teaching hospitals, health boards, government boards and research centres.

5.4.1 Distribution of study participants by faculty

Table 5.1 presents the distribution of study participants by Faculty. The study captured information from 166 participants from different faculties. Thirty-three percent (32.5%, n = 54) were from the Faculty of Medicine; 22.9% (n = 38) were from the Faculty of Nursing; 20.5% (n = 34) were from the Faculty of Biomedical Sciences; 15.7% (n = 26) were from the Faculty of Public Health; while 8.4% (n = 14) were from the Faculty of Midwifery.

Table 5.1: Distribution of study participants by faculty

Faculty	Number of respondents	Relative frequency
Medicine	54	32.5%

Nursing	38	22.9%
Biomedical Sciences	34	20.5%
Public Health	26	15.7%
Midwifery	14	8.4%
Total	166	100.0%

5.4.2 Distribution of study participants by department

Table 5.2 presents the distribution of study participants by departments. The study captured information from 166 participants from different departments within the five faculties. Twelve participants each (7.2%, n = 12) were from the Departments of: Basic Studies[16]; Midwifery and Obstetrics; and Gynecology, respectively. The least responses (1.2%, n = 2) were from the Departments of Anesthesia and Mental Health, respectively.

Table 5.2: Distribution of study participants by department

Department	Number of respondents	Relative frequency
Basic Studies	12	7.2%
Midwifery	12	7.2%
Obstetrics & Gynaecology	12	7.2%
Biomedical Sciences	12	7.2%
Community & Mental Health Nursing	11	8.4%
Internal Medicine	10	6.0%
Physiotherapy	10	6.0%
Public Health	10	6.0%
Surgery	10	6.0%
Paediatrics & Child Health	9	5.4%
Ophthalmology	8	4.8%
Clinical Nursing	7	4.2%
Health Systems & Policy	7	4.2%

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[16] The Department of Basic Studies at Kamuzu College of Nursing teaches courses such as Biology, Sociology for Health, Health Communication, Research Methods and Ethics for the Medical Profession, Statistics for the Medical Profession, etc.

Medical Surgical Nursing	6	3.6%
Pharmacy	6	3.6%
Clinical Studies	5	3.0%
Family Medicine	5	3.0%
Medical Laboratory Services	5	3.0%
Pathology	5	3.0%
Anesthesia	2	1.2%
Mental Health	2	1.2%
Total	166	100.0%

5.4.3 Distribution of study participants by degree type

From a total of 166 participants (researchers/academics), 21.1% had gone up to doctoral level (n = 35); 72.9% had gone up to Master's level (n = 121); 5.4% had gone up to undergraduate level (n = 9); while 0.6% (n = 1) was an upgrading staff in an undergraduate degree programme. Figure 5.1 shows the distribution of participants by degree type.

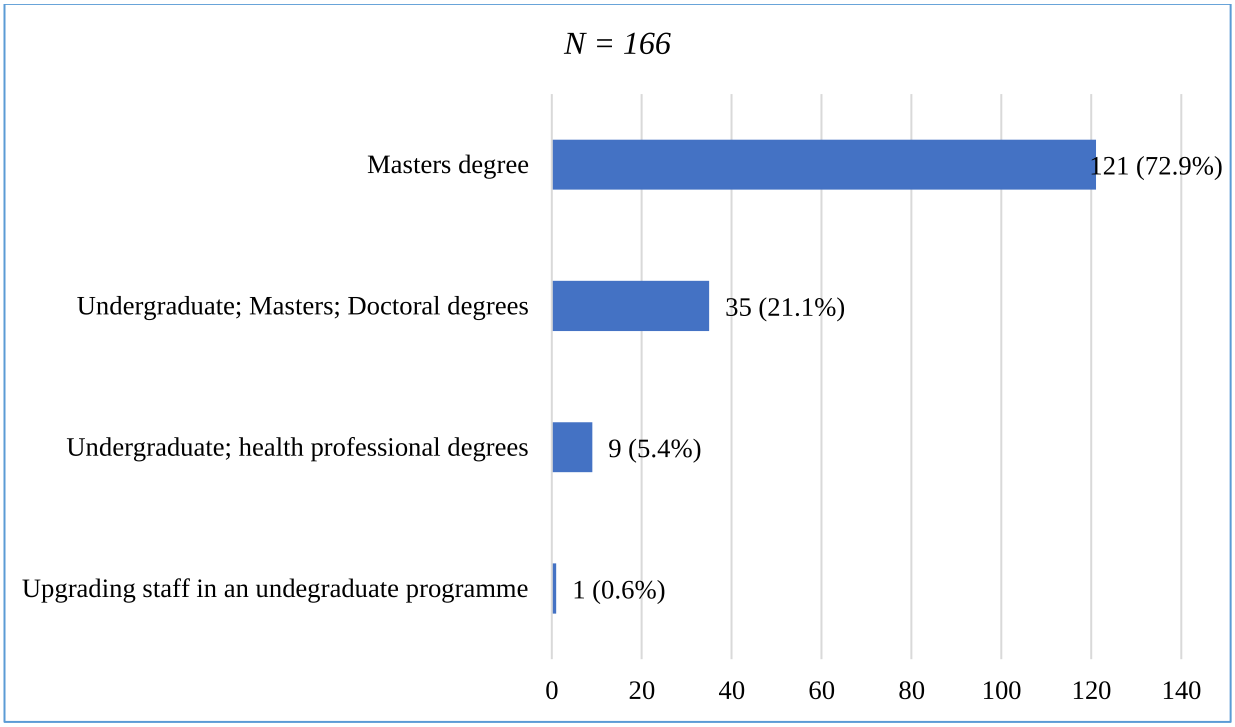

Figure 5.1: Distribution of study participants by degree type

5.4.4 Distribution of study participants by affiliation

From the 166 participants, there were 480 responses (N = 480 represents total number of multiple responses from the 166 surveyed participants (see Figure 5.2)). Majority of the respondents were involved in many health activities. Twenty six percent (26%, n = 125) are involved in university non-teaching hospital activities, 25% (n = 120) are involved in college non-teaching activities while (20%, n = 96) are involved in teaching hospitals. Very few academic members of staff are involved in health research centres (3.3%, n = 16) and health insurance boards (3.1%, n =15).

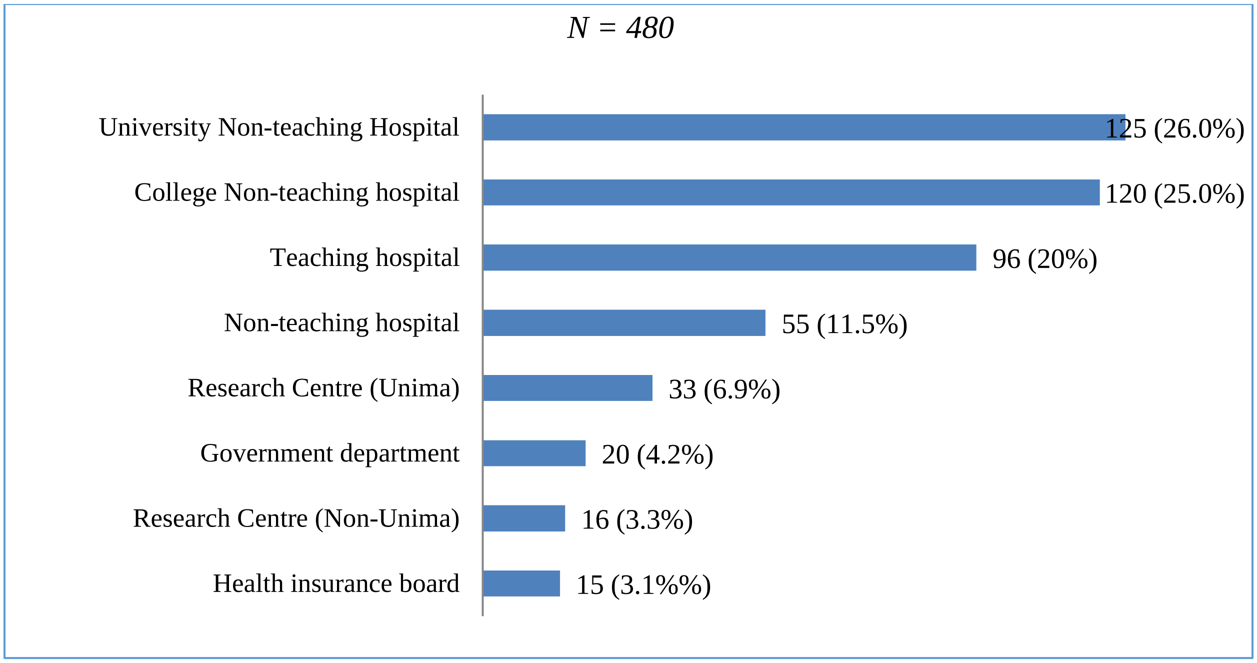

Figure 5.2: Distribution of study participants by affiliation

5.5 Research question one: How much health research and what health policies are available in Malawi?

This question is two-fold, part one addresses the question: how much health research has been done in Malawi from 1992 to 2017. Part two addresses the question: what health-related policies have been developed in Malawi from 1992 to 2017.

5.5.1 Health research in Malawi

Following the opening of the Kamuzu College of Nursing in 1979 and the College of Medicine under the University of Malawi in 1991, much health research has been conducted in Malawi. This study examined health research from 1992 to 2017. Section 5.5.1.1 presents some highlights from interviews with Directors at the Ministry of Health and statistical analysis using the Auto-Regressive Integrative Moving Average (ARIMA)[17] model.

5.5.1.1 Trends of medical and health research publications in Malawi

Figure 5.3 highlights the distribution of publications[18] by year at the University of Malawi from 1992 to 2017. The number of publications seems to have steadily increased between 1992 and 1996. However, publications seem to have decreased between 1996 and 1999, followed by a sharp increase between 1999 and 2000, then by a slow increase between 2000 and 2004, after which they stagnated between 2004 and 2006. Thereafter, an upward step-wise movement manifested itself. The percentage of change in number of publications attributed to change in time is found to be 89% ($R^2 = 0.890$). From only seven (0.18%) publications in 1992, the number of publications grew to reach 435 (11.0%) in 2017.

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[17] The ARIMA is a form of statistical analysis model that uses time series data to predict future trends (Rotich & Onyancha, 2017: 23). The ARIMA model is a form of regression analysis that seeks to predict future movements. In the current study it was used to predict the rate of health research publications in Malawi from 2018 to 2030.

[18] Publications here refer to journal articles, book titles and chapters in books.

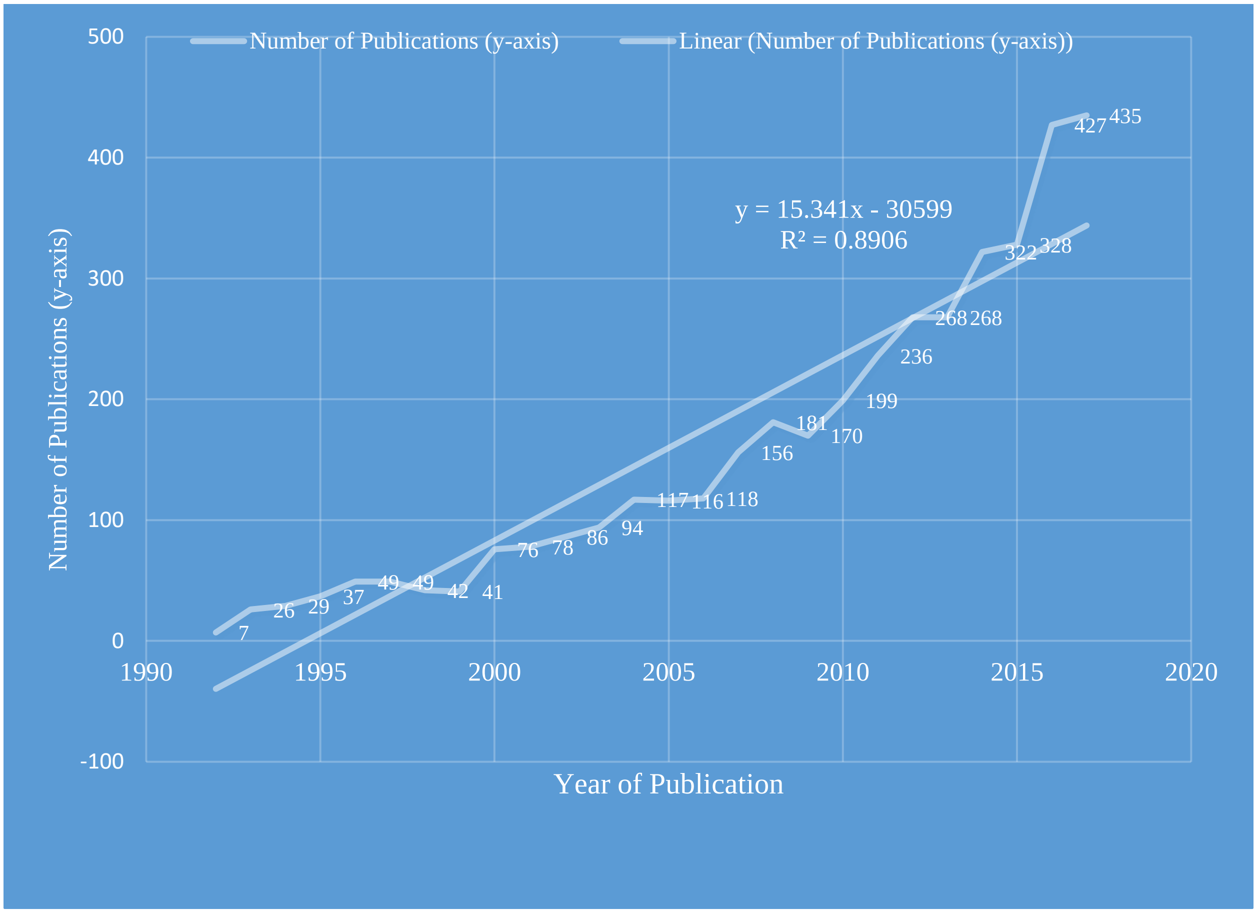

Figure 5.3: Trends in medical and health research publications in Malawi (1992-2017)

To forecast the trend of growth of the publications for the next thirteen years, 2018 to 2030, an Auto-Regressive Integrative Moving Average (ARIMA) model (ARIMA (1, 1, 0)) was used. This is a complex linear model that includes three parts. Firstly, there is a linear combination of the influence of previous values (AR); secondly, a random walk (I); and thirdly, a linear combination of previous errors (MA). Figure 5.4 reveals that the number of publications will continue to grow at an exponential rate.

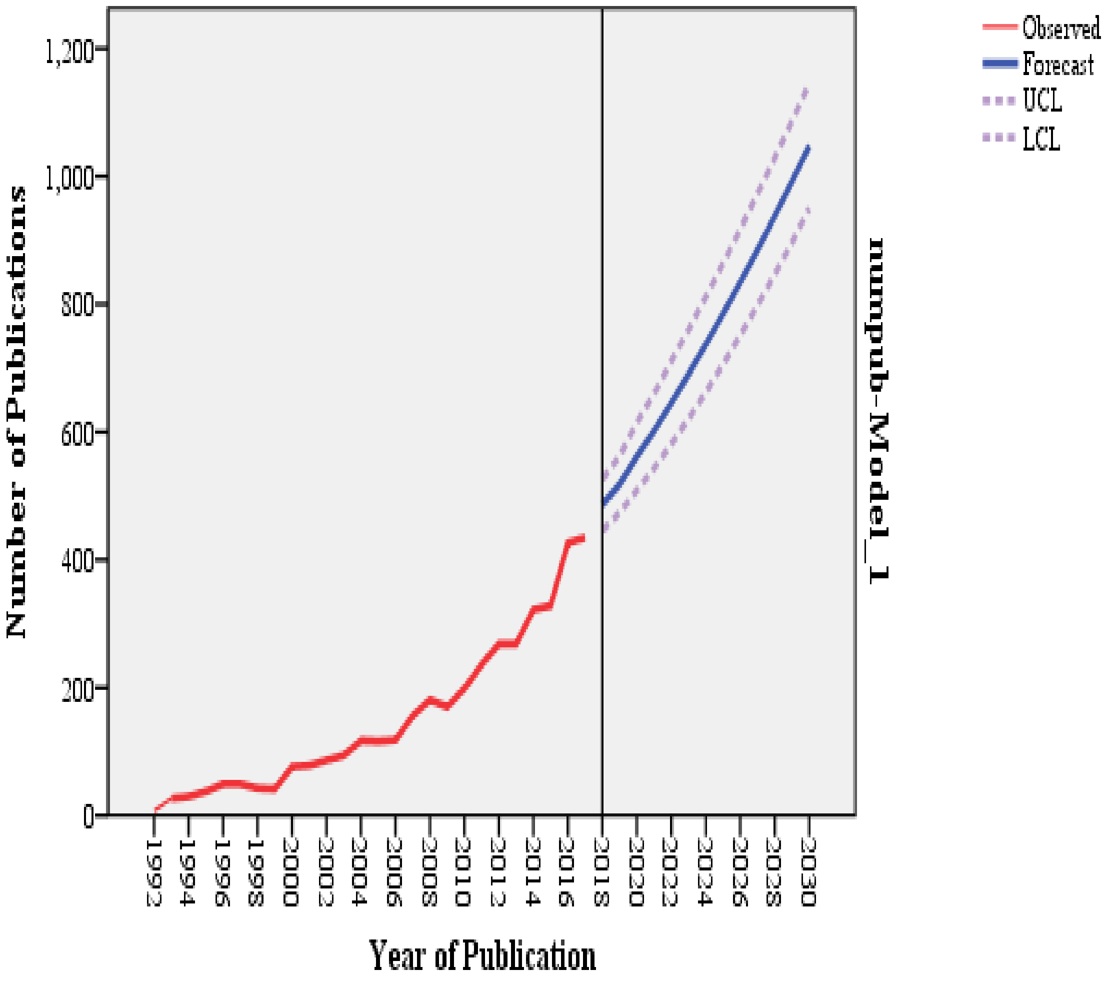

Figure 5.4: ARIMA Model trends in health research publications in Malawi (1992-2017)

The number of publications is likely to increase from about 487 (95% Lower Confidence Interval, LCL[19]: 447, 526) publications in 2018 to approximately 1048 (95% Upper Confidence Interval, UCL: 950, 1146) publications in 2030 (refer to Table 5.3).

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[19] An ARIMA model control chart consists of three parallel lines: firstly, a forecast line that reflects the average level of process operation; secondly, an upper control limit (UCL); and, thirdly a lower control limit (LCL) calculated according to the standard deviation of a process variable (Russo, Camargo & Fabris, 2012: 35).

Table 5.3: Forecast for health research publications in Malawi: 2018 – 2030

		Forecast												
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Number of articles	**Forecast**	487	518	562	602	646	691	737	785	835	886	938	992	1048
	UCL	526	562	615	660	711	760	812	864	918	973	1029	1087	1146
	LCL	447	474	509	543	582	621	663	706	751	798	847	898	950

5.5.1.2 Health research evidence by sources

Table 5.4 shows the various sources of journals that published the health research from Malawi from 1992 to 2017. The Table only presents the 20 topmost ranked journals by source. The Table shows that most of the articles 261 (6.5%) were published in *Plos One*; and 229 (5.7%) articles in the *Malawi Medical Journal* published by the College of Medicine at the University of Malawi. Indirectly, it means 94.1% of the research articles are published outside the country. Further analysis showed that 347 journals contributed one health research article each from Malawi representing 8.7% of the total research articles published. Similarly, 95 journals contributed two articles each from Malawi representing 5.3% of the research articles.

Table 5.4: Health research evidence by sources

Number	Rank	Source article	Journal articles	%
1	1	*Plos One*	261	6.5
2	2	*Malawi Medical Journal*	229	5.7
3	3	*Lancet*	139	3.5
4	4	*International Journal of Tuberculosis & Lung Disease*	137	3.4
5	5	*Trans. of the Royal Society of Trop. Medicine & Hygiene*	122	3.0
6	6	*Tropical Doctor*	121	3.0
7	7	*Journal of Infectious Diseases*	116	2.9

8	8	*Tropical Medicine & International Health*	105	2.6
9	9	*Malaria Journal*	97	2.4
10	10	*Journal of Acquired Immune Deficiency Syndromes*	95	2.4
11	11	*AIDS*	91	2.3
12	12	*American Journal of Tropical Medicine & Hygiene*	89	2.2
13	13	*East African Medical Journal*	66	1.7
14	14	*Clinical Infectious Diseases*	55	1.4
15	15	*BMC Health Services Research*	45	1.1
16	16	*Plos Medicine*	41	1.0
17	17	*Bulletin of the World Health Organisation*	40	1.0
18	18	*Archives of Diseases in Childhood*	39	1.0
19	19	*New England Journal of Medicine*	37	0.9
20	20	*BMC Public Health*	36	0.9
21	21	*Journal of the International AIDS Society*	34	0.9
22	22	*BMC Infectious Diseases*	33	0.8
.	.			
.	.	……………	.	.
		Total	**3985**	**100.0**

5.5.2 Review of health policies in Malawi from 1992 to 2017

The researcher identified a sample of health policies in Malawi. This process entailed selecting a typology of policies from each policy category and assessing the representation of the policies across departments/divisions/programme or unit (refer to Tables 4.7 & 5.5, respectively). The study set out to examine a typology of health policies from 1992 to 2017.

5.5.2.1 Identification of a sample of health policies in Malawi

Due to poor record keeping the study was only able to access some print and electronic health-related policies from 2002 to 2017. A total of 30 health-related policies were selected for analysis and presentation based on how research evidence was used in their formulation. Table 5.5 shows policies analysed.

Table 5.5: Policies in each category

Category	Policy Title	Document type	Status	Period

Planning & Policy Development	National Health Finance Strategy	Strategy	Approved	2011-2016	
	National Health Research Agenda	Strategy	Approved	2012-2016	2017-2022
	Health Sector Strategic Plan	Plan	Approved	2011-2016	
	Malawi National eHealth Strategy	Strategy	Approved	2011-2016	
Central Monitoring & Evaluation	National Health Information System Policy	Policy	Approved	2015-	
Health Education Services	Health Promotion Policy	Policy	Approved	2014-	
	National Sanitation Policy	Policy	Approved	2006-	
National Malaria Control Programme	National Malaria Policy	Policy	Approved	2002-	
	Malaria Strategic Plan	Plan	Approved	2005-2010	2011-2015
	Malaria Communication Strategy for Malawi	Strategy	Approved	2009-2014	2015-2020
Environmental Health	Infection Control & Waste Management Plan for Malawi	Plan	Approved	2016-	
	National Environmental Health Policy	Policy	Approved	2011-	
	Health Care Waste Management Policy & Strategic Plan	Policy & Plan	Approved	2004-	2016-
	Infection Control & Waste Management Plan for Malawi	Plan	Approved	2016-	
National TB Control Programme	Malawi Policy on TB Control in Prisons	Policy	Approved	2012-	
	National TB Control Programme Strategic Plan	Plan	Approved	2012-2016	
Nursing Services	National Community Home Based Care Policy & Guidelines	Policy	Approved	2005-2010	
	National Palliative Care Policy	Policy	Approved	2014-	
Clinical Services	National Alcohol Policy	Policy	Approved	2015-	
	Injection Safety Policy	Policy	Approved	2004-	
	National Nutrition Policy	Policy	Approved		
HIV & AIDS	National HIV/AIDS Policy	Policy	Approved	2004-	
	Strategy for the Health Sector Response to HIV/AIDS in Malawi	Strategy	Approved	2003	
Reproductive Health Unit	National Sexual & Reproductive & Rights Policy	Policy	Approved	2009	
	Reproductive Health Strategic Plan	Plan	Approved	2006-2011	
Diagnostics services	National Medicines Policy	Policy	Approved	1991-	

	Malawi Standards Treatment Guidelines	Guidelines	Approved	2009-2014	2015-
	Malawi Essential Medicines List	List	Approved	2009-	

Figure 5.5 shows sources of health-related policies analysed. Twenty-seven (27 or 90%) of the health-related policies identified were from the Ministry of Health while one (1 or 3%) were from the Ministries of Economic Planning, Irrigation and Water Development and the Office of the President and Cabinet, respectively.

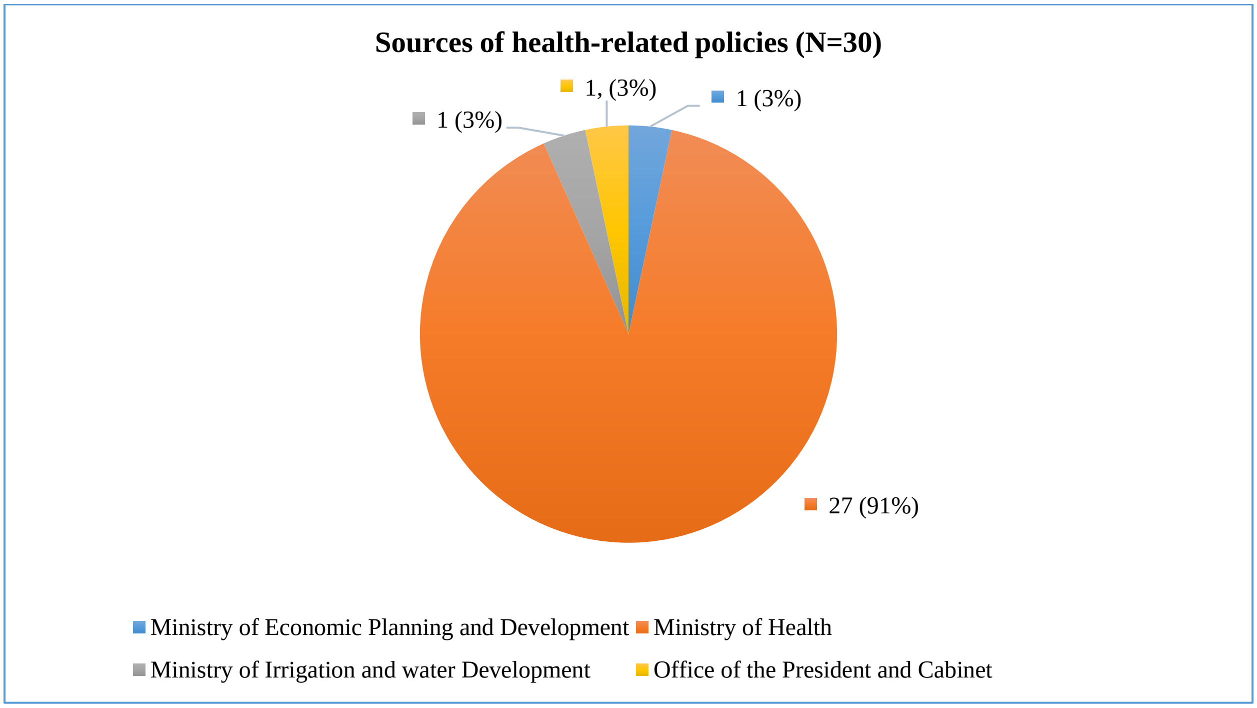

Figure 5.5: Sources of health policies

5.5.2.2 Role of Ministry in policy formulation

To assess the use of health research evidence in the polices, the research adopted and revised the Staff Assessment of engagement with Evidence Tool devised by the SPIRIT team under the Cipher Investigations (Makkar et al., 2016a, 2016b). Figure 5.6 shows the various roles played by ministries in the policy formulation.

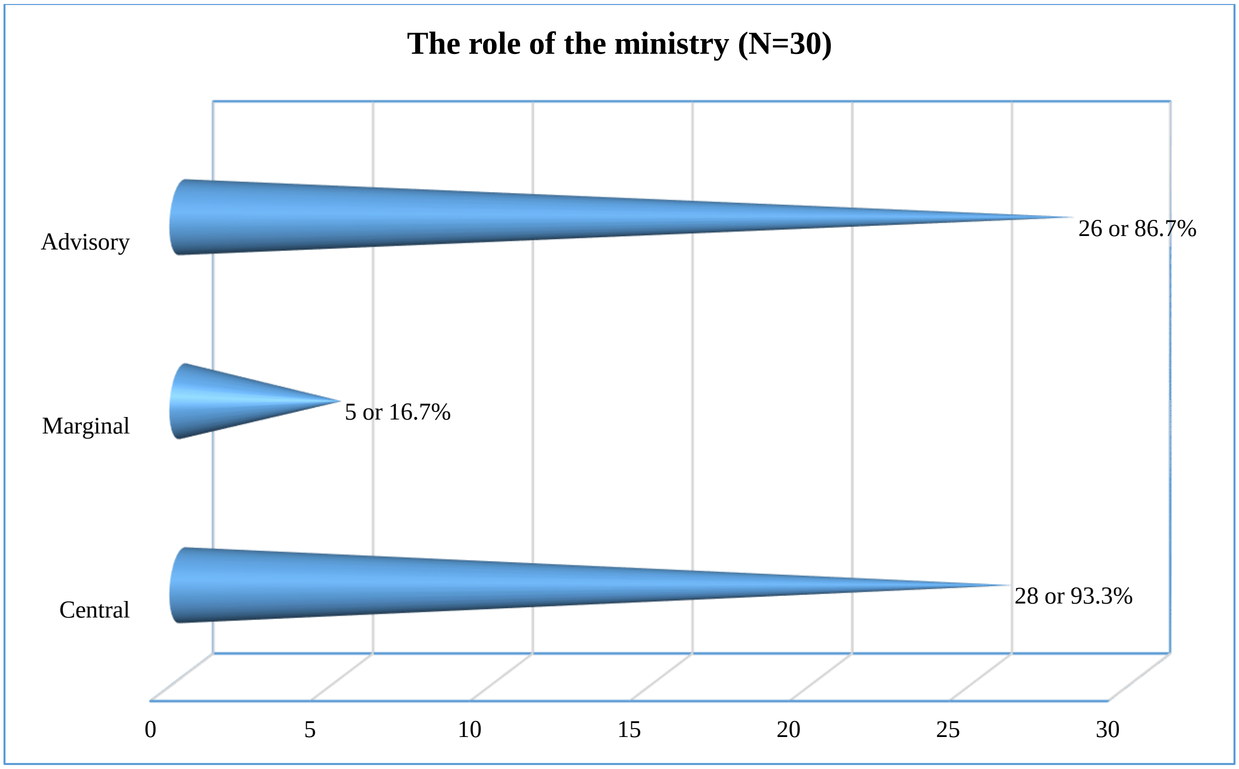

Figure 5.6: Role of the ministry in policy formulation

Central role suggests that the policy makers developed the policy document themselves. Marginal role refers to the policy makers contributing towards the policy document while advisory role suggests that the policy makers directed the process of policy document as well (Makkar, et al., 2016b: 2). Based on the premises highlighted earlier, Figure 5.6 implies that the 26 (86.7%) and 28 (93.3%) of the policies were formulated by the Ministries of Health, Economic Planning and Development, Irrigation and Water Development and the Office of the Vice President (OVP). The ministries and the OVP played an advisory and central role in the policy formulation. Qualitative content analysis of the policies revealed that the central role is a result of the Malawi government's commitment to fulfil international agreements, obligations and declarations. For example, health policies need to adhere to international obligations. The National Palliative Care Policy was a response to the 2002 Cape Town Declaration; 2005 Korea Declaration; the Palliative Care Conventions of 2003; and the African Ministers of Health session on Palliative Care of 2013. Locally, the Ministry of Health was also responding to the Malawi Health Sector Strategic Plan of 2011-2016, Malawi Vision 2020 and the Malawi Growth and Development Strategy II.

Regarding the Malaria policy, the Government played both central and advisory roles. Again, this was in response to the Roll Back Malaria agreement at the Abuja Declaration signed by Heads of State in 2000. Further, the National Alcohol Policy conforms with the World Health Assembly, and the African Ministers of Health commitment to reducing the harmful use of alcohol. The alcohol policy was formulated as a commitment to the World Health Organisation's Global Action Plan on the prevention and control of some non-communicable diseases.

5.5.2.3 How research informed the formulation of health policy documents

The purpose of this subsection is to describe the methodology used to find health research evidence that informed policy formulation. The process can either be systematic or serendipitous. It can also involve broad and rigorous searches or narrow and limited searching. Figure 5.7 shows methods of searching for health research evidence. Qualitative content analysis of the policies shows that both primary studies (journal articles) and secondary studies (textbooks) were missing in the policy documents. A good example was the 2006-2010 Malaria Strategic Plan in which the Ministry of Health introduced Lumefantrine-Artemether as the first line drug for the treatment of malaria and, Amodiaquine-Artesunate as the second line leaving Quinine for the treatment of severe malaria and management of malaria in pregnancy. Qualitative content analysis of the Malaria Strategic Plan indicates that this was in line with WHO's recommendation. No primary or secondary studies done in Malawi have been captured in the Malaria Strategic Plan.

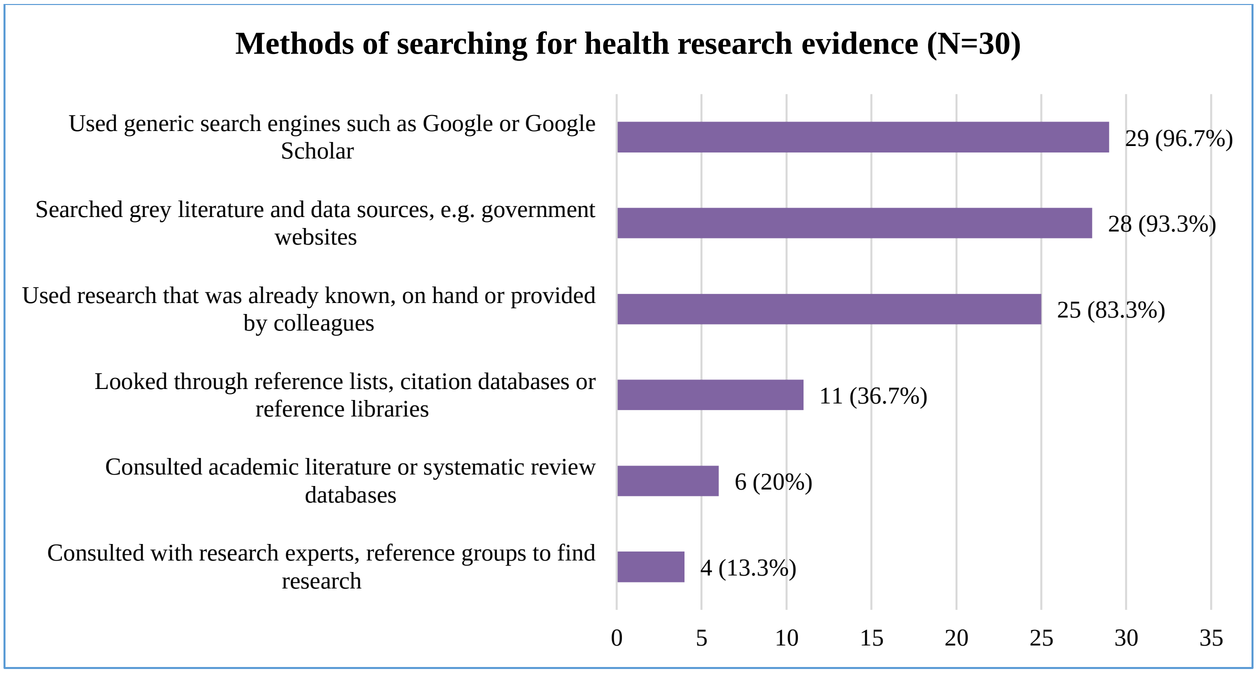

Figure 5.7: Methods of searching for health research evidence

Figure 5.7 shows that in 29 (96.7%) of the 30 policies, the policy formulators used generic search engines such as Google or Google Scholar to look for heath research evidence. In 28 (93.3%) of the policies they searched for grey literature and other government documents. In only 6 (20%) of the policies did the policy formulators use academic literature in the form of journal articles and randomised controlled trials. Qualitative content analysis of the selected policies shows that no systematic reviews or policy briefs were consulted. Basic research used range from the use of data from the National Statistical Office, World Health Organisation, Google or grey literature from government websites.

5.5.2.4 Types of research found in health policies

The purpose of this subsection is to identify the type of academic documents used in the formulation of the health policies in Malawi. These could be primary research studies such as reports of trials published in journals; secondary research articles such as systematic reviews; technical monographs or textbooks; government reports or other unpublished grey literature or data from registries (Makkar et al., 2016a, 2016b). Figure 5.8 shows types of research found in the health policies examined.

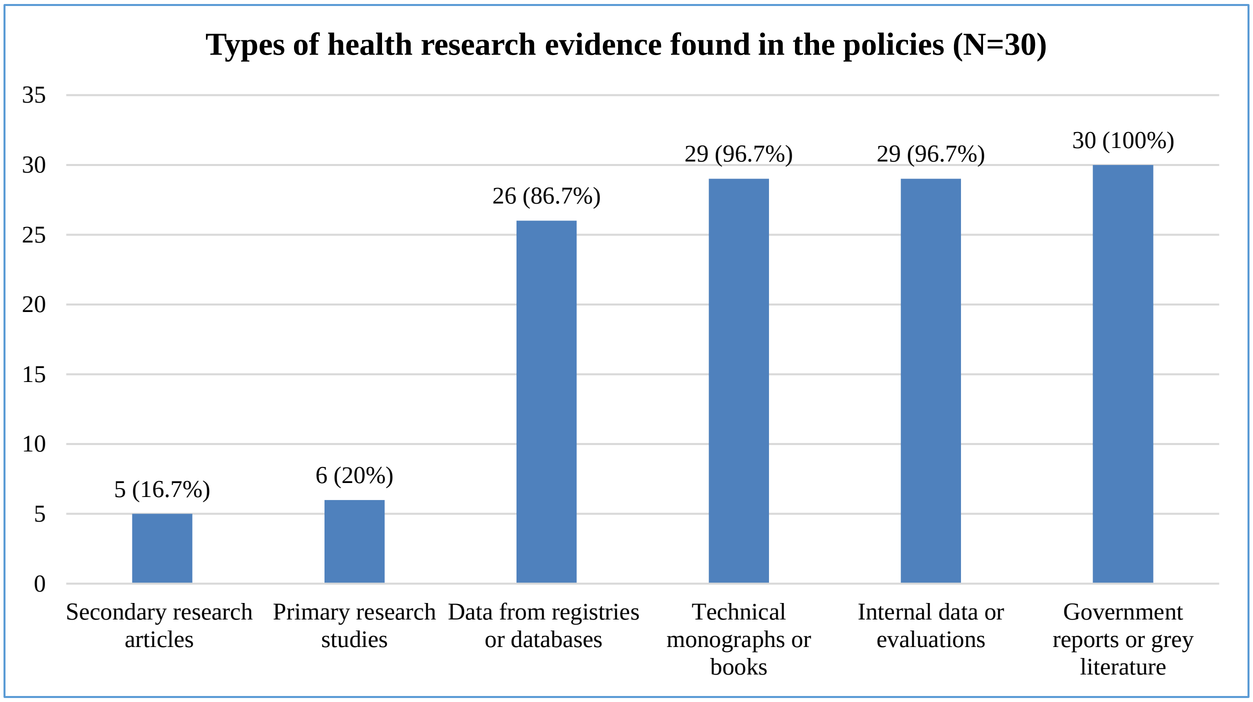

Figure 5.8: Types of research data found in health policies

Figure 5.8 shows that in 5 (16.7%) of the 30 policy documents the policy formulators used secondary research articles such as research summaries. In 6 (20%) of the policy documents they used primary research in the form of trials and published journals. No evidence of systematic reviews was encountered during the analysis of the bibliographical references of the policy documents. Many of the health policy documents used technical monographs from the ministries especially the National Statistical Office (29 or 96.7%); government reports including evaluations of previous policies or programmes from various organisations (30 or 100%); internal data or evaluations within the ministries (96.7%) or data from ministry registries (26 or 86.7%). Content analysis of the 30 policies shows that policy introductory statements indicate that government reports and unpublished police reports are mostly used simply to provide the context of the policy problem. Other than that, there is not feasible actionable messages such as policy briefs of research evidence.

5.5.2.5 Relevance of the research found in health polices

For relevance this current study used the concepts of appropriateness of the health research evidence for the health policies and their application to the policy context and population (Makkar et al., 2016a, 2016b). Figure 5.9 shows the relevance of the health research evidence within the policy context.

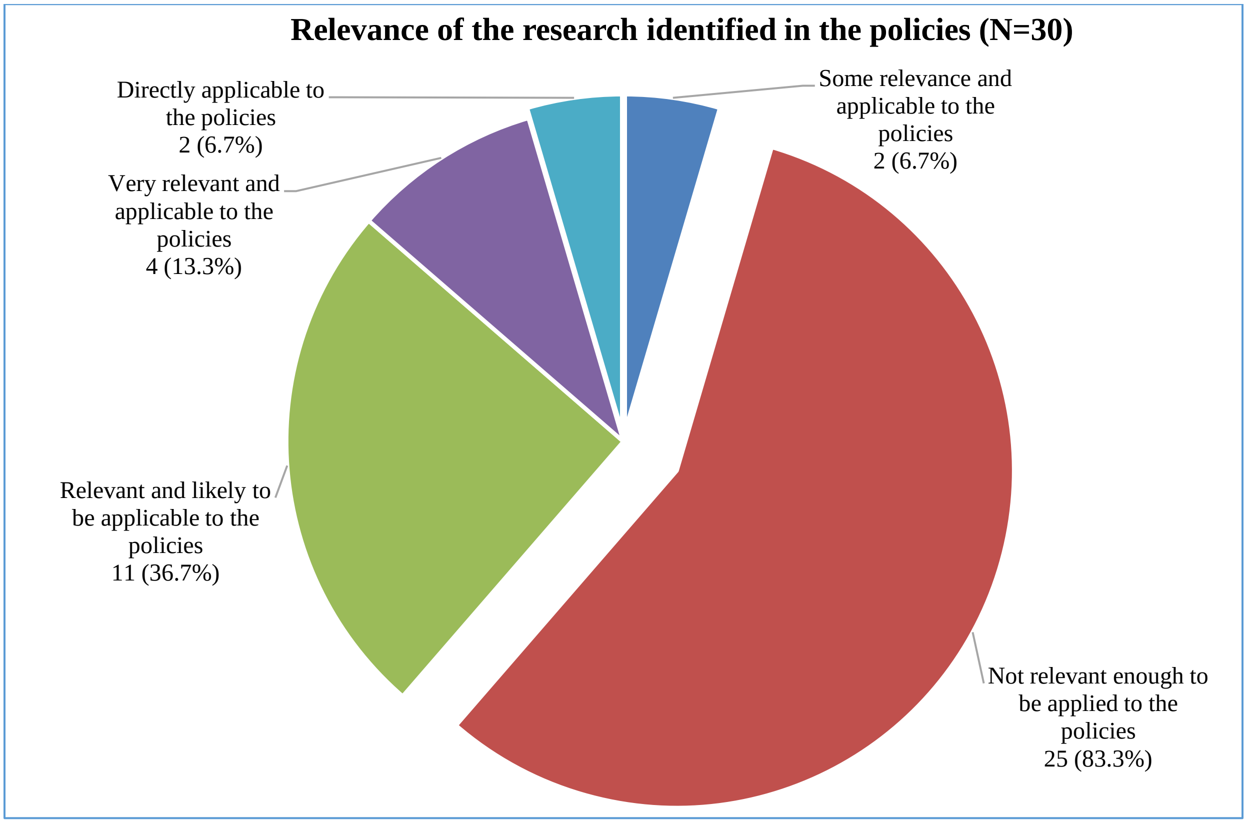

Figure 5.9: Relevance of the research found in health policies

Figure 5.9 shows that in 25 (83.3%) of the 30 policies the research evidence was not relevant enough to be applied to the health policy context. In 4 (13.3%) of the policies there was very relevant documents to the policy context. In only 2 (6.7%) of the policies was health research evidence directly applicable to the health policy documents. Content analysis of the policy documents shows that in only 2 (4.5%) of the health policy documents, health research evidence was directly applicable to the policy documents and the research evidence came from the use of randomised controlled trials and peer reviewed journal articles.

5.5.2.6 Assessment of the health evidence found in health policies

It was important to figure out how the assessment of the research evidence was derived. Four levels suggested by Makkar et al. (2016a, 2016b) were adopted and these were: applicability of the research evidence to policy context; use of the actionable or feasible research evidence; consistency of the research evidence with the previous research; and, compatibility with organisational values or knowledge. Figure 5.10 shows the assessment levels for the health research evidence found in the policy documents.

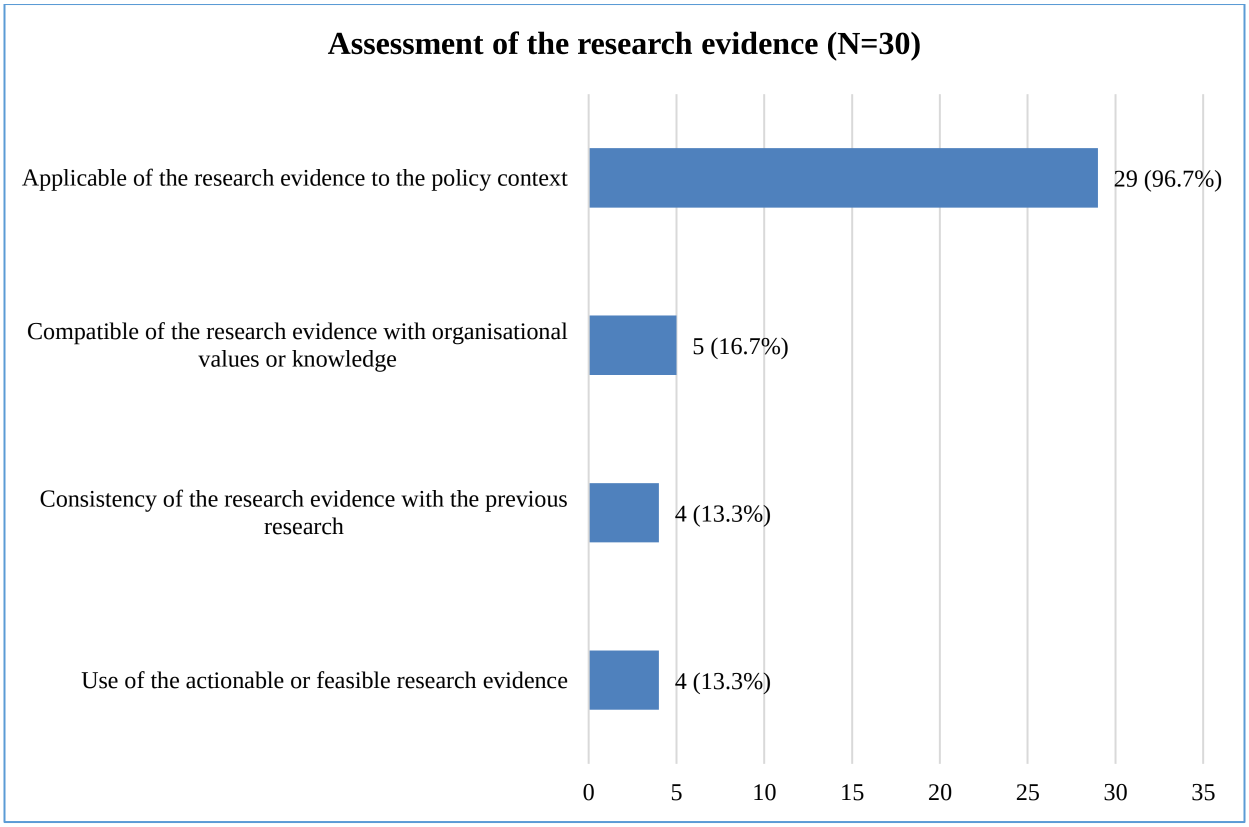

Figure 5.10: Assessment of research evidence

Figure 5.10 shows that in 4 (13.3%) of the 30 policy documents the research evidence was consistent with the previous research especially from the National Statistical Office and previous policy documents and actionable or feasible research evidence in the form of Ministry research summaries, respectively. In 29 (96.7%) of the policy documents, the research evidence was applicable to the policy documents. However, no actionable documents such as policy briefs and systematic reviews were referred to in the policy documents.

5.5.2.7 Quality of the health research evidence

Quality suggests that the research design was robust enough to lead to accurate conclusions. In the absence of systematic reviews informing the health policies selected for analysis, the available health research evidence was weighed as to how scientifically robust the studies were in terms of sample size sufficiency, methods of collecting data and how validity issues were addressed (Makkar et al., 2016a, 2016b). Figure 5.11 shows the outcome of the quality assessment of health research evidence.

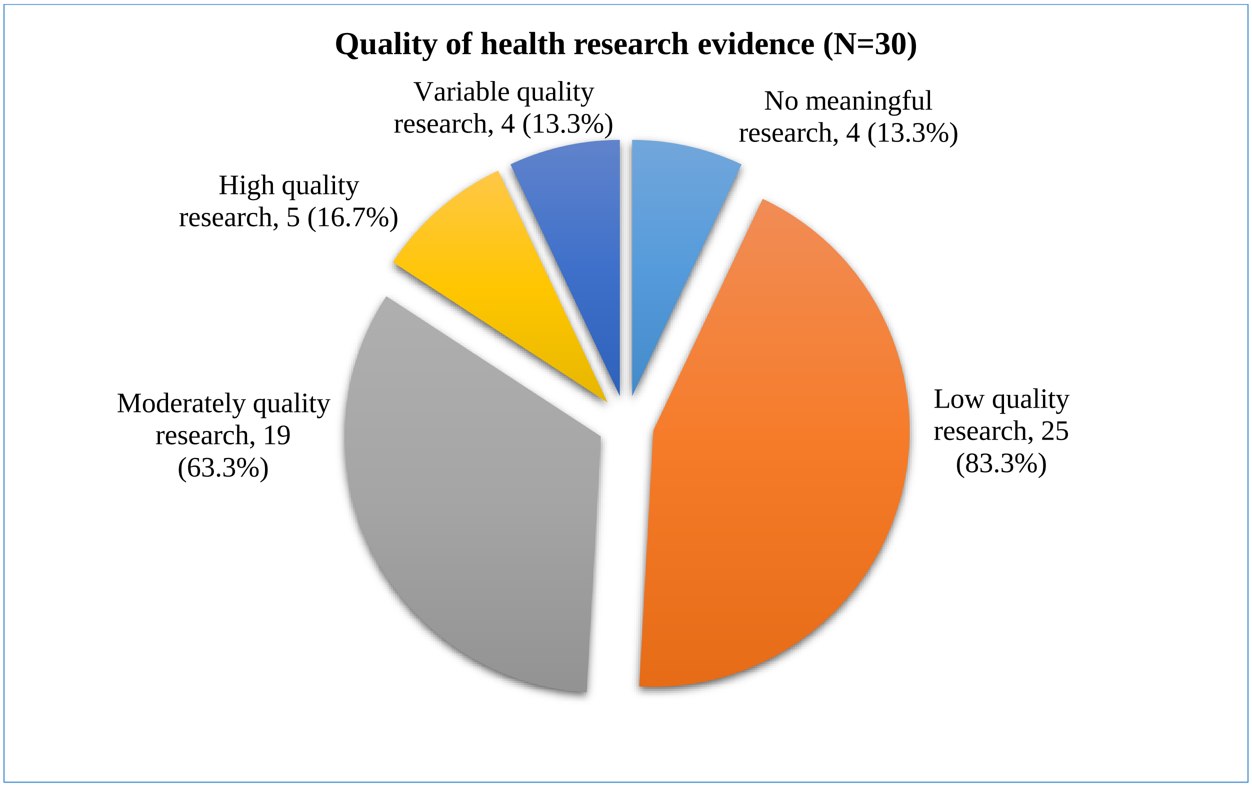

Figure 5.11: Quality of health research evidence

Figure 5.11 shows that in 4 (13.3%) of the 30 health policy documents there were meaningful health research evidence and the quality varied considerably. In 25 (83.3%) of the policies there was low quality of research which relied heavily on internal data from the ministry registries, grey literature from ministry research summaries and reports from the National Statistical Offices. Only

5 (16.7%) of the documents showed the use of primary research studies such as peer reviewed journal articles and randomised controlled trials.

5.5.2.8 Forms of consultations in health policy formulation

The policy-making culminates into a consultative process which involves various personnel and strategies (Makkar et al., 2016a, 2016b). Figure 5.12 shows the forms of consultations for the policy formulation (N = 30).

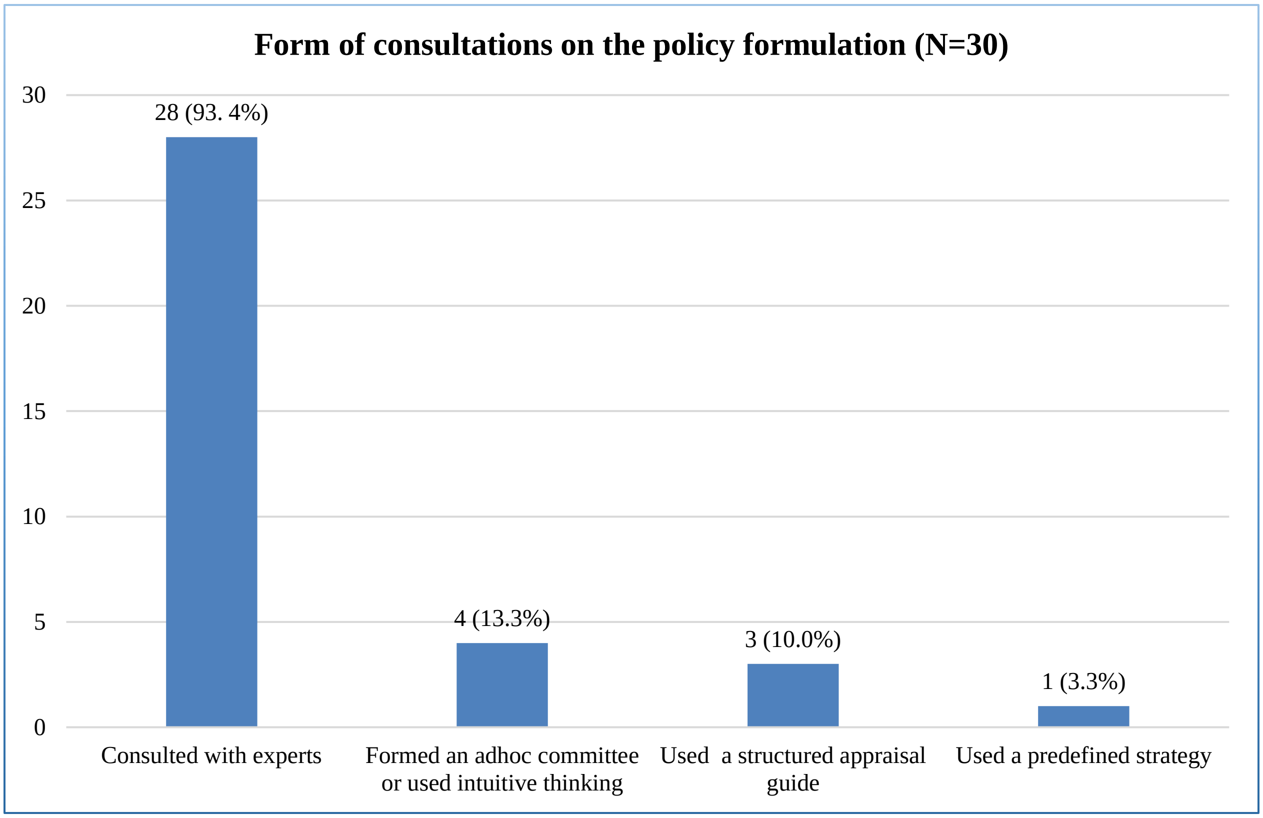

Figure 5.12: Form of consultations for the policy formulation

Figure 5.12 shows that in 28 (93.4%) of the 30 policies, subject experts were consulted and formulated the policies. In 3 (10%) of the policy documents policy formulators used a structured appraisal of evidence. In 4 (13.3%) of the policy documents, there were no references to sources of evidence which suggests that they were formulated adhoc or intuitively using policy makers institutional memory rather than any research evidence. In some cases, experts consulted each other for direction on policy formulation outside the use of health research evidence.

5.5.2.9 Methods of soliciting health research evidence in policy documents

Methods of examining the research evidence include: intuitive processes, specific criteria, standard processes of evaluating evidence adhoc, or personnel involved (Makkar et al., 2016a, 2016b). Figure 5.13 shows the evaluation of the quality of health research evidence.

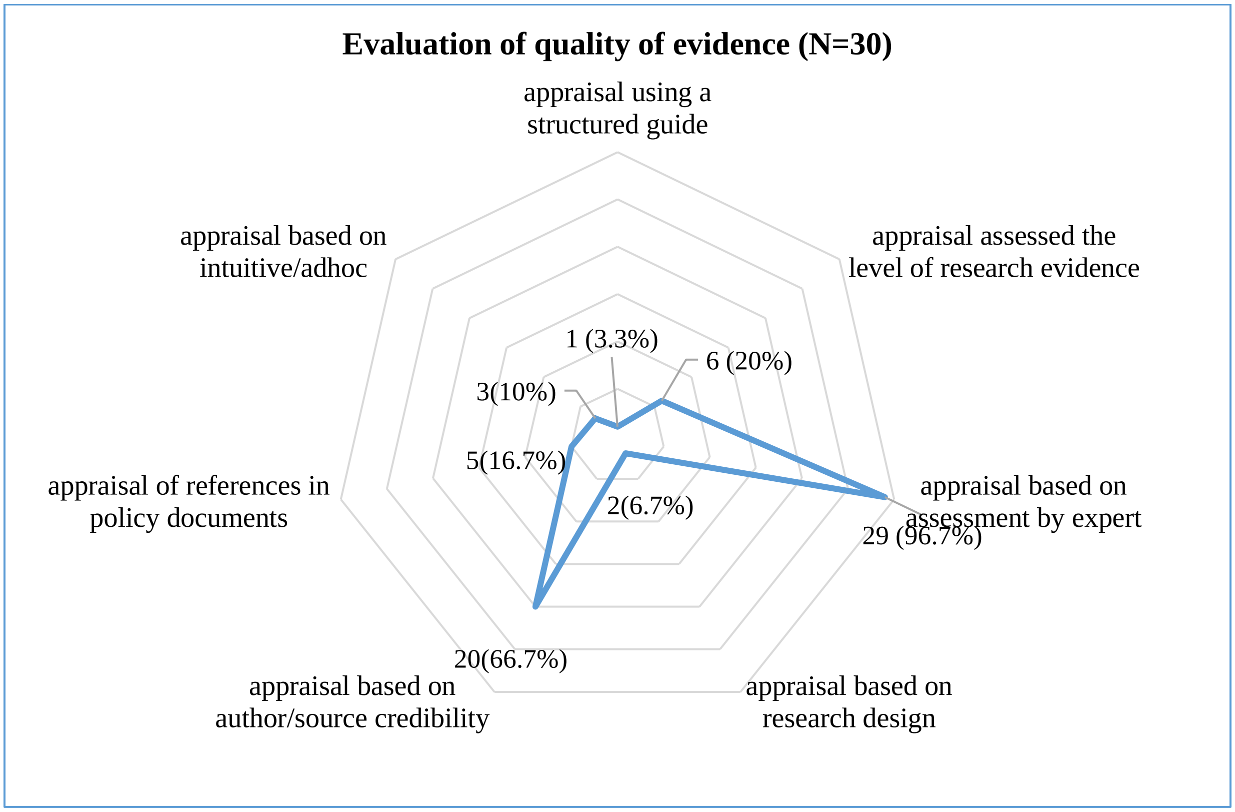

Figure 5.13: Methods of soliciting health research evidence

Figure 5.13 shows that in 29 (96.7%) and 20 (66.7%) of the 30 health policy documents, appraisal of evidence was based on expert opinion and author or source of credibility. In 5 (16.7%) appraisal of health research evidence was based on references in policy documents. In only 2 (6.7%) of the policies appraised the research design was based on research evidence while in 6 (20%) the appraisal was based on the level of research evidence.

5.5.2.10 Type of personnel involved in health policy formulation

Health policy formulation involves working groups some of which include experts, researchers, clinicians, practitioners (Makkar et al., 2016a, 2016b). Figure 5.14 shows the type of personnel involved in health policy formulation in Malawi.

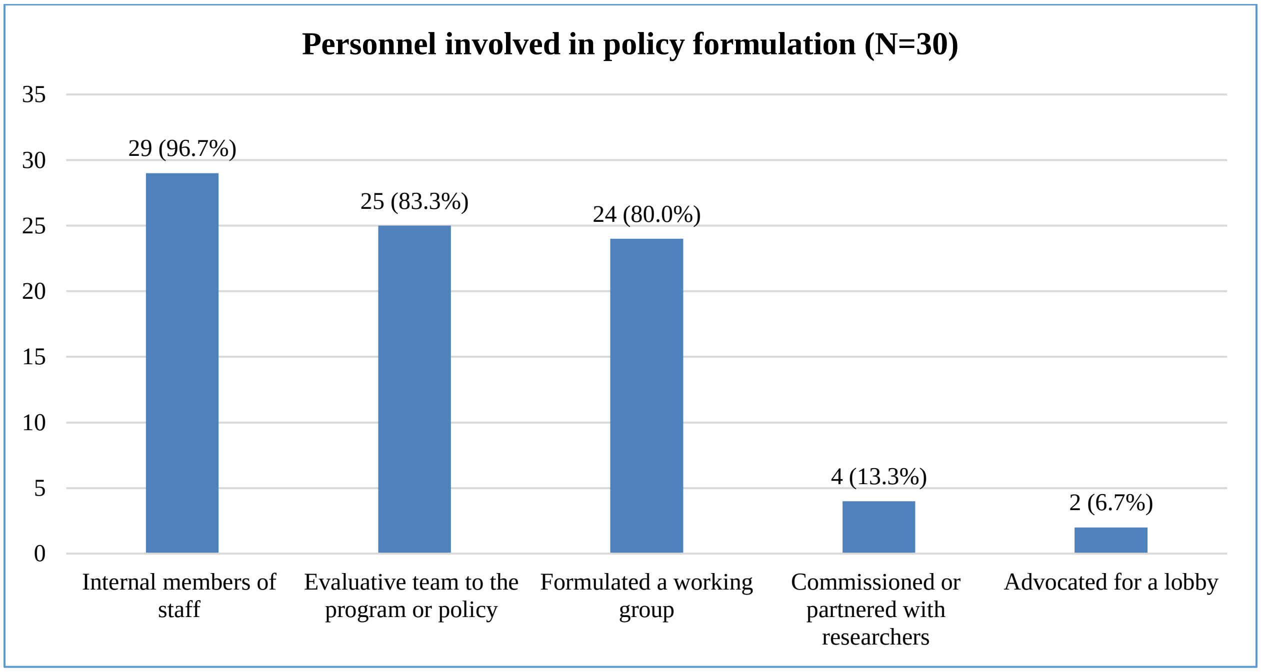

Figure 5.14: Type of personnel involved in health policy formulation

Figure 5.14 shows that in 29 (96.7%) of the 30 policy documents policy formulators involved internal members of staff within the ministries. In 25 (83.3%) of the policies an evaluative team within the ministry was established. In 24 (80%) of the policies a working group was formulated. In only 4 (13.3%) of the policy documents policy formulators partnered with researchers in designing the policy documents.

5.5.2.11 How research informed the development of the policy document

Research use in health policy formulation can be effected at four levels, namely: instrumentally, conceptually, tactically or it can be imposed on the policy itself or the processes (Makkar et al., 2016a, 2016b). These four levels informed the type of research evidence use in Malawi:

5.5.2.11.1 Conceptual use of research evidence

Conceptual use of research is derived when the research itself provides indirect knowledge for understanding the policy formulation processes and helps the policy formulators grasp issues that may influence their thinking but without documentable or direct impact (Makkar, et al. 2016a: 316). This includes health research evidence informing the background thinking about the design, conduct, evaluation, selection of outcomes and development of the evaluation tools for the policy formulation processes. Figure 5.15 shows how health research evidence conceptually informed health policy formulation in Malawi.

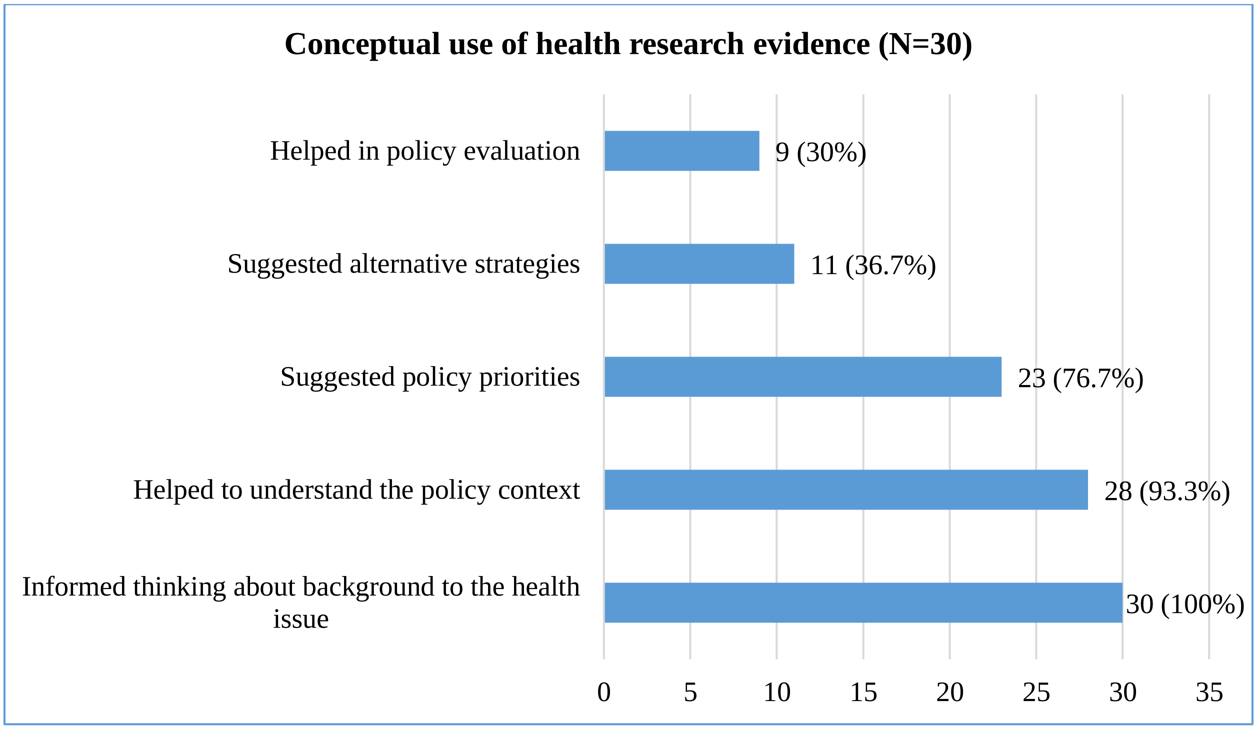

Figure 5.15: Conceptual use of health research in policy formulation

Figure 5.15 shows that in all 30 (100%) of the policy documents analysed, research informed thinking about the health policy issues. In 28 (93.3%) of the policy documents research helped the policy formulators to understand the policy context.

5.5.2.11.2 Instrumental use of health research evidence

Instrumental use of health research evidence entails the use of health research evidence to provide knowledge of action that informs policy decisions and directly informs the policy content (Makkar et al., 2016a, 2016b). This includes the use of health research evidence in determining the policy evaluation methods, selection of policy outcomes or the identification of existing policy tools for usage. Figure 5.16 shows the instrumental use of health research evidence use in Malawi.

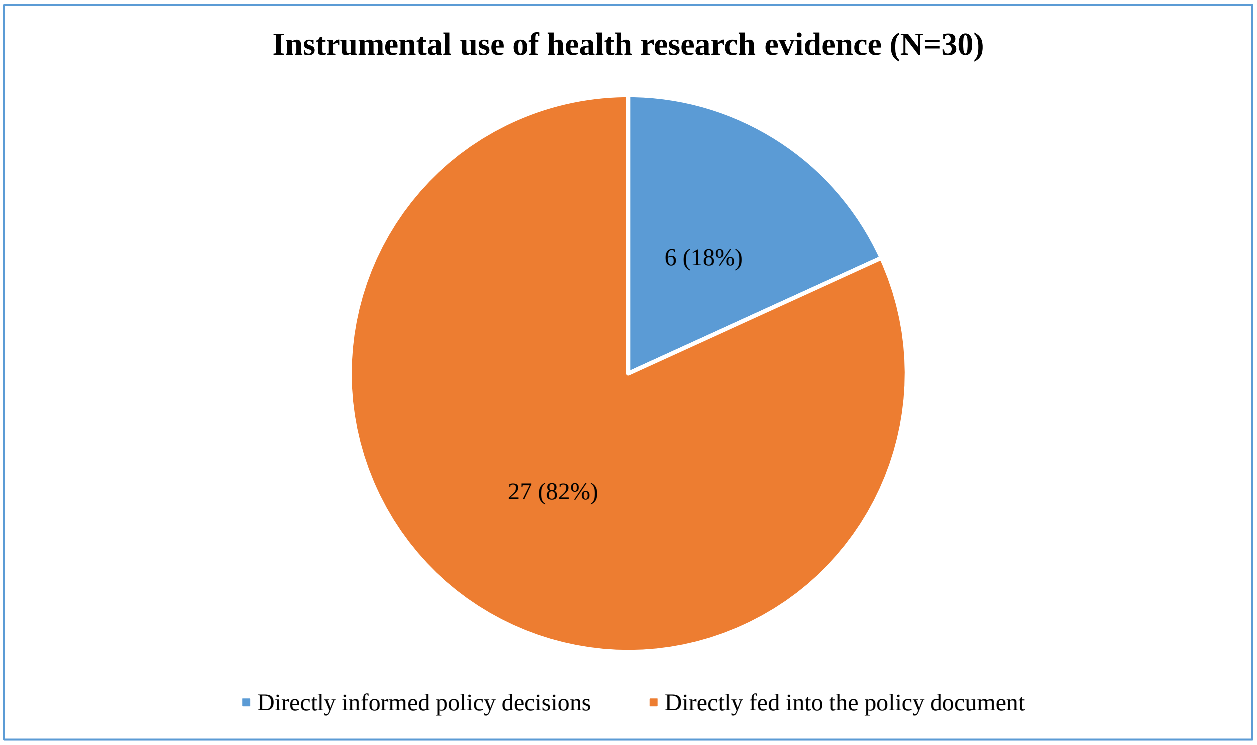

Figure 5.16: Instrumental use of health research evidence

Figure 5.16 shows that in only 6 (18%) of the 30 policy documents health research directly informed policy decisions. In 27 (82%) of the policy documents, health research evidence fed into the policy documents by way of citing and referencing at the end.

5.5.2.11.3 Tactical use of research evidence

Tactical use of health research evidence gives credibility and trustworthiness to the policy document as it persuades other stakeholders to support the policy document (Makkar et al., 2016a, 2016b). Health research evidence provides hard core evidence to persuade stakeholders to support the existing policy decision. Figure 5.17 shows how health research evidence has supported health policy formulation in Malawi tactically.

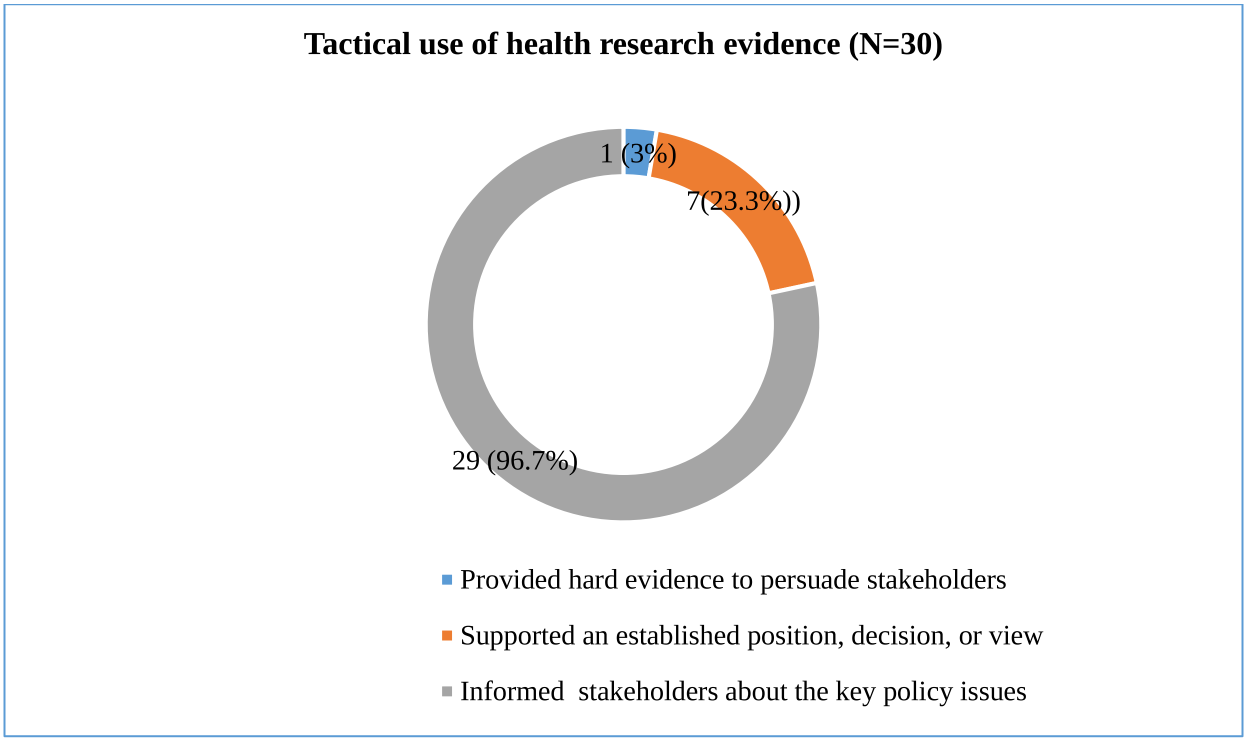

Figure 5.17: Tactical use of health research evidence

Figure 5.17 shows that in 29 (96.7%) of the 30 policy documents, health research evidence only informed policy stakeholders of key policy issues. In only 1 (3%) of the policy documents health research evidence provided adequate health research evidence that persuaded stakeholders to support or act upon an existing decision or view about the health policy formulation.

5.5.2.11.4 Imposed use of research evidence

Health research evidence is said to have been imposed on a health policy if there are organisational or regulatory requirements to use health research evidence in some way or another (Makkar et al., 2016a, 2016b). This is achieved when organisations encourage the use of health research evidence, expect health research evidence to be used as the best practice or mandates the use of health research use every time a policy document is being formulated. Figure 5.18 shows the imposed use of health research evidence in Malawi.

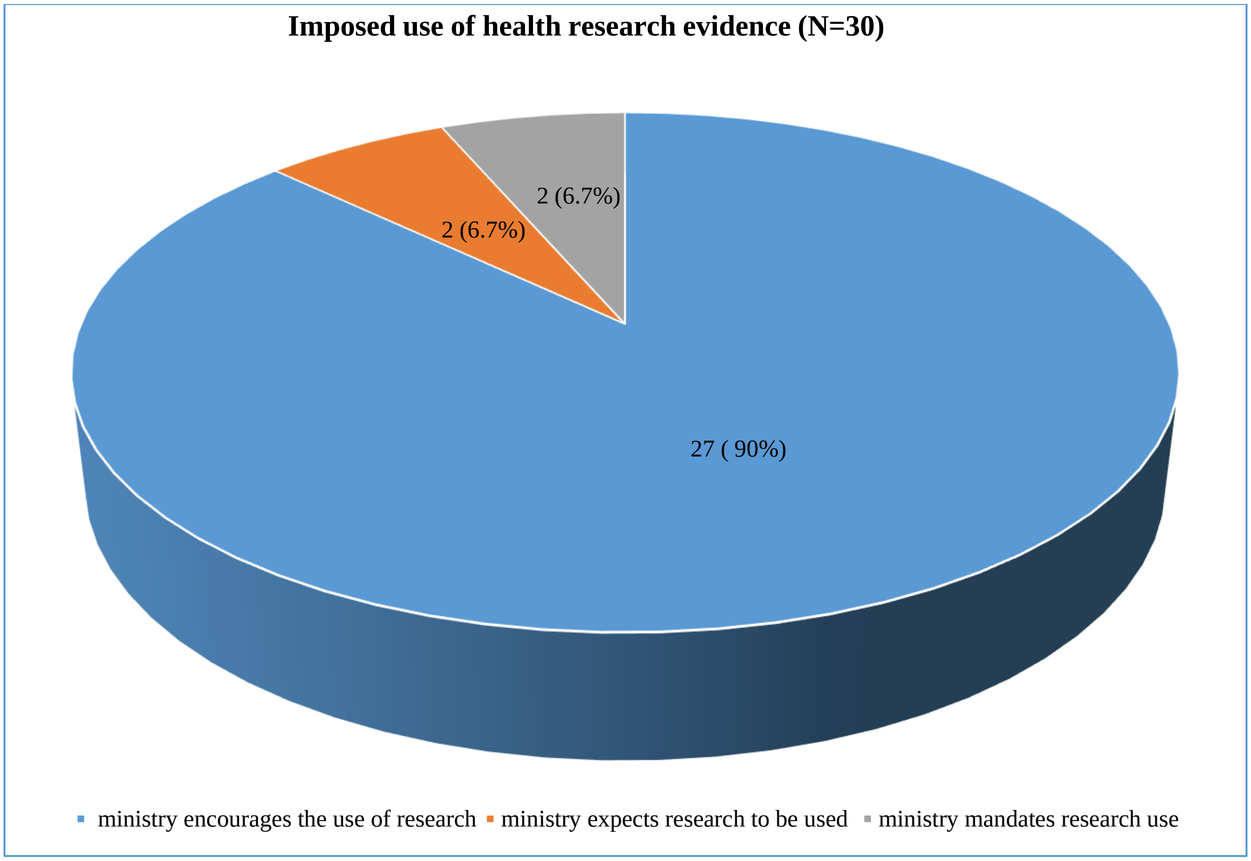

Figure 5.18: Imposed use of health research evidence

Figure 5.18 shows that in 27 (90%) of the 30 policy documents, ministries only encourage the use of health research evidence. In 2 (6.7%) of the policy documents it is only an expectation that health research evidence would be used and that it is mandatory to use health research evidence respectively as there are no written regulations imposed on policy formulators.

5.5.2.12 Barriers to research evidence use

Barriers to health research use in policy documents emanate from several factors some of which include time, individuals, team agency, political factors, and topical issues (Makkar et al., 2016a, 2016b). Figure 5.19 shows degree of barrier impact and the extent to which they impact health research evidence use in policy documents.

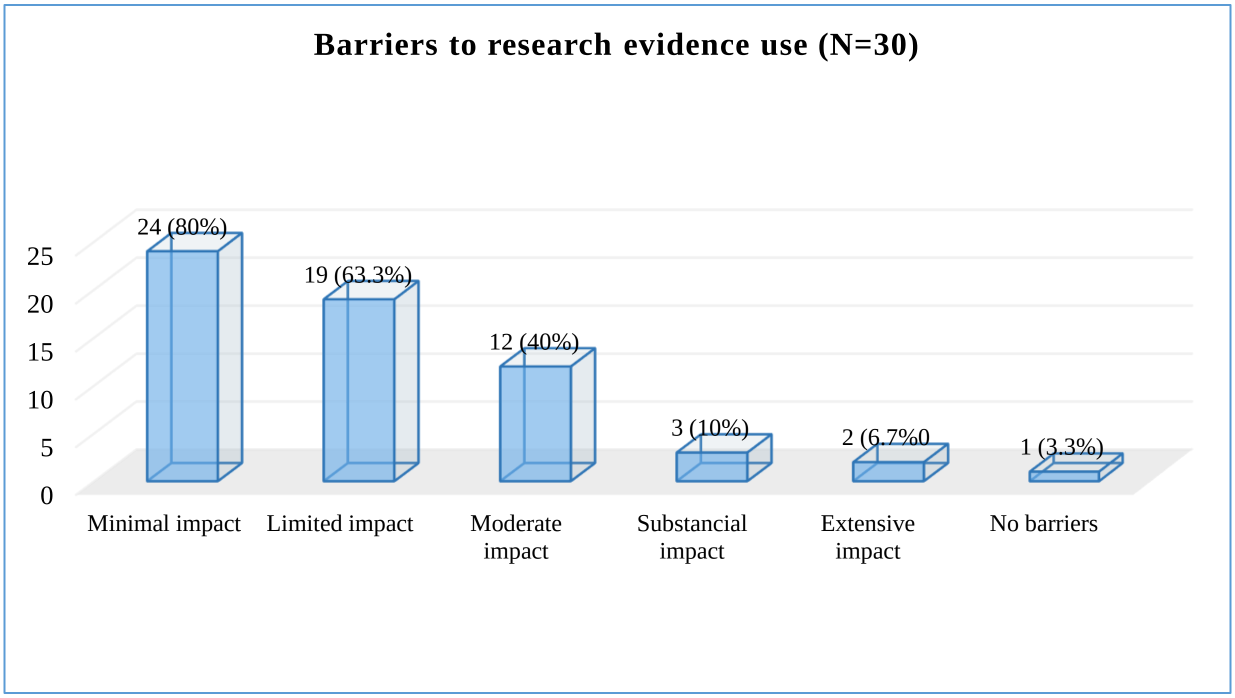

Figure 5.19: Barriers to health research evidence use

Figure 5.19 shows that in only one (3.3%) of the 30 policy documents analysed there were no barriers to health research evidence use. In 24 (80%) there was minimal impact of barriers while in only 2 (6.7%) of the policy documents there was extensive impact of barriers as the documents only provided guidelines to be followed when addressing health research issues.

5.5.2.13 Facilitators of research evidence use in policy formulation

There are factors that facilitate success in the use of health research evidence in policy formulation. Makkar et al. (2016b: 3) identify five such critical factors as including individual skills, team attributes, agency level attributes, political factors and policy topic factors. Figure 5.20 reflects the five facilitating factors in the use of health research evidence in policy formulation in Malawi.

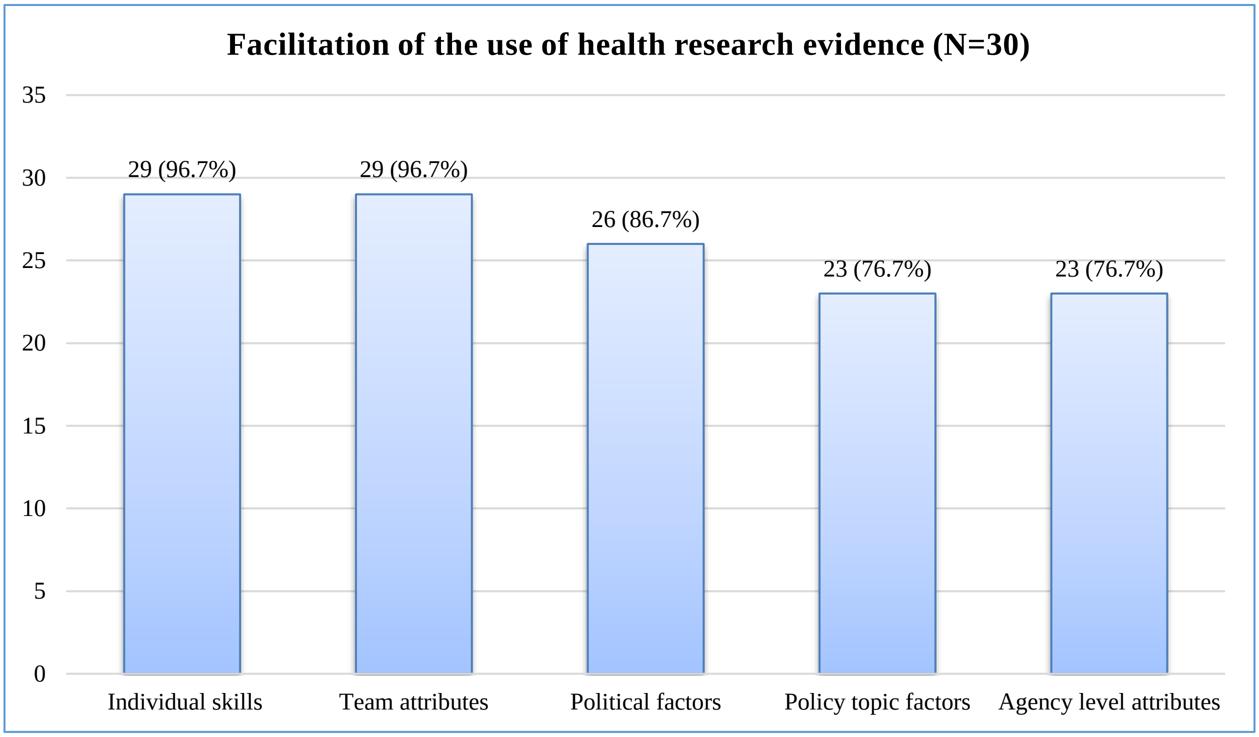

Figure 5.20: Facilitating attributes to the use of health research in Malawi

Figure 5.20 shows that many factors have influenced the way health research evidence is used in policy formulation. Evidence of both individual and team attributes were found in 29 (96.7%) of the 30 policy documents.

5.5.2.14 How research evidence contributed towards the development of the policies

The overall use of health research evidence was used to assess the importance of the contribution of research to policy documents in Malawi. Figure 5.21 shows the assessment results.

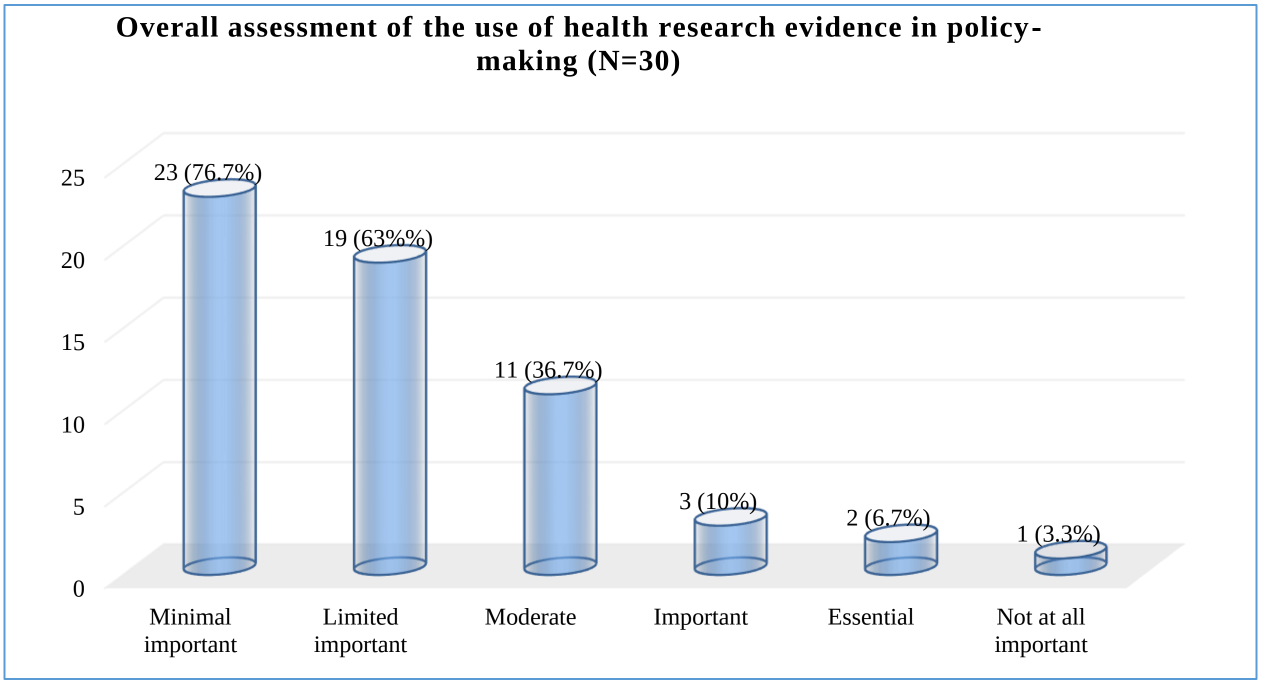

Figure 5.21: Overall assessment of the use of health research evidence in policy formulation in Malawi

Figure 5.21 shows that overall in 23 (76.7%) of the 30 policy documents analysed, health research evidence played a minimal role and hence had very little influence on the policy document. Similarly, in 19 (63.3%) of the policy documents health research evidence had very little influence on the formulation of the policy documents.

5.5.3 Interviews with directors of health research centres and of the Ministry of Health

Interviews were conducted with directors of research centres or their representatives as delegated. The demographic features of interests for the directors or their representatives were organisation and designation. Table 5.6 shows the organisations, designation and qualifications of the interviewees. Table 5.6 shows that out of 9 personnel from various research centres and the Ministry of Health, six were directors, one deputy director and two chief research officers. In terms of qualifications, seven were holders of Master's as their highest qualification while two were doctoral holders.

Table 5.6: Demographic feature of interviewees

Organisation	Designation	Qualification	Total
Kamuzu College of Nursing	Director	Masters	1
College of Medicine	Director Deputy Director	PhD PhD	1 1
Ministry of Health	Director Director	Masters Masters	1 1
Malawi Parliament	Chief Research Officer	Masters	1
National AIDS Commission	Chief Research Officer	Masters	1
Dignitas International	Director	Masters	1
National Commission for Science and Technology	Director	Masters	1
Total	6 Directors, 1 Deputy Director and 2 Chief Research Officers	7 Masters & 2 PhD holders	9

Interviews with four directors of research centres indicated that since independence in 1964, Malawi has conducted much health research on topical issues (Director Y, College of Medicine; Director M, Kamuzu College of Nursing; Director Q, Dignitas International & Director H, National Commission for Science and Technology). Operational research has been sponsored by national control disease programmes while some research has been conducted by academia (Director Z, Ministry of Health). The period between 1992-2010 is when health research was conducted in Malawi 'haphazardly' with no linkages to the national health research agenda (Director X, Ministry of Health). From 2011-2016 Malawi developed its National Health Research Agenda (Director P, National Commission for Science & Technology). The agenda categorises health research into eight thematic areas, namely: communicable diseases; non-communicable diseases; sexual and reproductive health; trauma; mental health; environmental health; nutrition; health systems; and, community system strengthening. Thematic areas for the National Health Research Agenda further necessitated that each health research should be cleared by the National Health Research Ethics Committee or the College of Medicine Research and Ethics Committee.

On the question of whose research has informed policy-making in Malawi, Directors X and Z (Ministry of Health) both indicated that much health research has been conducted and has informed health policy-making and decision-making. However, the Directors fall short of specifying which research has shaped decision-making and policy directions in Malawi. Indirectly, the interviews with the Directors in the Ministry of Health indicated a disjoint between what health research has been conducted in Malawi and how it has informed policy. These interviewees also indicated that there is a disjoint between researchers and policy makers.

On the issue of who influences health policy-making in Malawi, interviews with Directors X and Y (Ministry of Health) indicated that the government, through its technical working groups, influences policy. However, the interviewee with the Chief Research Officer from the National Aids Commission indicated that international organisations such as the United States Aid for International Development, United Nations International Children's Emergency Fund, and the World Health Organisation influence health policy-making in Malawi. Further probing indicated that the one who 'pays the piper calls the tune'. It does suggest that if the ''WHO influences health policy in Malawi they fund and take a central or advisory role'' (see Section 5.5.2.2). Director Q at Dignitas International suggested that as a non-governmental organisation or civil society organisation they have played various roles in informing health policy-making especially in sexual and reproductive health policies. This reflects the role of civil society organisation in policy-making in Malawi (see Section 3.3.2.2.2). Interviews failed to identify champions of health policy formulation in Malawi (see Section 3.3.3.3).

On the influence of research in health policy formulation, part of the questions was on the levels of correlation between health policy formulation and health research findings in Malawi. Interviews with Directors X (Ministry of Health) highlighted a gap between researchers and policy makers to the extent the director highlighted that ''two cannot walk together without agreeing''. The interview with the Director X (Ministry of Health) highlighted that some strides have been achieved especially through the Knowledge Translation Platform. The platform has worked with Dignitas International and the African Institute for Development Policy. However, it was a one-off activity for a selected few individuals and the project lasted for three years. What has remained to date are workshops, seminars and research dissemination conferences.

Directors X and Y (Ministry of Health) highlighted that in terms of health research evidence supporting health policy decisions, efforts are available, however, technological, human and material resources were mentioned as the main challenges. Where efforts were well cultivated, health research evidence is used but is largely of low quality (see Section 5.5.2.7).

On the issue of at what level is research used, there were divided views as Director Y suggested that health research is mainly used at policy formulation level, while Director X suggested that it is used at policy development level. On sources of health research evidence used the directors suggested programme evaluation reports, demographic and health surveys and other governments publications (see Sections 5.5.2.4 & 5.5.2.7). On the level of preparedness to use health research evidence, Directors X and Y (Ministry of Health) highlighted challenges with access to research materials, lack of a reading culture, resources for policy rollout.

On research contribution to policy implementation, Directors X and Y felt that not much has been done in Malawi. They highlighted that as much as they use health research evidence in speeches, much of it is from their programme evaluations, Google or their internal databases and registries. Director Y (Ministry of Health) also highlighted that as a country, Malawi lacks a national database from which policy makers could draw health research results. By inference it would seem that they rely on Google and other sources of information (see Section 5.5.2.3).

On the level of utilisation, interviews with Directors X and Y (Ministry of Health) encountered divided views on access, storage, memorandum of understanding between researchers and funders, knowledge translation platform, the conduct of the research itself in terms of ethical clearances, reporting mechanisms and the mandates on which the institutions were established. On reasons for the inability to use research evidence, Directors from the Ministry of Health suggested lack of collaboration, ambiguities of terms used, time to peruse and go through research recommendations. However, the directors acknowledged that training is a useful tool for the transfer of health research. Director Z suggested that strengthening the Knowledge Translation Platform, interaction, establishing a rapport between researchers and policy makers were some of the way forward. On how research ought to be communicated, Director Z (Ministry of Health) suggested conferences, policy briefs and policy dialogues.

5.5.4 Self-assessment tool for research institutions

The study used this tool (see Appendix C) to ascertain the role of health research institutions in Malawi in knowledge translation activities. Sections 5.5.4.1 to 5.5.4.4 report on critical areas in the tool, namely: the question of health research; knowledge production; knowledge translation; and, promoting the use of health research evidence in Malawi.

5.5.4.1 The question of health research in Malawi

Four of the nine participating organisations stated that they do not have a list of organisations which benefit from their research while five stated that they have. The explanation obtained suggests that partners working in the health systems use the research generated. On the question of a databank or repository, four institutions indicated that they have databanks and repositories for research data while five indicated that they do not have. Those that indicated that they have databanks or repositories stated that they house research data with their libraries while the rest are in the pipe line identifying the right hardware, software and where to house them. On holding regular meetings for the identification of and exchange of research priorities, only one institution indicated that it does not hold regular meetings while the balance of eight indicated that they do hold regular meetings. Some of the regular meetings are organised by the Ministry of Health through technical working groups in which the research institutes themselves act as the secretariat.

When directors of the research centres/institutes were asked whether policy makers are aware of the research being conducted in their research institutes and centres, all nine responded positively. Some suggested that they are operational arms of the Ministry of Health. For example, the Malaria Alert Centre at the College of Medicine is an operational arm of the National Malaria Control Programme. Notable explanations also suggested that following the setting up of the National Health Research Agenda of 2011-2016, many policy makers are aware of the research that health research institutions are conducting.

As to whether research institutions invite policy makers to institutional meetings as a way of extending cooperation on knowledge sharing or cooperation, three institutions indicated that they do not while the majority of six said yes, they do. The latter indicated that they invite policy makers to workshops, community of practice activities, policy dialogues and that some of these are technical working groups of the Ministry of Health.

On the availability of a website for promoting visibility of research priorities among other health research partners, only one organisation indicated that it does not while the balance of eight do. However, the latter indicated that they do not update their websites regularly and hence many websites are not very current.

When the directors were asked about whether research priorities are determined through meetings with policy makers, only two institutions said that they do not while seven said they do. Some suggested that the national research agenda determined the research issues. Generally academic research institutes follow departmental or faculty research agendas. Regarding regular updating of the research agenda and timeously communication with policy makers, almost half (four) of these organisations indicated that they do not while five indicated that they regularly do so. Some indicated that they rely on the revision of the National Health Research Agenda while others referred to their institutional strategic plans which are revised every five years.

Four of the nine institutions indicated that their budgets necessitate researchers identifying and applying for external funding while five indicated that this was not the case. At the University of Malawi, research centres are encouraged to mobilize resources internally and externally. The Malaria Alert Centre at the College of Medicine indicated that they have journal clubs which encourage researchers to apply for call up notices for funding. On the issue of research institutions providing incentives to researchers for securing external funding, six such institutions stated that they do not while only three indicated that they do. The former indicated that a small percentage of between 7-10% serves as incentives and some of the latter indicated that incentives are a good option to explore.

5.5.4.2 Knowledge production in Malawi

On whether their research studies result in the production of actionable messages with the level of research evidence, four institutions indicated that they do not while five said they do. The Malaria Alert Centre mentioned that they do systematic reviews which are shared with the policy makers.

The Knowledge Translation Platform, an arm of the Ministry of Health, claim they have done some policy briefs to support the use of health research evidence. Other responses, like from the National Commission for Science and Technology and the National AIDS Commission, suggested that it is not their mandate to produce actionable messages.

With regard to participation in the co-production or co-designing of the research, only two institutions responded in the negative while the majority seven said they do. Those that do, like the Malaria Alert Centre, stated that research groups were formed for that purpose. For the Ministry of Health, it was indicated that before any study is conducted the Directorate under which it falls to has to approve first. For the Kamuzu College of Nursing, it was stated that several outside universities have been helping faculty members to work in teams and to co-produce and co-design research.

About the level of trust that policy makers place on the quality of research done in the research centres, two indicated that they were not sure whether policy makers trust their research or not while six expressed confidence that they do. For example, the Malaria Alert Centre stated that studies underlining the use of Artemisinin-based combination therapy and rapid diagnostic tests for malaria treatment were done at the Centre. Dignitas International and the National AIDS Commission suggested that their results are highly cited in policies, strategies and other key government documents.

On quality assurance and whether it is needed in the research centres with specific reference to data gathering protocols and research training, two institutions indicated that quality assurance is not needed while a majority seven stated that it is a requirement. The College of Medicine and the Kamuzu College of Nursing stated that they have quality assurance officers and internal working groups that approve the conduct of any research after a thorough review. The Malaria Alert Centre indicated that most of the research is laboratory based and quality assurance is a must.

On whether quality control is carried out with reference to internal monitoring and external supervision by a separate research group, three research institutions stated that they do not while six indicated that they do. In the case of the College of Medicine, they undergo Research and

Ethics Committee reviews. In the case of other institutions, they apply for ethics clearance with the National Health Research Committee, under the National Commission for Science and Technology.

With regards to the time frame from the research proposal presentation stage to the beginning of the research being reasonable, two stated that it is not reasonable while seven indicated that it is reasonable. The Research Support Centre at the College of Medicine indicated that that is precisely their role. The Kamuzu College of Nursing indicated that it is difficult to ascertain this as most of the studies are academic. The rest of the institutions either stated that it is not their mandate or it does not apply to them as they do not do research.

On the issue of a reasonable gap between conclusion of the study and finalisation of the results in report form and cognisant of the timelines, three research institute directors responded in the negative while six indicated that they observe timelines strictly. However, they acknowledged that researchers sometimes delay unnecessarily despite agreeing on work plans. The Research Support Centre at the College of Medicine works hand-in-hand with researchers on timelines. The Kamuzu College of Nursing stated that most of their research follow academic timelines.

In terms of funding provided for other forms of research dissemination (workshops, conferences, etc), apart from publishing in peer reviewed journals, only two institutions responded in the negative while the majority of seven indicated that funds for workshops and seminars are provided for. The College of Medicine acknowledged that every year they hold research dissemination conferences or support staff financially to present at local and international research dissemination workshops and seminars. At the Malaria Alert Centre, grants are provided for such activities for every research/study conducted.

5.5.4.3 Knowledge translation in Malawi

On the issue of transferring research findings to funders and ascertaining what findings should be transferred to policy makers, three of the directors stated that they do not have mechanisms in place for this, while six suggested that mechanisms are in place. The Knowledge Translation Platform indicated that policy briefs are sent to policy makers. The National AIDS Commission stated that they do send the research reports to policy makers. Other institutions like the College of Medicine rely on annual research dissemination conferences. The Kamuzu College of Nursing stated that most of the research is academic and end with student assessment and grades. Dignitas International stated that they isolate recommendations and actions for specific target audiences.

Regarding peer reviewing all research reports before disseminating them to policy makers, four of the nine institutions indicated that they do while the remaining four indicated that they do not do. Explanations ranged from selected peer reviewing, internal peer reviewing but not external reviewers, sometimes not necessary, to only key ones are peer reviewed. On whether in the institutions researchers are familiar with knowledge translation issues, a majority of six said they are not, while only three indicated that researchers are aware of knowledge translation issues. The latter emphasised that knowledge translation need to be strengthened. Other responses suggested that knowledge translation is not done in Malawi and is a new concept.

Only three directors indicated that their researchers do not play a role in converting research evidence into actionable messages for policy makers while six stated that their researchers do. The Ministry of Health Director indicated that they have engaged the Knowledge Translation Platform on several occasions to build capacity towards knowledge translation. The Kamuzu College of Nursing and the Research Support Centre College of Medicine stated that they do not convert research evidence into actionable messages. The Knowledge Translation Platform indicated that they convert research into policy briefs. On the issue of research communication skills, as many as five institutions indicated that researchers do not have appropriate communication skills while four stated that they do. Research centres were of the view that some training in this area is needed. As to whether research centres use the services of individuals with knowledge transfer skills such as knowledge brokers, only two stated that they do while six stated that they do not. Explanations included: Malawi does not have knowledge brokers (Dignitas International); knowledge translation is a new phenomenon (the Malawi Parliament); it is not applicable to them (the National Commission for Science and Technology) and as a research centre they do not use them (College of Medicine Research Support Centre).

To the question as to whether researchers have the requisite resources for preparing research content for dissemination to the relevant target audience, two responses stated that they do not while seven stated that they do. The Research Support Centre stated that they do not provide funding for such activities. The Malaria Alert Centre indicated that they have the requisite equipment and skills. Dignitas International indicated that they use other institutions for this purpose. The National Commission for Science and Technology indicated that they have resources for research dissemination only. As to whether researchers have adequate time for preparing content for dissemination to relevant target audiences, four indicated that they do not while five indicated that they do. Explanations included that at the University of Malawi time is limited as researchers also have teaching loads and that researchers are involved in other activities apart from research. The National Commission for Science and Technology indicated that they devote time for research dissemination. Regarding incentives for performing knowledge translation activities, only two stated these are available while six indicated that they are not available. At the University of Malawi promotion is tied to number of publications, patents, etc. Both, the National Commission for Science and Technology and the Malawi Parliament stated that knowledge translation is not part of their work.

To the question as to whether knowledge translation and utilisation of research findings were part of the training programmes at research institutions, four institutions indicated that their researchers do not get any training while five indicated that they have in one way or another organised training for researchers including research methodology training. Only the Research Support Centre at the College of Medicine was emphatic about this while the rest could not say for sure when they last conducted training. As to whether the research centres are aware of the national research agenda in Malawi, just two institutions acknowledged that they were not aware while the majority of seven stated that they were aware of the agenda. Many of these research institutes stated that they use the national research agenda to identify research priorities. Regarding whether the format of peer reviewed publications in their research institutions easily inform policy makers, four stated that they do while the other five stated that they do not. On the issue of the gap between dispatching of manuscript and their publication in journals, as many as six indicated that they ensure that the time is adequate enough to ensure that the interventions emanating from the research are implementable while three could not tell whether the time lag is adequate or not. Notable responses to this question included that journal publishers often take time to publish the results.

About regular communication with the media for the transfer of health research evidence, four institutions indicated that they have such regular communication while five indicated that they do. Dignitas International, the Malaria Alert Centre, and the National AIDS Commission stated that they engage the media. The National Commission for Science and Technology engages the media when they have research to disseminate. Regarding the use of intellectual property (IP) rights to support researchers to disseminate health research finding prior to publication, a majority of seven stated that they do not use IP rights for this purpose use while only two indicated that they do. Explanations included that there is very little exploitation of intellectual property rights in Malawi. The University of Malawi has developed the intellectual property rights but its usefulness is not yet determined.

With regards to policy makers appreciating the role of local research from research centres in Malawi, only one research institution director felt that they do not while the majority of seven indicated that there is an appreciation from health policy makers of the role of local research. The Malaria Alert Centre indicated that policy makers request for joint research projects and it is the secretariat of the technical working group at the Ministry of Health. Similar responses were obtained from the National Commission for Science and Technology, and the National AIDS Commission. Colleges of the University of Malawi were uncertain on this issue.

Research institutes are supposed to examine the extent to which policy makers utilise research from their centres. In this study, seven of the directors indicated that they do not while two indicated that they do mainly through publications and citations. On whether they identify potential barriers to use of their research findings by policy and decision makers, six research institution directors indicated that they do not while only three indicated that they do. The Knowledge Translation Platform conducted one of such studies with support from the Ministry of Health and the African Institutes for Development Policy (AFIDEP).

Seven of the nine institutions indicated that they do not have criteria for the evaluation of their researchers' knowledge transfer activities. Only two indicated that they have such criteria. The Knowledge Translation Platform was the only organisation that developed guidelines to evaluate their research findings.

5.5.4.4 Promoting the use of health research evidence in Malawi

On whether research institutes and centres conduct educational programmes about evidence-based policy and decision-making for health policy and decision makers, five of the nine research institutions indicated that they do not while four indicated that they do. The Ministry of Health stated that they have trained 36 members of staff from the Ministry and Parliament. They have also conducted similar training with middle level district health managers. Those who indicated ‘no’ to this question felt that this mandate was outside their jurisdiction.

With regard to research centres conducting systematic reviews for the purposes of strengthening evidence-based policy and decision-making, five of the directors stated that they do not while four indicated that they do. The Malaria Alert Centre indicated that so far, they have conducted three systematic reviews in the following areas: the prevention of malaria in non-HIV pregnant women published with Cochrane databases; impact of a facility delivery versus home delivery published with BMC Health; and, responses of caregivers to children with fever and how mothers respond, published with Joanna Briggs. Other than the Malaria Alert Centre the other centres and institutes cited lack of training on how to conduct systematic reviews.

On the role of researchers from the research institutes participating in technical committees of the Ministry of Health to assist in policy or decision-making in Malawi, only one of the centres has never participated in such a capacity while the balance of eight have all participated. The Malaria Alert Centre stated that it is the secretariat of one of the working groups at the Ministry of Health. Faculty members at both the College of Medicine and the Kamuzu College of Nursing (University of Malawi) are appointed to different national committees. In response to the question on whether research centres send reminders to policy makers to follow research findings from their studies on topical issues, the majority of seven research institutions stated that they do not (but acknowledged that this is a good idea) while two indicated that they do.

5.6 Research question two: What relationship exists between health research evidence and policy formulation in Malawi?

In response to its objectives the study also sought to ascertain the relationship between health research evidence and policy formulation in Malawi by examining the relationship between researchers and academics on one hand and policy and decision makers on the other hand.

5.6.1 Interaction between researchers and policy makers

Questionnaire participants (academics and researchers) were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how often they had interacted, through Skype, telephone, conferences or face-to-face meetings with health policy or decision makers for any health research that they were involved in (see Appendix A). Table 5.7 presents the results.

Table 5.7: Participants' rating of their frequency of interaction with policy or decision makers.

	Frequency of interaction (N = 166)					**M**[20]	**SD**[21]
Area of interaction	**Never**	**Rarely**	**Occas.**	**Frequently**	**Always**		
Formulating study objectives	38.6%	20.5%	18.1%	18.7%	4.2%	2.3	1.27
Developing research design and methods	42.2%	15.7%	22.9%	14.5%	4.8%	2.2	1.27
Executing health research	36.1%	26.5%	18.7%	14.5%	4.2%	2.2	1.21
Analysing and interpreting research findings	39.2%	20.5%	21.7%	16.9%	1.8%	2.2	1.19
Developing research products	47.0%	17.5%	15.7%	14.5%	5.4%	2.1	1.30

Most participants indicated they had never interacted with policy or decision makers for any health research that they been involved in, as in: formulating study objectives (38.6%); developing research design and methods (42.2%); executing health research (36.1%); analysing and interpreting research findings (39.2%); and, even developing research products (47.0%).

However, the mean rating scores[22] indicate that on average participants rarely formulate study objectives (M = 2.3, SD = 1.27); develop research design and methods (M = 2.2, SD = 1.27);

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[20] M (Mean) refers to the calculated 'central' value of a set of numbers (Chu, 2013; McKenzie, 2013).

[21] SD (Standard Deviation) is used as measure to quantify the amount of variation of a set of data values from the mean (Chu, 2013; McKenzie, 2013).

[22] Mean rating scores in an interval data, refer to differences between responses calculated and the measurable response on the Likert scale. For example, a mean of 2.1 leans towards 'rarely' while a mean of 2.6 leans toward 'occasionally or 3' on a five-point scale (Sullivan & Artino, 2013).

execute health research (M = 2.2, SD = 1.21); analyse and interpret research findings (M = 2.2, SD = 1.19); and, develop research products (M = 2.1, SD = 1.30).

A Kruskal-Wallis H[23] test showed that there was a statistically significant difference in the rating score for firstly, formulating study objectives between faculties (χ^2 (4) = 14.403; p = 0.005), with a mean rank score of 81.24 for the Faculty of Medicine and 78.97 for the Faculty of Biomedical Sciences; secondly, for developing research design and methods between faculties (χ^2 (4) = 10.672; p = 0.029), with a mean rank of 99.38 for the Faculty of Public Health and 87.76 for the Faculty of Nursing; thirdly, for analysing and interpreting research findings between faculties (χ^2 (4) = 12.969; p = 0.010), with a mean rank of 84.98 for the Faculty of Public Health and Family Medicine and 68.85 for the Faculty of Biomedical Sciences. However, there were no statistically significant difference in the rating score for executing health research (refer to Table 5.8). In summary, formulating study objectives, developing research design and methods, analysing and interpreting research findings and developing research products are statistically associated with the faculty from which the participant was censused.

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[23] Kruskal-Wallis H test represented by the *P-value* is used to determine whether there is a significant association between the independent variable and the dependent variable or it is just by chance (Chu, 2013; McKenzie, 2013).

Table 5.8: Testing the differences between faculties in their interaction with policy makers

Dependent variable	**Independent variable**			χ^2 **(4)**	***P-value***
	Faculty	**N**[24]	**MR**[25]		
Formulating study objectives	Faculty of Medicine	54	81.24	14.403	0.005
	Faculty of Biomedical Sciences	34	78.97		
	Faculty of Public Health	26	88.35		
	Faculty of Nursing	38	73.39		
	Faculty of Midwifery	14	121.64		
Developing research design and methods	Faculty of Medicine	54	85.3	10.672	0.029
	Faculty of Biomedical Sciences	34	74.21		
	Faculty of Public Health	26	99.38		
	Faculty of Nursing	38	87.76		
	Faculty of Midwifery	14	58.07		
Executing health research	Faculty of Medicine	54	71.05	9.295	0.053
	Faculty of Biomedical Sciences	34	89.57		
	Faculty of Public Health	26	81.62		
	Faculty of Nursing	38	96.18		
	Faculty of Midwifery	14	85.86		
Analysing and interpreting research findings	Faculty of Medicine	54	94.3	12.969	0.010
	Faculty of Biomedical Sciences	34	68.85		
	Faculty of Public Health	26	84.98		
	Faculty of Nursing	38	73.07		
	Faculty of Midwifery	14	103		
Developing research products	Faculty of Medicine	54	85.19	15.873	0.003
	Faculty of Biomedical Sciences	34	64.65		
	Faculty of Public Health	26	103.71		
	Faculty of Nursing	38	88.99		
	Faculty of Midwifery	14	70.36		

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[24] N refers to the number of respondents from each faculty.

[25] Mean Rank refers to the mean for each faculty for a specific query (Chu, 2013; McKenzie, 2013).

Chi-square (χ^2) evaluate differences in mean ranks to assess that the medians are equal across the faculties (Chu, 2013; McKenzie, 2013).

5.6.2 Involvement of policy or decision makers in research

Questionnaire participants (academics and researchers) were asked to indicate on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always) how often they have involved health policy or decision makers about health research in Malawi (see Appendix A). Table 5.9 presents the results. Most of the participants said that they rarely involved policy or decision makers in government-sponsored meetings (28.3%); never involved expert committee or group meetings with policy or decision makers (28.3%); never invited policy or decision makers to conferences and workshop (38.0%); never involved policy or decision makers in formal or private networks (27.7%); never involved policy or decision makers in events organised by their Colleges (38.6%); never involved policy or decision makers in informal conversations (35.3%); and, subsequently have never shared weblinks with policy or decision makers (47.6%).

Table 5.9: Researchers involvement of policy makers about health research in Malawi

	Frequency of Involvement (N = 166)						
Involved through	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**M**	**SD**
Government-sponsored meetings	24.7%	28.3%	24.7%	18.1%	4.2%	2.5	1.17
Expert committee or group meetings	28.3%	25.9%	23.5%	18.1%	4.2%	2.4	1.20
Conferences and workshops	38.0%	18.7%	16.3%	22.9%	4.2%	2.4	1.31
Formal private or public networks	27.7%	30.1%	27.1%	8.4%	6.6%	2.4	1.17
Events organised by the Colleges	38.6%	20.5%	20.5%	14.5%	6.0%	2.3	1.28
Informal conversations	35.5%	32.5%	19.3%	9.0%	3.6%	2.1	1.11
The sharing of web-links	47.6%	22.3%	17.5%	8.4%	4.2%	2.0	1.17

Mean rating scores indicate that on average participants sometimes involve policy or decision makers in government sponsored meetings (M = 2.5, SD = 1.17); rarely involve policy or decision makers in expert committee or group meetings (M = 2.4, SD = 1.20); rarely involve policy or decision makers in conferences and workshops (M = 2.4, SD = 1.31); rarely involve policy or decision makers in formal private or public networks (M = 2.4, SD = 1.17), rarely involve policy or decision makers in events organised by the College (M = 2.3, SD = 1.11); and, rarely share web links with policy or decision makers (M = 2.0, SD = 1,17).

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for firstly, involving policy or decision makers in expert committee or group meetings between faculties (χ^2 (4) = 10.908; p = 0.025), with a mean rank score of 73.46 for the Faculty of Medicine and 87.03 for the Faculty of Nursing. However, there was no statistically significant difference in the rating score for involving policy or decision makers in firstly, government sponsored meetings; secondly, in their involvement of policy or decision makers in conferences and workshops; thirdly, in their involvement of policy or decision makers in formal private or public networks; fourthly, in their involvement in events organised by the Colleges; fifthly, in their involvement with policy or decision makers in informal conversations; and lastly, in sharing web links with policy or decision makers (refer to Table 5.10). In summary, only involvement in expert committee or group meeting with policy or decision makers was statistically associated with the faculty from which the participant was censused.

Table 5.10: Testing the differences in involvement with policy makers about the use of health research evidence in Malawi

	Independent variable (N = 166)				
Dependent variable	**Faculty**	**N**	**MR**	**χ^2 (4)**	***P-value***
Government-sponsored meetings	Faculty of Medicine	54	85.06	1.863	0.763
	Faculty of Biomedical Sciences	34	80.88		
	Faculty of Public Health	26	91.6		
	Faculty of Nursing	38	81.5		
	Faculty of Midwifery	14	74.25		
Expert committee meetings	Faculty of Medicine	54	73.46	10.908	0.025
	Faculty of Biomedical Sciences	34	92.56		
	Faculty of Public Health	26	97.96		
	Faculty of Nursing	38	87.03		
	Faculty of Midwifery	14	63.79		
Conferences and workshops	Faculty of Medicine	54	78	4.404	0.359
	Faculty of Biomedical Sciences	34	83.28		
	Faculty of Public Health	26	75.77		
	Faculty of Nursing	38	91.79		
	Faculty of Midwifery	14	97.11		
Formal private or public networks	Faculty of Medicine	54	77.76	5.278	0.261
	Faculty of Biomedical Sciences	34	96.78		
	Faculty of Public Health	26	79.58		
	Faculty of Nursing	38	83.2		
	Faculty of Midwifery	14	81.5		
Events organised by Colleges	Faculty of Medicine	54	77.9	6.397	0.171
	Faculty of Biomedical Sciences	34	88.15		
	Faculty of Public Health	26	91.92		
	Faculty of Nursing	38	89.45		

	Faculty of Midwifery, Neonatal	14	62.04		
Informal conversations	Faculty of Medicine	54	78.49	5.974	0.199
	Faculty of Biomedical Sciences	34	79.59		
	Faculty of Public Health	26	93.19		
	Faculty of Nursing	38	92.96		
	Faculty of Midwifery	14	68.64		
The sharing of web-links	Faculty of Medicine	54	88.69	2.259	0.693
	Faculty of Biomedical Sciences	34	83.5		
	Faculty of Public Health	26	75.23		
	Faculty of Nursing	38	81.46		
	Faculty of Midwifery	14	84.39		

5.6.3 Participation of policy or decision makers in research

Academic/Researcher participants were asked to indicate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how often they participated in identified activities related to health research (see Appendix A). Table 5.11 presents the results.

Table 5.11: Frequency of participation in each of the activities related to health research

Activity participated in	**Frequency of participation (N = 166)**						
	Never	**Rarely**	**Occasionally**	**Frequently**	**Always**	**M**	**SD**
Conducted deliberative dialogues with key stakeholders	25.3%	25.9%	30.7%	15.1%	3.0%	2.5	1.12
Established and maintained long term partnerships with health policy or decision makers	43.4%	14.5%	27.1%	12.0%	3.0%	2.2	1.20
Involved policy or decision makers in establishing the direction of health research on a health topic	43.4%	22.3%	14.5%	16.3%	3.6%	2.1	1.24
Participated in the formulation of the National Health Research Agenda	53.0%	16.9%	16.3%	8.4%	5.4%	2.0	1.24
Participated in the formulation of the National Health Policy	53.0%	20.5%	13.9%	7.2%	5.4%	1.9	1.20

Most of the participants said that they occasionally conducted deliberate dialogues with key stakeholders (30.7%); never established and maintained long term partnerships with policy or decision makers (43.4%); never involved policy or decision makers in establishing the overall direction of the health research conducted (43.4%); never involved policy or decision makers in the formulation of the National Health Research Agenda (53.0%); never involved policy or decision makers in formulation of the National Health Policy (53.0%).

Mean rating scores indicate that on average participants occasionally conduct deliberate dialogues with key stakeholders (M = 30.7, SD = 1.12); rarely established and maintained long term partnerships policy or decision makers (M = 2.2, SD = 1.20); rarely involve policy or decision makers in the overall direction of the health research conducted by themselves or the Colleges (M = 2.1, SD = 1.24); rarely participated in the formulation of the National Health Research Agenda (M = 2.0, SD = 1.24); and, rarely participated in the formulation of the National Health Policy (M = 1.9, SD = 1.20).

5.6.4 Ability of policy or decision makers to participate in Knowledge translation activities

Questionnaire participants (academic and researchers) were asked on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always) to rate how often they performed certain activities such as workshops or seminars to increase the capacity of health policy or decision makers to use health research findings in Malawi. Table 5.12 presents the results. Most of the participants never performed activities to increase the capacity of health policy or decision makers to adapt health research evidence in their work (48.8%); never acquired health research evidence in their work (56.6%); never performed activities to increase the capacity of health policy or decision makers to adapt apply health research evidence in their work (57.2%); and never performed activities to increase the capacity of health policy or decision makers to assess the use of health research evidence in their work (56.0%).

Table 5.12: Activities to increase the capacity of policy or decision makers to use health

research

Purpose of performing activity	Frequency of performing activity (N = 166)						
	Never	Rarely	Sometimes	Often	Always	M	SD
Adapt health research evidence in their work	48.8%	22.9%	15.1%	7.2%	6.0%	2.0	1.22
Acquire health research evidence in their work	56.6%	20.5%	15.1%	6.0%	1.8%	1.8	1.03
Apply health research evidence in their work	57.2%	21.7%	12.7%	5.4%	3.0%	1.8	1.06
Assess health research evidence in their work	56.0%	28.9%	6.0%	7.8%	1.2%	1.7	0.98

Mean rating scores indicate that on average participants rarely performed activities to increase the capacity of health policy or decision makers to adapt health research evidence in their work (M = 2.0, SD = 1.22); rarely performed activities to increase the capacity of health policy or decision makers to adapt acquire health research evidence in their work (M = 1.8, SD = 1.03); rarely performed activities to increase the capacity of health policy or decision makers to apply health research evidence in their work (M = 1.8, SD = 1.03); and, rarely performed activities to increase the capacity of health policy or decision makers to assess the use of health research evidence in their work (M = 1.7, SD = 0.98).

5.6.5 Facilitation of research use by policy or decision makers

Participants were asked, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), to rate how often they often they performed the identified knowledge translation activities related to health research evidence (see Appendix A). Table 5.13 presents the results. Most of the participants have never developed reports, summaries or messages that used language appropriate to specific policy or decision makers (33.1%); never tailored the content of their emails to specific policy or decision makers for their attention to new health research evidence (42.8%); and, never tailored aspects of research conducted to specific health policy or decision makers through institutional websites, social media, radio and television (50.6%).

Table 5.13: Facilitation of research use by policy or decision makers

Activities	Never	Rarely	Occasionally	Frequently	Always	M	SD

Developed reports, summaries or messages that used language appropriate to policy makers	33.1%	25.9%	16.9%	15.7%	8.4%	2.4	1.316
Tailored the content of mailings or e-mails to policy makers for their attention to new research evidence	42.8%	26.5%	12.7%	13.9%	4.2%	2.1	1.219
Tailored other aspects of research conducted to policy makers through institutional websites, etc.	50.6%	18.1%	13.9%	9.0%	8.4%	2.07	1.331

Mean rating scores indicate that on average participants rarely develop reports, summaries or messages that use language appropriate to specific policy or decision makers (M = 2.4, SD = 1.316); rarely tailor the content of their emails to specific policy or decision makers for their attention to new health research evidence (M = 2.1, SD = 1.219); and, rarely tailor aspects of research conducted to specific health policy or decision makers through institutional websites, social media, radio and television (M = 2.07, SD = 1.331).

5.6.6 Accessibility of research by policy or decision makers

Participants (academics/researchers) were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how often performed identified knowledge translation activities related to health research evidence (see Appendix A). Table 5.14 presents the results. Most of the participants have never developed messages for health policy or decision makers that specified possible action such as recommendations, take-home messages, actionable messages (45.8%); never provided access to a searchable database of brief summaries of articles, reports, syntheses that specified possible action for health policy or decision makers (50.0%); never provided reprints of articles published in scientific journals to health policy or decision makers (51.8%); never provided syntheses of the research literature to health policy or decision makers (56.0%); never developed brief summaries of syntheses or formal systematic reviews of the research literature for health policy or decision makers (53.6%); never developed brief summaries of articles or research reports for health policy or decision makers (54.8%); and, never provided formal systematic reviews of the research literature to health policy or decision makers (66.9%).

Mean rating scores indicate that on average participants rarely developed messages for health policy or decision makers that specified possible action such as recommendations, take-home messages, actionable messages (M = 2.11, SD 1.26); rarely provided access to a searchable database of brief summaries of articles, reports, syntheses that specified possible action for health policy or decision makers (M = 1.97, SD = 1.1.67); rarely provided reprints of articles published in scientific journals to health policy or decision makers (M = 1.93, SD = 1.207); rarely provided syntheses of the research literature to health policy or decision makers (M = 1.87, SD = 1.189); rarely developed brief summaries of syntheses or formal systematic reviews of the research literature for health policy or decision makers (M = 1.81, SD = 1.073); rarely developed brief summaries of articles or research reports for health policy or decision makers (M = 1.77, SD = 1.06); and, rarely provided formal systematic reviews of the research literature to health policy or decision makers (M = 1.62, SD = 1.042).

Table 5.14: How frequently researchers perform knowledge translation activities

Knowledge translation activities	Never	Rarely	Occasionally	Frequently	Always	M	SD
Developed messages for health policy makers that specified possible action	45.8%	21.1%	14.5%	13.9%	4.8%	2.11	1.26
Provided access to a searchable database of brief summaries of articles, reports, syntheses that specified action for policy makers	50.0%	18.1%	21.1%	6.6%	4.2%	1.97	1.167
Provided reprints of articles published in scientific journals to policy makers	51.8%	21.1%	15.1%	6.0%	6.0%	1.93	1.207
Provided syntheses of the research literature to policy makers	56.0%	17.5%	15.7%	5.4%	5.4%	1.87	1.189
Developed brief summaries of syntheses of the research literature for policy makers	53.6%	24.7%	11.4%	7.8%	2.4%	1.81	1.073
Developed brief summaries of articles for policy makers	54.8%	25.3%	10.8%	6.0%	3.0%	1.77	1.06
Provided formal systematic reviews of the research literature to policy makers	66.9%	14.5%	11.4%	4.2%	3.0%	1.62	1.042

A Kruskal-Wallis H test showed there was a statistically significant difference in the rating score for providing syntheses of the research literature to policy or decision makers ($\chi2$ (4) = 9.278; p = 0.041) and providing reprints of articles published in scientific journals ($\chi2$ (4) = 9.149; p = 0.047).

There were no statistically significant differences in the rating scores for involving policy or decision makers in firstly, providing access to searchable databases; providing systematic reviews of the research; developing brief summaries of articles; developing summaries of syntheses; and, developing messages for policy or decision makers (refer to Table 5.15). In summary, providing syntheses of the research literature to policy or decision makers and providing reprints of articles published in scientific journals were statistically significant across the faculties.

Table 5.15: Testing the differences between faculties on knowledge translation activities

	Independent variable			χ^2 (4)	*P-value*
Dependent variable	Faculty	N	MR		
Provided access to a searchable database of brief summaries of articles, reports, syntheses that specified possible action for health policy or decision makers	Faculty of Medicine	54	86.08	6.822	0.144
	Faculty of Biomedical Sciences	34	93.54		
	Faculty of Public Health	26	80.79		
	Faculty of Nursing	38	80.51		
	Faculty of Midwifery	14	62.29		
Provided reprints of articles published in scientific journals to health policy or decision makers	Faculty of Medicine	54	90.44	9.149	0.047
	Faculty of Biomedical Sciences	34	92.22		
	Faculty of Public Health	26	73.10		
	Faculty of Nursing	38	79.33		
	Faculty of Midwifery	14	66.21		
Provided syntheses of the research literature to health policy or decision makers	Faculty of Medicine	54	82.72	9.229	0.041
	Faculty of Biomedical Sciences	34	98.68		
	Faculty of Public Health	26	83.12		
	Faculty of Nursing	38	76.87		
	Faculty of Midwifery	14	68.36		
Provided formal systematic reviews of the research literature to health policy or decision makers	Faculty of Medicine	54	81.41	5.880	0.206
	Faculty of Biomedical Sciences	34	75.25		
	Faculty of Public Health	26	84.00		
	Faculty of Nursing	38	88.28		
	Faculty of Midwifery	14	97.71		
Developed brief summaries of articles or research reports for health policy or decision makers	Faculty of Medicine	54	79.89	6.499	0.165

	Faculty of Biomedical Sciences	34	74.63		
	Faculty of Public Health	26	86.33		
	Faculty of Nursing	38	90.34		
	Faculty of Midwifery	14	95.14		
Developed brief summaries of syntheses or formal systematic reviews of the research literature for health policy or decision makers	Faculty of Medicine	54	80.63	7.532	0.112
	Faculty of Biomedical Sciences	34	75.85		
	Faculty of Public Health	26	98.31		
	Faculty of Nursing	38	86.53		
	Faculty of Midwifery	14	77.43		
Developed messages for health policy or decision makers that specified possible action	Faculty of Medicine	54	82.57	4.301	0.368
	Faculty of Biomedical Sciences	34	76.29		
	Faculty of Public Health	26	95.13		
	Faculty of Nursing	38	86.66		
	Faculty of Midwifery	14	74.39		

5.6.7 Collaboration between researchers and policy makers

Researchers and academics were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how often they have collaborated with other health research partners in knowledge translation activities related to health research evidence. Table 5. 16 presents the results. Most of the participants have never participated in knowledge translation skill-building activities such as conferences or courses about knowledge translation (33.7%); never identified and worked with knowledge translation specialists outside their Colleges (40.4%); never worked with knowledge translation specialists to promote health research evidence use (46.4%); never developed relationships with print, radio or television journalists reporting on health issues (46.4%); never identified and worked with knowledge brokers outside their Colleges (48.8%); and, have never identified and worked with credible messengers for health policy or decision makers (50.0%).

Table 5.16: Collaboration with other health research partners in knowledge translation activities

Collaborative activities	Never	Rarely	Occasionally	Frequently	Always	M	SD
Participated in knowledge translation skill-building activities	33.7%	20.5%	23.5%	16.9%	5.4%	2.4	1.26
Identified and worked with knowledge translation specialists outside of the Colleges	40.4%	25.9%	14.5%	15.1%	4.2%	2.17	1.229
Worked with knowledge translation specialists to promote health research evidence use	46.4%	21.7%	9.0%	18.7%	4.2%	2.13	1.294
Developed relationships with print, radio or television journalists reporting on health issues.	46.4%	23.5%	19.3%	6.0%	4.8%	1.99	1.157
Identified and worked with knowledge brokers outside of the Colleges	48.8%	22.9%	15.1%	8.4%	4.8%	1.98	1.191
Identified and worked with credible messengers for health policy makers	50.0%	25.3%	9.6%	9.6%	5.4%	1.95	1.215

Mean rating scores indicate that on average participants rarely participate in knowledge translation skill-building activities such as conferences or courses about knowledge translation (M = 2.4, SD = 1.26); rarely identify and work with knowledge translation specialists outside their Colleges (M = 2.17, SD = 1.229); rarely work with knowledge translation specialists to promote health research evidence use (M = 2.13, SD = 1.294); rarely develop relationships with print, radio or television journalists reporting on health issues (M = 1.99, SD = 1.157); rarely identify and work with knowledge brokers outside their Colleges (M = 1.98, SD = 1.191); and, rarely identify and work with credible messengers for health policy or decision makers (M = 1.95, SD = 1.215).

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for firstly, participation in knowledge translation skill-building activities, especially conferences, between faculties (χ^2 (4) = 19.674; $p < 0.001$), with a mean rank score of 69.72 for the Faculty of Biomedical Sciences and 72.07 for the Faculty of Midwifery; secondly, for working with knowledge translation specialist to promote the use of health research evidence between faculties (χ^2 (4) = 16.223; $p = 0.002$), with a mean rank of 108.19 for the Faculty of Public Health and 84.22 for the Faculty of Medicine; thirdly, for identifying and working with knowledge translation specialists between faculties (χ^2 (4) = 12.763; $p = 0.010$), with a mean rank of 81.06 for the Faculty of Medicine and 79.61 for the Faculty of Nursing; fourthly, for identifying and working with knowledge brokers outside the Colleges, with mean rank of 74.78 for the Faculty of Biomedical Sciences and 84.59 for the Faculty of Midwifery.

However, there were no statistically significant difference in the rating score for identifying and working with credible messengers and developing relationships with print, radio or television journalists reporting on health issues respectively (refer to Table 5.17). In summary, participation in knowledge translation skill-building especially conferences, developing research design and methods, working with knowledge translation specialist to promote the use of health research evidence, identifying and working with knowledge translation specialist and identifying and working with knowledge brokers outside the colleges were statistically associated with the faculty from which the participant was censused.

Table 5.17: Test for differences in knowledge translation between faculties

Dependent variable	Independent variable Faculty	N	MR	χ^2 (4)	*P-value*
Participated in knowledge translation skill-building activities				19.674	<0.001
	Faculty of Medicine	54	84.79		
	Faculty of Biomedical Sciences	34	69.72		
	Faculty of Public Health	26	115.58		
	Faculty of Nursing	38	76.26		
	Faculty of Midwifery	14	72.07		
Worked with knowledge translation specialists to promote health research evidence use				16.223	0.002
	Faculty of Medicine	54	84.22		
	Faculty of Biomedical Sciences	34	67.65		
	Faculty of Public Health	26	108.19		
	Faculty of Nursing	38	82.38		
	Faculty of Midwifery	14	76.39		
Identified and worked with knowledge translation specialists outside of the Colleges				12.763	0.010
	Faculty of Medicine	54	81.06		
	Faculty of Biomedical Sciences	34	73.74		
	Faculty of Public Health	26	108.58		
	Faculty of Nursing	38	79.61		
	Faculty of Midwifery	14	80.64		
Identified and worked with knowledge brokers outside the colleges				15.331	0.002
	Faculty of Medicine	54	79.05		
	Faculty of Biomedical Sciences	34	74.78		
	Faculty of Public Health	26	108.77		
	Faculty of Nursing	38	84.59		
	Faculty of Midwifery	14	71.96		
Identified and worked with credible messengers for health policy or decision makers				6.832	0.141
	Faculty of Medicine	54	75.72		
	Faculty of Biomedical Sciences	34	79.93		
	Faculty of Public Health	26	92.13		
	Faculty of Nursing	38	92.75		
	Faculty of Midwifery	14	81.04		

Developed relationships with print, radio or television journalists reporting on health issues.				5.963	0.200
	Faculty of Medicine	54	82.30		
	Faculty of Biomedical Sciences	34	83.94		
	Faculty of Public Health	26	82.23		
	Faculty of Nursing	38	92.95		
	Faculty of Midwifery	14	63.79		

5.6.8 Impact of health research and health policy formulation in Malawi

Academic/Researcher participants were asked to rate, on a 5–point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly agree), their impact in terms of health research findings and policy formulation in Malawi. Table 5.18 presents the results.

Table 5.18: Impact of health research and health policy formulation in Malawi

Impact	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	M	SD
Had findings that were not used by policy makers but were potentially important	13.9%	11.4%	26.5%	27.7%	20.5%	3.3	1.299
Own research or reviews have been used to inform health policy or practice	22.9%	12.0%	25.3%	25.9%	13.9%	2.96	1.363
Own research assisted health policy in formulating health policy issues	19.9%	22.3%	32.5%	16.9%	8.4%	2.72	1.205
Own research helped policy makers to identify policy alternatives	21.7%	22.3%	30.1%	18.1%	7.8%	2.68	1.221
Own research helped policy makers to choose the preferred policy options	26.5%	24.7%	21.7%	18.7%	8.4%	2.58	1.29
Own research was used to justify the final health policy	31.3%	23.5%	27.7%	13.3%	4.2%	2.36	1.176

Most of the participants agreed that they had findings that were not used by health policy or decision makers but were potentially important (27.7%); agreed their own research or reviews were used to inform health policy or practice (25.9%); were uncertain about their own research assisting health policy in formulating health policy issues (32.5%); were uncertain about their own research having helped health policy makers to identify policy alternatives (30.1%); strongly disagreed that their own research helped health policy makers to choose the preferred policy options (26.5%); and, strongly disagreed that their own research was used to justify the final health policy (31.3%).

Mean rating scores indicate that on average participants were uncertain that their findings were not used by health policy or decision makers but were potentially important (M = 3.33, SD = 1.299); were uncertain that their own research or reviews were used to inform health policy or practice (M = 2.96, SD = 1.363); were uncertain about their own research assisting health policy in formulating health policy issues (M = 2.72, SD = 1.205); were uncertain about their own research having helped health policy makers to identify policy alternatives (M = 2.68, SD = 1.221); were uncertain that their own research helped health policy makers to choose the preferred policy options (M = 2.58, SD = 1.29); strongly disagreed that their own research was used to justify the final health policy (M = 2.36, SD = 1.176).

5.6.9 Factors that may increase or sustain the use of health research evidence in policy-making

Participants were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), factors within the faculties that may increase or sustain the use of health research evidence in policy-making. Table 5.19 presents the results.

The study showed that for such factors, 42.8% of the researchers always consider the context in which the health research evidence is placed; 39.8% always consider the availability and access to supportive resources; 41.0% emphasise the need for interactions between researchers and research users; 39.2% frequently or always examine the organisation’s readiness to receive and use health research evidence; and, 41.0% always think about the nature and relevance of the health research evidence.

Mean rating scores indicate that on average participants, when considering factors that increase or sustain the use of health research evidence in policy-making, they frequently take into account the context in which the health research evidence is placed (M = 4.06, SD = 1.1); frequently take into account the availability of and access to supportive resources (M = 3.98, SD = 1.128); frequently emphasise the need for interactions between researchers and research users (M = 3.97, SD = 1.198); frequently examine the organisation's readiness to receive and use health research evidence (M = 3.96, SD = 1.203); frequently think about the nature and relevance of the health research evidence (M = 3.93, SD = 1.192).

Table 5.19: Factors that may increase the use of health research evidence in policy-making

Factors within faculties	Never	Rarely	Occasionally	Frequently	Always	M	SD
The context in which the health research evidence is placed	6.0%	3.6%	11.4%	36.1%	42.8%	4.06	1.11
The availability of and access to supportive resources and tools	6.0%	4.2%	15.7%	34.3%	39.8%	3.98	1.128
Interactions between researchers and research users and other stakeholders	8.4%	3.6%	11.4%	35.5%	41.0%	3.97	1.198
The organisation's readiness to receive and use health research evidence	9.0%	3.6%	9.0%	39.2%	39.2%	3.96	1.203
The nature and relevance of the health research evidence	6.0%	8.4%	12.7%	31.9%	41.0%	3.93	1.192

A Kruskal-Wallis H test showed that there was no statistically significant difference in the rating between faculty scores for the nature and relevance of the health research evidence; the context in which the health research evidence is placed; the need for interactions between researchers and research users; the organisation's readiness to receive and use health research evidence; the nature and relevance of the health research evidence (refer to Table 5.21). In summary none of the factors highlighted earlier were statistically significant across the faculties.

Table 5.20: Testing differences for factors that may sustain the use of research evidence in policy-making

	Independent variable				
Dependent variable	**Faculty**	**N**	**MR**	**χ^2 (4)**	***P-value***
The nature and relevance of the health research evidence	Faculty of Medicine	54	80.38	3.466	0.481
	Faculty of Biomedical Sciences	34	78.40		
	Faculty of Public Health	26	83.29		
	Faculty of Nursing	38	93.01		
	Faculty of Midwifery	14	82.50		
The context in which the health research evidence is placed	Faculty of Medicine	54	79.94	5.374	0.246
	Faculty of Biomedical Sciences	34	75.85		
	Faculty of Public Health	26	88.79		
	Faculty of Nursing	38	92.18		
	Faculty of Midwifery	14	82.43		
Interactions between researchers and research users and other stakeholders	Faculty of Medicine	54	79.83	2.775	0.598
	Faculty of Biomedical Sciences	34	78.66		
	Faculty of Public Health	26	87.46		
	Faculty of Nursing	38	89.93		
	Faculty of Midwifery	14	84.57		
The organisation's readiness to receive and use health research evidence	Faculty of Medicine	54	81.05	4.300	0.362
	Faculty of Biomedical Sciences	34	77.00		
	Faculty of Public Health	26	83.38		
	Faculty of Nursing	38	92.92		
	Faculty of Midwifery	14	83.39		
The availability of and access to supportive resources and tools	Faculty of Medicine	54	78.76	8.150	0.084
	Faculty of Biomedical Sciences	34	73.35		
	Faculty of Public Health	26	86.98		
	Faculty of Nursing	38	96.03		
	Faculty of Midwifery	14	85.96		

5.6.10 Strategies used to increase the generation of research for health policy formulation

Participants were asked to rate, on a 5–point Likert scale (1 = Unimportant; 2 = Of little importance; 3 = Moderately important; 4 = Important; 5 = Very important), strategies that may, within their faculties, increase the generation of relevant health research for health policy formulation. Table 5. 21 presents the results.

Table 5.21: Strategies used to increase the generation of research for health policy formulation

Strategies	Unimportant	Of little importance	Moderately important	Important	Very important	M	SD
Agreement between researchers and health policy makers about research priorities	4.2%	6.0%	4.2%	23.5%	62.0%	4.33	1.086
Commissioning and co-funding research	4.8%	1.8%	12.0%	38.0%	43.4%	4.13	1.024
Encouraging research usage from locally generated health research data	5.4%	3.6%	9.6%	39.8%	41.6%	4.08	1.07
Integrating research into the roll-out of health policies and programmes	8.4%	4.8%	12.0%	30.1%	44.6%	3.98	1.236
Establishing partnership research programmes	9.6%	4.2%	21.7%	16.3%	48.2%	3.89	1.317

Most of the participants suggested that agreement between researchers and health policy makers about research priorities was very important (62.0%); commissioning and co-funding research was very important (43.4%); encouraging research usage from locally generated health research data was very important (41.6%); integrating research into the roll-out of health policies and programmes was very important (44.6%); and, establishing partnership research programmes was very important (48.2%).

Mean rating scores indicate that on average participants felt that agreement between researchers and health policy makers about research priorities was important (M = 4.33, SD = 1.086); commissioning and co-funding research was important (M = 4.13, SD = 1.024); encouraging research usage from locally generated health research data was important (M = 4.08, SD = 1.07); integrating research into the roll-out of health policies and programmes was important (M = 3.98, SD = 1.236); and, establishing partnership research programmes (48.2%) was important (M = 3.89, SD = 1.317).

A Kruskal-Wallis H test showed that there was no statistically significant difference in the rating between faculty scores for agreement between researchers and health policy makers about research priorities; commissioning and co-funding research; encouraging research usage from locally generated health research data; integrating research into the roll-out of health policies and programmes; establishing partnership research programmes (refer to Table 5.22). In summary, researchers and academics across the faculties felt that none of the factors highlighted in Table 5.22 informs knowledge translation of health research evidence into policy formulation.

Table 5.22: Testing differences for strategies to increase the generation of research for health policy formulation

	Independent variable				
Dependent variable	**Faculty**	**N**	**MR**	χ^2 **(4)**	***P-value***
Agreement between researchers and health policy makers about research priorities	Faculty of Medicine	54	82.91	1.922	0.755
	Faculty of Biomedical Sciences	34	78.75		
	Faculty of Public Health	26	83.12		
	Faculty of Nursing	38	86.71		
	Faculty of Midwifery	14	89.32		
Establishing partnership research programmes	Faculty of Medicine	54	83.16	0.873	0.931
	Faculty of Biomedical Sciences	34	86.03		
	Faculty of Public Health	26	80.96		
	Faculty of Nursing	38	86.21		

	Faculty of Midwifery	14	76.04		
Commissioning and co-funding research	Faculty of Medicine	54	82.06	8.072	0.082
	Faculty of Biomedical Sciences	34	72.10		
	Faculty of Public Health	26	89.46		
	Faculty of Nursing	38	92.47		
	Faculty of Midwifery	14	81.29		
Encouraging research usage from locally generated health research data	Faculty of Medicine	54	78.53	7.249	0.116
	Faculty of Biomedical Sciences	34	77.19		
	Faculty of Public Health	26	86.79		
	Faculty of Nursing	38	94.62		
	Faculty of Midwifery	14	81.71		
Integrating research into the roll-out of health policies and programmes	Faculty of Medicine	54	88.83	2.806	0.597
	Faculty of Biomedical Sciences	34	80.24		
	Faculty of Public Health	26	75.54		
	Faculty of Nursing	38	85.24		
	Faculty of Midwifery	14	80.93		

5.6.11 Tools for measuring the impact of health research findings

Participants (academics and researchers) were asked to rate, on a 5–point Likert scale (1 = Not at all; 2 = Very little; 3 = Somewhat; 4 = To a smaller extent; 5 = To a larger extent), tools for measuring the impact of health research findings within the faculties. Table 5.23 presents the results.

Most of the participants suggested that to a larger extent they look for evidence of the transfer of research and innovation into practice through patents, prototypes and licenses (41.6%); to a larger extent they look for the number of people asking for feedback or more information (36.7%); to a larger extent they look for number of new products, practices and procedures developed based on the research outcomes (44.0%); to a larger extent they look for evidence of debates in the media (30.1%); to a smaller extent they look for the number of articles in the press (38.6%); for the number of citations in online platforms such as Google Scholar, Web of Science, etc. (25.9%); speaker evaluations from conference presentations (36.1%); and the number of references in scientific publications (30.7%); somewhat they look for evidence of new funders in the subject area (30.1%) and, a survey of end users and trends in website visits (31.9%).

Table 5.23: Tools for measuring the impact of health research findings

Tools	Not at all	Very little	Somewhat	To a smaller extent	To a larger extent	M	SD
Evidence of the transfer of research and innovation into practice	11.4%	2.4%	17.5%	27.1%	41.6%	3.85	1.306
Number of people asking for feedback or information	6.0%	7.8%	25.3%	24.1%	36.7%	3.78	1.198
Number of new products or research outcomes	10.8%	4.8%	24.7%	15.7%	44.0%	3.77	1.347
Number of articles in the press	6.6%	2.4%	28.9%	38.6%	23.5%	3.70	1.064
Evidence of debates in the media	13.3%	4.8%	27.1%	24.7%	30.1%	3.54	1.324
Number of citations in online platforms	7.2%	9.0%	32.5%	25.9%	25.3%	3.53	1.174
Number of references in scientific publications	7.8%	9.0%	29.5%	30.7%	22.9%	3.52	1.169
Survey of end users and trends in website visits	9.0%	9.0%	31.9%	31.9%	18.1%	3.41	1.155
Evidence of new funders in the subject area	9.0%	11.4%	30.1%	28.9%	20.5%	3.40	1.196
Speaker evaluations from conferences presentations	9.0%	10.8%	31.3%	36.1%	12.7%	3.33	1.113

Mean rating scores indicate that on average participants to a large extent look for evidence of the transfer of research and innovation into practice through patents, prototypes and licenses (M = 3.85, SD = 1.306); number of people asking for feedback or more information (M = 3.78, SD = 1.198); number of new products, practices and procedures developed based on the research outcomes (M = 3.77, SD = 1.347). Somewhat they look for surveys of end users and trends in website visits (M = 3.41, SD = 1.155); and, evidence of new funders (M = 3.4, SD = 1.196)(refer to Table 5.23).

5.6.12 Immediate outcome of health research

Questionnaire participants (academics and researchers) were asked to rate, on a 5–point Likert scale (1 = Unimportant; 2 = Of little importance; 3 = Moderately important; 4 = Important; 5 = Very important), the immediate outcome of health research findings within faculties. Table 5.24 presents the results.

Table 5.24: Immediate outcome of health research

Outcomes	Unimportant	Of little importance	Moderately important	Important	Very important	M	SD
Be aware about new health research evidence	3.6%	2.4%	6.6%	35.5%	51.8%	4.3	0.961
Incite behavioural intentions to use new evidence	2.4%	6.0%	10.2%	27.1%	54.2%	4.25	1.024
Create discussions about new research evidence	3.0%	4.8%	15.1%	31.9%	45.2%	4.11	1.029
Be knowledgeable of new health research evidence	13.9%	2.4%	6.0%	28.9%	48.8%	3.96	1.379

Most of the participants indicated that being aware about new health research evidence was very important (51.8%); inciting behavioural intentions to use new evidence information was also very important (54.2%); creating discussions about the new research evidence is equally very important (45.2%); and, just as being knowledgeable of new health research evidence is also very important (48.8%).

Mean rating scores indicate that on average participants indicated that being aware about new health research evidence is important (M = 4.3, SD = 0.961); inciting behavioural intentions to use new evidence information is also important (M = 4.25, SD = 1.024); creating discussions about the new research evidence is important (M = 4.11, SD = 1.029); and, just as being knowledgeable of new health research evidence is also important (M = 3.96, SD = 1.379).

Table 5.25: Testing the differences for immediate outcome of research evidence

	Independent variable				
Dependent variable	**Q1_Faculty**	**N**	**MR**	χ^2 **(4)**	***P-value***
Be aware about new health research evidence	Faculty of Medicine	54	83.11	13.502	0.007
	Faculty of Biomedical Sciences	34	84.21		
	Faculty of Public Health	26	91.00		
	Faculty of Nursing	38	87.29		
	Faculty of Midwifery	14	59.07		
Be knowledgeable of new health research evidence	Faculty of Medicine	54	77.3	12.475	0.013
	Faculty of Biomedical Sciences	34	78.71		
	Faculty of Public Health	26	96.65		
	Faculty of Nursing	38	93.71		
	Faculty of Midwifery	14	66.93		
Create discussions about new research evidence	Faculty of Medicine	54	83.39	0.897	0.924
	Faculty of Biomedical Sciences	34	81.13		
	Faculty of Public Health	26	84.85		
	Faculty of Nursing	38	86.91		
	Faculty of Midwifery	14	77.93		
Incite behavioural intentions to use new evidence	Faculty of Medicine	54	80.39	4.966	0.288
	Faculty of Biomedical Sciences	34	80.21		
	Faculty of Public Health	26	93.15		
	Faculty of Nursing	38	87.78		
	Faculty of Midwifery	14	73.96		

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for firstly, being aware about new health research evidence between faculties ($\chi2$ (4) = 13.502; p = 0.007), with a mean rank score of 83.11 for the Faculty of Medicine and 87.29 for the Faculty of Nursing; secondly, being knowledgeable of the new health research evidence was also statistically significant between faculties ($\chi2$ (4) = 12.475; p = 0.013), with a mean rank of 78.71 for the Faculty of Biomedical Sciences and 66.93 for the Faculty of Midwifery. However, there was no statistically significant difference in the rating score for creating discussions about new health research evidence and inciting behavioural intentions to use of new health research evidence, respectively (refer to Table 5.25). In summary, being aware about new health research evidence and being knowledgeable of the new health research evidence were statistically associated with the faculty from which the participant was censused.

5.6.13 Satisfaction with the use of health research evidence in Malawi

Participants were asked to rate, on a 5–point Likert scale (1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Neither satisfied nor dissatisfied; 4 = Somewhat satisfied; 5 = Very satisfied), how satisfied they are on the use of health research evidence in health policy-making especially in the identified health policy areas (see Appendix A). Table 5.26 presents the results.

Table 5.26: Satisfaction with the use of health research evidence

Policy areas	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied	M	SD
National health policy contents	9.6%	13.9%	48.2%	19.9%	8.4%	3.04	1.032
National health policy agendas	17.5%	9.0%	43.4%	21.7%	8.4%	2.95	1.161
National health policy implementations	16.9%	11.4%	47.6%	20.5%	3.6%	2.83	1.056
National health policy evaluations	15.7%	12.0%	51.8%	15.7%	4.8%	2.82	1.034

Most of the participants indicated that they were neither satisfied nor dissatisfied with the National health policy contents (48.2%); with the National health policy agenda (43.4%); with the National health policy implementations 47.6%); and, with the National health policy evaluations (51.8%).

Mean rating scores indicate that on average participants were neither satisfied nor dissatisfied with the National health policy contents (M = 3.04, SD = 1.032); neither satisfied nor dissatisfied with the National health policy agenda (M = 2.95, SD = 1.161); neither satisfied nor dissatisfied with the National health policy implementations (M = 2.83, SD = 1.056); and, neither satisfied nor dissatisfied with the National health policy evaluations (M = 2.82, SD = 1.034).

5.6.14 Satisfaction with the use of health research evidence in health institutions

Participants (researchers and academics) were asked to rate, on a 5–point Likert scale (1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Neither satisfied nor dissatisfied; 4 = Somewhat satisfied; 5 = Very satisfied), how satisfied they are with the way the identified institutions (see Appendix A) have used health research evidence generated in Malawi. Table 5.27 presents the results.

Table 5.27: Satisfaction with the use of health research evidence in health institutions

Institutions	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied	M	SD
The Ministry of Health and the National Health Commission	11.4%	9.0%	54.8%	20.5%	4.2%	2.97	0.962
The nursing and medical colleges in Malawi	15.1%	12.7%	50.6%	14.5%	7.2%	2.86	1.073
The National Commission for Science and Technology	12.7%	7.2%	68.1%	9.6%	2.4%	2.82	0.862
The Parliamentary Committee on Health	19.3%	11.4%	58.4%	7.8%	3.0%	2.64	0.98
The Nurses and Midwives Council of Malawi	20.5%	12.0%	56.0%	8.4%	3.0%	2.61	1.001
The Medical Council of Malawi	18.7%	15.7%	54.2%	9.0%	2.4%	2.61	0.971

Most of the researchers indicated that they were neither satisfied nor dissatisfied with the way the following have used health research evidence generated in Malawi: 54.8% with the Ministry of Health and the National Health Commission; 50.6% with the nursing and medical colleges in Malawi; 68.1% with the National Commission for Science and Technology; 58.4% with the Parliamentary Committee on Health; 56.0% with the Nurses and Midwives Council of Malawi; and, 54.2% with the Medical Council of Malawi. Mean rating scores indicate that on average participants were neither satisfied nor dissatisfied with the way all the health institutions have used health research evidence generated in Malawi.

5.6.15 Satisfaction with the way the country has addressed knowledge translation activities

Participants were asked to point out, on a 5–point Likert scale (1 = Very dissatisfied; 2 = Somewhat dissatisfied; 3 = Neither satisfied nor dissatisfied; 4 = Somewhat satisfied; 5 = Very satisfied), how satisfied they were with the way the country has addressed knowledge translation activities in Malawi. Table 5.28 presents the results.

Table 5.28: Satisfaction with the way the country has addressed knowledge translation activities

Knowledge translation activities	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied	M	SD
Adaptation of health research evidence to the local context	15.1%	11.4%	44.0%	14.5%	15.1%	3.03	1.213
Identification of health problems and conducting research to address them	15.1%	15.1%	46.4%	19.9%	3.6%	2.82	1.034
Selection, tailoring and implementation of health research knowledge in health policies	16.9%	14.5%	49.4%	15.7%	3.6%	2.75	1.031
Assessment of barriers to the use of health research evidence in health policy formulation	20.5%	13.3%	47.0%	11.4%	7.8%	2.73	1.146
Strategies used by health research partners for the use of health research evidence	23.5%	13.3%	48.2%	12.7%	2.4%	2.57	1.058
Evaluation of the impact of health	29.5%	15.7%	41.0%	11.4%	2.4%	2.42	1.102

research knowledge and its usage							
Monitoring the use of health research knowledge	32.5%	10.2%	42.8%	13.3%	1.2%	2.4	1.112

Most of the participants indicated that they were neither satisfied nor dissatisfied with the way the way Malawi has addressed knowledge translation activities: adaptation of health research evidence to the local context in Malawi (44.0%); identification of health problems and the conducting of relevant research to address the health problems identified in Malawi (46.4%). Mean rating scores indicate that on average participants were neither satisfied nor dissatisfied with: adaptation of health research evidence to the local context in Malawi (M = 3.03, SD = 1.213); identification of health problems and the conducting of relevant research to address the health problems identified in Malawi (M = 2.824, SD = 1.034). However, the participants were somewhat dissatisfied with evaluation (M = 2.42, SD = 1.102) and monitoring of health research evidence (M = 2.4, SD = 1.112). A Kruskal-Wallis H test showed that there was no statistically significant difference in the rating score for knowledge translation activities as their P–value was greater than or equal to 0.05 in all cases (refer to Table 5.29).

Table 5.29: Testing differences for knowledge translation activities in Malawi

	Independent variable				
Dependent variable	Q1_Faculty	N	MR	χ^2 (4)	*P-value*
Identification of health problems and the conducting of research to address the health problems identified	Faculty of Medicine	54	81.49	3.037	0.561
	Faculty of Biomedical Sciences	34	80.07		
	Faculty of Public Health	26	90.38		
	Faculty of Nursing	38	89.80		
	Faculty of Midwifery	14	69.68		
Adaptation of health research evidence to the local context in Malawi	Faculty of Medicine	54	82.92	4.663	0.334
	Faculty of Biomedical Sciences	34	83.53		
	Faculty of Public Health	26	90.67		
	Faculty of Nursing	38	87.82		
	Faculty of Midwifery	14	60.64		
Assessment of barriers to the use of health research evidence in health policy formulation in Malawi	Faculty of Medicine	54	84.37	4.243	0.391
	Faculty of Biomedical Sciences	34	78.88		
	Faculty of Public Health	26	95.31		
	Faculty of Nursing	38	84.47		
	Faculty of Midwifery	14	66.79		
Selection, tailoring and implementation of health research knowledge in health policies in Malawi	Faculty of Medicine	54	89.11	9.133	0.058
	Faculty of Biomedical Sciences	34	74.88		
	Faculty of Public Health	26	89.77		
	Faculty of Nursing	38	89.37		
	Faculty of Midwifery	14	55.21		
Monitoring the use of health research knowledge in Malawi	Faculty of Medicine	54	77.66	6.359	0.178

	Faculty of Biomedical Sciences	34	82.66		
	Faculty of Public Health	26	100.65		
	Faculty of Nursing	38	85.86		
	Faculty of Midwifery	14	69.82		
Evaluation of the impact of health research knowledge and its usage in Malawi	Faculty of Medicine	54	79.65	5.730	0.227
	Faculty of Biomedical Sciences	34	74.13		
	Faculty of Public Health	26	97.25		
	Faculty of Nursing	38	90.34		
	Faculty of Midwifery	14	77		
Strategies used by health research partners for the use of health research evidence in Malawi	Faculty of Medicine	54	81.86	4.762	0.332
	Faculty of Biomedical Sciences	34	73.97		
	Faculty of Public Health	26	95.33		
	Faculty of Nursing	38	89.38		
	Faculty of Midwifery	14	75.04		

5.7 Research question three: What communication and dissemination strategy can be developed to facilitate the use of health research evidence for health policy formulation in Malawi?

In response to its objectives the study also sought to develop a communication and dissemination strategy to facilitate the use of health research evidence for health policy formulation in Malawi.

5.7.1 Communication of health research outcomes

Participants (academics and researchers) were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how often have they communicated health research outcomes on health systems and health policy in general. Table 5.30 presents the results.

Table 5.30: How research outcomes are communicated

Research communication	Never	Rarely	Occasionally	Frequently	Always	M	SD
Published articles in journals used by health policy makers	21.1%	19.9%	25.9%	19.9%	13.3%	2.84	1.326
Organised a research dissemination conference where the research was show-cased to health policy makers	42.2%	19.9%	16.9%	10.8%	10.2%	2.27	1.372
Created a flyer or poster presentation to summarise health research evidence for the attention of health policy makers	39.2%	21.1%	22.3%	13.9%	3.6%	2.22	1.207
Mailed or e-mailed to health policy or decision makers articles, reports, syntheses, formal systematic reviews	44.0%	27.1%	15.1%	9.0%	4.8%	2.04	1.18
Involved members of the press about new research	45.8%	25.3%	13.9%	12.0%	3.0%	2.01	1.165
Mailed, e-mailed to policy makers a newsletter containing brief summaries	54.8%	16.9%	13.9%	10.8%	3.6%	1.92	1.203
Requested that the research be included on the College website or National Digital Repository	51.8%	19.9%	16.9%	9.0%	2.4%	1.9	1.124
Drafted policy briefs for possible inclusion into policy papers for policy makers	54.8%	16.3%	22.9%	3.0%	3.0%	1.83	1.071
Articulated the usefulness of new research through social networking and blogs	53.6%	25.9%	11.4%	6.0%	3.0%	1.79	1.061
Drafted a press release which show-cased new research outcomes for the attention of health policy makers	59.0%	25.9%	7.8%	4.8%	2.4%	1.66	0.983

Most of the researchers have occasionally published articles in journals used by health policy or decision makers (25.9%); never organised a research dissemination conference where the research was show-cased to health policy or decision makers (42.2%); never created a flyer or poster presentation to summarise health research evidence for the attention of health policy or decision makers (39.2%); never mailed or e-mailed to health policy or decision makers articles, reports, syntheses, formal systematic reviews (44.0%); never involved members of the press (newspapers, radio, television) about new research (45.8%); never mailed or e-mailed to health policy or decision makers a newsletter containing brief summaries or messages (54.8%); never requested that the research be included on the College website or National Digital Repository so that health policy or decision makers can have access to it (51.8%); never drafted policy briefs for possible inclusion into policy papers for health policy or decision makers (54.8%); never articulated the usefulness of new research through social networking and blogs (53.6%); and, never drafted a press release which show-cased new research outcomes for the attention of health policy or decision makers (59.0%).

Mean rating scores indicate that on average researchers occasionally publish articles in journals used by health policy or decision makers (M = 2.84, SD = 1.326); rarely organise research dissemination conferences where the research was show-cased to health policy or decision makers (M = 2.24, SD = 1.372); rarely create flyers or poster presentations to summarise health research evidence for the attention of health policy or decision makers (M = 2.22, SD = 1.207); rarely mail or e-mail to health policy or decision makers articles, reports, syntheses, formal systematic reviews (M = 2.04, SD = 1.18); rarely involve members of the press about new research (M = 2.01, SD = 1.165); rarely mail or e-mail to health policy or decision makers a newsletter containing brief summaries or messages (M = 1.92, SD = 1.203); rarely request that the research be included on the College website or National Digital Repository so that health policy or decision makers can have access to it (M = 1.9, SD = 1.124); rarely draft policy briefs for possible inclusion into policy papers for health policy or decision makers (M = 1.83, SD = 1.071); rarely articulate the usefulness of new research through social networking and blogs (M = 1.79, SD = 1.061); and, rarely draft a press release which show-cases new research outcomes for the attention of health policy or decision makers (M = 1.66, SD = 0.983).

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for the drafting of policy briefs for possible inclusion into the policy papers for policy makers attention between faculties ($\chi 2$ (4) = 12.343; p= 0.014), with a mean rank score of 79.17 for the Faculty of Medicine and 92.97 for the Faculty of Nursing. However, there were no statistically significant difference in the rest of the research communication strategies as the P – values were greater than or equal to 0.05 (refer to Table 5.31). In summary, researchers felt that the best way to communicate health research evidence is through drafting policy briefs**.**

Table 5.31: Testing differences for how health research outcomes can be communicated in Malawi

	Independent variable			χ^2 (4)	*P-value*
Dependent variable	Faculty	N	MR		
Mailed or emailed to health policy makers articles, reports, syntheses				3.621	0.463
	Faculty of Medicine	54	90.29		
	Faculty of Biomedical Sciences	34	86.84		
	Faculty of Public Health	26	82.15		
	Faculty of Nursing	38	72.38		
	Faculty of Midwifery	14	84.39		
Mailed or emailed to policy makers a newsletter containing a brief summary of research				3.652	0.457
	Faculty of Medicine	54	89.18		
	Faculty of Biomedical Sciences	34	88.18		
	Faculty of Public Health	26	76.56		
	Faculty of Nursing	38	74.59		
	Faculty of Midwifery	14	86.82		
Requested that the research be included on the College website or National Digital Repository				3.430	0.493
	Faculty of Medicine	54	82.90		
	Faculty of Biomedical Sciences	34	85.72		
	Faculty of Public Health	26	96.19		
	Faculty of Nursing	38	79.45		
	Faculty of Midwifery	14	67.86		
Created a flyer or poster presentation to summarise health research				3.978	0.418
	Faculty of Medicine	54	82.90		

evidence for the attention of health policy makers					
	Faculty of Biomedical Sciences	34	85.72		
	Faculty of Public Health	26	96.19		
	Faculty of Nursing	38	79.45		
	Faculty of Midwifery	14	67.86		
Organised a research dissemination conference to show-case health research evidence				3.931	0.415
	Faculty of Medicine	54	77.07		
	Faculty of Biomedical Sciences	34	81.32		
	Faculty of Public Health	26	95.63		
	Faculty of Nursing	38	89.13		
	Faculty of Midwifery	14	75.75		
Published articles in journals used by policy makers				5.989	0.199
	Faculty of Medicine	54	79.41		
	Faculty of Biomedical Sciences	34	73.68		
	Faculty of Public Health	26	88.00		
	Faculty of Nursing	38	97.76		
	Faculty of Midwifery	14	76.07		
Drafted policy briefs for possible inclusion into the policy papers for policy makers				12.343	0.014
	Faculty of Medicine	54	79.17		
	Faculty of Biomedical Sciences	34	71.63		
	Faculty of Public Health	26	104.48		
	Faculty of Nursing	38	92.97		
	Faculty of Midwifery	14	75.93		
Drafted a press release which show-cased new research outcomes				4.376	0.359
	Faculty of Medicine	54	80.47		
	Faculty of Biomedical Sciences	34	75.69		
	Faculty of Public Health	26	98.96		
	Faculty of Nursing	38	87.70		
	Faculty of Midwifery	14	74.04		
Articulated the usefulness of new research through social networking and blogs				5.606	0.230
	Faculty of Medicine	54	80.47		
	Faculty of Biomedical Sciences	34	75.69		
	Faculty of Public Health	26	98.96		

	Faculty of Nursing	38	87.70		
	Faculty of Midwifery	14	74.04		
Involved members of the press about new research evidence				2.182	0.708
	Faculty of Medicine	54	82.02		
	Faculty of Biomedical Sciences	34	75.53		
	Faculty of Public Health	26	91.88		
	Faculty of Nursing	38	86.28		
	Faculty of Midwifery	14	85.46		

5.7.2 Dissemination of health research findings

Researchers were asked to rate, on a 5–point Likert scale (1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Frequently; 5 = Always), how involved were the identified groups (see Appendix A) in the communication and dissemination of their health research findings. Table 5.32 presents the results.

Table 5.32: Dissemination of health research findings

Groups	Never	Rarely	Occasionally	Frequently	Always	M	SD
Universities and research institutes and centres	13.9%	16.9%	28.9%	25.9%	14.5%	3.1	1.25
Libraries and data repository managers	25.9%	10.2%	34.9%	15.7%	13.3%	2.8	1.34
Research funding agencies	28.9%	21.1%	31.9%	10.8%	7.2%	2.5	1.22
Health policy or decision makers	36.7%	25.3%	24.7%	6.0%	7.2%	2.2	1.21
Mass media	47.0%	19.9%	16.3%	12.7%	4.2%	2.1	1.23
Civil society organisations	45.2%	25.3%	18.1%	6.6%	4.8%	2.0	1.16
Parliamentary Committee on Health	63.3%	21.1%	6.0%	6.6%	3.0%	1.7	1.06

Most of the researchers, (28.9%) have occasionally used their universities and research institutes and centres to disseminate health research findings; 34.9% occasionally used libraries and data repository managers; 31.9% occasionally used research funding agencies; 36.7% never used health policy or decision makers; 47.0% never used mass media; 45.2% never used civil society organisations; and, 63.3% never used the Parliamentary Committee on Health.

Table 5.33: Testing differences on how research should be disseminated in Malawi

	Independent variable			χ^2 (4)	*P-value*
Dependent variable	Faculty	N	MR		
Parliamentary Committee on Health	Faculty of Medicine	54	80.64	8.173	0.086
	Faculty of Biomedical Sciences	34	69.82		
	Faculty of Public Health	26	97.40		
	Faculty of Nursing	38	90.86		
	Faculty of Midwifery	14	81.96		
Health policy and decision makers	Faculty of Medicine	54	86.95	2.060	0.734
	Faculty of Biomedical Sciences	34	88.99		
	Faculty of Public Health	26	83.40		
	Faculty of Nursing	38	75.70		
	Faculty of Midwifery	14	78.21		
Libraries and data repository managers				4.917	0.304
	Faculty of Medicine	54	72.44		
	Faculty of Biomedical Sciences	34	91.88		
	Faculty of Public Health	26	89.85		
	Faculty of Nursing	38	85.32		
	Faculty of Midwifery	14	89.07		
Research funding agencies	Faculty of Medicine	54	77.43	2.127	0.716
	Faculty of Biomedical Sciences	34	83.96		
	Faculty of Public Health	26	89.37		
	Faculty of Nursing	38	89.49		
	Faculty of Midwifery	14	78.68		
Civil society organisations	Faculty of Medicine	54	82.50	2.229	0.699
	Faculty of Biomedical Sciences	34	91.71		
	Faculty of Public Health	26	86.94		
	Faculty of Nursing	38	77.63		
	Faculty of Midwifery	14	76.96		
Universities and research institutes and centres				11.246	0.025
	Faculty of Medicine	54	82.83		
	Faculty of Biomedical Sciences	34	68.88		
	Faculty of Public Health	26	106.02		
	Faculty of Nursing	38	87.88		
	Faculty of Midwifery	14	67.86		
Mass media	Faculty of Medicine	54	82.40	8.675	0.072

	Faculty of Biomedical Sciences	34	73.38
	Faculty of Public Health	26	105.94
	Faculty of Nursing	38	81.07
	Faculty of Midwifery	14	75.71

Mean rating scores indicate that on average researchers occasionally use their universities and research institutes and centres to disseminate health research findings (M = 3.1, SD = 1.25); occasionally use libraries and data repository managers (M = 2.8, SD = 1.34); occasionally use research funding agencies (M = 2.5, SD = 1.22); rarely use health policy or decision makers (M = 2.2, SD = 1.21); rarely use mass media (M = 2.1, SD = 1.23); rarely use civil society organisations (M = 2.0, SD = 1.06); and, rarely use the parliamentary committee on health (M = 1.7, SD = 1.06).

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for universities and research institutes and centres between faculties ($\chi2$ (4) = 111.246; p= 0.025), with a mean rank score of 82.88 for the Faculty of Medicine and 87.88 for Faculty of Nursing. However, there were no statistically significant difference in the rest as the p – values were greater than or equal to 0.05 (refer to Table 5.33). In summary, researchers felt that the best way to communicate health research evidence is through universities, research institutes and centres.

5.7.3 Format for communicating research findings to policy makers

Researchers were asked to rate, on a 5–point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly agree), the best way of disseminating health research findings so that health policy or decision makers may use them for policy-making in Malawi. Table 5.34 presents the results.

Table 5.34: Format for disseminating health research findings to policy makers for policy formulation

Means of dissemination	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	M	SD
Present to health policy or decision makers at their fora	3.0%	1.8%	15.1%	20.5%	59.6%	4.32	0.997
Organise face-to-face meetings with health policy or decision makers	2.4%	10.8%	10.8%	24.7%	51.2%	4.11	1.125
Publish in report form for stakeholders	3.0%	4.2%	15.1%	41.6%	36.1%	4.04	0.978
Present at a research conference	3.6%	8.4%	13.9%	34.3%	39.8%	3.98	1.098
Publish in peer reviewed journals	6.0%	13.9%	15.7%	24.7%	39.8%	3.78	1.27
Organise seminars and workshops	4.8%	4.8%	26.5%	36.1%	27.7%	3.77	1.06
Publish in report form for a funding agency	4.2%	4.8%	35.5%	39.2%	16.3%	3.58	0.961
Distribute newsletters targeted at health policy or decision makers	8.4%	10.8%	24.7%	33.1%	22.9%	3.51	1.2
Present to practitioners through targeted mailing lists	7.8%	8.4%	38.0%	18.7%	27.1%	3.49	1.2

Most of the researchers strongly agreed with presenting to health policy or decision makers at their fora (59.6%); strongly agreed to organising face-to-face meetings with health policy or decision makers (51.2%); strongly agreed to presenting at a research conference (39.8%); strongly agreed to publishing in peer reviewed journals (39.8); agreed to organising seminars and workshops (36.1%); agreed to publishing in report form for stakeholders (41.6%); agreed to distributing newsletters targeted at health policy or decision makers (33.1%); and, were uncertain about presenting to practitioners through targeted mailing lists (38.0%).

Mean rating scores indicate that on average researchers strongly agree on the need to present to health policy or decision makers at their fora (M = 4.32, SD = 0.997); organise face-to-face meetings with health policy or decision makers (M = 4.11, SD = 1.125); publish in report form for stakeholders (M = 4.04, SD = 0.978); present at a research conference (M = 3.98, SD = 1.098); publish in peer reviewed journals (M = 3.78, SD = 1.27); organise seminars and workshops (M = 3.77, SD = 1.06); publish in report form for a funding agency (M = 3.58, SD = 0.961); distribute newsletters targeted at health policy or decision makers (M = 3.51, SD = 1.2); and, to present to practitioners through targeted mailing lists (M = 3.49, SD = 1.2). A Kruskal-Wallis H test showed there were no statistically significant difference in the rest as the p – values were greater than or equal to 0.05 (refer to Table 5.35). This means that academics and researchers across the faculties saw no need to identity appropriate means of disseminating health research evidence to policy formulators.

Table 5.35: Disseminating channels for health research findings to policy makers for policy formulation

	Independent variable			χ^2 (4)	*P-value*
Dependent variable	Faculty	N	MR		
Publish in peer reviewed journals	Faculty of Medicine	54	83.05	1.411	0.845
	Faculty of Biomedical Sciences	34	86.16		
	Faculty of Public Health	26	74.88		
	Faculty of Nursing	38	85.05		
	Faculty of Midwifery	14	90.64		
Publish in report form for a research funding agency	Faculty of Medicine	54	75.14	5.089	0.280
	Faculty of Biomedical Sciences	34	77.76		
	Faculty of Public Health	26	90.17		
	Faculty of Nursing	38	91.68		
	Faculty of Midwifery	14	95.07		
Present at a research conference	Faculty of Medicine	54	79.10	5.450	0.246
	Faculty of Biomedical Sciences	34	75.82		
	Faculty of Public Health	26	81.10		
	Faculty of Nursing	38	90.53		
	Faculty of Midwifery	14	104.50		
Present to health policy makers at their fora	Faculty of Medicine	54	73.20	6.666	0.151
	Faculty of Biomedical Sciences	34	81.74		

	Faculty of Public Health	26	85.75		
	Faculty of Nursing	38	93.97		
	Faculty of Midwifery	14	94.89		
Present to practitioners through targeted mailing lists				4.851	0.307
	Faculty of Medicine	54	79.98		
	Faculty of Biomedical Sciences	34	78.51		
	Faculty of Public Health	26	74.62		
	Faculty of Nursing	38	95.18		
	Faculty of Midwifery	14	93.96		
Organise face-to-face meetings with health policy makers				3.650	0.452
	Faculty of Medicine	54	78.31		
	Faculty of Biomedical Sciences	34	81.07		
	Faculty of Public Health	26	81.37		
	Faculty of Nursing	38	87.78		
	Faculty of Midwifery	14	101.79		
Organise seminars and workshops				1.269	0.873
	Faculty of Medicine	54	81.70		
	Faculty of Biomedical Sciences	34	79.76		
	Faculty of Public Health	26	80.46		
	Faculty of Nursing	38	89.71		
	Faculty of Midwifery	14	88.29		
Distribute newsletters targeted at health policy makers				8.734	0.066
	Faculty of Medicine	54	75.59		
	Faculty of Biomedical Sciences	34	84.82		
	Faculty of Public Health	26	69.87		
	Faculty of Nursing	38	96.71		
	Faculty of Midwifery	14	100.54		

5.7.4 Sources of research findings influential in bridging health research and policy discussions in Malawi

Researchers were asked to rate, on a 5–point Likert scale (1 = Important; 2 = Little importance; 3 = Partly important; 4 = Very important; 5 = Absolutely important), sources of research findings influential in bridging the gap between health research policy discussions in. Table 5.36 presents the results. Most of the researchers indicated that they found the following absolutely important: general locally generated health research evidence in Malawi (53.0%); reviews or syntheses of the research literatures (46.4%); liaising with the various research centres (42.2%); reports from official policy committees, policy advisers or officials (45.8%); attendance at seminars and conferences at which research findings are presented (42.2%); briefs from research brokers (36.7%) etc. (see Table 5.36). Some researchers found the following partly important: general international scientific literature (38.0%); relying on issues from mass media (44.6%). Of little importance was waiting for dialogue from international health agencies (28.9%).

Table 5.36: Sources of research findings influential in bridging health research and policy discussions in Malawi

Sources of research	Important	Little importance	Partly important	Very important	Absolutely important	M	SD
General locally generated health research evidence	3.6%	4.8%	21.1%	17.5%	53.0%	4.11	1.12
Reviews or syntheses of the research literatures	5.4%	4.8%	23.5%	19.9%	46.4%	3.97	1.178
Liaising with the various research centres	4.2%	5.4%	22.3%	25.9%	42.2%	3.96	1.117
Reports from official policy/science committees, policy advisers or officials	6.0%	7.2%	16.9%	24.1%	45.8%	3.96	1.211
Attendance at seminars and conferences at which research findings are presented	6.0%	3.0%	24.1%	24.7%	42.2%	3.94	1.153
Briefs from research brokers/promoters/translators	5.4%	9.6%	24.7%	23.5%	36.7%	3.77	1.201
Direct communication with individual researchers	5.4%	8.4%	30.7%	21.7%	33.7%	3.7	1.178
Briefs of research findings produced by researchers	5.4%	10.8%	30.1%	18.7%	34.9%	3.67	1.213
General international scientific literature	5.4%	13.9%	38.0%	14.5%	28.3%	3.46	1.194

Relying on networks consisting of interest groups and other stakeholders	6.0%	18.1%	39.2%	18.1%	18.7%	3.25	1.137
Waiting for dialogue from international health agencies	15.7%	28.9%	24.7%	17.5%	13.3%	2.84	1.266
Relying on issues from mass media	10.8%	25.9%	44.6%	12.0%	6.6%	2.78	1.017

Mean rating scores indicate that on average researchers found the following absolutely important: general locally generated health evidence (M = 4.11, SD = 1.12); reviews or syntheses of research literatures (M = 3.97, SD = 1.174); liaising with various research centres (M = 3.96, SD = 1.117; direct communication with individual researchers (M = 3.7, SD = 1.178) (see Table 5.36). However, researchers the following partly important general international scientific reviews (M = 3.46, SD = 1.194) and relaying on networks (M = 3.25, SD = 1.137).

A Kruskal-Wallis H test showed that there was a statistically significant difference in the rating score for the drafting of briefs of research produced by researchers for policy makers' attention, between faculties ($\chi 2$ (4) = 10.051; p = 0.037), with a mean rank score of 73.29 for the Faculty of Medicine and 98.63 for the Faculty of Nursing. However, there was no statistically significant difference in the rest of the sources as the p – values were greater than or equal to 0.05 (refer to Table 5.37). In summary, researchers felt that the source of research findings most influential in bridging the gap between health research and policy discussions in Malawi is through drafting policy briefs.

Table 5.37: Testing differences for sources of health research in Malawi

Dependent variable	Independent variable Faculty	N	MR	χ^2 (4)	*P-value*
General international scientific literature				2.374	0.667
	Faculty of Medicine	54	76.71		
	Faculty of Biomedical Sciences	34	86.60		
	Faculty of Public Health	26	84.40		
	Faculty of Nursing	38	90.87		
	Faculty of Midwifery	14	80.46		
General locally generated literature				1.518	0.831
	Faculty of Medicine	54	81.24		
	Faculty of Biomedical Sciences	34	83.15		
	Faculty of Public Health	26	92.62		
	Faculty of Nursing	38	82.95		
	Faculty of Midwifery	14	77.64		
Briefs of research produced by researchers				10.051	0.037
	Faculty of Medicine	54	73.29		
	Faculty of Biomedical Sciences	34	72.75		
	Faculty of Public Health	26	93.70		
	Faculty of Nursing	38	98.63		
	Faculty of Midwifery	14	88.82		
Reviews or syntheses of the research literatures				3.859	0.426
	Faculty of Medicine	54	77.09		
	Faculty of Biomedical Sciences	34	88.40		
	Faculty of Public Health	26	92.90		
	Faculty of Nursing	38	86.90		
	Faculty of Midwifery	14	71.00		
Direct communication with individual researchers				3.987	0.407
	Faculty of Medicine	54	75.81		
	Faculty of Biomedical Sciences	34	80.51		
	Faculty of Public Health	26	86.37		
	Faculty of Nursing	38	94.70		
	Faculty of Midwifery	14	84.68		
Attendance at seminars and conferences at which findings are presented				1.391	0.846
	Faculty of Medicine	54	78.61		

	Faculty of Biomedical Sciences	34	84.12		
	Faculty of Public Health	26	91.12		
	Faculty of Nursing	38	84.80		
	Faculty of Midwifery	14	83.18		
Liaising with the various research centres				6.596	0.150
	Faculty of Medicine	54	75.94		
	Faculty of Biomedical Sciences	34	75.41		
	Faculty of Public Health	26	90.73		
	Faculty of Nursing	38	97.04		
	Faculty of Midwifery	14	82.11		
Reports from policy committees				3.003	0.560
	Faculty of Medicine	54	76.74		
	Faculty of Biomedical Sciences	34	86.53		
	Faculty of Public Health	26	81.04		
	Faculty of Nursing	38	92.63		
	Faculty of Midwifery	14	82.00		
Briefs from research brokers	Faculty of Medicine	54	76.42	4.000	0.406
	Faculty of Biomedical Sciences	34	84.56		
	Faculty of Public Health	26	89.83		
	Faculty of Nursing	38	92.39		
	Faculty of Midwifery	14	72.39		
Mass media	Faculty of Medicine	54	81.45	1.761	0.783
	Faculty of Biomedical Sciences	34	87.37		
	Faculty of Public Health	26	79.04		
	Faculty of Nursing	38	81.38		
	Faculty of Midwifery	14	96.04		
Networks of interested groups	Faculty of Medicine	54	90.59	4.285	0.376
	Faculty of Biomedical Sciences	34	79.69		
	Faculty of Public Health	26	68.85		
	Faculty of Nursing	38	85.62		
	Faculty of Midwifery	14	86.86		
Dialogue from international health agencies				8.475	0.075
	Faculty of Medicine	54	69.39		
	Faculty of Biomedical Sciences	34	85.28		
	Faculty of Public Health	26	98.17		
	Faculty of Nursing	38	90.71		
	Faculty of Midwifery	14	86.79		

5.8 Chapter summary

The first part of this findings chapter addressed issues pertaining to the response rate to the study, methods used to analyse both qualitative and quantitative data, and the demographic features of the study participants. The chapter reported on the extent of health research and health policies in Malawi between 1992 and 2017 and presented findings from the interviews with directors of health research centres and institutions and from the Ministry of Health in Malawi.

The chapter further reported on the self-assessment tool administered to the identified health research centres and institutions in Malawi on specific areas such as the question of health research, knowledge production, knowledge translation, and the promotion of the use of health research evidence in Malawi. It also reported on the assessment of health policies in Malawi. The chapter has explored the relationship between health researchers and policy formulation on topical issues such as their interaction, involvement, participation, training, facilitation, accessibility of research evidence, collaboration, impact of research on policy makers, factors that may increase or sustain the use of health research evidence, and such.

The last part of the chapter reported on aspects of communication and dissemination of health research evidence, formats for communicating health research evidence, disseminating channels for health research evidence, sources appropriate for communicating and disseminating health research evidence. The next chapter discusses the main findings of the study and the proposed communication and dissemination strategy based on data gleaned from literature and the findings reported in Chapter Five.

Chapter 6

INTERPRETATION AND DISCUSSION OF MAIN FINDINGS

6.1 Introduction

This chapter offers interpretation of the main research findings within the context of the study's research objectives and its research questions, as well as its theoretical framework. Creswell (2014: 244) defines data interpretation in qualitative research as the process whereby the researcher draws meaning from the findings of the analysed data. The meanings may result in lessons learnt, comparison of information with the literature review or personal experiences. In quantitative research, interpreting the results means drawing general conclusions from the results for the research questions, hypothesis, and the objectives of the study through drawing inferences (Creswell, 2014: 244). The interpretation and discussion of the main research findings in this chapter is according to the research questions generated to guide the study in addressing its objectives.

6.2 Health research in Malawi

The first research question required ascertaining how much health research was available and what health policies were formulated in Malawi from 1992 to 2017. Much health research has been done in Malawi from 1992 to 2017. Earlier studies by Kirigia et al. (2015: 8) indicated that between 2005 and 2012, a total of 215 health research journal articles, books and chapter publications were published from Malawi. This study, using a search strategy in *Scopus*, identified 1435 health research publications (journal articles, books and book chapters) from Malawi within the same period. Similarly, Gondwe and Kavinya (2008: 90), through a search strategy done in Medline and PubMed databases for the period 1996 to 2006, found 489 health research publications from Malawi. This study identified 907 publications within the same period. In total this study identified 3985 heath research publications from researchers in Malawi from 1992 to 2017. The percentage change in health research publications for Malawi from 1992 to 2017 was found to be 89% (see Figure 5.3). Using the ARIMA Model (Russo, Camargo & Fabris, 2012: 35), the forecast is that the number of health research publications from 2018 to 2030 will increase from between 447 and 526 in 2018 to between 950-1146 by 2030 per annum (see Figure 5.4). A similar study by Rotich and Onyancha (2017: 23) at the Moi University in Kenya, for the period 2002 to 2014, found that the linear growth rate was 80%. This suggests that growth in health research publications in Malawi compares favourably well with that of other regional outlets such as Kenya.

6.2.1 Health research evidence by source

Two hundred and sixty-one publications representing 6.5% of health research publications in Malawi have been published in *Plos One* which is multidisciplinary and 5.7% or 229 publications in the *Malawi Medical Journal* (see Table 5.4). Both journals are peer reviewed and open access journals indexed in Africa Journals Online. A similar study by Rotich and Onyancha (2017: 27) observed that 17.7% of health researchers in Kenya publish in the *East African Journal* which is locally sponsored by the Kenyan Medical Association. In South Africa, between 1991 and 2005, the *South African Medical Journal* published 4.4% of the health research journal articles locally (Chuang et al., 2011: 57). All three African journals are publishing locally and in open access format. Out of the 3985 articles, books and book chapters in Malawi for the period 1992 to 2017, 118 (3%) were articles published as open access as either gold[26], green[27] or hybrid[28] while the remaining 3867 (97.0%) were from other types of access including subscription and promotional access.

Globally, the European Commission presents statistics of the overall growth of the open access movement in the *Scopus* database alone (European Commission, 2018). For example, between 2009 and 2016, a number of researchers in developed countries published either through green or gold open access publishing models. These countries include: Germany (22.1% green open access model and 8.7% gold open access model); Belgium (28.1% green open access model and 8.6% gold open access model); United Kingdom (28% green open access model and 8.2% gold open access model); USA (29.1% green open access model and 7% gold open access model); Netherlands (27.2% green open access model and 8.8% gold open access model); Denmark (24.8% green open access model and 10% gold open access model); Sweden (24.3% green open access

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[26] Gold open access refers to an online open access publishing model that provides access to journal article content free of charge to both users and authors (Smith et al., 2017: 4).

[27] Green route refers to an open access publishing model that allows for articles to be self-archived by the authors or institutions in repositories to provide free access to users (Smith et al., 2017: 4).

[28] Hybrid refers to a publishing model that allows access through subscription through pay-per-view or institutional subscriptions but also allows the author to pay article processing charges for free (open) access by users (Smith et al., 2017: 4).

model and 10.2% gold open access model); and Norway (21.5% green open access model and 11.3 % gold open access model) (European Commission, 2018).

Related trends were also identified in developing countries. For example, Lithuania (11.2% green open access model and 16.8% gold open access model); Malta (15.8% green open access model and 10.8% gold open access model); Latvia (11.5% green open access model and 20.2% gold open access model)(European Commission, 2018).

In terms of disciplines within the medical and health sciences, the European Commission (2018) indicates that biomedical health research contributes 25% in green open access and 12.5% in gold open access; clinical medicine contributes 20% in green open access and 13.9% in gold open access; health sciences contributes 15.3% in green open access and 12.9% in gold open access; and, medical engineering contributes 16.3% in green open access and 3.7% in gold open access.

While the path for Africa is not very clear from the data by the European Commission (2018), and as also observed by Rotich and Onyancha (2017: 27), this study and other studies in Africa provide testimony of the acceptance of open access publishing models by health researchers in Africa. Compared with health researchers in Malawi, more Kenyan researchers (17.7%) are publishing in open access journals as compared to health researchers in Malawi (6.5%).

6.3 Health policies in Malawi

Public health policies in the health sector in Malawi secure the health of the communities, complement wider health coverage and service delivery reforms (World Health Organisation, 2018). These policies are in three categories. Firstly, there are systems policies which act as blocks to support universal coverage and effective service delivery (World Health Organisation, 2018). Generally, systems policies deal with essential drugs, technology, quality control, human resources, which primary care and universal coverage reforms depend on. Secondly, there are public health policies which deal with specific actions needed to address certain priority health problems through prevention and health promotion (World Health Organisation, 2018). Public health policies address technical issues and programmes that provide guidance on how to deal with priority health problems. Public health policies also deal with classical public health interventions from public hygiene and disease prevention to health promotion. Thirdly, there are health policies whose contributions to health are from intersectoral collaboration (World Health Organisation, 2018). The World Health Organisation (2008b) defines intersectoral collaboration as actions undertaken by sectors outside the health profession but in collaboration with the health sector, on health issues or health equity outcomes.

6.3.1 Role of the Ministry in health policy formulation

In Malawi the role of the Ministry of Health is either central (93.3%), advisory (86.7%) or marginal (16.7%) (see Figure 5.6). Research on the role of governments in health policy formulation suggest that health policies are largely based on treaties, negotiations, adoptions, ratifications. Because of this domestic implementation of the treaties do not guarantee achievement of health policies (Hoffman & Røttingen, 2015: 26–27). Suggestions point to inconsistencies associated with ratification of health-rights treaties and health or social outcomes (Palmer et al., 2009: 1987). This suggests that as much as governments sign treaties they need to go beyond them and begin to implement policies based on the available health research evidence and the challenges facing their people. This applies to Malawi as well.

6.3.2 Methods of allowing research information to inform health policy documents

The study has revealed that 96.7% of the policy or decision makers in Malawi use search engines such as Google to look for health research evidence. Other than that, 93.3% use grey literature and only 20% use academic literature in a form of journal publications and clinical trials (see Figure 5.7). Studies on the use of search engines allude to the fact that while access to health and medical information has been beneficial to both patients, and policy and health care professionals, there is a growing concern that substantial proportions of clinical information on the web is inaccurate, erroneous, misleading, or fraudulent, and poses a threat to public health (McLeod, 1998 : 1663; Orton et al., 2011: 3). In a rapid review by Moore, Todd and Redman (2009: 27), 63% of the researchers reported to have used one systematic review in every two years. Moore, Todd and Redman (2009: 27) further highlighted that 40-50% of the researchers found that systematic reviews had great influence in decisions around programme justification and planning. Nonetheless, 37-44% of the researchers in Moore, Todd and Redman's study indicated that the systematic review did not have any influence on policy development and programme evaluation.

Further, regression analysis suggested that the use of research evidence largely depends on the organisational values placed on the use of research evidence (Moore, Todd & Redman, 2009: 27). In the current study, systematic reviews were not identified in the health policies. Only one randomised controlled trial and the use of peer reviewed journals were identified. According to the National Health and Medical Research Council (2009), systematic reviews, appraised evidence of syntheses and guidelines and peer reviewed journal articles constitute filtered information and are considered as high levels of health research evidence. Similarly, randomised controlled trials, cohort studies, case controlled reports and expert opinion are rated as low health research evidence and considered as unfiltered information. In the case of health policies in Malawi, it does indicate that low levels of health research evidence are used for health policy formulation.

6.3.3 Types of research found in health documents

The study revealed that 100% of the policy makers in Malawi use reports including evaluations of previous policies or programmes; 96.7% use internal data or evaluations within the ministries or 86.7% use data from ministry registries. Only 20% of the policy makers use primary research in the form of journal articles. Further, only 16.7% of the policy documents use secondary research articles such as research summaries (see Figure 5.8). In a study by Ritter (2009: 72) in Australia nine sources of research evidence were highlighted: 45.2% use health research experts; 45.2% refer to technical reports, monographs and bulletins; 25.8% access the Internet, specifically Google; 25.8% use statistical data held by the research and policy units; 22.6% refer to policy makers in other jurisdictions such as the National Statistical Offices; 16.1% consult academic literature; 12.1% use internal expertise; and, 6.5% use previous government policies. In another study in Canada, Orton et al. (2011: 4) found that practitioners and policy makers consulted the following sources: 87% use printed academic literature; 85% use websites; 66% use health organisations; and, 64% use non-governmental and voluntary organisations. The case in Malawi compares favourably with the Australian case where only 20% and 16.1% respectively, use researched academic literature. The case in Malawi also suggests that policy makers rely on the Punctuated Equilibrium Model in which the policy process is based on incremental adjustment of the previous policy evaluations and the use of internal data or data from ministry registries (Cerna, 2013: 9) (see Section 3.4.1.3).

6.3.4 Relevance of research found in health documents

This study has revealed that 83.3% of the health policies in Malawi are based on data relevant to the Ministry of Health. Most of this data include: policy evaluations and internal data or registry data from the ministries. A rapid review by Moore, Todd and Redman (2009: 19) suggest that analyses of local information such as routinely collected health data and local evaluations has value in increasing the use of research evidence in policy. However, in the current study in Malawi, there is over usage of internal data from registries in the formulation of health policies at the expense of quality research and data generated through health research in the country.

6.3.5 Assessment of evidence in health policy documents

Assessment of evidence entails assessing the quality of evidence, its effects on equity, and its applicability in the policy-making settings (Thornhill, Judd & Clements, 2009: 22). Imani-Nasab et al. (2017: 461) argue that researchers assess the quality of articles with their own knowledge of research methodology; reputation of the journals in which it was published; its impact factors; international reputation of the funding organisation such as WHO; evidence pyramid which favours systematic reviews first and use that as evidence to inform policy documents.

In the current study, it has been shown that 96.7% of the policy documents in Malawi were based on previous policy documents as applicable to the policy context. Similarly, 16.7% of the policy assessment showed that low level research evidence in a form of reports from the National Statistics Office, reports from previous policy evaluations and other internal data or data from ministry registries played a major role in policy formulation (see Figure 5.7). Reliance on registry and internal data as opposed to reliable health research evidence has received condemnation especially with where to place studies derived from registries within the hierarchies of health research evidence (Roovers, 2007: 1119). Debate centres on the assessment of registry and internal data regarding methods of grading levels of research evidence, underlying assumptions, shortcomings in assessing types of evidence and consistency in evaluating the evidence itself (Blommestein, Franken & Uyl-de Groot, 2015: 557-558).

6.3.6 Quality of health research evidence in policy documents

Research documents examining the levels of quality of research documents show a limited number of studies on the topic. Quality of health research evidence considers the sample size sufficiency, methods of collecting data and how threats to validity were addressed (Makkar et al., 2016b: 3). In this study, it has been observed that high quality research information from peer reviewed journals to randomised controlled trials only constituted 9%. Moderate health researched evidence comprising of reports from the National Statistical Offices and other government agencies only contributed 7% while data from registries and previous internal policies contributed 44% of the health research evidence.

Zardo and Collie (2014: 501) in their research in Australia found out that out of 50 references to health research evidence and 23.4% of the policies examined on compensable injuries, health research evidence in a form of peer reviewed journal articles had the least sources of health research evidence. There were more references supporting claims in decision making than in support of policy information. The study concluded that 47.5% were significant references to internal policies of unresearched information; 21.8% were clinical reports; 8.5% were internal legislation of unresearched information; 10.3% were external policies; and, 2.4% were legislative documents.

Comparatively, the current study shows that in Malawi the Ministry of Health relies on previous internal policies as sources of health research evidence. Accordingly, such sources of information constitute unfiltered information and in the hierarchy of health research evidence they are considered as low sources of health research evidence and therefore unreliable (National Health and Medical Research Council, 2009).

6.3.7 Procedures in health policy formulation

Health policies are formulated by personnel at various levels. In this study, 93.3% of the policies were formulated by ‘consultants or experts’ assembled by the ministry policy units; 10% were through a structured appraisal guideline adopted from previous guidelines; 3.3% were from a predefined strategy such as a previous policy; while 13.3% were from a team assembled as an adhoc committee.

Many players influence policy formulation, including civil society organisations (see Section 3.3.2.2.2), political influences as well as the donor community. The World Health Organisation (2009: 127–128) argues that because of the conflict between various health policy makers many health policies are old and only wearing ‘new clothes’; largely they are path works of subsector components often formulated by vertical programmes; poorly integrated into the framework while neglecting important ideas; they are sketched under pressure because of donor support; formulated with international pressure, obligations and expectations in order to project a broad and positive image of the health sector.

6.3.8 Methods of soliciting research evidence in health documents

The study has shown that 66.7% of the health policies are appraised based on author or source credibility; 96.7% are appraised based on expert assessment; only 6.7% are appraised based on research designs. The World Health Organisation (2009: 28) observed that in most cases health policies are blue printed from international models by experts brought by aid agencies. The World Health Organisation (2009: 28) also noted that some health policies are formulated by prominent insiders with high profiles despite their overambitious goals and technical drawbacks.

In the current study, many policies in Malawi were formulated by a team of health policy and decision makers and the academia (by invitation). However, while this is the model in most of the health policies in Malawi, the levels of health research evidence used in the health polices is very low and unreliable. The Ministry of Health relies on registry data and internal evaluations of previous policies. The Ministry of Health also relies on data from the National Statistical Office. This indirectly suggests that health researchers invited to participate in health policy formulation do not take advantage of their presence at the policy formulation and the health research evidence available from various research undertaken to articulate the usefulness of peer reviewed health research evidence in health policy formulation.

6.3.9 Type of personnel involved in health policy formulation

This study in Malawi shows some intersection of various players in policy formulation. For example, 96.7% of health policies in Malawi were formulated by internal members within the ministries; 83.3% involved an evaluative team specifically set for the policy; 80% of them involved setting up a working group; and, 13.3% involved health researchers. The current study shows that as much as the interaction between health researchers and policy makers exists in Malawi, it has not translated into the transfer of health research evidence into health policy formulation. The two worlds of researchers and policy makers are still apart from each other and the use of health research evidence in policy-making or formulation is superficial.

Evidently Hawkes et al. (2015: 163), in an assessment of policy makers in Bangladesh, Nigeria, Gambia and India, observed that most of the health researchers pursued their own interests; had poor communications skills; their research outputs were irrelevant to the national needs; they lacked centralised sites for accessing information; and few, had opportunities for interacting with policy makers. On the other hand, health policy makers were poorly capacitated to interpret and use health research data.

In summary, the Ministry of Health plays a central role in health policy formulation in Malawi. Secondly, the Ministry of Health in Malawi does not use health research evidence in a form of systematic reviews as appropriate source of health research evidence. Instead the Ministry relies on internal data from its registry or evaluation of the previous policies. The levels and quality of health research evidence used in health policy formulation is very low on the hierarchy of health research evidence in which systematic reviews are considered as the highest level of research evidence and expert opinions are considered as the lowest levels of health research evidence. While some health researchers are invited during health policy formulation, their presence in the policy planning teams has not contributed to the improved use of high quality research evidence in policy formulation. The use of health research evidence in health policy formulation in Malawi is therefore superficial.

6.4 How research informs the development of policy documents

This study has shown that conceptually, 30% of the health research in Malawi has informed the thinking about the background to the health policy issue; 93.3% of the research has helped policy makers understand the policy context; 76.7% of the research suggested policy priorities; while only 30% helped in policy evaluation. Instrumentally, only 18% of the research directly informed health policy decision while 82% was only used to feed into the policy document as supporting statements to be cited and referenced at the end. Tactically, this research has shown that 78% of the research use is to inform policy stakeholders of key policy issues; 19% supports an established position, decision or view; and only 3% of the policy documents provide adequate research evidence that can persuade stakeholders to support an existing decision or view about health policy formulation.

Internationally, there is a growing pressure on using health research evidence to improve decision making and this requires access to evidence as well as the capacity to use the research evidence (Rodríguez et al., 2017: 65). Research in Africa and Asia by Rodríguez et al. (2017: 65) shows that South Africa and Zambia have high levels of organisational capacity to use health research evidence, while Pakistan and Bangladesh have the lowest organisational capacity to use health research evidence. In contrast, it was also noted that individual capacity was highest in Pakistan and South Africa while lowest in Bangladesh and Lebanon in terms of health research evidence use in policy formulation.

6.4.1 Barriers to research evidence use

This study has shown that 3.3% of the policy documents showed the policy makers had no barriers to health research evidence; 80% faced minimal barriers while 6.7% faced extensive barriers as the documents provided only guidelines to be followed when addressing health research issues.

Oliver et al. (2014: 2) in their systematic review found that barriers to health evidence uptake were largely due to poor access to quality and relevant research, and lack of timely research output. Wallace, Nwosu and Clarke (2012: 2) identified lack of use, awareness, limited access, familiarity, and lack of perceived usefulness as barriers to health research evidence uptake. Murthy et al. (2011: 2) suggest that barriers to health research usage is exacerbated by the enormous volume of health research evidence, and the difficulties in applying global health research evidence in a local clinical context.

Orton et al. (2011: 10) in a study in Kenya and Malawi noted that barriers to the use of research evidence include: policy-makers' perceptions of the health research evidence as inadequate to address their needs; lack of interaction and existence of a gap between health researchers and policy-makers; the context and culture in which policy-makers work; and, competing influences between health research and policy-making.

6.4.2 Facilitators of research evidence use

This study has shown that 96.7% of the individual's skills count for the use of health research evidence and team attributes, respectively. Apart from individual attributes, 86.7% were based on political factors supporting the use of health research evidence while 76.7% were dictated by the policy topic factors.

Contrary, Oliver et al. (2014: 2), in their systematic review observed that health evidence uptake was largely due to firstly, collaboration between researchers and policymakers; and, secondly, improved relationships and skills. Orton et al. (2011: 8) further argue that facilitators of health research evidence also include that health research should firstly be targeted at the needs of policy-makers; secondly, health research should highlight key messages; and thirdly, there is need to build health research capacity between health researchers and policy makers.

6.5 Relationship between health policy researchers and policy makers

The second research question guiding this study was to ascertain the relationship between health researchers and policymakers. Orton et al. (2011: 2) argue that the gulf between health researchers and policy-makers has accelerated the inability to use health research evidence between policy makers and health researchers. Similarly, research evidence indicates that unless the two worlds begin to talk with each other, very little would be achieved in the use of health research evidence in policy formulation. Sections 6.6.1 to 6.6.15 discuss the relationship between health researchers and health policy makers in Malawi.

6.5.1 Interaction between researchers and policy makers

The study has shown that 38.6% of the researchers do not formulate study objectives with policy makers in mind; 42.2% execute health research on their own; 36.1% analyse and interpret the results and 47% develop research products on their own. On average researchers rarely involve policy makers in any of the research activities (see Table 5.7). Statistical analysis using the Kruskal-Wallis H test showed no significant difference on researchers' involvement of policy makers in health research between faculties.

Ellen, Lavis and Shemer (2016: 4-5) in their study in Israel observed that 54% of the policy makers perceived health research as not identifying the right policy alternatives; 59% thought that health research evidence lacked coordination while 60% suggested that priorities from the health systems drew attention away from health issues warranting health research evidence. Statistical results through Mann Whitney non-parametric results of the same study indicated that research organisations, researchers, policymakers, and stakeholders were responsible for knowledge translation activities. In the current study, formulating study objectives, developing research design and methods, analysing and interpreting research findings and developing research products were statistically significant and associated with the faculties from which the researchers were drawn (see Table 5.8).

6.5.2 Involvement of policy or decision makers in health research

This study showed that 28.3% of the researchers rarely involve policy makers in their research. Overall, 28.3% never involve policy makers in government sponsored meetings; 38.0% never involve policy makers in events organised by their colleges; 35.3% never involve policy or decision makers in their informal conversations; and, 47.6% never share weblinks with policy or decision makers.

Uzochukwu et al. (2016: 67) in a study in Nigeria found that policy makers involvement in health research was, firstly, to support the use of certain policy or decision-making strategies. Secondly, policymakers involved researchers in order to get the research outcome. Thirdly, the policy makers were involved in designing the research objectives and the whole research process. Fourthly, policy makers were involved in the use of health research findings to influence policy. Policy makers also were involved in active dissemination of research findings to as many policy stakeholders as possible. A Kruskal-Wallis H test in the current study showed that there was a statistical significant difference between faculties at the University of Malawi in the involvement of policy makers in the research process expert committee representation at the Ministry of Health (see Table 5.9). However, there was no involvement of policy makers in the actual research itself, in the designing of the research objectives, the active dissemination, and use of the research evidence to influence policy formulation. The Nigeria model therefore would be an ideal model for effective transfer of health research into policy-making.

6.5.3 Participation of policy or decision makers in health research

The study shows that 30.7% of the researchers occasionally conduct deliberate dialogues with policy stakeholders; 43.4% have never involved policy or decision makers in establishing the overall direction of the health conducted; 53.0% were never involved in the formulation of the National Health Research Agenda as well as the National Health Policy.

Contrary, Kirigia, Ota and Shongwe (2017: 1) outlined the process of developing Swaziland’s national health research agenda. The report suggests that many policy makers were consulted in the 14 fourteen step processes which included: search and review health research priorities;

situation analysis; identification of health research stakeholders; identification of main research themes; ranking of the main research themes; identification of sub-themes; identification of research gaps and many others. In the current study, to the contrary, the mean score showed on average that health researchers rarely participated in the formulation of the National Health Research Agenda and the National Health Policy in Malawi.

6.5.4 Ability of policy makers to use research evidence

In this study 48.8%, 56.6%, 57.2% and 56.0% of the researchers have never adapted, acquired, applied and assessed health research evidence, respectively. Uneke et al. (2017: 707), in a study in Nigeria, noted that researchers' ability to acquire health research evidence had a mean score of 3.41 on a scale of between 1 and 5 while ability to adapt research evidence was at 3.29. In the current study, the mean scores were 2.0 for adapt, 1.8 for acquisition, 1.8 and 1.7 for applying and assessing the use of health research evidence. This suggests that, unlike in the Nigerian case, in Malawi rarely do health researchers adapt, apply, assess and apply health research evidence in their work.

6.5.5 Facilitation of research use by policy or decision makers

In this study, 33.1% of the researchers have never developed reports, summaries or messages that used language appropriate to policy or decision makers; 42.8 have never tailored the contents of their communication strategies to policy or decision makers; while 50.6% have never used institutional websites, social media, radio and television to tailor their research aspects for usage by policy or decision makers.

Ndumbe-Eyoh and Mazzucco (2016: 254), in a study in Canada, observed that social media was frequently being used in communicating and accessing health research information. For example, 76% of the researchers used Facebook and 61% used You Tube compared to 45% that used Twitter, 29% LinkedIn and 25% Instagram. While social media tools can increase the depth and breadth of health research evidence engagement and the building of relations and conversations around the use of health research evidence, the results in this study for Malawi collectively suggest that many researchers are not making use of the social media, radio, institutional websites and television for this purpose.

6.5.6 Accessibility of research evidence by policy or decision makers

The study revealed that 45.8% of the researchers never provide access to searchable databases for research reports, articles and synthesis; 51.8% have never provided reprints, or brief summaries; 56.0% have never used synthesis of literature (see Table 5.14). A country assessment by Oronje et al. (2015) showed that Malawi and Kenya faced related problems. For example, the two countries, lack repositories for health research where policy or decision makers can access research for use in their work. Secondly, the two countries lack subscriptions at ministry and parliament levels to journals and other online databases to enable access to research necessary for informing policy decisions. Thirdly, health research evidence in the two countries was poorly packaged and disseminated by researchers. At individual level, the two countries lacked technical skills required to enable health research evidence use. Similarly, a Kruskal-Wallis H test showed no statistical significance in the scores between faculties at the University of Malawi (see Table 5.15) on the issue of access to research evidence. Indirectly, it does suggest that researchers and policy makers are struggling to have access to the best research resources because of lack of subscriptions or platforms that are readily available when doing their work.

6.5.7 Collaborations between researchers and policy makers

This study has shown that 33.7% of the researchers have never participated in knowledge translation activities; 40.4% have never worked with knowledge translation specialists; 46.6% have never developed relationships with print, radio or television media.

Uneke et al. (2017: 706) in a study in Nigeria noted that collaborations between policy makers and researchers improved knowledge translation mean ratings from 3.40 to 3.74 on a 5-point scale. Secondment in policy-makers' organisations increased from mean score of 2.80 to 3.07 while in the researchers' institution it increased from 2.58 to 2.84. The Nigerian study further noted that collaboration through staff exchange allowed policy makers to participate in academic and research activities including serving on research ethics committees. In return, health researchers provided support to policy or decision makers on the use of research evidence in policy-making. The study further noted an increase in the knowledge of policy makers in the analysis from 20.7% to 50.4% and contextualisation of policy settings from 31.3% to 42.8%. Contrary to the secondment of staff as a means of collaborating knowledge translation activities in the Nigerian study, a Kruskal-Wallis H test for the current study shows that conferences, developing research designs and methods, working with knowledge translation specialists and working with brokers were statistically significant and associated with the faculties in the University of Malawi. The faculty members felt that these activities were useful in translating knowledge from health research to policy-making.

6.5.8 Impact of health research evidence on policy formulation

The study identified that 27.7% of the researchers had findings which were not used by health policy or decision makers but were important; 25.9% agreed that their own research was used to inform health policy or practice; 32.5% were uncertain about their research having contributed towards policy alternatives.

Campbell et al. (2009: 4) in their research in Australia and New Zealand found that 66% of the researchers reported that policy makers used their own local research to inform policy agendas or to evaluate the impact of policy; 39% of the researchers had findings that were not used but were important for policy formulation; 59% of the researchers stated that their own research increased policy makers awareness of the policy issue; 41% said their research evidence helped in identifying policy alternatives; while 49% had their research used for choosing the preferred policy option and their own research was used to justify the final policy document.

These two research results highlight challenges of research evidence use in developed and developing countries. The differences account for a minimum and justify the existence of a bigger problem in transferring health research evidence into policy formulation.

6.5.9 Factors that increase or sustain use of health research evidence

In the current study, 42.8% of the researchers consider the nature of the research evidence as being more influential in policy formulation and practice; 39.8% consider the context in which health research evidence is placed; 39.2% always examine the organisation’s readiness to use health research evidence while 41% think about the relevance of the health research evidence.

Moore, Todd and Redman (2009: 17–18) on 89 policy makers in Australia, report related results. For example, on the nature and relevance of the evidence, research influenced policy when it targeted the intended audience; when it related to the priorities of the people involved and was also synthesized and presented in a format appropriate to the users. Similarly, the context of the research evidence influenced policy if it demonstrated relevance and application in local context. On interactions, the research was more influential when researchers understood the priorities, engaged with policy makers as partners, and research results were presented in direct reference to the policy makers questioning. In terms of organisational readiness, research was only valued in organisations whose leadership valued the use of research, promoted learning and questioning culture and provided opportunities for training and skill development on the use of health research. The study in Australia also demonstrated that research evidence use was associated with the provision of access to databases, libraries, research summaries, knowledge brokers and networks to help explain and interpret results. In the case of the current study, a Kruskal-Wallis Test showed no statistically significant differences in the rating for faculty scores within the University of Malawi for the provision of access to health research evidence resources.

6.5.10 Strategies for generation of health research evidence for policy makers

In the current study, 62% of the researchers highlighted that an agreement between researchers and policy makers was very important; 43.4% suggested that co-funding as very important; 41.6% suggested that the use of locally generated health research was very important; while 44.6% showed that establishing partnership is the way to go. These sentiments corresponded with mean scores obtained (see Table 5.21). A Kruskal-Wallis H test showed there was no statistically significant difference in the rating between faculties on strategies for generation of health research evidence. Indirectly, faculty members felt that agreement between researchers and policy makers, co-funding, the use of locally generated health results and establishing partnership were important factors in generating health research evidence for policy makers but they were not so emphatic as can be seen from the results.

However, an analysis by Moore, Todd and Redman (2009: 21–22) involving 89 policy makers in Australia showed that gaining agreement about research priorities stimulated researchers to consider addressing research questions relevant to the policy agencies. Policy priorities developed through workshops in turn provide opportunities for collaboration and communication. Establishing partnerships provides opportunities for researchers and policy makers to participate in activities, research generation, cultivate and develop research skills (Lomas, 2007: 16). Commissioning and co-funding increases motivation and linkage while encouraging participation in policy formulation (Lomas, 2007: 17). Encouraging use of local data increases opportunities for the integration of local data into the international evidence and influences local policy and practice (Redman, Jorm & Haines, 2008: 16). Contrarily, research in the current study, via a Kruskal-Wallis H test showed no statistically significance between faculties at the University of Malawi in all the four factors mentioned (see Tables 5.19 & 5.20).

6.5.11 Tools for measuring the impact of health research evidence

This study shows that 41.6% of the researchers look for evidence of transfer of research into practice; 36.7% look for feedback from readers; 44% look for new products, practices and procedures on research outcomes; 38.6% look for articles in the press; while 25.9% look for number of citations in online platforms such as Google Scholar, Web of Science, etc. Mean scores in the current study correspondingly tallied the researchers’ responses (see Table 5.23).

Unlike the current study, Kuruvilla et al. (2006: 139) in the United Kingdom Research Assessment Exercise indicated that research impact measures four broad areas of impact. Firstly, research impact measures the type of problem, research methods employed, publications, research products, patents, research networks established, research management and communication. Secondly, policy impacts measure the level of policy-making, type of policy, nature of policy impact, policy networks and political capital. Thirdly, impact measures health and intersectoral collaborations, evidence-based practice, quality of care, information systems, service management and cost effectiveness. Lastly impact measures service delivery, attitudes and behaviour, health literacy, health status, equity and human rights. While the Malawian experience is specific to certain direct measurables, the UK scenario examines broader research activities encompassing a wider spectrum of knowledge translation activities.

6.5.12 Immediate impact of the outcome of research evidence

The study showed that the immediate impact of the outcome of research evidence comprised of 51.8% being aware of new health research evidence; 54.2% inciting behavioural intentions to use new evidence; 45.2% created discussions about new health research evidence; and, 48.8% being knowledgeable of the new health research evidence. These scores, corresponding with mean scores and a Kruskal-Wallis H test, showed that there was a statistically significant difference in the ratings across faculties for being aware and being knowledgeable of new health research evidence.

Health research evidence contributes to policies and practices and where they have been applied the real impact has been felt. In Tanzania several household surveys informed the development of health services for common diseases affecting mothers and young children and contributed to a 43% and 46% reduction in infant mortality in two districts of rural Tanzania between 2000 and 2003 (Afnan-Holmes et al., 2015: e396). While the Tanzanian research study incited behaviour that resulted in the use of new health research evidence to inform new health policy, the current study suggests that researchers in Malawi do not believe that the immediate outcome of new health research evidence includes creating discussions about the new research and inciting behavioural intentions to use new health research evidence.

6.5.13 Satisfaction with the formulation of health research tools

In this study, 48.2% of the researchers indicated that they were not satisfied with the formulation of the national health policy contents; 43.4% with the national health policy itself and 47.6% with the national health policy evaluations. Mean scores corroborated the same picture (see Table 5.26).

The study by Campbell et al. (2009: 4) in Australia and New Zealand found that 87% of the researchers and policy makers attended forums where health research findings were being presented; 58% invited researchers to give a research perspective in policy development; 47% invited researchers to be active members of a policy development committee; 74% regularly used research contacts for policy backup; and, 3% contracted a research group to conduct a research view or study. While the study by Campbell et al. (2009: 4) in Australia indicates the use of health researchers in policy formulation, the current study suggests that most health researchers in Malawi are not involved in policy formulation. This underscores an assertion by Young et al. (2014: 339) that policy or decision makers are largely influenced by their own values, experiences, expertise and judgement. They are also influenced by lobbyists, pressure groups, the amount of resources available at their disposal rather than health research evidence. In developing country contexts, Young further postulates that national health policy processes are propelled by donor factors in the form of financial and technical support.

6.5.14 Satisfaction with the use of health research evidence in health institutions

This study has also indicated that 54.8% of the researchers were neither satisfied nor dissatisfied with the Ministry of Health and the National Health Commission; 68.1% with the National

Commission for Science and Technology; 58.7% with the Parliamentary Committee on Health (see Table 5.27**).** The mean scores also corroborated the responses.

A study by Corluka et al. (2015: 1) in Argentina showed that 80% of researchers were not involved in decision-making, while over 90% of researchers indicated they preferred to be involved in the decision-making process. However, few institutionalised linkages existed where researchers were involved in health policy-making. The study therefore concluded that the disconnect between political decision-making and the health research system, coupled with rare opportunities for interaction, contributed to the challenges in health research evidence use in health policy-making in Argentina. In the current study, majority of the health researchers are neither satisfied or dissatisfied partly because health research institutions in Malawi have not engaged health researchers for them to be able to appreciate their existence.

6.5.15 Satisfaction with knowledge translation activities

This study solicited seven steps from the knowledge translation framework developed by Graham et al. (2006: 19) on knowledge translation activities. Health researchers in this study were neither satisfied nor dissatisfied with the way knowledge translation activities were addressed in Malawi. Forty-four percent (44%) were neither satisfied nor dissatisfied with the adaption of research evidence; 46.6% with the identification of health research problems and the conducting of the research itself; 49.4% with the selection, tailoring and implementation; 47% with the assessment of barriers to the use of health research; 48.2% with the strategies used by health researchers for the use of heath research evidence; 41% with the evaluation and 42.8% with the monitoring of health research evidence use. A Kruskal-Wallis H test showed no statistically significant differences in the rating scores between faculties. This means researchers in all the five faculties indicated that were not convinced in the way health research has been used in the country.

A study by Ellen et al. (2014: 2) in Israel found out that health researchers and policy makers' interaction with fellow researchers and policy makers in the formulation of a research question or execution of the research itself ranged from 35% to 42%; while 40% of the players interacted through formal or informal meetings especially during conferences, workshops or private conversations. El-Jardali et al. (2012: 2), in their research in involving countries around the Mediterranean region, found that 67.2% of the researchers transfer research to fellow researchers while 40.5% transfer them to policy or decision makers in the government. The researchers indicated that they transfer 14.5% of the documents as policy briefs; 24.4% as messages; 16% indicated that they interact with policy or decision makers in policy priority setting; and, 19.8% involve the policy makers in their research. On barriers to the use of health research evidence, 67.9% indicated insufficient policy dialogue opportunities; 67.9% indicated lack of collaboration between researchers and policy or decision makers; 66% suggested lack of opportunities to implement research findings; 61.3% suggested non-receptive nature of players in the policy arena; and, 57.7% suggested political influence on sensitive health research evidence. The study unveiled involvement of policy or decision makers at various priority setting levels and the provision of technical assistance as the prerequisite for policy or decision makers interaction in knowledge translation activities.

In the current study, researchers in Malawi suggested that they are neither satisfied or dissatisfied partly because, as suggested by Moore, Todd and Redman (2009: 10), firstly, the health research evidence is irrelevant and not applicable to the needs of the policy or decision makers. Secondly, the evidence may not have been tailored for use in local context. Thirdly, there are minimal interactions and partnerships between health researchers and policy or decision makers. Fourthly, there are no meaningful strategies and tools to help researchers and policy makers break the barriers on health research evidence use.

In summary, it does seem that the relationship between researchers and policy makers is fragile with each of the two worlds handling their activities without taking the other into account. It also seems that the interaction between researchers and policy makers is weak as policy makers and researchers do not formerly interact in order to shape direction on the use of health research evidence. The policy makers and researchers do not involve each other in activities that may enhance the use of health research evidence. The two worlds do not participate in dialogues that may lead to the exchange of health research evidence.

6.6 Communication and dissemination strategy

The third research question guiding this study targeted the development of a communication and dissemination strategy for disseminating health research evidence into health policy formulation. Sections 6.6.1 to 6.6.4 outline some strategies based on this study.

6.6.1 Sources of research evidence recommended by researchers

The study has shown that 25.9% of the researchers publish articles in journals used by policy and decision makers. Majority of the researchers, 42.2%, have never organised a research dissemination conference; 39.2% have never created a flyer; 54.8% have never emailed or mailed health researchers; 51.8% have never requested that their research be put on a website; 54.8% have never drafted a policy brief nor 59.0% drafted a press release (see Table 5.30). Some health research evidence generated in Malawi gets published, but policy and decision makers have no time to read and interpret research articles published on so many health challenges faced by the country. This was also corroborated by an official from Parliament (personal communication during data collection interviews) who claimed that what policy and decision makers need are not policy briefs but points in bullet form against which they just need to tick.

Interviews with policy makers suggest that they would prefer to receive health research evidence through websites, emails, conferences, workshops and journal articles. The issue of access to journal articles relates to subscriptions, and as observed (see Section 6.4.1) by both the Ministry of Health and Parliament in Malawi, just as in Kenya, they lack subscriptions to journals and other online databases to enable access to research necessary for informing policy decisions.

6.6.2 Dissemination of health research evidence to policy or decision makers

The study has shown that 28.9% of the researchers use their universities and research institutes to disseminate health research findings; 34.9% use their libraries and repositories; 31.9% rely on research funders (see Table 5.32).

Campbell et al. (2009: 4), in their research in Australia and New Zealand, found out that 88% of researchers prefer to publish in peer reviewed journals; 66% prefer to publish in reports for funders; 54% prefer presenting at conferences; and, 51% prefer to present to policy makers themselves. The results in Australia differ with that in Malawi partly because Australia unlike Malawi has taken bold steps in knowledge translation. Ruggeri (2014: e193) suggests that dissemination of health research is even more problematic in Africa because of poor Internet connectivity, electricity blackouts, inadequate research supervision, poor quality or relevance of work, sustainability, partnership, un-uniform sustainability and lack of partnerships to provide guidance.

6.6.3 Communicating research evidence to policy or decision makers

The study has shown that 59.6% of the researchers prefer to present their findings at the policy makers fora; 51.2% prefer organising face-to-face meetings; 36.1% recommend publishing a report for policy makers; 39.6% prefer to present at a conference where policy makers are invited.; 39.8% prefer publishing in peer reviewed journals (see Table 5.34). In an interview with Researcher Y at the College of Medicine it was emphasised that ‘‘two cannot walk together without agreeing’’, meaning researchers and policy makers needed to work together.

Campbell's (2009: 4) research in Australia and New Zealand found that 78% of the researchers preferred presenting at a forum where policy makers were present; 51% preferred participating in a policy development committee; 54% preferred publishing in the funder’s newsletter; 90% liked presenting at a conference. While the results for Australia and New Zealand, on one hand, and Malawi, on the other hand, create wide disparities on how to communicate health research evidence, interaction between researchers and policy makers is highlighted as the most critical element in transferring knowledge from health research to policy or decision makers. The interaction involves understanding the research to be done, priorities, purpose and design, results and presentation.

6.6.4 Sources of health research evidence for policy formulation

In this study 53% of the researchers found local research evidence important; 46.4 % prefer literature reviews important; 38% find international literature important; 44.6% indicated that mass media can play an important role while 28.9% purported that dialogue from international health agencies was important (see Table 5.36).

Walugembe et al. (2015: 2) in their study in Bangladesh found that health researchers preferred conducting dissemination workshops; publishing in peer reviewed journals; developing policy briefs; holding one-on-one meetings; and, joining advocacy networks. While the list is not exhaustive, systematic reviews do not seem to be the preferred destination as very few studies have used research evidence from systematic reviews in policy-making.

In summary, the findings of this study indicate that much health research has been conducted in Malawi since 1992. Health research is increasing at an exponential rate (see Figures 5.3 & 5.4). The study also has shown that there is minimal use of health research evidence in policy formulation (see Section 5.5.3). The study also shows that researchers rarely interact with policy makers (see Table 5.7); rarely involve policy makers (see Table 5.9); rarely participate in activities involving policy or decision makers (see Table 5.11); rarely provide training on the use of health research evidence (see Table 5.12); rarely facilitate the use of health research evidence (see Table 5.13); rarely provide access for health research evidence to policy makers (see Table 5.14); rarely collaborate with policy or decision makers (see Table 5.16); rarely summarise and communicate their research findings to policy makers; rarely communicate their research findings to policy makers.

The study has also indicated that researchers have not yet identified the ways of communicating research evidence to policy makers; best ways of relating their research to policy makers so that it has a greater impact on their work; researchers do not frequently take into account factors that may increase health research evidence use beyond journal publications; researchers do not realise the importance of increasing strategies for health research evidence use in policy-making (see Table 5.21); to a large extent researchers are aware of the tools for measuring the impact of their health research evidence but do not know how best they can use them for the benefit of policy makers (see Table 5.23); researchers are aware of the immediate importance of the health research evidence, for example, that research should inform policy-making and improve people's welfare for the better through sound and research-based policy formulation (see Table 5.24); researcher are neither satisfied nor dissatisfied with the formulation of national health research tools (see Table 5.26); researchers are neither satisfied nor dissatisfied with the way some health-related institutions have used health research evidence (see Table 5.28). Based on these findings the next section discusses a framework for the communication and dissemination of research evidence.

6.7 Framework for a communication and dissemination strategy

The framework is based on the research from this study. It draws from aspects gleaned from this study in its entirely including findings and discussion thereof in the context of the literature and theory framing the study in response to the research questions addressing the study's objectives.

6.7.1 What 'works' for the communication and dissemination strategy

During interviews with policy makers it was highlighted that technical working groups at the Ministry of Health regularly meet to share experiences. Similarly, it was observed that following the formulation of the National Research Agenda in 2012, researchers were grouped into research teams. The interaction of research teams in the various colleges and universities in Malawi and their interaction with policy or decision makers in a form of technical working groups at the Ministry of Health could be ‘what works’. The proposed communication and dissemination strategy is based on the idea of technical work groups at the policy level interacting with research groups at the college or university level or research centre.

6.7.2 Technical Working Groups at the Ministry of Health

During interviews with Directors X and Y at the Ministry of Health and Director M from College of Medicine, it was reported that the Technical Working Groups provide the right forum for researchers to interact with policy or decision makers. Technical Working Groups (TWGs) are multi-disciplinary groups composed of researchers, policy or decision makers that provide a platform for interaction and the exchange of experiences and ideas around particular health issues and within health systems research. In an interview with Directors X and Y at the Ministry of Health it was reported that Technical Working Groups invite prominent health researchers in Malawi.

6.7.3 Research working groups at college/research centre level

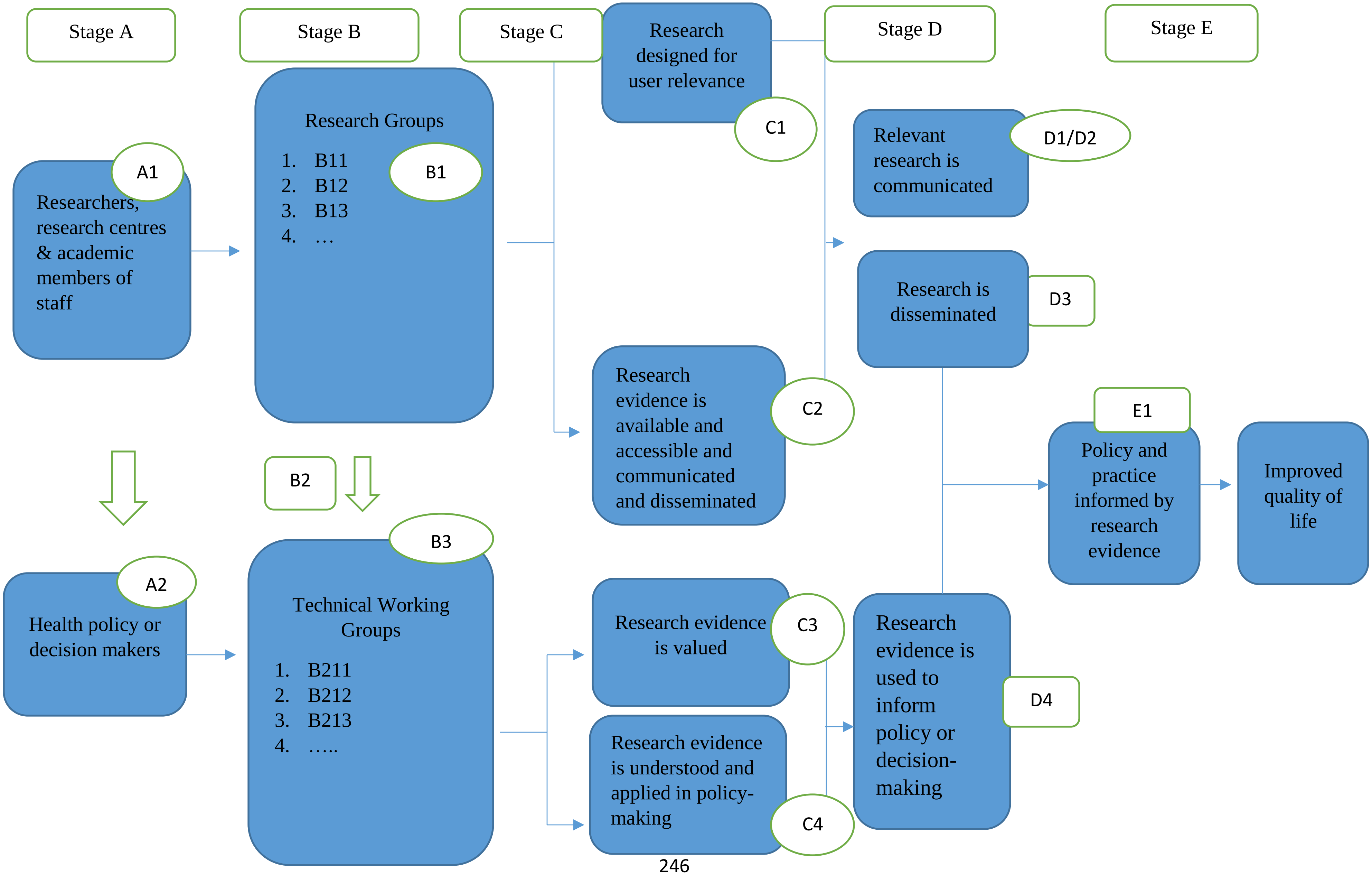
The College of Medicine research centres have research working groups. A research group refers to a group of researchers from the same department, research centre or faculty working together on an issue or topic. Research groups may be composed of researchers all from the same academic unit or subject or from different subjects within a faculty. Both College of Medicine and Kamuzu College of Nursing researchers are organised based on research working groups.

6.8 Proposed framework for a health evidence communication and dissemination strategy

Figure 6.1 captures a proposed communication and dissemination strategy framework for health research evidence that involves health researchers on the one hand and health policy or decision makers on the other, both interacting through technical working groups at policy level and research working groups at research evidence generation level. Members of the academia constitute membership of the technical working groups by invitation. The framework involves division of labour wherein the academia carries the mantle of designing research but with the policy or decision makers in mind.

Research evidence is published in various avenues such as in journals or presented at conferences where policy or decision makers are invited. Thereafter researchers synthesise and summarise the research into user friendly formats and this is communicated to policy or decision makers. These can be in a form of policy briefs or summaries of research. Policy or decision makers weigh the available evidence and when the evidence is understood it is used in policy or decision-making to inform health policy formulation and practice. It is envisaged that with such a process health research evidence is used to drive evidence-based policy or decision-making and ultimately improve people’s lives.

Figure 6.1: Framework for a health research evidence communication and dissemination strategy



6.8.1 Analysis of the proposed communications and dissemination strategy

The development of a framework for health research evidence communication and dissemination strategy was informed by the framework developed by Newman (2012) and data gleaned from the research in the current study. Table 6.1 highlights the stages of the framework from the study.

6.8.1.1 Stage A

Stage A is composed of A1 and A2. A1 is composed of health researchers, research centres and academic members of staff who are doing research in Malawi. A2 are scholars, health researchers and academic members of staff who after graduation or change of career become health policy or decision makers. This study was interested in health researchers at the College of Medicine, and the Kamuzu College of Nursing (University of Malawi), and selected health research partners at the Ministry of Health (see Table 4.6). This study has shown that A1 rarely interacts with A2 (see Summary 5.6).

6.8.1.2 Stage B

Apart from informal gathering during workshops, conferences and seminars, Technical Working Groups and researchers in Working Groups formerly meet at Technical Working Groups at the invitation of the policy makers. Stage B1 refers to all researchers in academia and research centres, grouped in research working groups or research teams. These may be a research group on tuberculosis, HIV/AIDS, sexually transmitted diseases, malaria, diarrhoeal diseases, nutrition, maternal and neonatal care, etc. However, at the Ministry level the technical working groups are much broader. For example, a technical working group on communicable diseases at Ministry of Health draws several research groups into the Technical Working Group represented by B211, B212, B213, etc. This study argues that it is only at Technical Working Groups that researchers and policy makers can interact formerly and where health research evidence may be discussed and debated based on its evidential value, adopted and rejected during policy or decision-making. This applies to a select few and researchers that serve in the Technical Working Groups, depending on their technical expertise and their research evidence as made available at the meetings. Table 6.1 shows how researchers want to interact with policy makers. The analysis that follows draws upon the results from the Kruskal-Wallis H tests and what was statistically significant across the faculties.

Table 6.1: How researchers want to interact with policy makers

Item	Feature	P-value	Rank[29]	Statistical significance
B1 Interaction with B2	Government-sponsored meetings	P=0.763, P>0.05	7	🟥
	Expert committee or groups meetings	P=0.025, P<0.05	1	🟦
	Formal private or public networks	P=0.261, P>0.05	4	🟥
	Events organised by the colleges	P=0.171, P>0.05	3	🟥
	Conferences and workshops	P=0.359, P>0.05	5	🟥
	Informal conversations	P=0.199, P>0.05	2	🟥
	Sharing websites	P=0.693, P>0.05	6	🟥

🟦 Blue shows statistical significance 🟥 Red shows statistically no significance.

Table 6.1 shows that policy makers and researchers prefer to interact through expert committees or technical working groups (P = 0.025, P<0.05).

6.8.1.3 Stage C

Stage C1 (see Figure 6.1) draws its input from the research study and involved the generation of health research evidence. Table 6.2 shows the results of the statistical analysis.

Table 6.2: Research processes to involve policy makers

Item	Feature	P-value	Rank	Statistical significance
C1 Research designed for user relevance	Developing research products	P=0.003, P<0.05	1	🟦
	Formulating study objectives	P=0.005, P<0.05	2	🟦
	Analysing and interpreting research findings	P=0.010, P<0.05	3	🟦
	Developing research design and methods	P=0.029, P<0.05	4	🟦
	Executing health research evidence	P=0.053, P>0.05	5	🟥

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[29] The red in the rank refers to the statistically significant observations while the blue in the rank refers to the statistically not significant observations in the study. The ranking thereafter is in order of merit from statistical significance to non-statistical significance. Statistical significance is when P<0.05. Non-statistical significance is when P>0.05.

In terms of research designed for user relevance, this study has indicated that researchers should involve policy or decision makers, firstly in developing research products ($P=0.003$, $P<0.05$); secondly, formulating study objectives ($P=0.005$, $P<0.05$), analysing and interpreting research findings ($P=0.010$, $P<0.05$) and; fourthly in developing research designs and methods ($P=0.029$, $P<0.05$) (see Table 5.7).

Stage C2 dwells on accessibility and availability. Table 6.3 shows the results of the statistical analysis on how research products should be accessed.

Table 6.3: How research evidence should be available and accessible

Item	**Feature**	**P-value**	**Rank**	**Statistical significance**
C2 Research evidence is available and accessible	Searchable databases, brief summaries of articles, reports, syntheses	$P=0.144$, $P>0.05$	4	🟥
	Provide reprints of peer reviewed articles	$P=0.047$, $P>0.05$	2	🟦
	Provide syntheses of the research literature	$P=0.041$, $P>0.05$	1	🟦
	Providing systematic reviews of research	$P=0.206$, $P>0.05$	6	🟥
	Developing brief summaries of articles	$P=0.165$, $P>0.05$	5	🟥
	Developing summaries of syntheses	$P=0.112$, $P>0.05$	3	🟥
	Developing messages for policy makers	$P=0.368$, $P>0.05$	7	🟥

On the actual materials that should be made available and shareable, researchers suggested that health research evidence should be communicated, firstly, through syntheses of the research literature ($P=0.041$, $P>0.05$); and secondly, through reprints of articles published in scientific journals ($P=0.047$, $P>0.05$) (see Table 5.14).

C3 refers to health research value. One of the values of health research relates to the social value (Barsdorf & Millum, 2017: 105). This is a value that examines the expected benefits and research priorities. Social value applies to health research, firstly, in health issues priority setting especially when funders, policy-makers, or researchers decide on alternative research projects. Secondly, social value relates to assessment of the risks and burdens in conducting health research. In this study the value of research was placed on four critical factors. Table 6.4 outlines some of the factors that show the value placed on health research in Malawi.

Table 6.4: How researchers value health research evidence

Item	Feature	P-value	Rank	Statistical significance
C3 How research evidence should be valued	Researchers and policy makers are aware of new health research evidence	P=0.007, P<0.05	1	🟦
	Researchers and policy makers are knowledgeable of the new research evidence	P=0.013, P<0.05	2	🟦
	Researchers and policy makers create discussions about the use of new health research evidence	P=0.924, P>0.05	4	🟥
	Researchers and policy makers incite behavioural change with the intention to use research evidence in their work	P=0.206, P>0.05	3	🟥

C4 refers to how research evidence is understood. Table 6.4 shows that research evidence should be valued based on researchers and policy makers being aware of new health research evidence (P=0.007, P<0.05) and, researchers and policy makers being knowledgeable of the new research evidence (P=0.013, P<0.05).

Table 6.5: How research evidence is understood

Item	Feature	P-value	Rank	Statistical significance
C4 How health research evidence should be understood and applied in policy-making	Researchers and policy makers understand the context in which health research is placed	P=0.246, P>0.05	2	🟥
	Researchers and policy makers understand the need for interaction between researchers and policy makers	P=0.598, P>0.05	5	🟥
	Organisations where researchers and policy makers work are ready to receive and use health research evidence	P=0.362, P>0.05	3	🟥
	Researchers and policy makers understand the nature of the research evidence	P=0.481, P>0.05	4	🟥
	The availability of and access to supportive resources and tools	P=0.084, P>0.05	1	🟥

The statistical analysis in Table 6.5 shows that researchers did not agree that all the 5 factors in C4 were critical in knowledge translation. Inability to understand and apply research evidence directly means research evidence may not be used to inform policy or decision-making. However, the researchers almost agreed on the availability of and access to supportive resources and tools (P = 0.084).

6.8.1.4 Stage D

D1 (see Figure 6.1) refers to research communication. Table 6.6 shows statistical analysis of how research results should be communicated.

Table 6.6: Format for research communication

Item	Feature	P-value	Rank	Statistical significance
D1 How research should be communicated	Articles, reports and synthesis to health policy-making	P=0.463, P>0.05	8	🟥
	Newsletter of research summary	P=0.457, P>0.05	7	🟥
	College website or institutional repository	P=0.493, P>0.05	9	🟥
	Flyer or poster presentation	P=0.418, P>0.05	6	🟥
	Research dissemination conference	P=0.415, P>0.05	5	🟥
	Articles in journals used by policy makers	P=0.199, P>0.05	2	🟥
	Policy briefs	P=0.014, P<0.05	1	🟦
	Presse releases	P=0.359, P>0.05	4	🟥
	Social media and blogs	P=0.230, P>0.05	3	🟥
	The use of media	P=0.708, P<0.05	10	🟥

D2 refers to research dissemination. Table 6.6 shows statistical analysis of how research results should be disseminated. Overall, the consensus suggested that research should be communicated through policy briefs (P=0.014, P<0.05).

Table 6.7: How research results should be disseminated

Item	Feature	P-value	Rank	Statistical significance
D3 How research should be disseminated	Universities, research centres and institutes	P=0.025, P<0.05	1	🟦
	Parliamentary committee on health	P=0.086, P>0.05	3	🟥
	Health policy or decision makers	P=0.734, P>0.05	7	🟥
	Libraries and institutional repositories	P=0.304 P>0.05	4	🟥
	Research funding agencies	P=0.716, P>0.05	6	🟥
	Civil society organisations	P=0.699, P>0.05	5	🟥
	Mass media	P=0.072 P<0.05	2	🟥

Table 6.7 shows statistical analysis of sources trusted by researchers as the best in research communication. Researchers agreed that universities, research centres and institutes should be responsible for disseminating health research evidence (P=0.025, P<0.05).

Table 6.8: Sources of research information

Item	**Feature**	**P-value**	**Rank**	**Statistical significance**
D4 Sources of research information	General international literature	P=0.667, P<0.05	9	🟥
	Locally generated literature	P=0.831, P>0.05	11	🟥
	Research briefs by researchers	P=0.037, P<0.05	1	🟦
	Reviews of syntheses of the literature	P=0.426, P>0.05	5	🟥
	Direct communication with the policy makers	P=0.407, P>0.05	7	🟥
	Attendance at seminars and conferences	P=0.150, P>0.05	3	🟥
	Liaising with various research centres	P=0.560 P<0.05	8	🟥
	Policy reports from policy committees	P=0.406, P<0.05	6	🟥
	Mass media	P=0.783, P>0.05	10	🟥
	Networks of interested groups	P=0.376, P>0.05	4	🟥
	Dialogue from international literature	P=0.075 P>0.05	2	🟥

Table 6.8 shows that researchers agreed that the best health research information should be in a form of research briefs prepared by researchers for policy makers (P=0.037, P<0.05).

6.9 Proposed health research-based framework for a communication and dissemination strategy

The research-based framework for the communication and dissemination strategy recognises that researchers and policy makers are in two different worlds. However, through research groups and technical working groups, researchers and policy makers have opportunity to interact with each other and facilitate knowledge translation. Figure 6.2 shows the proposed research-based framework. Drawn from Figure 6.1 for all statistically significant factors the framework is reduced to Figure 6.2. Figure 6.2 draws upon two worlds of researchers and policy makers. The two worlds intersect at the point of interaction when researchers meet policy makers at the Technical Working Groups. The statistically

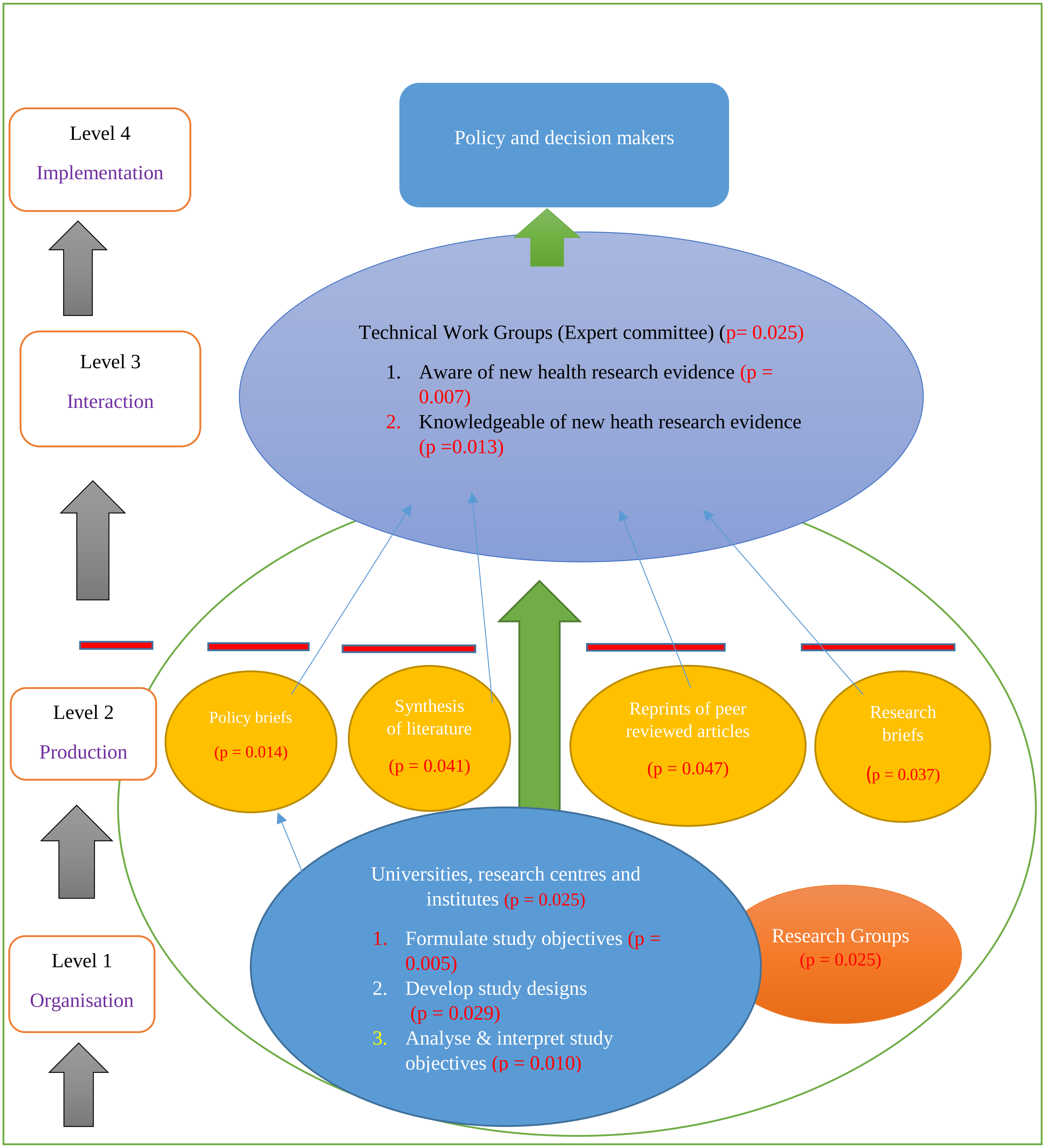

Figure 6.2: The proposed health research-based framework for the communication and dissemination strategy

6.10 Chapter summary

This chapter discussed main findings of the study in the context of the literature reviewed and the KTA theory framing the study. It discussed and interpreted findings on the extent of health research and health policies in Malawi. Health research in Malawi is increasing at an exponential rate and the Ministry of Health plays a central role in health policy formulation. The chapter also examined the relationship between health researchers and health policy makers. It showed that the interaction between researchers and policy makers is weak as researchers and policy makers do not interact on the use of health research evidence to inform health policy formulation. In developing a research-based framework for a communication and dissemination strategy for facilitating the use of health research evidence, the chapter highlighted key factors based largely on statistical analyses conducted for the study. The next chapter provides a summary of the study, conclusions and recommendations.

Chapter 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The chapter provides a summary of the study, conclusions and key recommendations. By summary, the study seeks to provide a general overview of the study. The study findings highlight study implications. Implications refer to how the research applies to policy, practice, theory, and subsequent research. Study conclusions pull together the various results of the study, their meanings and importance to the study. Study recommendations requests for specific actions in respect to policy, practice, theory, or subsequent research.

7.2 Summary

The study sought to review health research findings at the University of Malawi's College of Medicine and Kamuzu College of Nursing and health policies at the Ministry of Health in Malawi and based on the results, to develop a communication and dissemination strategy to facilitate the use of health research evidence for health policy formulation. The study revealed that heath research evidence plays a minimal role in health policy formulation. Health researchers and policy makers rarely interact in all of the research process from formulating of studies, developing research designs and methods, to executing and developing the research products. Researchers rarely involve policy makers in their research. Policy makers are rarely involved in health research. Researchers rarely adapt, acquire, apply and assess research evidence for policy makers. Researchers rarely develop reports, summaries, or briefs for use by policy or decision makers. Researchers rarely develop messages for health policy makers. Policy makers rarely participate in knowledge translation activities. Researchers rarely publish or make research information easily accessible to policy or decision makers. Researchers rarely disseminate their research findings for the reach of policy makers. Researchers agreed that an agreement between researchers and policy makers about research priorities was very useful. They suggested that policy briefs were appropriate for communicating research results. Researchers indicated that university research centres and institutes were the appropriate sites for research dissemination and that policy briefs were the main sources of health research evidence.

7.3 Conclusions and implications for theory, policy and practice

This section concludes the study. It is based on information gleaned from different sections of the study responding to the critical questions addressing the study's broad objective of reviewing health research findings at the University of Malawi's College of Medicine and Kamuzu College of Nursing and health policies at the Ministry of Health in Malawi and based on the results, to develop a communication and dissemination strategy to facilitate the use of health research evidence for health policy formulation. The study was guided by the following critical research questions: How much health research and what health policies are available in Malawi? What relationship exists between health research evidence and policy formulation at national level in Malawi? What communication and dissemination strategy can be developed to facilitate the use of health research evidence for health policy formulation in Malawi?

7.3.1 Health research done in Malawi

A search strategy using the *Scopus* abstract and citation database indicated health research which is growing at an exponential rate in Malawi. The forecast using the ARIMA model reviewed that percentage change in health research publications is at 89%. The percentage change refers to the forecast in the number of health research publications within a certain period. In the current study, the number of publications is likely to move from between 447 and 526 in 2018 to between 950 to 1146 in 2030. This shows some growth in health research in Malawi. The challenge is that not much of this health research informs health policy formulation in Malawi.

In terms of sources of publications, some of the publications originate from the *Malawi Medical Journal* hosted by the University of Malawi, College of Medicine. Of interest is that the journal is hosted under the open access publishing model, a testimony of the acceptance of the model by health researchers in Malawi.

7.3.2 Health policies in Malawi

Malawi formulates health systems, public health and general health policies. The Ministry of Health plays both a central and advisory role in policy formulation. Health policy makers largely use search engines and grey literature as sources of health research information. They also, to a large extent, use previous policies or programme data, internal data or evaluations within ministries, or data from ministry registries. In some cases, they rely heavily on data from the National Statistical Office. The study has revealed that generally, policy makers rarely use health research evidence from health researchers. The quality of health research use on policy formulation is questionable as policy makers rely on data from registries which is not peer reviewed. Procedures in policy formulation largely involves the shortlisting of experts or consultants based on subject specialisation. Their voices and not evidence count in the policy formulation. Expert opinion and author credibility counts more than the research evidence. Unfiltered sources of health research evidence are used to justify policy alternatives.

7.3.3 The relationship between researchers and policy makers

The study has revealed that health researchers rarely interact with policy makers in almost all activities ranging from formulating study objectives, developing research design and methods, to executing health research and analysing and interpreting the research findings. The study has also revealed that researchers rarely involve policy makers in expert groups, conferences and workshops, formal private or public networks, the sharing of websites and even in informal conversations. The study has also shown that researchers rarely provide training to policy makers to enable them to adapt, acquire, apply and assess health research evidence. Researchers rarely facilitate the use of health research evidence. These include developing reports; summaries; or messages; tailoring the contents; or identifying social media, radio, television, and institutional websites for delivering health research evidence to policy makers. The study also showed that researchers rarely provide access to searchable databases of brief summaries of articles, reprints of articles, syntheses of the literatures and brief research summaries. The study revealed that there is very little collaboration between researchers and policy makers in knowledge translation, skill-building, promoting health research evidence, developing relationships with the media, journalists and knowledge brokers. Researchers acknowledge that their research has rarely impacted on health policy-making. Research findings, and reviews are not used in policy documents to inform policy or practice, formulate policy issues and policy options.

The current study suggested that policy makers do not appreciate the nature and relevance of the health research evidence; the context in which health research evidence is placed; interactions between researchers and policy makers; organisation's readiness to use evidence and the availability and access to supportive resources and tools. Policy makers appreciated strategies to increase the generation of health research evidence for policy-making, for example: agreements between researchers and policy makers; commissioning and co-funding research; integrating research into the roll-out of health policies; and, establishing partnerships. However, policy makers emphasised that two cannot walk together without agreeing. Both researchers and policy makers indicated that being aware of new health research evidence and being knowledgeable about new health research evidence was very useful. The study therefore assumes that building bridges over their relationship and providing a for formal interaction promises to be one of the best strategies to facilitate the use of health research evidence in health policy formulation.

7.3.4 Communications and dissemination strategy

Researchers rarely communicate with policy makers by way of emailing or mailing articles; organising research dissemination conferences, creating flyers or reports, syntheses; involving members of the press or requesting that research be included in an institutional repository or website; and, drafting policy briefs and press releases showcasing new research. Researchers also acknowledged that they rarely involve research centres and institutes; research funding agencies; libraries and data repository managers; civil society organisations; and, parliamentary committee on health in disseminating health research evidence. Researchers rarely present their research targeting policy makers; organise face-to-face meetings with policy makers; publish in reports targeting policy makers; present at some conferences where policy makers are invited; publish in peer reviewed journals which are read by policy makers; organise seminars and workshops whose intended audience are policy makers; and, distribute newsletters targeted at policy and decision makers.

However, for purposes of designing a communication and dissemination strategy, interaction is the first interface point. Secondly, the study has singled out establishments such as universities, research institutes and research centres as the appropriate organisational structures to promote knowledge translation activities. Thirdly, the study has included basic strategies that should inform health research evidence use in policy formulation. These are that researchers should, by way of division of labour, formulate study objectives, develop study designs, analyse and interpret studies and develop research products with policy makers in mind. At the level of production researchers should provide policy briefs, syntheses of literature, reprints of peer reviewed articles and research briefs for sharing with policy or decision makers. At the level of interaction, the study has established that the expert committees or technical working committee are very useful for health research use and sharing with policy makers in informating health policy formulation. However, the study has revealed that both researchers and policy makers need to be aware and knowledgeable of new health research evidence.

7.4 Implications for theory

The KTA framework views knowledge translation as an iterative process that seeks to build a gap between what we know through the research processes and moving the same into practice. However, theory and practice are but not the same. The KTA framework has stages critical for knowledge to move from research into practice which include: the need to identify health research evidence, its context, and facilitation, its adoption in a local context, potential barriers that may hinder its usage, actions and strategies that may help move research into action as well as monitoring and evaluating activities that may enhance the use of health research in practice.

The KTA framework is underpinned by the concept of interaction between researchers on one hand and policy or decision makers on the other hand. In this research while it is recognised that interaction is very important to move research into practice, the study has indicated that the interaction is rarely done and where it is done it is ineffective towards the transfer of health research into practice. This is a shortfall that the KTA framework did not anticipate. Researchers and policy makers belong to two different words and where they interact it does not translate into the transfer of health research information into policy. Rather, the KTA framework should examine forms of formal interaction that may result in the transfer of health research information into policy and practice. This study has indicated that formal interaction in the technical expert groups is one of such interactions that would facilitate the use of health research evidence in policy formulation. The extent to which researchers and policy makers engage each other largely depends on the quality and in depth of the formal interaction. However, in bridging the gap between health researchers and policy makers, the health research evidence must be seen to be relevant and applicable to the needs of the policy makers. Secondly, the health research evidence must be tailored to the local use and context of the policy makers. Thirdly, there must exist mutual trust and interactions between researchers and policy makers. Lastly, there must exist strategies and tools that may help to address barriers to research use.

7.5 Recommendations

The study makes the following recommendations which address both policy and practical issues drawn on from the study:

i. The study highlighted key issues in knowledge translation in Malawi. For example, statistical analysis on the nature and relevance of the health research evidence showed it has no impact amongst the faculties at the University of Malawi to drive health research evidence into policy formulation in Malawi χ^2 (4) = 3.466; $p = 0.481$, $p>0.05$. Yet, health research worldwide shows that health research is likely to influence policy-making if it is targeted at the policy or decision makers, relates with their work priorities and is synthesised and presented in a format easy to understand (Dobbins et al., 2002: 149; Dobrow, Goel & Upshur, 2004: 208; Graham & Tetroe, 2007: 20; Redman, Jorm & Haines, 2008: 16). Researchers at the University of Malawi were uncertain in their responses to the questionnaire (see Appendix A). There is need to bring knowledge translation issues to the common health researchers to the University of Malawi researchers so that health researchers are able to appreciate the nature and relevance of the health research evidence health research in informing policy and practice.

ii. Statistical analysis of the context in which the health research evidence is placed generated χ^2 (4) = 5.374; $p = 0.248$, $p>0.05$ which means health researchers at the University of Malawi felt that putting health research evidence into the local context was not necessary as long as it is applied at the global level. Globally, research is more likely to influence policy or decision making if it is relevance and applicability applies to the local context and not just adopted for the sake of adopting (Dobbins et al., 2002: 149; Dobrow, Goel & Upshur, 2004: 210). Researchers in the University of Malawi should be enlightened on the need to localise research and apply its evidential value with local needs in mind.

iii. Interactions between researchers and policy or decision makers generated the following statistical results χ^2 (4) = 2.775; $p = 0.598$, $p>0.05$ which meant that researchers at the University of Malawi under-rated the role of formal and informal interactions in bridging the gap between theory, research and practice. Research worldwide indicates that the interaction between researchers and policy makers is useful as it creates a trusting relationship between researchers and policy makers and is one of the mechanisms to push health research evidence use in policy formulation (Denis & Lomas, 2003: 1; Redman, Jorm & Haines, 2008: 16; McWilliam et al., 2009: 2). Theoretically the KTA is based on interaction and great emphasis has been on interaction. The findings of this study indicate how rarely researchers interact with policy makers. It is recommended that a deliberate concerted effort be made to enable researchers and policy makers in Malawi to frequently and formerly interact.

iv. Organisations' readiness to receive and use health research evidence generated the following statistical results $\chi 2$ (4) = 4.3; $p = 0.362$, $p>0.05$ which means that researchers suggested that organisational infrastructure and ability to use health research evidence was not critical in health research evidence use in policy formulation in Malawi. Research worldwide indicates that leadership in organisations that promote the culture of learning and questioning and provides opportunities for skills development, training and health research usage have more opportunities to enable policy makers to use health research evidence (Dobbins et al., 2002: 149; Dobrow, Goel & Upshur, 2004: 210; Redman, Jorm & Haines, 2008: 16). Hence, it is recommended that researchers at the University of Malawi and other institutions of higher learning including health research institutes and centres should take a leading role in knowledge translation activities as they well positioned to do so.

To make the recommendations actionable, the study suggests that Research Centres in the University of Malawi should conduct knowledge translation activities as part of their training sessions, seminars and workshops.

7.6 Further research

This study took a more general approach to knowledge translation by involving both researchers and policy or decision makers. Amongst researchers are various research groups. Similarly, within policy technical working groups there are various combinations. Research on the linkage between a specific research working group and its influence on the technical working group at Ministry of Health would be ideal and it is recommended.

Majority of the health research are not captured in journal articles and other peer reviewed publications. Much of this research information are documented in clinical practice guidelines. This study did not address research from clinical practical guidelines which are considered critical in health research. A study on how research from clinical practice guidelines has informed health policy formulation is very critical and needed.

7.7 Chapter summary and general conclusion

This final chapter provided a summary of the study, conclusions and recommendations. The chapter highlighted theoretical gaps in the interaction between health researchers and policy makers as informed by the Knowledge-To-Action theoretical framework. The study adopted the pragmatism philosophical framework with its credo of ‘what works’. It further adopted the mixed method research approach with the convergent parallel mixed method design which called for data collection via various methods. The data from various sources allowed the researcher to sift the best possible information that was used to draw patterns from qualitative data and statistical inferences from quantitative data. The convergence of various forms of data, as summarised in this study, provided a rich output for the study in terms of the behaviours and attitudes of both researchers and policy makers towards bridging the gap between research evidence and its use in policy and practice.

However, on critical reflection after completion of the study, the researcher would like to acknowledge that a small gap in the concurrent data collection from researchers (through a largely structured questionnaire) and policy makers (via interviews and a semi-structured self-assessment tool). This reflection highlighted that the two groups, coming from two different worlds (academia and the policy-making world), could not critique each other synchronously. In hindsight, a useful approach would have been to engage both researchers and policy makers together in focus group discussions with the researcher acting as a moderator. Focus group discussions as applied within the convergent parallel mixed method design, would have enhanced the richness of data collected from two groups of respondents coming from different worlds but engaging on the common topic of enhanced health care.

Notwithstanding this shortfall, the researcher is confident that the study's overall methodology, including the choice of worldview (pragmatism), approach (mixed method), design (convergent parallel mixed method) and data collection methods (questionnaire, interviews, self-assessment tool, policy assessment tool, literature search strategy), allowed the researcher to collect the requisite data to adequately respond to the three research questions generated to address the study's objectives. The KTA framework provided a useful context within which to review the relationship between health research evidence and policy formulation in Malawi. While the study reviewed literature that emanated largely from developed countries (mainly because much research in knowledge translation has been done in these countries), it supplemented this with literature from low and middle-income countries which have been engaging in knowledge translation activities.

The outcome of this study has value for Malawi in that it highlights that despite resource constraints, there exists in the country university research groups and sizeable technical working groups at the Ministry of Health and health research partners, which provide an opportunity for interacting and enhancing the use of health research evidence in policy formulation towards improved health care delivery. The framework for a communication and dissemination strategy to facilitate the use of health research evidence, which was an outcome of the study, has relevance for health researchers and policy makers in the transfer and use of health research evidence not only in Malawi (which was the research site for the study), but also in other low and middle-income countries in Africa and in the developing world generally, with similar resource constraints. The developed world too could benefit from this study as it offers lessons for linking research groups and technical working groups not just in health but across various disciplines for purposes of facilitating the use of research evidence in policy formulation.

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Appendices

Appendix A: Informed consent & Questionnaire for academics and researchers

Dear Sir/Madam,

I kindly request you to participate in the study titled '**Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence'**. The study is being undertaken in fulfillment of a PhD at the University of Cape Town, Library and Information Studies Centre. I am looking for your experiences, clarifications and suggestions on how knowledge from health research findings in Malawi has informed health policy in Malawi.

Your participation in this study is voluntary and all efforts will be made to ensure your anonymity and the confidentiality of the information you provide, during the reporting of the findings. Your signature indicates acceptance to participate in the study. Should you choose to discontinue participating in this study, you may withdraw at any time without prejudice even after signing this form. It should take less than 25 minutes to complete the questionnaire.

Please read the consent statements below and place a tick **(✓)** in the right-hand column for each statement if you agree with the statement.

Item no.	**Consenting statement**	**Tick (✓)**
1.	I confirm that I have read and understood the information provided about the study.	
2.	I understand that I am not obliged to participate in the study, and that I am free to withdraw from the study at any time, without providing a reason.	
3.	I understand that my anonymity will be assured and that any information provided would be treated with confidentiality during the reporting of findings.	
4.	I understand that there will be no direct benefit to me personally, accruing from the study.	
5.	I understand that I will not be compensated for participating in the study.	
6.	I hereby freely consent to participate in the study.	

Name of Participant	**Signature**	**Date**
Name of the Researcher	**Signature**	**Date**

For further information please contact the research team below:

Researcher: Patrick Mapulanga
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Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence

Questionnaire for academics and researchers at the College of Medicine/Kamuzu College of Nursing, University of Malawi

Introduction

Knowledge translation is a set of activities involved in moving research output from the laboratory, the research journal, and the academic conference into the hands of policy makers who in turn put it into practice by influencing policy change based on the available research evidence (Sharon, Tetroe & Graham, 2009). With this questionnaire, I hope to learn more about how health researchers have undertaken *knowledge translation* activities in Malawi.

Instruction: Please select the most appropriate response for each item. Tick (✓) in the space provided.

Section A: Demographic features

No.	Items	Coding categories		Ticking space (use ✓ mark)
Q1.	Faculty	1	Faculty of Medicine	
		2	Faculty of Biomedical Sciences & Health Professions	
		3	Faculty of Public Health & Family Medicine	
		4	Faculty of Nursing	
		5	Faculty of Midwifery, Neonatal & Reproductive Health Studies	
		6	Other (please specify)	
Q2.	Department	1	Anesthesia	
		2	Biomedical Sciences	
		3	Family Medicine	
		4	Pathology	
		5	Internal Medicine	
		6	Mental Health	
		7	Medical Laboratory Sciences	
		8	Obstetrics and Gynecology	
		9	Paediatrics and Child Health	
		10	Pharmacy	
		11	Physiotherapy	
		12	Surgery	
		13	Ophthalmology	
		14	Health Systems & Policy	
		15	Public Health	
		16	Basic Studies	
		17	Community and Mental Health Nursing	

		18	Medical Surgical Nursing	
		19	Midwifery	
		20	Clinical Nursing	
		21	Clinical Studies	
		22	Other (please specify)	

Q3. What type of degree(s) have you completed, in what year and in which country did you obtain the degree(s) from?

Degree	**Name of degree (e.g. MBBS, BSc, MSc, MD, PhD)**
Undergraduate degree	
Master's degree	
Doctoral degree	
Health professional degree	
Other degrees (please specify)	

Q4. Please indicate the type of institution within which you have been actively conducting health research and undertaking knowledge translation activities on health research.

Please tick all that apply. Tick (✓) in the space provided.

Type of working partner in health research	**Tick (✓)**
University (excluding teaching hospitals)	
College (excluding teaching hospitals)	
Teaching hospital setting	
Non-teaching hospital setting	
Health insurance board	
Research Centre (affiliated with the University of Malawi)	
Research Centre (not affiliated with the University of Malawi)	
Government department or agency	
Other (please specify)	

Section B: Knowledge translation activities

Instruction: For each statement circle the appropriate number.

Interaction

Q5. Please indicate how often you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) have interacted through Skype, telephone, conferences or face-to-face meetings with health policy or decision makers for any health research that you or the College of Medicine or Kamuzu College of Nursing may have been involved in.

Never 1	Rarely 2	Occasionally 3	Frequently 4	Always 5		
a.	Interacted when developing a specific health research question or objective	**1**	**2**	**3**	**4**	**5**
b.	Interacted when establishing the preferred research design and methods	**1**	**2**	**3**	**4**	**5**
c.	Interacted when executing the health research itself	**1**	**2**	**3**	**4**	**5**
d.	Interacted when analysing/interpreting the research findings	**1**	**2**	**3**	**4**	**5**
e.	Interacted when developing research products (e.g. research reports, brief summaries and/or messages)	**1**	**2**	**3**	**4**	**5**

Involvement

Q6. Please indicate how often you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) have involved health policy or decision makers about health research in Malawi.

Never 1	Rarely 2	Sometimes 3	Often 4	Always 5		
a.	Involved health policy or decision makers through government-sponsored meetings	**1**	**2**	**3**	**4**	**5**
b.	Involved health policy or decision makers through an expert committee or group	**1**	**2**	**3**	**4**	**5**
c.	Involved health policy or decision makers through conferences and workshops	**1**	**2**	**3**	**4**	**5**
d.	Involved health policy or decision makers through formal private or public networks	**1**	**2**	**3**	**4**	**5**
e.	Involved health policy or decision makers through events organised by College of Medicine or Kamuzu College of Nursing	**1**	**2**	**3**	**4**	**5**
f.	Involved health policy or decision makers through informal conversations	**1**	**2**	**3**	**4**	**5**
g.	Involved health policy or decision makers through other mechanisms (please specify) e.g. web-links	**1**	**2**	**3**	**4**	**5**

Participation

Q7. Please indicate how often you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) have participated in each of these activities related to health research.

Never 1	Rarely 2	Occasionally 3	Frequently 4	Always 5		
a.	Conducted deliberative dialogues with key stakeholders (dialogues where research evidence was discussed together with the views, experiences, and tacit knowledge of relevant stakeholders)	**1**	**2**	**3**	**4**	**5**
b.	Established and maintained long term partnerships with health policy or decision makers (e.g. through an advisory board)	**1**	**2**	**3**	**4**	**5**
c.	Involved health policy or decision makers in establishing the overall direction of health research on a health topic conducted by you or the College of Medicine or Kamuzu College of Nursing.	**1**	**2**	**3**	**4**	**5**
d.	Participated in the formulation of the National Health Research Agenda	**1**	**2**	**3**	**4**	**5**
e.	Participated in the formulation of the National Health Policy	**1**	**2**	**3**	**4**	**5**

Training

Q8. How often have you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) performed activities (e.g. conducted workshops or seminars) to increase the capacity of health policy or decision makers to use health research findings in Malawi?

Never 1	**Rarely 2**	**Sometimes 3**	**Often 4**	**Always 5**

a.	Provided training to health policy or decision makers to develop their capacity to acquire health research evidence in their work	**1**	**2**	**3**	**4**	**5**
b.	Provided training to health policy or decision makers to develop their capacity to assess health research evidence in their work	**1**	**2**	**3**	**4**	**5**
c.	Provided training to health policy or decision makers to develop their capacity to adapt health research evidence in their work	**1**	**2**	**3**	**4**	**5**
d.	Provided training to health policy or decision makers to develop their capacity to apply health research evidence in their work	**1**	**2**	**3**	**4**	**5**

Facilitation

Q9. How often have you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) performed each of these knowledge translation activities related to health research evidence?

Never 1	**Rarely 2**	**Occasionally 3**	**Frequently 4**	**Always 5**

a.	Developed reports, summaries or messages that used language appropriate to specific health policy or decision makers (i.e. non-technical, jargon free language)	**1**	**2**	**3**	**4**	**5**
b.	Tailored the content of mailings or e-mails to specific health policy or decision makers for their attention to new research evidence	**1**	**2**	**3**	**4**	**5**
c.	Tailored other aspects of research conducted to specific health policy or decision makers through institutional websites, social media, radio and television, etc.	**1**	**2**	**3**	**4**	**5**

Access

Q10. How often have you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) performed each of these knowledge translation activities related to health research evidence?

Never 1	**Rarely 2**	**Occasionally 3**	**Frequently 4**	**Always 5**

a.	Provided access to a searchable database of brief summaries of articles, reports, syntheses that specified possible action for health policy or decision makers	**1**	**2**	**3**	**4**	**5**
b.	Provided reprints of articles published in scientific journals to health policy or decision makers	**1**	**2**	**3**	**4**	**5**
c.	Provided syntheses of the research literature to health policy or decision makers	**1**	**2**	**3**	**4**	**5**
d.	Provided formal systematic reviews of the research literature to health policy or decision makers	**1**	**2**	**3**	**4**	**5**

e.	Developed brief summaries of articles or research reports for health policy or decision makers	**1**	**2**	**3**	**4**	**5**
f.	Developed brief summaries of syntheses or formal systematic reviews of the research literature for health policy or decision makers	**1**	**2**	**3**	**4**	**5**
g.	Developed messages for health policy or decision makers that specified possible action (i.e. recommendations, take-home messages, actionable messages)	**1**	**2**	**3**	**4**	**5**

Collaboration

Q11. How often have you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) collaborated with other health research partners in knowledge translation activities related to health research evidence?

Never **1**	**Rarely** **2**	**Occasionally** **3**	**Frequently** **4**	**Always** **5**		
a.	Participated in knowledge translation skill-building activities (e.g. conferences or courses about knowledge translation)	**1**	**2**	**3**	**4**	**5**
b.	Worked with knowledge translation specialists to promote health research evidence use	**1**	**2**	**3**	**4**	**5**
c.	Identified and worked with knowledge translation specialists outside of the College of Medicine or Kamuzu College of Nursing.	**1**	**2**	**3**	**4**	**5**
d.	Identified and worked with knowledge brokers outside of the College of Medicine or Kamuzu College of Nursing (i.e. people who bring researchers and their target audiences together and build relationships among them that make knowledge translation more effective)	**1**	**2**	**3**	**4**	**5**
e.	Identified and worked with credible messengers for health policy or decision makers (i.e. those who, regardless of their role or organisation, are members of health systems and policy research)	**1**	**2**	**3**	**4**	**5**
f.	Developed relationships with print, radio or television journalists reporting on health issues.	**1**	**2**	**3**	**4**	**5**

Communication

Q12. How often have you (in your personal capacity or on behalf of the College of Medicine or Kamuzu College of Nursing) communicated health research outcomes on health systems and health policy in general?

Never **1**	**Rarely** **2**	**Occasionally** **3**	**Frequently** **4**	**Always** **5**		
a.	Mailed or e-mailed to health policy or decision makers articles, reports, syntheses, formal systematic reviews or messages without an explicit request to do so	**1**	**2**	**3**	**4**	**5**
b.	Mailed or e-mailed to health policy or decision makers a newsletter containing brief summaries or messages	**1**	**2**	**3**	**4**	**5**
c.	Requested that the research be included on the College website or National Digital Repository so that health policy or decision makers can have access to it	**1**	**2**	**3**	**4**	**5**
d.	Created a flyer or poster presentation to summarise health research evidence for the attention of health policy or decision makers	**1**	**2**	**3**	**4**	**5**

e.	Organised a research dissemination conference where the research was show-cased to health policy or decision makers	**1**	**2**	**3**	**4**	**5**
f.	Published articles in journals used by health policy or decision makers	**1**	**2**	**3**	**4**	**5**
g.	Drafted policy briefs for possible inclusion into policy papers for health policy or decision makers	**1**	**2**	**3**	**4**	**5**
h.	Drafted a press release which show-cased new research outcomes for the attention of health policy or decision makers	**1**	**2**	**3**	**4**	**5**
i.	Articulated the usefulness of new research through social networking and blogs	**1**	**2**	**3**	**4**	**5**
j.	Involved members of the press (newspapers, radio and television) about new research	**1**	**2**	**3**	**4**	**5**

Dissemination

Q13. How involved are the following groups in the communication and dissemination of your health research findings?

Never 1	Rarely 2	Occasionally 3	Frequently 4	Always 5

a.	Parliamentary Committee on Health	**1**	**2**	**3**	**4**	**5**
b.	Health policy or decision makers	**1**	**2**	**3**	**4**	**5**
c.	Libraries and data repository managers	**1**	**2**	**3**	**4**	**5**
d.	Research funding agencies	**1**	**2**	**3**	**4**	**5**
e.	Civil society organisations	**1**	**2**	**3**	**4**	**5**
f.	Universities and research institutes and centres	**1**	**2**	**3**	**4**	**5**
g.	Mass media	**1**	**2**	**3**	**4**	**5**
h.	Other industries (please specify)	**1**	**2**	**3**	**4**	**5**

Q14. What is the best way of disseminating health research findings so that health policy or decision makers may use them for policy-making in Malawi?

Strongly Disagree 1	**Disagree 2**	**Uncertain 3**	**Agree 4**	**Strongly Agree 5**

a.	Publish in peer reviewed journals	**1**	**2**	**3**	**4**	**5**
b.	Publish in report form for a funding agency	**1**	**2**	**3**	**4**	**5**
c.	Publish in report form for stakeholders	**1**	**2**	**3**	**4**	**5**
d.	Present at a research conference	**1**	**2**	**3**	**4**	**5**
e.	Present to health policy or decision makers at their fora	**1**	**2**	**3**	**4**	**5**
f.	Present to practitioners through targeted mailing lists	**1**	**2**	**3**	**4**	**5**
g.	Organise face-to-face meetings with health policy or decision makers	**1**	**2**	**3**	**4**	**5**
h.	Organise seminars and workshops	**1**	**2**	**3**	**4**	**5**

i.	Distribute newsletters targeted at health policy or decision makers	**1**	**2**	**3**	**4**	**5**
j.	Engage other industries (please specify)	**1**	**2**	**3**	**4**	**5**

Evaluation

Q15. What has been your impact in terms of health research and health policy formulation in Malawi?

Strongly Disagree **1**	**Disagree** **2**	**Uncertain** **3**	**Agree** **4**	**Strongly Agree** **5**

a.	Own research or reviews have been used to inform health policy or practice	**1**	**2**	**3**	**4**	**5**
b.	Had findings that were not used by health policy or decision makers but were potentially important	**1**	**2**	**3**	**4**	**5**
c.	Own research assisted health policy in formulating health policy issues	**1**	**2**	**3**	**4**	**5**
d.	Own research helped health policy makers to identify policy alternatives	**1**	**2**	**3**	**4**	**5**
e.	Own research helped health policy makers to choose the preferred policy options	**1**	**2**	**3**	**4**	**5**
f.	Own research was used to justify the final health policy	**1**	**2**	**3**	**4**	**5**
g.	Other (please specify)	**1**	**2**	**3**	**4**	**5**

Sustainability

Q16. How may the following factors increase or sustain the use of health research evidence in policy-making?

Never **1**	**Rarely** **2**	**Occasionally** **3**	**Frequently** **4**	**Always** **5**

a.	The nature and relevance of the health research evidence	**1**	**2**	**3**	**4**	**5**
b.	The context in which the health research evidence is placed	**1**	**2**	**3**	**4**	**5**
c.	Interactions between researchers and research users and other stakeholders	**1**	**2**	**3**	**4**	**5**
d.	The organisation's readiness to receive and use health research evidence	**1**	**2**	**3**	**4**	**5**
e.	The availability of and access to supportive resources and tools	**1**	**2**	**3**	**4**	**5**

Q17. How do the following strategies increase the generation of relevant health research for health policy?

Unimportant **1**	**Of little importance** **2**	**Moderately important** **3**	**Important** **4**	**Very important** **5**

a.	Agreement between researchers and health policy makers about research priorities	**1**	**2**	**3**	**4**	**5**
b.	Establishing partnership research programmes	**1**	**2**	**3**	**4**	**5**
c.	Commissioning and co-funding research	**1**	**2**	**3**	**4**	**5**
d.	Encouraging research usage from locally generated health research data	**1**	**2**	**3**	**4**	**5**
e.	Integrating research into the roll-out of health policies and programmes	**1**	**2**	**3**	**4**	**5**

Impact

Q18. If you were to measure the impact of your health research findings, which of the following tools are likely to inform the impact of your research?

Not at all 1	Very little 2	Somewhat 3	To a smaller extent 4	To a larger extent 5

a.	Evidence of debates in the media	**1**	**2**	**3**	**4**	**5**
b.	Evidence of new funders in the subject area	**1**	**2**	**3**	**4**	**5**
c.	Evidence of the transfer of research and innovation into practice (patents, prototypes and licences)	**1**	**2**	**3**	**4**	**5**
d.	Number of new products, practices and procedures developed based on the research outcomes	**1**	**2**	**3**	**4**	**5**
e.	Number of articles in the press	**1**	**2**	**3**	**4**	**5**
f.	Number of people asking for feedback or more information	**1**	**2**	**3**	**4**	**5**
g.	Number of references in scientific publications	**1**	**2**	**3**	**4**	**5**
h.	Number of citations in online platforms such as Google Scholar, Web of Science, etc.	**1**	**2**	**3**	**4**	**5**
i.	Speaker evaluations from conferences presentations	**1**	**2**	**3**	**4**	**5**
j.	Survey of end users and trends in website visits	**1**	**2**	**3**	**4**	**5**
k.	Other (please specify)	**1**	**2**	**3**	**4**	**5**

Q19. The immediate outcome of your health research findings is to let the general public, health researchers and funders:

Unimportant 1	Of little importance 2	Moderately important 3	Important 4	Very important 5

a.	Be aware about new health research evidence	**1**	**2**	**3**	**4**	**5**
b.	Be knowledgeable of new health research evidence	**1**	**2**	**3**	**4**	**5**
c.	Create discussions about new research evidence	**1**	**2**	**3**	**4**	**5**
d.	Incite behavioural intentions to use new evidence	**1**	**2**	**3**	**4**	**5**

Q20. How satisfied are you on the use of health research evidence in health policy-making especially in the following health policy areas?

Very dissatisfied 1	**Somewhat dissatisfied 2**	**Neither satisfied nor dissatisfied 3**	**Somewhat satisfied 4**	**Very satisfied 5**

a.	National health policy agendas	**1**	**2**	**3**	**4**	**5**
b.	National health policy contents	**1**	**2**	**3**	**4**	**5**
c.	National health policy implementations	**1**	**2**	**3**	**4**	**5**
d.	National health policy evaluations	**1**	**2**	**3**	**4**	**5**

Q21. How satisfied are you with the way the following have used health research evidence generated in Malawi?

Very dissatisfied 1	**Somewhat dissatisfied 2**	**Neither satisfied or dissatisfied 3**	**Somewhat satisfied 4**	**Very satisfied 5**

a.	The National Commission for Science and Technology	**1**	**2**	**3**	**4**	**5**
b.	The Ministry of Health and the National Health Commission	**1**	**2**	**3**	**4**	**5**
c.	The nursing and medical colleges in Malawi	**1**	**2**	**3**	**4**	**5**
d.	The Parliamentary Committee on Health	**1**	**2**	**3**	**4**	**5**
e.	The Nurses and Midwives Council of Malawi	**1**	**2**	**3**	**4**	**5**
f.	The Medical Council of Malawi	**1**	**2**	**3**	**4**	**5**

Q22. How satisfied are you with the way the country has addressed the following knowledge translation activities?

Very dissatisfied 1	**Somewhat dissatisfied 2**	**Neither satisfied or dissatisfied 3**	**Somewhat satisfied 4**	**Very satisfied 5**

a.	Identification of health problems and the conducting of relevant research to address the health problems identified in Malawi	**1**	**2**	**3**	**4**	**5**
b.	Adaptation of health research evidence to the local context in Malawi	**1**	**2**	**3**	**4**	**5**
c.	Assessment of barriers to the use of health research evidence in health policy formulation in Malawi	**1**	**2**	**3**	**4**	**5**
d.	Selection, tailoring and implementation of health research knowledge in health policies in Malawi	**1**	**2**	**3**	**4**	**5**
e.	Monitoring the use of health research knowledge in Malawi	**1**	**2**	**3**	**4**	**5**
f.	Evaluation of the impact of health research knowledge and its usage in Malawi	**1**	**2**	**3**	**4**	**5**
g.	Strategies used by health research partners for the use of health research evidence in Malawi	**1**	**2**	**3**	**4**	**5**

Q23. Which sources of research findings would be influential in the bridging the gap between health research and health policy discussions in Malawi?

Important **1**	**Little importance** **2**	**Partly important** **3**	**Very important** **4**	**Absolutely important** **5**

a.	General international scientific literature	**1**	**2**	**3**	**4**	**5**
b.	General locally generated health research evidence	**1**	**2**	**3**	**4**	**5**
c.	Briefs of research findings produced by researchers	**1**	**2**	**3**	**4**	**5**
d.	Reviews or syntheses of the research literatures	**1**	**2**	**3**	**4**	**5**
e.	Direct communication with individual researchers	**1**	**2**	**3**	**4**	**5**
f.	Attendance at seminars and conferences at which research findings are presented	**1**	**2**	**3**	**4**	**5**
g.	Liaising with the various research centres	**1**	**2**	**3**	**4**	**5**
h.	Reports from official policy/science committees, policy advisers or officials	**1**	**2**	**3**	**4**	**5**
i.	Briefs from research brokers/promoters/translators	**1**	**2**	**3**	**4**	**5**
j.	Relying on issues from mass media	**1**	**2**	**3**	**4**	**5**
k.	Relying on networks consisting of interest groups and other stakeholders	**1**	**2**	**3**	**4**	**5**
l.	Waiting for dialogue from international health agencies	**1**	**2**	**3**	**4**	**5**

Thank you very much for your participation

Appendix B: Informed consent & Interview schedule for directors

Dear Sir/Madam,

I kindly request you to participate in the study titled '**Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence'**. The study is being undertaken in fulfillment of a PhD at the University of Cape Town, Library and Information Studies Centre. I am looking for your experiences, clarifications and suggestions on how knowledge from health research findings in Malawi has informed health policy in Malawi.

Your participation in this study is voluntary and all efforts will be made to ensure your anonymity and the confidentiality of the information you provide, during the reporting of the findings. Your signature indicates acceptance to participate in the study. Should you choose to discontinue participating in this study, you may withdraw at any time without prejudice even after signing this form. It should take less than 45 minutes to complete the interview.

Please read the consent statements below and place a tick **(✓)** in the right-hand column for each statement if you agree with the statement.

Item no.	**Consenting statement**	**Tick (✓)**
1.	I confirm that I have read and understood the information provided about the study.	
2.	I understand that I am not obliged to participate in the study, and that I am free to withdraw from the study at any time, without providing a reason.	
3.	I understand that my anonymity will be assured and that any information provided would be treated with confidentiality during the reporting of findings.	
4.	I understand that there will be no direct benefit to me personally, accruing from the study.	
5.	I understand that I will not be compensated for participating in the study.	
6.	I hereby give permission for the conversations during the interview session to be audio-recorded.	
7.	I hereby freely consent to participate in the study.	

Name of Participant	**Signature**	**Date**
Name of the Researcher	**Signature**	**Date**

For further information please contact the research team below:

Researcher: Patrick Mapulanga	**Supervisor:** Ass. Professor Jaya Raju
Institution: KCN, University of Malawi	**Institution**: University of Cape Town
Cell: 265888855528	**Phone Number**: 27 21 650 4546
Email: pmapulanga@kcn.unima.mw	**Email**: jaya.raju@uct.ac.za

Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence

Interview schedule for directors of research centres/health institutions

Introduction

Many health researchers and other individuals and groups are undertaking a variety of research activities with the aim that their research would be used by policy and decision makers. In this research the term 'knowledge translation' has been adopted for consistency.

Knowledge translation may be defined as a set of activities involved in moving research output from the laboratory, the research journal, and the academic conference into the hands of policy makers who can put it into practice by influencing policy change based on evidence-based research (Sharon, Tetroe & Graham, 2009). With this interview, I hope to learn more about how researchers have undertaken knowledge translation activities in health research to inform health policy in Malawi.

Your experiences and suggestions would be used to inform the design of a communication and dissemination strategy for health research findings to help in informing health policy formulation in Malawi.

Note: Your responses would be treated with confidentiality. All responses will remain anonymous, for reporting purposes. Please feel free to ask questions related to this study. You may contact the researcher or supervisor if you have any additional questions.

Instruction: Interviewer to tick (**✓**) in the space provided or record required information.

Section A: Demographic features

No.	Items	Coding categories	Name/title
Q1.	Organisation	1	
	Designation	2	

Q2. What type of degree(s) have you completed

Degree	Name of degree (e.g. MBBS, MSc, MD, PhD)
Undergraduate degree	
Master's degree	
Doctoral degree	
Health professional degree	
Other degrees (please specify)	

Section B: Research usage in Malawi

Q3. Please shed some light on the health research conducted by your research centre/institution in Malawi and what knowledge you are generating?

Q4. Does your research centre/institution have any health research activities that have resulted in research issues being on the national health policy agenda in Malawi?

Q5. What has been the role of health research conducted by your research centre/institution in health policy formulation in Malawi?

Q6. Whose research evidence or ideas have shaped health policy agenda in Malawi?

Q7. Who influences the content of health policy in Malawi?

Section C: The influence of research on health policy formulation

Q8. What level of correlation do you perceive as existing between health policy formulation and health research findings in Malawi?

Q9. Is there any evidence that suggests the use of health research in health policy formulation in Malawi?

Q10. During health policy formulation, how far do policy makers draw upon research findings to support their positions?

Q11. For which aspects of the health policy formulation does research seem to be most relevant? [health policy agenda, policy content, policy implementation or policy evaluation]

Section D: Communicating and receiving health research information

Q12. Which sources of research findings are most influential in health policy discussions in Malawi?

Q13. How well equipped are the health policy makers to absorb health research findings in Malawi?

Q14. How important are health research findings in attempting to influence the health policy-making process in Malawi?

Section E: Research contribution to health policy implementation

Q15. Once health policy has been formulated, how important are research findings in generating support for financial resources, political commitment and public opinion?

Q16. Are health research findings drawn upon in any speech, article, interview, etc. given by policy makers to support the policy?

Q17. Are any health research findings helping in demonstrating how health policy in Malawi could best be implemented and do they inform any decisions made at the policy implementation stage?

Section F: Level of research utilisation

Q18. To what extent does health research emanating from specific research centres or from research programmes and projects involve the participation of policy makers?

Q19. In the whole policy-making process, which types of research prove to be most useful? [explore the national/international dimension, and the following types of research: biomedical; clinical; epidemiological; health services and policy; economic; and, evaluative].

Q20. Are health research efforts in Malawi directed towards the most critical aspects of health policy formulation?

Q21. Are there any aspects of the health policy debate where more research-based information would have been useful?

Q22. Has there been funding invested in health research in relation to health policy formulation in Malawi?

Q23. How important is the utilisation of health research in policy-making, particularly in terms of quality and timeliness? [instrumental, conceptual, tactical and imposed use of research].

Q24. If health research in Malawi does not influence policy-making to the extent that it can, what are the possible reasons for this?

Q25. What factors do you believe could make health policy makers more receptive to health research in Malawi?

Q26. How should health research be communicated and disseminated so as to influence its usage in health policy formulation in Malawi?

Thank you for your participation

End of interview

Appendix C: Consent form & Self-assessment tool for research centres and institutions

Dear Sir/Madam,

I kindly request you to participate in the study titled '**Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence'**. The study is being undertaken in fulfillment of a PhD at the University of Cape Town, Library and Information Studies Centre. I am looking for your experiences, clarifications and suggestions on how knowledge from health research findings in Malawi has informed health policy in Malawi.

Your participation in this study is voluntary and all efforts will be made to ensure your anonymity and the confidentiality of the information you provide, during the reporting of the findings. Your signature indicates acceptance to participate in the study. Should you choose to discontinue participating in this study, you may withdraw at any time without prejudice even after signing this form. It should take less than 30 minutes to complete this self-assessment.

Please read the consent statement below and place a tick **(✓)** in the right-hand column for each statement if you agree with the statement.

Item no.	Consenting statement	Tick (✓)
7.	I confirm that I have read and understood the information provided about the study.	
8.	I understand that I am not obliged to participate in the study, and that I am free to withdraw from the study at any time, without providing a reason.	
9.	I understand that my anonymity will be assured and that any information provided will be treated with confidentiality during the reporting of findings.	
10.	I understand that there will be no direct benefit to me personally, accruing from the study.	
11.	I understand that I will not be compensated for participating in the study.	
12.	I hereby freely consent to participate in the study.	

Name of Participant	**Signature**	**Date**
Name of the Researcher	**Signature**	**Date**

For further information please contact the research team below:

Researcher: Patrick Mapulanga	**Supervisor:** Ass. Professor Jaya Raju
Institution: KCN, University of Malawi	**Institution**: University of Cape Town
Cell: 265888855528	**Phone Number**: 27 21 650 4546
Email: pmapulanga@kcn.unima.mw	**Email**: jaya.raju@uct.ac.za

Self-assessment tool for research centres and institutions

Introduction

Knowledge translation is a set of activities involved in moving research output from the laboratory, the research journal, and the academic conference into the hands of policy makers who in turn put it into practice by influencing policy change based on the available research evidence (Sharon, Tetroe & Graham, 2009). With this self-assessment tool, I hope to learn more about how health researchers have undertaken *knowledge translation* activities in Malawi.

Instructions: For each of the items please circle either (a) or (b) and thereafter, provide an explanation in support of the option selected.

Section A: The question of health research in Malawi (that is, how do health research centres/institutions identify health policy makers' research needs and convert them into research questions?)

1. Does your research centre/institution have a list of organisations that could use research findings generated by your centre/institution?

   a. Yes

   b. No

   Explanation:____
   ____

2. Does your research centre/institution have a databank or repository for ingesting of research data for open distribution?

   a. Yes
   b. No

   Explanation:____
   ____

3. Are regular meetings held, within your research centre/institution, for the identification and exchange of research priorities?

   a. Yes
   b. No

Explanation:____
____

4. Are policy and decision makers in the health sector aware of the fields your research centre/ institution has expertise in?

    a. Yes
    b. No

   Explanation: ____
   ____

5. In your research centre/institution, do you hold regular and purposeful meetings with health policy and decision makers as a way of extending co-operation on knowledge sharing and networking?

    a. Yes
    b. No

   Explanation:____
   ____

6. Does your research centre/institution have a website for promoting visibility of its research priorities among other health research partners?

    a. Yes
    b. No

   Explanation:____
   ____

7. In your research centre/institution, are research priorities also determined through meetings with policy and decision makers and not just with users (e.g. other researchers) of health research findings?

    a. Yes
    b. No

   Explanation:____
   ____

8. In your research centre/institution, are health research priorities updated regularly and communicated timeously to health policy and decision makers?

   a) Yes
   b) No

   Explanation:____
   ____

9. Does your research centre's/institution's budget necessitate researchers to identify and apply for external sources of funding?

   a. Yes
   b. No

   Explanation:____
   ____

10. Does your research centre/institution provide incentives to researchers for securing external funding?

   a. Yes
   b. No

   Explanation: ____
   ____

Section B: Knowledge production in Malawi (that is, how do research centres/institutions produce knowledge that is useful to health policy and decision makers?)

11. In your research centre/institution, are research studies resulting in the production of 'actionable messages' with a level of research evidence (e.g. systematic reviews, policy briefs) considered priorities for research agendas and grant allocations?

   a. Yes
   b. No

   Explanation:____
   ____

12. Do members of research groups in your centre/institution participate in the co-production or co-designing of the research itself?

    a. Yes
    b. No

    Explanation:____
    ____

13. Do users of health research findings (e.g. policy makers, other researchers) trust the quality of the research done in your research centre/institution?

    a. Yes
    b. No

    Explanation:____
    ____

14. Is quality assurance required in your research centre/institution for each research study, with specific reference to data gathering protocols and research training?

    a. Yes
    b. No

    Explanation:____
    ____

15. Is quality control with specific reference to internal monitoring and external supervision by a separate outside research group, carried out in your research centre/institution while research is being conducted?

    a. Yes
    b. No

    Explanation:____
    ____

16. In your research centre/institution, is the gap between presentation of the research proposal and the beginning of the research reasonable (that is, the duration of the process of reviewing research proposals takes less than 6 months)?

    a. Yes
    b. No

Explanation:____

____

17. In your research centre/institution, is the gap between the conclusion of the study and the finalisation of results in report form, reasonable (that is, less than 6 months)?

    a. Yes
    b. No

Explanation:____

____

18. Are researchers in your centre/institution cognisant of timelines (that is, the project's duration, avoidance of unnecessary delays), while designing the research proposal and undertaking the research itself?

    a. Yes
    b. No

Explanation:____

____

19. In your research centre/institution, apart from publishing in peer reviewed journals, are budgets allocated for other forms of dissemination of research findings (e.g. workshops, seminars, conferences)?

    a. Yes
    b. No

Explanation:____

____

Section C: Knowledge translation in Malawi (that is, what appropriate means are available for disseminating health research centres'/institutions' findings to target audiences?)

20. In your research centre/institution, apart from transferring research findings to funders and other researchers, is there a process of ascertaining what findings should be transferred to relevant policy and decision makers?

    a. Yes
    b. No

Explanation:____

____

21. In your research centre/institution, are all health research reports peer reviewed prior to knowledge dissemination or translation?

    a. Yes
    b. No

    Explanation:____

22. In your research centre/institution, are researchers familiar with knowledge translation and how to perform it?

    a. Yes
    b. No

    Explanation:____

23. In your research centre/institution, do researchers convert their findings into ‘actionable messages’ appropriate to relevant policy and decision makers?

    a. Yes
    b. No

    Explanation:____

24. In your research centre/institution, do researchers have adequate communication skills for knowledge translation of health research findings?

    a. Yes
    b. No

    Explanation:____

25. In your research centre/institution, do researchers use the services of individuals with knowledge transfer skills (e.g. knowledge brokers)?

    a. Yes
    b. No

    Explanation:____

26. In your research centre/institution, do researchers have the resources (e.g. finance, skills, IT infrastructure, computer hardware and software) for preparing research content for dissemination to relevant target audiences (e.g. print and online, including social media)?

   a. Yes
   b. No

Explanation:____

27. In your research centre/institution, do researchers have adequate time for preparing research content for dissemination to relevant target audiences?

   a. Yes
   b. No

Explanation: ____

28. In your research centre/institution, are researchers adequately incentivised for performing knowledge translation (e.g. promotion opportunities, honoraria, other rewards)?

   a. Yes
   b. No

Explanation:____

29. Is knowledge translation and utilisation of research findings, in your research centre/institution, a part of the general training programme or research methodology training?

   a. Yes
   b. No

Explanation:____

30. Is your research centre/institution aware of the national health research needs of the country (Malawi) and does it perform relevant health research interventions on behalf of the country?

   a. Yes
   b. No

Explanation:____

31. In your research centre/institution, is the format of peer reviewed publications such that health policy and decision makers are easily informed of the ‘actionable messages’?

    a. Yes
    b. No

    Explanation:____

32. In your research centre/institution, is the gap between dispatching manuscripts and their publication in journals adequate enough to ensure that the interventions emanating from the research are implementable?

    a. Yes
    b. No

    Explanation:____

33. Does your research centre/institution have regular communication with public and private media for the transfer of health research evidence?

    a. Yes
    b. No

    Explanation:____

34. Are intellectual property rights used in your research centre/institution to support researchers to disseminate findings prior to their publication in journals or other forums?

    a. Yes
    b. No

    Explanation:____

35. Is there an appreciation from health policy and decision makers in Malawi of the role of local research emanating from your research centre/institution?

    a. Yes
    b. No

Explanation:____

____

36. Do your researchers study the extent to which policy and decision makers utilise research emanating from your centre/institution?
    a. Yes
    b. No

Explanation:____

____

37. In your research centre/institution, do researchers identify potential barriers to policy and decision makers utilising your health research findings?
    a. Yes
    b. No

Explanation:____

____

38. Are there criteria for evaluation of researchers' knowledge transfer activities in your research centre/institution?
    a. Yes
    b. No

Explanation:____

____

Section D: Promoting the use of health research evidence in Malawi (that is, how do research centres/institutions support policy and decision makers to better utilise health research findings?)

39. In your research centre/institution, do you conduct educational programmes about evidence-based medicine or evidence-based decision-making for policy and decision makers?
    a. Yes
    b. No

Explanation____

____

40. Does your research centre/institution conduct systematic reviews for the purposes of strengthening evidence-based policy and decision-making?

    a. Yes
    b. No

Explanation:____
____

41. Do researchers, in your research centre/institution, play an active role in technical committees that help in health policy or decision-making in Malawi?

    a. Yes
    b. No

Explanation:____
____

42. Does your research centre/institution send policy and decision makers reminders to follow research findings from its studies on topical issues?

    a. Yes
    b. No

Explanation: ____
____

End of the self-assessment tool

Thank you for your participation

Appendix D: Health Policy Assessment Tool

Adapted and revised from the Staff Assessment of engagement with Evidence (SAGE)

1	**Ministry**	
2	**Name of Policy**	
3	**Date**	
	Circle all options that apply	
4	Role of the ministry in the policy development	○ Central ○ Marginal ○ Advisory
	Circle all options that apply	
5	Nature of research evidence	○ Academic literature or systematic review databases? ○ Consulted with research experts, reference groups to find research? ○ Searched grey literature and data sources, e.g. government websites? ○ Looked through reference lists, citation databases or reference libraries? ○ Used research that was already known, on hand or provided by colleagues? ○ Used generic search engines such as Google or Google Scholar?
	Circle all options that apply	
6	Type of research found	○ Primary research studies; such as reports of trials published in research journals ○ Secondary research articles (reviews) such as systematic reviews or research summaries ○ Technical monographs or books ○ Government reports or grey literature, including evaluations of policies or programs ○ Internal data or evaluations ○ Data from registries or databases
	Circle one best option that applies	
7	Relevance of the research found	○ Not relevant enough to be able to be applied in our policy context, population, etc ○ Some relevance and possibly able to be applied in our policy context, population, etc ○ Relevant and likely to be able to be applied in our policy context, population, etc ○ Very relevant and very likely to be able to be applied to our policy context, population, etc ○ Directly applicable to our policy context, population
	Circle all options that apply	
8	Assessment of the research evidence	An assessment was made on research and was found: ○ Applicable to the policy context or issue? ○ Actionable/feasible? ○ Consistent with previous research?

		o Compatible with organisational values/knowledge?
	Circle all options that apply	
9	Consultations	Did the policymakers: o Consult with experts to assess relevance? o Use criteria or a structure appraisal guide? o Undertake these actions as part of a predefined strategy o Was it ad hoc/intuitive?
	Circle one best option that applies	
10	Quality or reliability of the research studies	o No meaningful research o Low quality research o Moderately quality research o High quality research o Variable quality research
	Circle all options that apply	
11	Evaluation of the quality of research evidence	o Appraisal using systematic/structured guide o Appraisal assessed the level of research evidence o Appraisal based on assessment by expert o Appraisal or research design or conclusions o Appraisal of author/source credibility o Appraisal of citations or references in research or policy or program documents o Pre-specified process or intuitive or ad hoc
	Circle all options that apply	
12	Who was involved in the formulation of the policy	o Commissioned or partnered with researchers to conduct research project or analysis of data o Evaluative team to the program or policy in question o Internal members of staff conducted research or analysis of data o Formulated a working group, consulted with stakeholders or advisory committee o Advocated for a lobby, or explained the need for research in press release or to researchers
	Circle all options that apply	
13	How was research used in the policy	Research *(Conceptual use of research)* o informed thinking about the background to a health issue o helped to understand the program/policy context (e.g., target population, setting, feasibility) o suggested policy priorities (e.g. by suggesting which issues need action) o suggested alternative strategies o helped in the design an evaluation
		Research *(instrumental use of research)* o Directly informed policy/program decisions, (e.g. helped to identify priorities or alternative strategies) o Directly feed into the policy document

		Research *(tactical use of research)* o Provided hard evidence/ ammunition to persuade stakeholders to support or act upon an existing decision or view o Supported, confirmed, back up, or justified an established position, decision, or view o Informed the stakeholders about the key issues relating to the policy issue
		Research used because *(imposed use of evidence)*: o The ministry encourages the use of research o The ministry expects research to be used (i.e., it is regarded as best practice) o The ministry mandates research use
	Circle one best option that applies	
14	Barriers to research use	o No barriers o Minimal impact on research use o Limited impact on research use o Moderate impact on research use o Substantial impact on research use o Extensive impact on research use
	Circle all options that apply	
15	Facilitators or enablers to the development of the policy	Facilitation related to: o Individual skills/knowledge o Team attributes o Agency level attributes o Political factors o Policy/program topic factors
	Circle one best option that applies	
16	How research contributed towards the development of the policy	o Not at all important – played no role o Minimal importance – very little influence on document o Limited importance – little influence on document o Moderate – some influence on document o Important – substantial influence on document o Essential – extensive influence on document

End of Assessment tool

Appendix E: Ethics Clearance Letter from the University of Cape Town

Library and Information Studies Centre
University of Cape Town
Upper Campus

Private Bag X1, RONDEBOSCH, 7701 South Africa
Level 6 Hlanganani, The Chancellor Oppenheimer Library
Tel: +27 (0) 21 650 4546 Fax: +27 (0) 21 650 2529
E-mail: lisc@uct.ac.za
Internet: www.lib.uct.ac.za/lisc

Ref No. UCTLIS2017 06-05 29 June 2017

Mr Patrick Mapulanga
Library and Information Studies Centre
Chancellor Oppenheimer Library
University of Cape Town

Ethics Approval for PhD Research

Dear Mr Mapulanga

I am pleased to inform you that ethics clearance has been granted by an Ethics Review Committee of the Library and Information Studies Centre, Faculty of Humanities, University of Cape Town for you to proceed with collecting data for your PhD study on Knowledge Translation of Health Research Findings. The Committee would like to commend you for your comprehensive approach to the ethical dimensions of your research and for taking into account the requirements set out by the National Commission for Science and Technology in Malawi.

The Committee is satisfied that this comprehensive approach and attention to detail in the instruments, consent forms and covering letters more than adequately cover issues of ethics associated with your research.

We wish you well with your data collection and the completion of your research.

Yours faithfully,

M C Nassimbeni

Mary Nassimbeni, (Em. Ass. Prof.)

Chair: Department (LISC) Research Ethics Committee

CC: Ass. Prof Jaya Raju, Supervisor

"Our Mission is to be an outstanding teaching and research university, educating for life and addressing the challenges facing our society."

Appendix F: Ethics Clearance Letter from the National Commission for Science and Technology

NATIONAL COMMISSION FOR SCIENCE AND TECHNOLOGY
Lingadzi House
Robert Mugabe Crescent
Private Bag B303
City Centre
Lilongwe
Tel: +265 1 771 550
+265 1 774 869
+265 1 774 189
Fax: +265 1 772 431
Mail: directorgeneral@ncst.mw
Website: http://www.ncst.mw

`A nation with scientifically and technologically led sustainable growth and development'

Ref No: NCST/RTT/2/6 **21st July, 2017**

Patrick Mapulanga
KCN
University of Malawi
pmapulanga@kcn.unima.mw

Dear Patrick Mapulanga,

RESEARCH ETHICS APPROVAL OF PROTOCOL P05/17/197: KNOWLEDGE TRANSLATION OF HEALTH RESEARCH FINDINGS AT UNIVERSITY OF MALAWI'S COLLEGE OF MEDICINE AND ITS RELEVANCE IN HEALTH POLICY FORMULATION IN MALAWI: A STUDY IN DEVELOPING A COMMUNICATION AND DISSEMINATION STRATEGY TO FACILITATE THE USE OF HEALTH RESEARCH EVIDENCE

Having satisfied all the ethical, scientific and regulatory requirements, procedures and guidelines for the conduct of research in the social sciences sector in Malawi, I am pleased to inform you that the above referred research study has officially been approved. You may now proceed with its implementation. Should there be any amendments to the approved protocol in the course of implementing it, you shall be required to seek approval of such amendments before implementation of the same.

This approval is valid for one year from the date of issuance of this letter. If the study goes beyond one year, an annual approval for continuation shall be required to be sought from the National Committee on Research in the Social Sciences and Humanities in a format that is available at the secretariat. Once the study is finished, you are required to furnish the Committee and the Commission with a final report of the study.

Wishing you a successful implementation of your study.

Yours Sincerely

Martina Chimzimu
NCRSH ADMINISTRATOR AND RESEARCH OFFICER
HEALTH, SOCIAL SCIENCES AND HUMANITIES
For: CHAIRMAN OF NCRSH

Appendix G: Authorisation Letter from the Ministry of Health

Telegram: HEALTH, Lilongwe
ephone: (265) 01 789 355
csimile:+ 265 1 788 173

Correspondences should be addressed
the Secretary for Health

In reply please quote No. ....

MINISTRY HEALTH
P.O.BOX 30377
Lilongwe

Ref. No. Admin 1/1

31st July, 2017

Mr. Patrick Mapulanga
Kamuzu College of Nursing
University of Malawi
Lilongwe 3

Dear Sir,

RE: PERMISSION TO CONDUCT AN INTERVIEW AND ADMINISTER A SELF-ASSESSMENT TOOL ON HEALTH RESEARCH FINDINGS AND HEALTH POLICY FORMULATION IN MALAWI

Reference is made to the above subject matter.

I write to convey approval for you to conduct the research in the Ministry of Health through interviews and the administration of a self-assessment tool with the Directorates of Clinical Services, Reproductive Health and Preventive Health.

Yours faithfully,

Dr. Dan Namarika
SECRETARY FOR HEALTH

Appendix H: Authorisation Letter from the College of Medicine

UNIVERSITY OF MALAWI

COLLEGE OF MEDICINE

Principal
M. H. C. Mipando MSc, PhD

College of Medicine
Private Bag 360
Chichiri
Blantyre 3
M
alawi

Telephone: 01 877249
01 877291
Fax: 01 874 700

Our Ref.: MC/R/1/12

Your Ref.:

24th August, 2017

Mr. Patrick Mapulanga
University of Malawi
Kamuzu College of Nursing
P/B 415
BLANTYRE

Cell: 0888 855 528
Email: pmapulanga@kcn.unima.mw

Dear Mr. Mapulanga,

RE: REQUEST FOR PERMISSION TO CONDUCT A STUDY AT COLLEGE OF MEDICINE

I refer to your letter dated 24th July, 2017 in which you are requesting for permission to conduct a study at our institution as follows:

i) To administer questionnaires to academics /researchers
ii) To interview people
iii) To collect data through a self –assessment tool

I write to inform you that your request has been approved.

We look forward to meeting you soon.

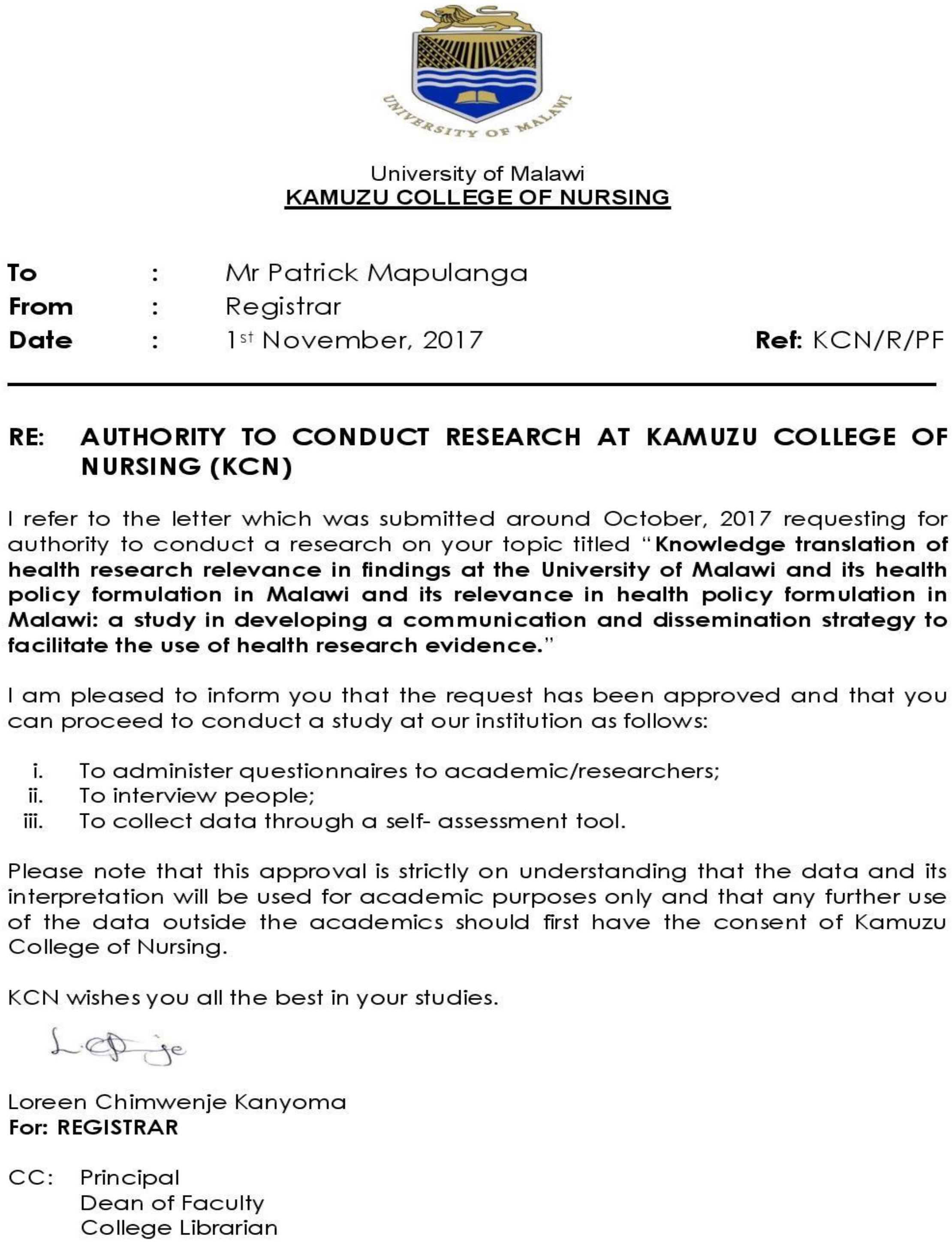
Yours sincerely,

University of Malawi
College of Medicine
29 AUG 2017
Registrar's Office
Private Bag 360, Blantyre 3

O Lipenga
FOR REGISTRAR

CC: Dean – Postgraduate & Research Studies
Director – Malaria Alert Centre
Director – MLW
Director – Research Support Centre

Appendix I: Authorisation Letter from the Kamuzu College of Nursing



University of Malawi
KAMUZU COLLEGE OF NURSING

To : Mr Patrick Mapulanga
From : Registrar
Date : 1st November, 2017 **Ref:** KCN/R/PF

RE: AUTHORITY TO CONDUCT RESEARCH AT KAMUZU COLLEGE OF NURSING (KCN)

I refer to the letter which was submitted around October, 2017 requesting for authority to conduct a research on your topic titled "**Knowledge translation of health research relevance in findings at the University of Malawi and its health policy formulation in Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence.**"

I am pleased to inform you that the request has been approved and that you can proceed to conduct a study at our institution as follows:

i. To administer questionnaires to academic/researchers;
ii. To interview people;
iii. To collect data through a self- assessment tool.

Please note that this approval is strictly on understanding that the data and its interpretation will be used for academic purposes only and that any further use of the data outside the academics should first have the consent of Kamuzu College of Nursing.

KCN wishes you all the best in your studies.

Loreen Chimwenje Kanyoma
For: REGISTRAR

CC: Principal
Dean of Faculty
College Librarian

Appendix J: Authorisation Letter from the Dignitas International

DIGNITAS

Ref: 41248

7th December 2017

Dear Patrick Mapulanga,

Re: Permission to conduct an interview and administer a self-assessment tool on health research findings and health policy formulation in Malawi

Reference is made to your letter dated 24th July 2017 in which you requested for permission to conduct a study at Dignitas International on a topic titled '*Knowledge translation of health research findings at the University of Malawi and its relevance in health policy formulation in Malawi: a study in developing a communication and dissemination strategy to facilitate the use of health research evidence'*. I am pleased to inform you that permission has been granted.

Regards,

Josh Berman

Ideas to Impact Lab Director

Dignitas International