

HEALTHY LIFESTYLE INTERVENTIONS: A SYSTEMATIC REVIEW FROM THE REALIST PERSPECTIVE

Submitted in part fulfilment of the degree of Master of Public Health (Health Economics)

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PREAMBLE

This thesis is a systematic review using realist methodology. It emerged out of an original protocol that proposed an exploration of the barriers to a healthy lifestyle in poorer peri-urban communities. The purpose of that protocol was to design more effective lifestyle interventions, and participatory action research was identified as a potentially effective methodology to encourage behaviour change in contexts where self efficacy may be low. That development itself raised questions about what exactly was meant by action research, participatory action research and community based participatory methodologies and how effective they were. Given these questions, it was decided to undertake a systematic review of published literature and it is that review that is presently submitted as a thesis.

Large parts of the protocol submitted in Section A have been taken from the original protocol that was submitted to and approved by the ethics committee. It explores the likely barriers to a healthy lifestyle in poorer communities and provides some South African context, but does not explore realist methodology or participatory methodologies in depth. The omission is deliberate because these issues are analysed in the literature review in Part B and repetition has been avoided where possible, a difficult task given the required structure of the thesis for the Master in Public Health degree. The mixed-methods data capture instruments proposed in the original protocol have not been included. They have not been used and, in the light of the findings of this systematic review, they probably will not be.

CONTENTS

PART A: PROTOCOL

Overview of the “chronic diseases of lifestyle” literature with particular reference to South Africa, problem statement, objectives and methods.....	4
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PART B: LITERATURE REVIEW

B1: History and philosophical basis of action research, participatory action research and community based participatory research.....	14
B2: Current use of terms “action research”, “participatory action research” and “community based participatory research.”	19
B3: Evaluating programmes designed to bring about behaviour change	
B3.1: Theory driven evaluation: Overview	24
B3.2: Realist enquiry – theoretical basis and practical process.....	26
B3.3: Methodological difficulties and confusion about realist review.....	28
B3.4: Proposed adaptation of realist enquiry methods.....	30
B4: Theories of behaviour	
B4.1: Models of intention driven behaviour	32
B4.2: Models of behaviour change.....	33
B4.3: Critique of rational behaviour models.....	34
B4.5: Synthesis of behavioural models.....	35
B5: Summary and interpretation of literature review	39

PART C: “JOURNAL READY” MANUSCRIPT

“Healthy lifestyle interventions: a systematic review from the realist perspective.”	40
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PART D: APPENDICES

Instructions to authors Social Science and Medicine.....	68
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PART E: EXECUTIVE SUMMARY/POLICY BRIEF	79
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REFERENCES.....	82
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ABSTRACT

Background

There is an emerging epidemic of chronic, non-communicable disease in low and middle income countries. The demonstration of tangible health benefits with lifestyle interventions has stimulated an interest in diet and exercise programmes targeted at poorer communities. A protocol exploring the possible drivers of unhealthy lifestyles in South Africa was produced, and participatory action research was identified as the “best fit” to address issues that may arise from low self-efficacy. However, as initial review of the literature indicated conflicting results about the efficacy of these interventions, particularly in poorer communities. A systematic review of community based lifestyle interventions was undertaken in order to understand why community based lifestyle interventions may succeed or fail.

Methods

Realist evaluation was selected as the method of choice. This required identification of the proposed mechanisms by which participatory action research is assumed to work; “problematisation” – or the extent to which an issue is considered problematic - was identified as an important prerequisite to action. Realist methodology was modified so that recurrent associations of context and outcome could be used to consider probable mechanisms. A systematic but not exhaustive search of the literature on community based participatory methodology and action research was undertaken using the Medline and CINAHL databases. Results were hand sorted into target groups and those involving lifestyle interventions were extracted.

Results

Interventions were more likely to succeed when community members had approached researchers with a request for help and this supported the role of problematisation. The mechanisms explaining other recurrent context-outcome regularities, such as poorer participation by the young and by men, were unclear.

PART A: PROTOCOL

“Epidemics appear, and often disappear without traces, when a new culture period has started...The history of epidemics is therefore the history of disturbances of human culture”. Rudolf Virchow.

Problem Statement

South Africa, in common with many other low and middle income countries, is facing an epidemic of diseases of lifestyle, including the chronic cardiometabolic conditions associated with overweight and obesity (Mayosi et al., 2009). This burden of disease follows a wealth gradient and is greater in poorer populations (Abegunde et al 2007; Groenewald et al., 2008; Marmot et al , 2005; WHO, 2004). It is logical that lifestyle change is necessary to tackle a disease of lifestyle, and the Diabetes Prevention Programme (Knowler 2002) demonstrated a significant reduction in the incidence of diabetes with an intensive programme of diet and exercise. This lead to an interest in community lifestyle interventions using participatory community methodologies. While these are appealing instruments for encouraging community behaviour change, the success of this approach is unclear, partly because differences in context, the content of the intervention and in outcome measures make both comparison of studies and systematic analysis difficult.

The chronic non-communicable disease epidemic: “diseases of lifestyle” are not “diseases of affluence”

Cardiovascular disease and diabetes were historically considered diseases of affluence. However, this perspective has changed with the recognition that risk factors for cardiometabolic disease occur at an early stage of economic development. It has been shown that as national income increases, there is a rapid increase in both population mean body mass index and serum cholesterol, which eventually flattens off and then declines (Ezzati et al., 2005) The burden of

disease from these conditions is now highest in low and middle income countries (World Health Organisation, 2004) and in economically deprived communities within richer countries (Marmot et al, 2005). Age standardised death rates from chronic diseases in low and middle income countries are 50% higher for men and 80% higher for women than in high income countries (Abegunde et al., 2007).

The situation in South Africa mirrors that globally. The WHO's 2004 report estimated that South Africa's burden of disease from chronic non communicable diseases was at least twice as high as in high income countries (Mayosi et al., 2009; WHO, 2004) and within South Africa, there is a poverty gradient with a significantly increased risk of death from diabetes, hypertension and stroke in Khayelitsha and Mitchell's Plain compared to the more affluent Cape Town suburbs (Groenewald et al., 2008).

Risk Factors

Cardiovascular disease and diabetes share the well recognised risk factors of obesity and a sedentary lifestyle. These risk factors are associated with urbanisation. An aging population, increasing urbanisation and dietary changes in both rural and urban populations mean that substantial increases in these conditions can be expected (Mayosi et al., 2009). Arteritis associated with HIV/AIDS and the atherogenic consequences of treatment with antiretrovirals will almost certainly contribute to the disease burden from cardiovascular disease in the future (Mayosi et al., 2009). Cardiovascular disease and diabetes are likely to impose an increasing strain on an already stretched health system.

Challenges in controlling chronic non-communicable disease in low and middle income countries

Adherence to chronic treatments is problematic worldwide and is assumed to be worse in economically disadvantaged communities, although measurement difficulties mean reliable data are scarce (WHO., 2003). In a study of the

Agincourt community in rural South Africa, over a quarter of individuals reported that they did not take their prescribed treatments. This study analysed the factors inhibiting access to care. In vulnerable households the major barrier was financial, particularly in relation to transport costs, but regular drug stockouts, administrative confusion and poor communication with providers were also relevant (Goudge et al, 2009).

However, deficiencies in the health system are not the only factor contributing to poor control of chronic conditions. Individuals and communities have the potential for substantial control over the disease burden with lifestyle modification.

Evidence for health gains with lifestyle interventions

There is good data from randomised trials showing that lifestyle modification programmes with diet and exercise have a beneficial effect on health. The Diabetes Prevention Program Research Group found that lifestyle intervention reduced the incidence of new diabetes in overweight individuals by 58% over 2.8 years, the average weight loss was 5.6kg (Knowler et al 2002). The Trials of Hypertension Prevention Phase II study reported that individuals who can sustain a weight loss of at least 4.5kg over 36 months had significant reductions in blood pressure and a relative risk of developing hypertension of 0.35 compared to controls (Stevens et al., 2001). The Look AHEAD study has randomised over 5,000 overweight type 2 diabetics to programmes of either lifestyle modification with diet and exercise, or more conventional management with diabetes education, interim results suggest that those on the lifestyle modification intervention are fitter and use fewer medications than the control arm (Jakicic et al., 2009; Redmon et al., 2010). However, the health benefits extend beyond reduction in cardiometabolic risk. Significant reduction in urinary incontinence in obese women has been shown with weight losses of between 5% and 10% of body weight (Wing et al., 2010).

It should be noted that the intervention in all of these studies was lifestyle modification involving exercise as well as dietary changes. It appears that exercise offers a protective effect that is independent of weight loss, two systematic reviews having shown that active obese individuals have lower cardiovascular mortality than sedentary individuals of normal weight (Blair & Brodney, 1999; Fogelholm, 2010). It is possible that the modest weight loss indicated in the studies above was an indicator of lifestyle change, rather than being an independent determinant of morbidity.

Several of the papers describing the magnitude of chronic diseases call for policies and planning to address unhealthy lifestyles, but the required behaviour change is not something that can be dictated by policy. It is a common experience among health professionals that patients who are advised to lose weight and exercise, do not reach their goals.

There are several models of health behaviour that are examined later in this thesis, but important insights are offered by social cognitive theory (Bandura, 1989). This theory sees human function as the result of a bi-directional interplay between personal factors, environmental factors and behaviour. Although relationships are bidirectional, they are not equally strong, for example, individuals are the product of their environments but also, to some extent, create the environment they experience: aggressive individuals are more likely to encounter a hostile social environment than friendly individuals. Central to the theory is the recognition of self-regulatory mechanisms, where individuals are able to reflect on the consequences of their actions and change behaviour accordingly (Pajares, 2002). According to social cognitive theory, the most important determinant of behaviour change is self-efficacy, which is a belief that the individual is capable of making behavioural changes perceived as necessary, and that the changes will result in the desired outcomes and are therefore worthwhile. Self-efficacy can be seen as a belief that the individual has some control over the behaviours and events that affect their lives. The level of self-efficacy has been shown to be negatively correlated with both personal and neighbourhood socioeconomic status (Boardman & Robert, 2000) and it is a

particularly interesting factor to explore in view of what has been called South Africa's "passive citizen culture" (Ramphela, 2012), an entrenched feeling of powerlessness resulting from decades of actual powerlessness.

Related to self-efficacy are patients' perceptions of the extent of weight loss and exercise required to have a beneficial effect on health. The higher the perceived goal, the greater the self-efficacy required to achieve change. The weight loss in the interventions described above was relatively modest, at around 5-10 kg and should be seen as achievable by most people. The exercise requirements are also not prohibitive, most following the pattern of the Diabetes Prevention Programme, which prescribed 2.5 hours of moderate intensity aerobic exercise per week, moderate intensity being defined as "exercise during which you can talk but not sing" (Centers for Disease Control and Prevention., 2011).

Misconceptions may result in an unnecessary barrier.

Social norms are key to other behavioural models and deserve consideration (Fishbein & Ajzen, 1975). A qualitative study of white, working class men in Denmark found that their ideal body image was associated with a weight of at least 100kg, slenderness in men being associated with homosexuality (Sabinsky, Toft, Raben, & Holm, 2007). Whether South African norms favour higher BMIs is unclear. Although the fictional Mma Ramotswe has popularised the concept of the healthy, "traditionally built" African woman, and one South African study indicated that fewer women considered themselves obese than whose body mass index was in the obese range (Puoane 2002), studies of Ghanaian women showed an ideal body image within the normal range (Jumah & Duda, 2007), and both black and white urban South African adolescents shared the same body image preoccupations (Szabo & Allwood, 2006).

Obstacles

Factors in the external environment may also become barriers to exercise and healthy eating. Lack of green space, fear of ridicule when exercising, personal

safety concerns and family pressure not to change preferred and familiar foods may all play a part and merit exploration.

How effective are community lifestyle interventions?

While the diabetes prevention programme established the potential of lifestyle interventions in general, it is unclear whether the approach has been successfully applied in poorer communities. The Looma Healthy Lifestyle Programme was established as a community initiated and run lifestyle intervention programme in a remote Australian Aboriginal community in 1993. The 7 year results showed some improvements in diet, physical activity and biochemical parameters, but not sustained weight loss (Rowley et al., 2000). A similar 2 year long community directed intervention programme in a remote Canadian Aboriginal community found some reduction in blood pressure, but no change in weight and a worsening in glucose control. Although the investigators had taken some trouble to identify cultural norms and values at the beginning of the investigation, they felt that these findings had not been sufficiently integrated into the programme and that this had contributed to failure (Daniel et al., 1999).

A “bottom up” approach to knowledge and knowing has become popular in recent decades, the underlying philosophy is that knowledge generated only by a society’s powerful cannot fully represent the interests of the poor (Baum, MacDougall, & Smith, 2006; Cornwall & Jewkes, 1995). However, there is conceptual haziness between the related concepts of action research, participatory action research and participatory methodologies. This lack of clarity about how participatory methodologies should work, together with doubts about the effectiveness of community lifestyle interventions indicate that a systematic review may be useful. However, the heterogenous nature of the interventions and the outcome measures make this a challenge.

Realist evaluation, a type of theory driven evaluation where variety is seen as adding richness to the analysis, is a potential tool for the systematic analysis of this type of literature (Jagosh, MacCaulay, & Pluye, 2012; Marchal, van Belle, van

Olmen, Hoeree, & Kegels, 2012; Pawson & Tilley, 1997; Pawson, Greenhalgh, Harvey, & Walshe, 2005). However, it requires that mechanisms thought to explain both the behaviour and the intervention are made explicit so that they can be interrogated by the empirical evidence (Pawson, 2006). Realist evaluation is a potentially useful methodology for examining the family of participatory research methods applied to lifestyle change and may yield some generalisable lessons from this heterogeneous literature.

Research Question

How effective are participatory methodologies in achieving lifestyle change related to diet and exercise, and why do they succeed or fail?

Objectives

1. To determine the philosophical basis of the participatory methodologies in order to understand the mechanisms by which they are intended to work and to provide clarity to the terms action research, participatory action research and participatory methodologies.
2. To explore how the terms action research, participatory action research and participatory community methodologies are used in the literature.
3. To define appropriate methodology for the systematic analysis of this type of literature.
4. To determine the effectiveness of participatory methodologies in achieving diet and exercise related lifestyle change by systematic review.

METHODS

Study type: Literature review using realist evaluation.

Review Strategy:

1. Search strategy: systematic but not exhaustive search of the use of the family of participatory approaches. The CINAHL and Medline databases are interrogated using “community based participatory research” as a MeSH term; or “action research” in title or abstract.
2. Inclusion criteria: Papers will be retained for analysis if they include any sort of community consultation process followed by an action.
3. Papers will be hand sorted and included in the systematic review if the consultation and action were directed towards exercise and/or dietary change in patients with, or at risk of, cardiometabolic disease.
4. The assumed mechanism for these lifestyle interventions will be abstracted after an initial read and made explicit as a theory that can be interrogated by the available data.

Data Handling

Reviewed papers will be loaded onto a qualitative analysis programme (Dedoose 4.9.5) for coding of context, mechanism and outcome variables

Ethics

Because the project requires secondary analysis of published data that is in the public domain, there are no significant issues surrounding confidentiality. The systematic review will provide benefit to the broader community by allowing better planning of lifestyle interventions.

Dissemination

Publication in a peer reviewed journal is anticipated.

PART B: STRUCTURED LITERATURE REVIEW

A core theme of this thesis is the importance of mechanism: mechanisms that drive and maintain unhealthy behaviours, and the mechanisms by which participatory interventions may work. The reason behind this search for mechanism is that it allows us to take a different approach to the definition of causality. The generative theory of causality holds that outcomes occur as result of mechanisms operating in different contexts, it is the understanding of *why* things happen in certain contexts. It is in contrast to the successionist theory of causality that holds that an action can be said to cause an outcome if the association is consistent when all other variables are held constant. The generative explanation of causality and , the realist approach that stems from it, are appealing tools for analysing social interventions because variable contexts are seen to add richness and explanatory power rather than being confounding variables.

This literature review is presented in four parts. Firstly, the origins and nature of action research (AR), participatory action research (PAR) and community based participatory research (CBPR) will be explored in order to determine the mechanisms by which they were originally understood to generate knowledge. In order to understand how these approaches are currently used, a systematic review of the way in which these research labels are applied in the current literature is then presented. To explore appropriate instruments for the systematic review of interventions sited in complex and uncontrolled social environments, methods for theory-based evaluation are then reviewed and the difficulties and controversies surrounding the relatively new approach of realist evaluation are explored. Finally, the widely used models of behaviour and behaviour change that were developed in the last half of the twentieth century are critically reviewed with a view to developing programme theories.

B1. HISTORY AND PHILOSOPHICAL BACKGROUND OF ACTION RESEARCH, PARTICIPATORY ACTION RESEARCH AND COMMUNITY BASED PARTICIPATORY RESEARCH.

In order to identify the possible mechanisms by which participatory methodologies are understood to work, it is necessary to explore exactly what is meant by this trio of terms - and whether they do, in fact, have distinct meanings. For this, it is necessary briefly to explore the history of action research, participatory action research and community based participatory research and their origins in the 20th century progressive education and child psychology movements.

Action research is the earliest of the three terms to make a regular appearance in the English literature and the action research strategy can be traced back to the American educational reform movement of the early 1900s. Faced with potential social upheaval following America's rapid industrialisation and increasing wealth, progressives felt that "schools...should take the lead in enabling citizens to understand an industrialized, urbanized nation" (Mershon & Schlossman, 2008). A pioneering institute in the movement to open children's minds and empower them to become active citizens was Teacher's College, Columbia University (*About teachers college*.2013), whose faculty John Dewey the educational reformer and philosopher joined in 1904.

The need for better ways of learning and knowing, and for education to develop on a scientific basis was recognised and in 1916, the National Association of Directors of Educational Research was formed. One of the founding members was Burdette R Buckingham, a former teacher, school superintendent and PhD graduate of Teacher's College. In 1922, Buckingham edited "Improving Schools by Standardized Tests" (Brooks, 1922). In the introduction, he draws attention to the value of generating knowledge by trying out an idea that makes sense and assessing the results. He contrasts this with researchers whose "occupation is straining at gnats and swallowing camels [and who] would hold up all progress while they split hairs over the setting up of a theoretically perfect 'criterion'". In

his 1926 “Research for Teachers” (Buckingham, 1926), Buckingham urges teachers to use their classrooms as laboratories by trying out better ways of teaching and observing the results. This idea of learning by doing lies at the heart of action research.

It is not clear when the term “action research” entered common currency, but it was already in use in 1945 when the American social reformer John Collier founded the Institute of Ethnic Affairs, described in its prospectus as an “action research agency created to find and to achieve solutions to problems within and between white and colored peoples, cultural minority groups and dependent peoples at home and abroad” (Brohoff & Patterson, 1973).

The child psychologist Kurt Lewin is usually credited with the first description of action research. Writing just after the Second World War, he likened social research to a bombing raid where target selection and planning was followed by action, and then followed by reconnaissance to see what had been achieved. This translated to a cycle of planning, action and reflection. In “Action Research and Minority Problems”, Lewin reports the use of action research methods in race-relations workshops in Connecticut (Lewin, 1946). It is a convincing and compelling manifesto for action research, but it is not – nor does it claim to be – the first description of action research.

Lewin died the following year at the age of 57, but an important debate on the nature of action research followed between John Collier and Lewin’s protégé and colleague Ronald Lippitt, who served as a director of Collier’s Institute of Ethnic Affairs. Collier felt that action research should be geared towards a particular political agenda, and that the researcher should make the group’s goals his/her own. Lippitt felt that the researcher should be a sympathetic mediator in helping the group achieve its goals, but that close identification with the goals of one action group would both undermine the scientific process and inhibit the researcher’s ability to form working relationships with other groups. Critically, Lippitt identifies his role as:

“...social therapy with skilled, non-directive leadership in the fact-facing and insight- having process... complete acceptance of previously rejected facts can be achieved best through the discovery of these facts by the group members themselves” (Cook, 2002).

Recognition of the importance of reflection and self discovery for the participants was an important new departure for action research.

The field evolved further in Latin America from the 1960s, largely informed by the work of Brazilian educator Paolo Freire, and it is in the South American context that the term “participatory action research” becomes used interchangeably with “action research.” Freire’s influential book, “The Pedagogy of the Oppressed” (Freire, 1970) was inspired by his experiences teaching illiterate peasants, and further nails down the importance of reflection and self discovery for the participants.

Like the earlier progressive educators in the United States, Freire saw education as an essential tool for advancing social justice, but rather than wishing to equip students to accommodate and possibly shape a changing world, “Pedagogy of the Oppressed” has an explicitly revolutionary intent. Freire argues that the oppressed have internalised feelings of inferiority and cannot be genuinely liberated until they have become aware of this and ceased to accept it as normal. For Freire, liberation cannot be granted by external agents, particularly because the powerful retain their “lack of confidence in the people’s ability to think, to want and to know.” He contends that meaningful reflection by the poor on their circumstances will lead to action and that action followed by reflection on the consequences of that action will result in genuine liberation. This suggests a more profound consequence of the action-reflection cycle - psychological liberation and a more complete experience of humanity for the oppressed, Freire called this self-realisation “*conscientização* [conscientization]”. His philosophy was translated into research methodology by Latin American social scientists such as Orlando Fals Borda, João Bosco Pinto and Michel Thiollent (Montero, 2000; Thiollent, 2011).

The MeSH term “community based participatory research” (CBPR) was introduced in 2009 to capture the growing interest in involving communities in the generation of knowledge about themselves. However, CBPR does not share the explicit philosophical basis of AR/PAR.

This historical review has shown that the loose usage of the terms AR/PAR/CBPR can mask explicit understandings about how knowledge is generated. Action research was originally “learning by doing” and although motivated by a desire for social progression, the learning was primarily done by the researcher. The importance of learning by the participants, particularly when reflecting on their own norms and values, was recognised by the middle of the 20th century and articulated by Ronald Lippitt; this approach was then developed further by Freire to posit a more generalised psychological and spiritual emancipation of the poor as a result of the reflection-action-reflection cycle.

Two distinct mechanisms for the participatory methodologies have emerged. Firstly, there is a re-fashioning of the power relationship between researcher and researched; secondly in AR/PAR but not necessarily in CBPR there is a process of “conscientization” or “problematization” of issues in the minds of the researched that is created by a process of reflection. Although popular, the status of these methodologies in the second decade of the 21st century is unclear. Several authors note that participatory methodology is a requirement for some grant giving organisations, the implication being that the claim to participatory methodology may be motivated by more than ideology (Thiollent, 2011), and that the refashioning of the power relationship between the researcher and the researched that characterised participatory methodologies from the 1960s has been diluted or lost (Cornwall & Jewkes, 1995; Montero, 2000). Ugalde goes further and suggests that the participatory label was used as a Trojan horse to promote political agendas not necessarily in the interests of the research subjects in Latin America (Ugalde, 1985). It is interesting to consider at what point “conscientization” becomes “thought control”. The issue about whose

agenda is advanced by action research was noted by Lewin, who commented that "Science gives more freedom and power...to democracy and fascism. The social scientist should recognize his responsibility also in respect to this." (Lewin, 1946). The question of "who decides what should become 'problematized' by whom" during the process of facilitated reflection should be asked in a critical approach to action research

B2: REVIEW OF CURRENT USE OF “ACTION RESEARCH”, “PARTICIPATORY ACTION RESEARCH” AND “COMMUNITY BASED PARTICIPATORY RESEARCH”

The evolution of action research into a method where critical reflection is a pre-requisite to action, and action becomes a means of “conscientization” and emancipation has been described; this has been contrasted with the rise of community participation techniques that may partly share the intent of action research but lack its philosophical foundation. It is informative now to explore the scope and current practice of these terms in the literature. The popularity of these research methods means that most search strategies yield many thousands of results. However, a pragmatic approach can be taken and a search strategy constructed that is representative and systematic without being necessarily exhaustive.

Two large health related databases were chosen, Medline and CINAHL, and the following query made:

Mesh term: Community based participatory research [N05.425.104]
OR “Action Research” in title or abstract.

The search yielded 4,897 results, and titles and abstracts were hand screened by a single researcher, retaining those in English where some sort of qualitative consultative process in a population was followed by an action. This broad search strategy generated a large number of results many of which were not relevant to the questions that prompted the search. In order to leave a clear audit trail for the literature review, the last 100 records in each batch of 1000 were sampled to document reasons for exclusion, these results are shown in Table 1. Following the initial screening process, seven hundred and eighty seven records were retained for further inspection.

Table1: Reasons for exclusion in sample of 500 records.

Retained for assessment	57	(11%)
Reflections on the process or place of AR/PAR/CBPR	128	(26%)
Community perceptions assessed but no action*	83	(17%)
No abstract or incomprehensible abstract	16	(3%)
Not health related	16	(3%)
Not English	18	(4%)
Duplicates	49	(10%)
Other**	131	(26%)

*Includes “baseline” or “partial” reports of a process

**Includes papers related to the “action research arm test” in rehabilitation, papers with no qualitative methodology and papers unrelated to search strategy.

Papers were then sorted according to the “target” community as a reflection of the power relationship between researcher and researched. The results are shown in Table 2.

Target Community			Number of studies
Socioeconomic identity (275)	Racial/ethnic minorities (183)	Aboriginal peoples	61
		Others	122
	Low and middle income countries		92
	Rural and remote		10
	Socioeconomic other		23
Health workers (227)	Health professionals and students		211
	Healthcare organisations		12
	CHWs and volunteers		2
Age related (58)	Elderly		20
	Youth		29
	Children		8
Parenting and pregnancy			10
Specific health issues*			55
Occupation Specific			8
Environmental Issues			7
Other			116

*Largest groupings: mental health and disability

The largest single “target community” was health professionals, these were largely nurses, and in 200 of 211 studies (94.8%), the methodology was identified as “action research” or “participatory action research” in the abstract or title. This contrasts with studies of racial and ethnic minorities in richer countries, where only 44 of 183 studies (24%) were identified as action research. Unless the researchers felt that nursing staff were in need of self-realisation, the use of the term “action research” seems to have moved away from research with emancipatory intent, and towards a method for changing professional practices.

Assuming that the papers labelled as action research include a genuine process of “conscientization” and those labelled as CBPR do not, it is interesting to speculate about what this asymmetrical use of research methodology means. Does it indicate a de-valuing of the process of reflection in the poor, with less importance given to the psychological processes that determine behaviour, or does it just indicates fashion and habit in particular academic fields? Do researchers feel that nurses are in need of self-realisation, or is action research just seen as an effective way of influencing work behaviours in educated professionals? Whichever is true, it is clear that the CBPR literature examining behaviour change in poorer communities should be read with a critical eye to the extent of “problematization” of the issues at hand.

B3: EVALUATING PROGRAMMES DESIGNED TO BRING ABOUT BEHAVIOUR CHANGE

In order to draw conclusions about the effectiveness of lifestyle intervention programmes, it is necessary to compare a number of programmes of varying content, set in complex and uncontrolled social contexts, and which use various measures of outcome. While there are very likely to be generalisable lessons in this body of work, it cannot be systematically assessed using conventional tools. The experimental approach cannot be used to infer causation of outcomes because co-variables cannot be held constant, and a “Cochrane” type approach would assign a very low level of evidence to studies that may have a rich content of qualitative evidence but little experimental rigour.

The theory driven approaches to programme evaluation offer a tool to evaluate social interventions that are sited in uncontrolled environments, and one species of theory driven evaluation - realist evaluation - has been proposed as a suitable tool for systematic literature review. Despite ongoing methodological uncertainty about how best to use this approach, realist evaluation probably offers the most potential for a systematic review of the use of participatory methodologies for lifestyle modification. Firstly, a critical review of theory driven evaluation is necessary.

B3.1 Theory Driven Evaluation: Overview

The last decades of the 20th century saw a growing interest in evidence based policy that was paralleled by an interest in methods for evaluating programmes, together with academic controversy regarding how this should best be done. There is ongoing debate about how best to evaluate social interventions, the following review will explore some of those controversies.

One point of contention is whether it is sufficient to know that a programme or intervention works, or whether we need to know the details of how it works: the academic metaphor is the programme as a “black box” versus a “transparent box”. The debate between Scriven and Chen in 1994 is reported in a review by Coryn et al (Coryn, Noakes, Westine, & Schroter, 2011); Scriven compares a programme to an aspirin that gives useful results without its users needing to know the mechanism of action, Chen counters that knowledge of a drug’s action will enable physicians to understand the conditions in which it works best and the possible side effects.

The theory driven approach to programme evaluation was described by Chen and Rossi in 1980. Their approach was stimulated by the large number of apparent “programme failures” measured by the then current approach of measuring administrator-defined programme goals. It was felt that this narrow understanding of programme outcomes missed important effects, and that social science theory could “unpack” programme function, provide a view of its component parts, and offer a more useful “multi-goal, theory driven approach” to evaluation (Huey-Tsyh Chen & Rossi, 1980). Theory driven evaluations go beyond the question about whether programmes work, they are concerned with why programmes work, or why they fail.

The two theory driven approaches to programme evaluation in current common use are theories of change and realist evaluation. As their starting point, they both require that the theory explaining how the programme is thought to work is made explicit; this theory becomes the template against which real life

observations are compared and it may become modified in the process. Both have the capacity to capture the complexity of social interventions that are applied in widely varied contexts.

In theories of change, the programme theory is a description of a process that is arrived at by consensus and involves the mapping out of an expected process using stakeholder consultation. The map includes programme requirements and preconditions, expected outcomes and measureable indicators of progress (Taplin & Clark, 2012), it is generally applied prospectively to search for blockages and weak links in a process.

Realist evaluation is a relatively new approach described by Pawson and Tilley in 1997 (Pawson & Tilley, 1997d). In realist evaluation, the programme theory is an understanding of the mechanisms by which the programme is understood to work. The proposed mechanism often involves a group of implicit, unproven, normative ideas. The researcher must make these explicit in order to test them and this requires a certain degree of substantive knowledge and subjective judgement; there is a risk that this construction is seen as an arbitrary process, but this misses the point. The theory to be tested by realist evaluation is a “best guess” starting point and the purpose of the review is to test and modify that theory in the light of empirical evidence. Realist evaluation is more concerned with identifying the circumstances in which a programme works best; it answers the question “what works for whom, in what circumstances and why?” (Pawson, Greenhalgh, Harvey, & Walshe, 2005). The defining characteristic of realist evaluation is a recognition that programme outcomes are highly dependent on circumstances, but it is underpinned by an explanatory imperative, to “look for causal powers within the objects or agents or structures under investigation” (Pawson, 2006). The two approaches were compared by Blamey, who offered the insight that the two theory driven approaches may be complementary, with theories of change giving insights into the mechanics and process of implementation, and realist review indicating the particular approaches that may be most effective in different groups and environments (Blamey & MacKenzie, 2007).

B 3.2 Realist Enquiry – Theoretical Basis and Practical Process

Realist enquiry is based on an explicit philosophical understanding of cause and effect. The successionist theory of causation underlies experimentation: If B invariably follows A when all other variables are held constant, then A can be said to cause B. Conversely, the generative theory of causation is the foundation of realist enquiry. It proposes that B happens as a result of a mechanism operating in a context; rather than trying to associate variables in a predictable cause and effect relationship, it is the mechanism itself that is the regularity (Pawson & Tilley, 1997c). In testing that regularity, a variety of contexts is seen as adding richness to the context variable, rather than being confounders that need to be controlled. The goal of realist evaluation involves the identification of configurations of context, mechanism and outcome (CMO configurations) that indicate what works for whom, in what circumstances and why. Pawson and Tilley's basic ingredients of realist social explanation are reproduced in Figure 1

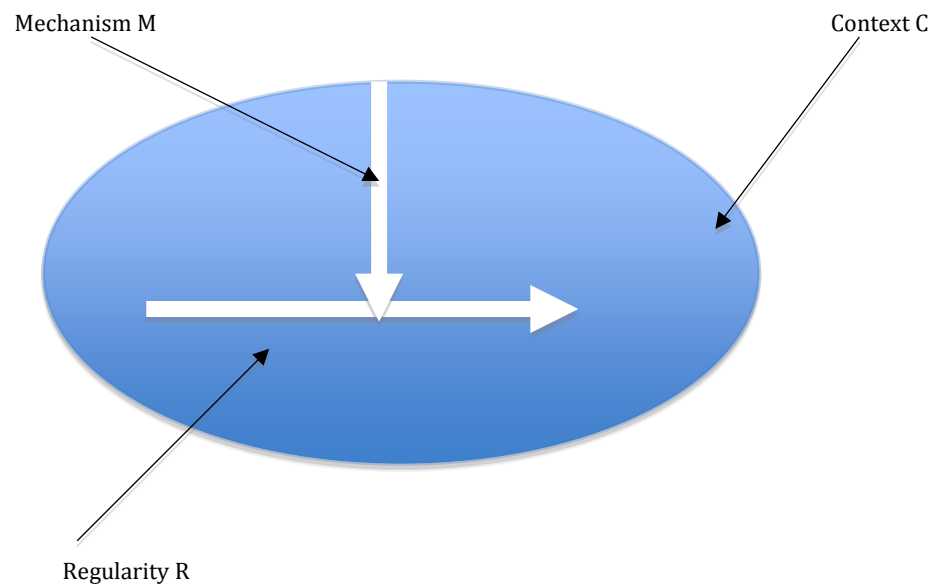


Figure 1: “Basic ingredients of realist social explanation” (From Pawson and Tilley (Pawson & Tilley, 1997d))

Pawson identifies several steps for a realist evaluation. Firstly, the review question needs to be clarified. Secondly, the means by which a programme is assumed to work must be identified and made explicit as a programme theory or theories. The search for evidence to test those theories follows, this may involve a variety of strategies with a high proportion generated by purposive strategies such as “snowballing” (Pawson et al., 2005), but must leave a clear, reportable audit trail. Data sources are included in the review on the basis of their usefulness in testing an implicit understanding about how an intervention is thought to work, together with an acceptable degree of rigour (Pawson et al., 2005). The data sources are then examined for recurrent associations, termed regularities, although Pawson later terms them “demi-regularities” because they are true some of the time, but not all of the time (Pawson, 2006). Pawson and Tilley define a regularity as “mechanism+context” (Pawson & Tilley, 1997c) and suggest that regularities can be used to build up a raft of different CMO configurations.

B 3.3 Methodological Difficulties and Confusion about Realist Review

While the underlying philosophy linking cause and effect seems a promising approach to interventions set in complex social environments, the realist evaluation literature makes for difficult reading and indicates some ongoing methodological uncertainty. In a review of realist evaluation in health systems research, Marchal identified several papers that used the terms “theory-driven evaluation”, “theories of change” and “realist evaluation” interchangeably (Marchal, van Belle, van Olmen, Hoeree, & Kegels, 2012). Some papers do not make a clear distinction between theories of evaluation and theory-driven evaluation (where the theory addresses the programme being evaluated, not the evaluation process itself) (Coryn et al., 2011). There are further inconsistencies about what constitutes the theory or theories under scrutiny, and the nature of the tool for interrogating them. These are examined next.

What is a theory?

The term “theory” is variously used by Pawson and Tilley to refer to the mechanism itself (Pawson & Tilley, 1997c); to “propositions about how mechanisms are fired in context to produce outcomes” (CMO configurations) (Pawson & Tilley, 1997a), and as more abstracted, transferrable hypotheses about likely outcomes in the presence of specified contexts and mechanisms – this is termed the “middle range theory” (Pawson & Tilley, 1997b). Marchal, while referring to the lack of methodological guidance noted by others, interpreted realist evaluation as a cycle, where the middle range theory is interrogated and modified in the light of a variety of CMO configurations (Marchal et al., 2012). However the more recent RAMESES publication identifies the starting point as the “programme theory” and indicates that the purpose of the evaluation is to identify the CMO configurations that constitute middle range

theories and suggest what works best in what circumstances and why (Wong et al., 2013).

What is a mechanism?

A further difficulty is the issue about what constitutes a mechanism and how it can be identified in empirical work. Many of Pawson and Tilley's examples are drawn from the field of criminality and crime prevention, and the mechanisms used reflect theories about how interventions may deter crime. The mechanisms assume that, for example, criminals make a calculation about how likely they are to "get away with it", and that calculation guides a rational choice. An example of such a CMO in health behaviour might be: context - clinic far from transport links; mechanism - patient unable to get to clinic; outcome - patient defaults from treatment. However, these mechanistic explanations are not always available and while the logic of the CMO argument makes sense, in practice mechanisms are usually hidden (Astbury & Leeuw, 2010). While efforts can be made to uncover the reasons why people make the choices they do, in a retrospective synthesis this information will often have to be inferred or guessed. This is particularly the case when the programme is designed to bring about behaviour change. Behaviour is itself a complex phenomenon described by a number of theories, these are briefly outlined in part B3.4 of this review and it is clear that in a retrospective literature review, few reports will give adequate information to make a judgement about the mechanisms underlying behavioural choices

The ongoing methodological uncertainty suggests that either there is something fundamentally unsatisfactory in the way that realist logic is applied to practical enquiry; or that the approaches are obscure and inaccessible to the average researcher. Interestingly, Pawson himself states that realist evaluation is not a research method as such, but a: "*logic of inquiry* that generates distinctive research strategies and designs, and then utilises available research methods and techniques within these." (Pawson, Greenhalgh, Harvey, & Walshe, 2004). If

this is the case, it seems completely legitimate to use the logic of realist evaluation with its power to assess use of a theory in diverse contexts, but to adapt the tools.

B3.4 Proposed Adaptation Of Realist Enquiry Methods

In a review of published literature, the regularities that are found will tend to be associations of context and outcome and, with behavioural interventions, the mechanisms may well be hidden. A regularity (or demi-regularity) can usefully be refashioned as “context+outcome”. The basic ingredients of a realist review would then be written:

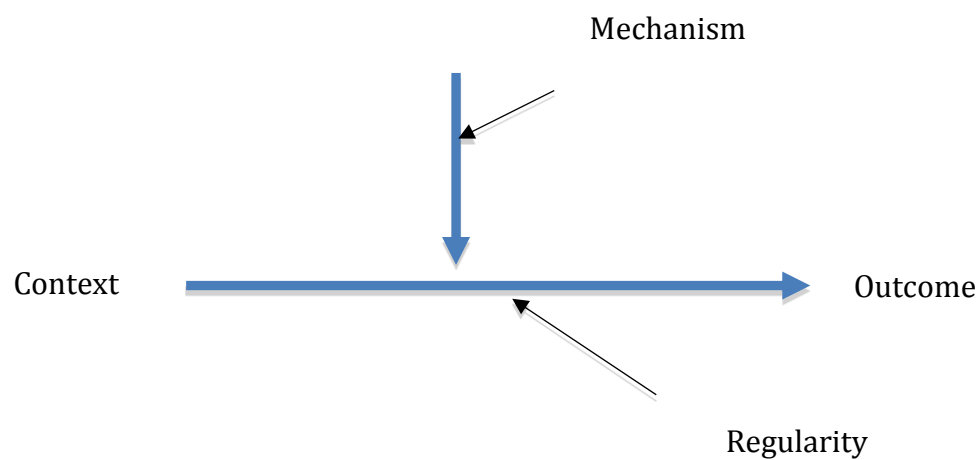


Figure 2: Proposed modification of the understanding of “regularity”.

When viewed in the aggregate, patterns of context and outcome would focus attention on the mechanisms that need to be uncovered. This is an incomplete answer to the question of what works for whom, in what circumstances and why, but it does not disregard the importance of mechanism and preserves the logic of realist enquiry. In order to uncover why people in certain contexts behave in a certain way, it is necessary first to establish that they *do* behave in certain ways in certain contexts. The likely mechanisms that determine behaviour can then be considered in the light of models of behaviour, these are considered in the next section.

Finally, Pawson and Tilley suggest that programmes “work” by introducing “blocking” mechanisms that compete with the default mechanism fired in a particular context and produce a different outcome. This concept is shown graphically in Figure 3:

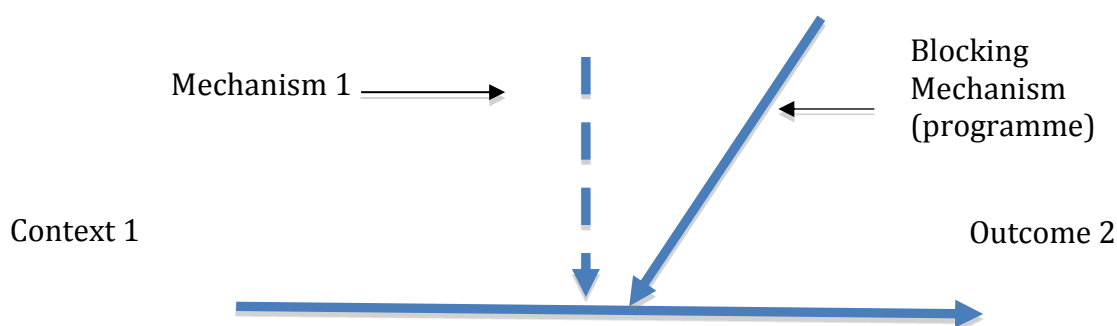


Figure 3: Mechanisms and blocking mechanisms

B4 THEORIES OF BEHAVIOUR

The social scientist wishing to explain behaviour has a wide variety of models to choose from. In a review commissioned by the UK Government's Social Research Unit, Darnton examined over 60 social-psychological models of behaviour in view of the "recognition of the increasing importance of influencing behaviour in order to achieve policy outcomes" (Darnton, 2008b). Putting aside some disquiet about the Orwellian implications of this initiative, the variety of models available probably indicates that none is completely satisfactory for all purposes. However, there is a common structure to many of these models, which build upon some key 20th century works. An important underlying theme is that behaviour is determined by intentions, and that intentions are a rational, utility optimising response to other factors (Darnton, 2008a). Prager also reviewed several models of behaviour and of behaviour change for Scotland's Environment (Prager, 2012); Darnton and Prager both identify Ajzen's theory of reasoned action and Triandis' theory of interpersonal behaviour as the best known examples of models based on intention driven behaviour (Darnton, 2008a; Prager, 2012) and so these are outlined in more detail.

B 4.1 Major Models of Intention Based Behaviour

Ajzen and Fishbein's theory of reasoned action argued that behavioural intentions were determined by attitudes and norms, but Ajzen later modified this theory to include "perceived behavioural control", or the individual's belief in their capacity to achieve the behaviour in question, and it is reproduced in Figure 4. The concept that an individual will evaluate his or her ability to achieve a behaviour in the context of external obstacles when forming behavioural intentions was also used by Bandura and termed "self-efficacy" (Bandura, 2006). Importantly, self-efficacy has been shown to be lower in poorer communities, and in their assessment of self efficacy and socioeconomic status, Boardman and Robert quote a body of work indicating that self efficacy has an influence on

health behaviours – weight management, physical activity, smoking and drug cessation and AIDS prevention(Boardman & Robert, 2000).

A less commonly used behavioural model, but one which is intuitively appealing, is Triandis' Theory of Interpersonal Behaviour (Darnton, 2008a) which includes emotions and habits. In this model, emotions influence intentions and habits can bypass the rational, intention based part of the process. The theory of interpersonal behaviour appears to have a more complete explanatory power than the Ajzen model and is shown in Figure 5. The issues of agency and self belief that are made explicit in Ajzen and Bandura's models respectively as "perceived behavioural control" and "self-efficacy" are not made explicit in the Theory of Interpersonal Behaviour, but are embedded in the concepts of "belief about outcomes" and "self concept". Self-concept refers to the goals or behaviours a person regards as appropriate for him or herself, and belief about outcomes indicates the expectation that a behaviour will result in a particular goal being achieved.

B4.2 Models of Behaviour Change

Prager makes a useful distinction between models that explain behaviour and those that describe the process of behaviour change. She outlines Persuasion Theories that assume that "exposure to information leads to a change in attitude" if the information is presented in the right way; Social Learning Theory that deals with motivation to learn – primarily influenced by example and by systems of rewards and punishments; and Community Based Social Marketing that focuses on the identification of barriers to a certain behaviour and strategies to overcome them. Prager and Posthumus' describe Adoption Theory (Prager & Posthumus, 2010), this appears to be the only theory that explicitly recognises the need for issues to be perceived as a problem before individuals or communities adopt "desired" behaviour changes.

B4.3 Critique of Rational Models

Because most of these models assume rational behaviour and because irrational behaviour is a recognisable human characteristic, it is at this point worth examining exactly what is meant by rationality. A useful critique of rational models of economic behaviour was written by Gary Becker (Becker, 1962)

Becker addressed the then current objections to the assumption of rational behaviour in economic theory. He stated that “rational behaviour” does not imply “lightning fast calculation, hedonistic motivation, and other presumably unrealistic behaviour”, but “consistent maximisation of a well ordered function, such as a utility or profit function”. He then goes on to show that economic theory does not depend on the assumption of individual rationality because even when households behave irrationally, the probability of their choices is determined by an opportunity space that is bounded by constraints of budget and price, and that the average (and therefore the aggregate) of the choices made approaches the value of a rational choice. Becker argues that empirical evidence supports microeconomic theory despite irrational behaviour because the empirical unit of analysis is the broader market, rather than the individual household that forms the theoretical unit of analysis. The implication is that economic theory is consistent with a wide range of irrational behaviour and works despite the rationality assumption, not because of it.

However, this does not mean that the assumption of rationality can be more generally dismissed as unimportant. Economic theory is concerned with predicting changes in consumption and production in the broader market, and it is aggregated household choices that matter, not individual ones. Theories used to explain health behaviour are principally concerned with the individual and while behaviours may certainly be confined to an opportunity space that is bounded by what is possible, individual irrational behaviours are not consistent with rational theories.

In a New York Times best seller, the behavioural economist Dan Ariely draws on a substantial body of academic work to make the argument that humans are “predictably irrational” (Ariely, 2008). This irrationality is not the same as the random irrationality whose mean effect approaches rational behaviour in Becker’s argument, but is rule-based behaviour that leads to predictable results - although not to consistent maximisation of utility. Ariely reports work indicating that the values we assign to objects are arbitrary and “anchored” to an initial suggestion of price (“coherent arbitrariness”); that our decisions are swayed by the choices of those around us, the impression we wish to give and by our emotions at the time; and how procrastination can result from the lower value placed on events in the future – this concept will be familiar to economists as “discounting”. Ariely also shows how social norms are easily replaced by market norms in human interactions, and how difficult it can be to re-establish social values. Ariely’s approach is implicitly realist in nature; as he defines the mechanisms driving irrational behaviour, he suggests blocking mechanisms that may result in utility gains.

B4.5 Synthesis of Behavioural Models

These models of behaviour have been included in this review because they indicate the complexity of current understanding about behavioural determinants, and because they provide the framework for considering mechanisms operating in programmes designed to bring about behaviour change.

It is a challenge to synthesise conflicting models of behaviour, but the empirical evidence will be considered with the understanding that: while intentions may to some degree be rational and based on what the individual thinks is “good for” him or herself, they are strongly affected by non-rational factors. These include the individual’s perception of his or her ability to achieve the desired outcome (which may itself be influenced by socioeconomic status); by already established values; by emotions; and by the choices of others. It is also clear that there is a disconnect between the currently accepted and best known models of behaviour,

and the central premise of action research which holds that meaningful reflection that results in insight into the nature and importance of a problem is a prerequisite to behaviour change.

Figure 4: Ajzen's Theory of Planned Behaviour (from Darnton 2008a)

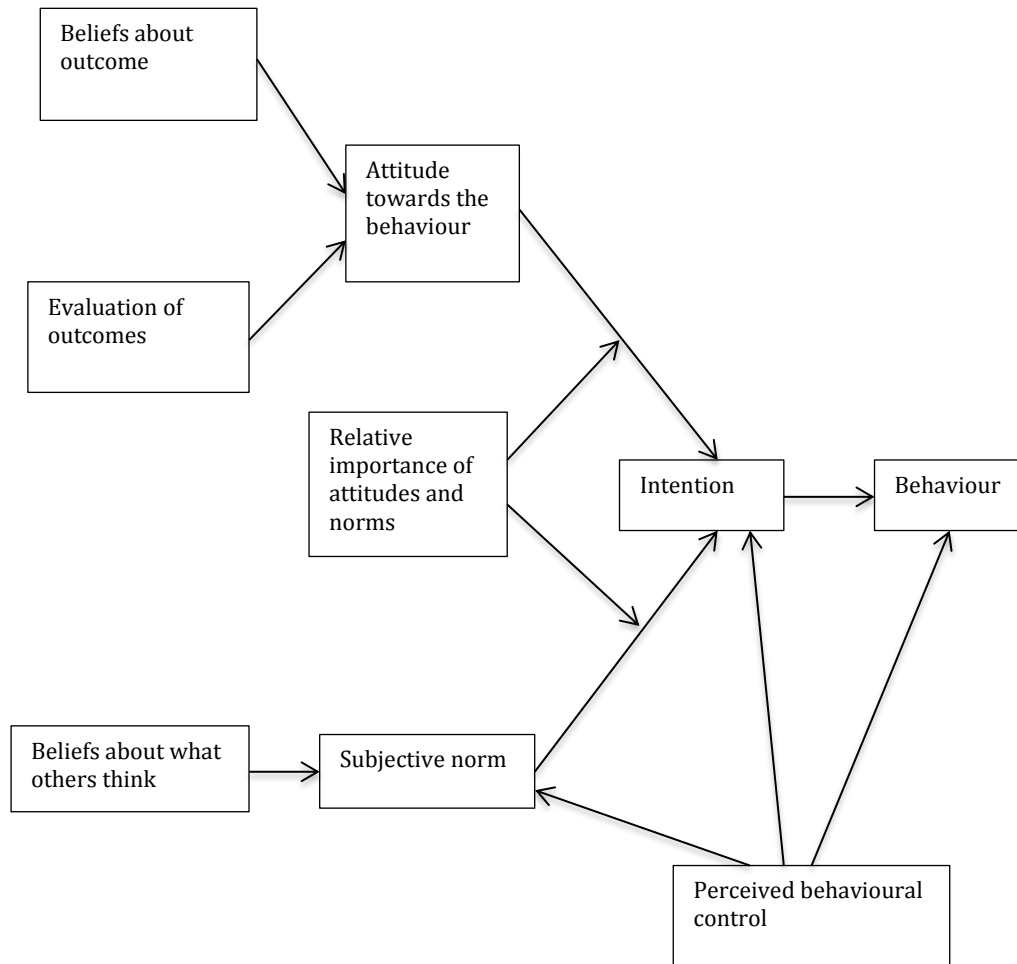
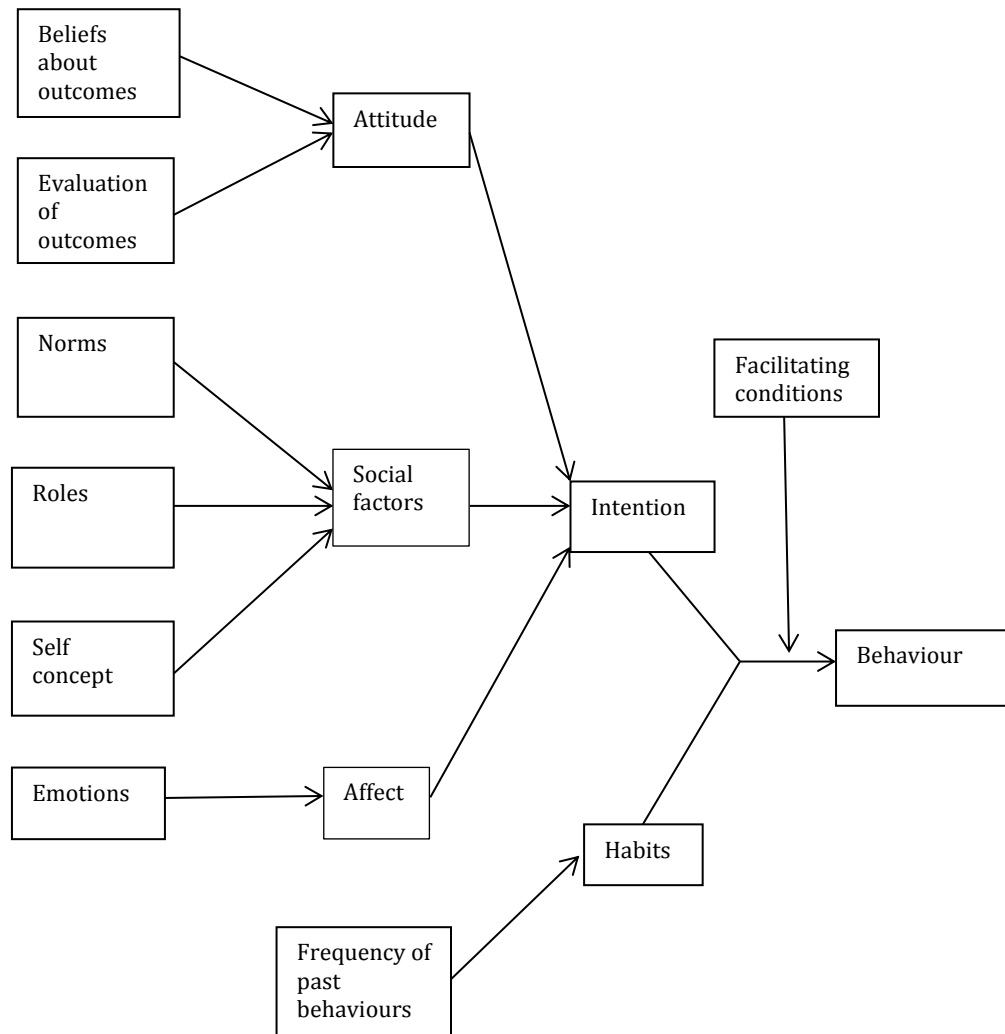


Figure 5. Triandis' theory of interpersonal behavior (from Prager 2012)



B5 LITERATURE REVIEW: SUMMARY AND INTERPRETATION

A suite of participatory methodologies has been used to encourage behaviour change in the poor. However, there is a critical difference between action research / participatory action research and other community based participatory methodologies because the former should explicitly recognise the importance of reflection and the “problematization” of reality as a prerequisite to action. A review of the community-based participatory methodology literature indicates that “action research” is primarily used to induce behaviour change in health professionals, rather than insight or emancipation in poorer communities as was originally intended.

The study that follows is a systematic review of community-based methods to encourage lifestyle changes in those at risk of cardiometabolic disease, particularly those living in poorer communities. Because differing programmes have been applied in widely differing, complex social environments the most appealing approach for systematic analysis is realist evaluation. The focus of realist evaluation is on the identification of mechanisms that give predictable results in certain contexts; varying contexts are seen as adding explanatory power to the mechanisms, rather than being confounding variables in need of control. However, a closer examination of the realist evaluation literature reveals ongoing methodological uncertainty and limited practical utility in a retrospective analysis because the primary tool – the context-mechanism regularity – is usually hidden.

It is proposed to maintain the logic of the realist approach, but to adapt the primary tool. Context-outcome regularities should be readily apparent in a literature review of community based lifestyle interventions, and can be used to focus attention on mechanisms that may explain health behaviours.

C: JOURNAL READY MANUSCRIPT

Formatted for Social Science and Medicine

COMMUNITY LIFESTYLE MODIFICATION INTERVENTIONS: A SYSTEMATIC
REVIEW FROM THE REALIST PERSPECTIVE

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Abstract

Background

The report of the Diabetes Prevention Programme raised hopes that the rising epidemic of cardiometabolic disease in poorer communities could be tackled with interventions promoting exercise and a healthy diet. A number of these lifestyle programmes have been reported, but wide differences in programme content, in context and in outcome measures presents a challenge for systematic review.

Methods

Realist review is a relatively new approach to the review of social interventions. Its basic unit of analysis is the context-mechanism-outcome configuration, or the discovery of why certain outcomes occur in certain contexts. In an adaptation of the original description of realist review we used qualitative software to produce a data matrix and code contexts and outcomes in a variety of papers. A putative theory stating that communities would adopt healthy lifestyle changes with appropriate information, culturally sensitive programmes and attention to external barriers was examined in the light of this evidence. Recurrent patterns of context and outcome were then used to highlight possible mechanisms that might influence the success or failure of lifestyle intervention programmes.

Findings

The assumption outlined above was not supported by empirical evidence. Outcomes were highly variable and, although few approached the

anthropometric results of the Diabetes Prevention Programme, results were best when groups of individuals or community leaders approached researchers with a request for help and worst when researcher driven behaviour change was attempted on a community-wide basis. Uptake in men and the young is a concern. The extent to which members of poorer communities perceive lifestyle issues as problems and “owned” the solutions emerged as potential mechanisms determining success or failure.

Highlights

- Despite methodological difficulties, realist evaluation can be adapted for the systematic review of social interventions
- Most community based diet and exercise interventions do not realise the benefits of the Diabetes Prevention Programme
- Uptake of diet and exercise programmes is worse in men and in the young.
- Results are best when community members approach researchers with a request for help.
- Insufficient attention may be given to the “problematism” of lifestyle in poorer communities.

Key Words: Community based participatory research, health behaviour, obesity

BACKGROUND

There is a large and growing burden of cardiometabolic disease in low and middle income countries, and in poorer communities in richer countries (Groenewald et al., 2008; Marmot M, 2005; Mayosi et al., 2009; World Health Organisation, 2004). The recognition that these “diseases of lifestyle” can be prevented by exercise and dietary changes (Knowler et al., 2002) has prompted an increased interest in lifestyle modification interventions in a variety of target communities, many using community based participatory methodologies to encourage behaviour change.

There has been little systematic evaluation of the effectiveness of these approaches, possibly because the nature of the interventions varies, they are sited within complex, dynamic social systems full of confounding variables and the outcome measures differ from study to study. This makes them unsuitable for a traditional “Cochrane type” systematic review that relies on a hierarchy of quantitative results, but there is nevertheless a rich body of evidence that may yield some generalisable lessons if interrogated with appropriate methods.

Theory based evaluation is a logic of enquiry that is concerned with how interventions work or why they fail. Essentially, a theory of how the programme is thought to work is made explicit as a “straw man” theory that is held up to examination by empirical evidence; real-life experience is then used to modify the theory. The two main approaches used are “theories of change” and “realist evaluation”.

In theories of change, the expected structure of the process with pre-conditions, expected outcomes and indicators is mapped out using widespread consultation. Measuring real life experience against this map identifies blockages and weak links in implementation (Taplin & Clark, 2012), and is essentially designed to evaluate the process of a programme (Blamey & MacKenzie, 2007).

Realist evaluation examines combinations of context, mechanism and outcome, or CMO configurations, that define “what works for whom, in what circumstances and why” (Pawson, 2006). The strength of realist evaluation is its potential to identify the circumstances in which a programme is likely to work best (Blamey & MacKenzie, 2007). Although realist enquiry has been principally used in the evaluation of programmes, the approach has also been described for the systematic review of literature (Jagosh, MacCaulay, & Pluye, 2012; Marchal et al., 2012; Pawson 2004, Pawson et al., 2005), when it may be termed “realist sythesis”.

The underlying logic of a realist evaluation is that outcomes happen as a result of a mechanism being activated in a particular context (Pawson & Tilley, 1997d). Variability in programme structure, context and implementation is not seen as a confounding problem, but as adding scope and richness to the context variables that uncover mechanisms. The focus of realist investigation is on the identification of mechanisms, rather than on controlling a variety of explanatory variables as is the case with experimentation. It aims to uncover the likely mechanisms fired in different contexts, giving an explanation of why an outcome

happened. There has been ongoing methodological confusion about exactly how to do a realist synthesis (Marchal et al., 2012), and a particular difficulty in identifying hidden mechanisms from a retrospective review (Astbury & Leeuw, 2010), but a recently published set of standards (Wong et al., 2013) provides an important step towards clarity.

The starting point of a realist synthesis is the programme theory: a hypothesis that indicates how the programme is expected to work and which can be interrogated by empirical evidence (Pawson & Tilley, 1997b, Jagosh et al 2012, Marchal et al 2012, Wong et al 2013). In the original description of realist synthesis, the authors propose that available documents should be inspected for recurrent associations of context and mechanism – “context-mechanism” regularities (Pawson & Tilley, 1997c). However, there is difficulty in identifying mechanisms in reports of programmes that aim to change behaviour, and other authors have commented on the need to infer mechanisms (Wong et al 2010, Kane et al 2010). In view of Pawson’s own statement that realist evaluation is not a research method as such, but a “*logic of inquiry* that generates distinctive research strategies and designs, and then utilises available research methods and techniques within these” (Pawson et al., 2004), we propose to adapt realist methodology and to extract recurrent associations, or regularities, of context and outcome from the literature; we use these as the empirical tool that examines the programme theory. Realist synthesis is designed to answer the question of “what works for whom, in what circumstances and why?” (ibid). Context-outcome regularities indicate “what works for whom and in what circumstances” and

focus attention on “why” – the mechanisms that may explain the success or failure of lifestyle interventions.

This review asks the question “how effective are community lifestyle interventions, and why do they succeed or fail?” Following a literature search, we propose a programme theory based on the probable assumptions that motivated the studies, and interrogate this proposed theory using context-outcome regularities. The purpose of that interrogation is to generate a “middle range” theory or theories that indicates what works for whom, in what circumstances and why.

METHODS

Search Strategy

Participatory methodologies recognise the importance of involving communities in the generation of knowledge about themselves. Action research and participatory action research are sometimes included in discussion of participatory methodologies (Cornwall & Jewkes, 1995) but are based on a quite distinct philosophy that will be discussed later. A systematic but not exhaustive search of the participatory research literature was made using:

Mesh term: Community based participatory research [N05.425.104]

[OR "Action Research" in title or abstract.]

The search yielded 4,897 results and titles and abstracts. These were hand screened, retaining those in English where some sort of qualitative consultative process in a population was followed by an action. Of the 787 studies that were retained, 20 reported the use of participatory methodologies to promote diet and/or exercise interventions. One of these was identified as an action research study (Davies et al, 2008), the rest as community based participatory research (CBPR). These studies found were all published between 2007 and 2013, so they were supplemented with two earlier studies known to the authors (Daniel et al., 1999; Rowley et al., 2000) that qualified as CBPR but were not linked as such with the then current MeSH vocabulary.

Programme Theory

The assumed programme theory underlying lifestyle interventions was constructed by considering the probable assumptions that were implicit in the design of the studies under investigation. This theory is as follows:

1. Individuals may not be aware of the health benefits of a programme of diet and exercise. Health education will result in positive motivation.
2. Individuals may wish to make lifestyle changes but be prevented by environmental or social barriers. Lifestyle changes can be facilitated by
 - a. Removal of the environmental barriers to lifestyle change
 - b. Creation of social solidarity by group interventions
 - c. Creation of culturally acceptable programmes in minority communities
3. Provision of a culturally acceptable lifestyle programme, with attention to environmental barriers, in an adequately informed community will result in healthy lifestyle changes.

Data Extraction

Recurrent issues relevant to context and outcome were identified from an initial reading of the selected papers and were entered into a matrix. This “virtual data extraction form” is shown in Table 1. Papers were entered into a web based qualitative software programme (Dedoose 4.5.95) and relevant text segments were coded according to the data matrix. The software was used to highlight,

annotate and order relevant data for the building of recurrent context-outcome configurations.

Qualitative and quantitative outcomes were extracted, inspected as a whole and assessed for programme success.

RESULTS

The twenty two studies selected for review are summarised in Table 2. They include 9 studies where community consultation was used to create a culturally tailored diet and exercise programme in poorer or more marginalised communities; 6 studies that aimed to generate physical activity in communities, only one of which was designated as low income; 4 interventions targeted at schools, and 3 interventions that attempted to produce community-wide lifestyle changes in poorer communities.

Measuring programme outcomes

The results from studies using physiological or anthropometric measures are listed in Table 3 with an attempt at ranking. Although the “exercise only” studies had good participation rates, Triangle Ystragynlais and Neighborhoods on the Move are considered “winners”; the former because activity was sustained by the community for seven years after the six week intervention ended, the latter because there was evidence of widespread community engagement and activity.

Having identified “what worked”, the question of “what worked for whom and in what circumstances” was approached by the qualitative analysis. The following context-outcome themes emerged.

Age and gender

Less effective in Youth

Uptake of interventions was disappointing in the young. The Okanagan study noted that

“Across study conditions, drop outs were in their late 30s to mid-40s and finishers in their mid-40s to late 40s.” The PILI programme noted that “older participants were more likely to complete at least half of the prescribed sessions compared with younger participants.” At Looma, there was

“a sustained increase in the proportion of older community members reporting regular physical activity and attempts to reduce their intake of fat and sugar, and this was consistent with the apparent improvement in insulin sensitivity....mean BMI increased in younger persons over the four-year follow up.”

Women participated more than men

There was substantially more participation by women than men, a median of 79% of participants were female (range 68%-93%). This is despite the fact that American men are equally likely to be obese(*Overweight and obesity statistics*.2013) or diabetic (*National diabetes fact sheet*.2011).

Cultural adaptation

Programmes that were culturally tailored and took into account socioeconomic obstacles such as transport and childcare were on the whole enjoyed by participants and showed reasonable completion rates. The extent of researcher sensitisation to the community prior to the intervention differed significantly between studies, ranging from a limited number of focus groups to 4 years of contact (Mendenhall, Seal, Greencrow, Littlewalker, & Brownowl, 2012).

Although the authors of the Okanaga study spent 7 months sensitising themselves to the culture and environment, they still felt the time had been insufficient for the building of proper relationships.

The importance of the social element

A recurrent theme was the high value placed on the social element of group interventions (Davies, Lester, O'Neill, & Williams, 2008; Krieger, Rabkin, Sharify, & Song, 2009; Leake, Bermudo, Jacob, Jacob, & Inouye, 2012; Mendenhall et al., 2012; Wieland et al., 2012). While peer support was clearly valuable, a lack of identity with the group ethos ("clique") can be a cause for dropout (Davies et al., 2008).

Sustainability and the importance of leadership

Several projects noted evidence of continued activity after the study end. Of the lifestyle intervention studies, Power Up, and the Family Education Diabetes Series (FEDS) were sustained after project end; additionally the Looma Healthy Lifestyle Programme had been in progress for 4 years at the time of report with continued academic input. Of the 5 exercise interventions that did not target deprived communities, 4 continued and the other was said to be a template for similar interventions. It is not clear whether the exercise intervention in a low-income community continued, but as a peer advocate who was paid an honorarium led the walks, and participants were given incentives (Zoellner et al., 2007), sustainability can be questioned.

Several of the sustained projects had convincing evidence of a strong, active community leadership that preceded the intervention. In Neighborhoods On The Move, Looma Healthy Lifestyles and FEDS, community members approached the academics with concerns and took an active part in the design and implementation of the programme. In Power Up, researchers were able to build a relationship with a highly successful inner-city community school that offered an after hours programme.

Conversely, in the Tongan Ma'alahi Youth Project researchers noted that: "lack of motivation, limited leadership skills, poor governance structures, and inadequate knowledge minimized the prospect of both the community's

acknowledgement and ownership of various health related issues and of intervention sustainability.”

Support from the community council for the project at Looma was evident but support from the band council at Okanagan was more limited and “the participation of influential group representatives did not generally extend beyond participation in tests and measurements”. Beyond community leadership, several studies found that support from “top down” structures was important. In Leicester, UK, researchers found limited administrative support for a variety of measures aimed at healthier schools; somewhat surprisingly provision of drinking water was not an option for “logistic reasons.” The Ma’alahi Youth Project found its achievements similarly limited by policy issues, particularly in schools.

Finance, Power and Ownership

In Tonga, previous community researchers had paid community members for participation; the Ma’alahi team had a “no pay” policy and their job was made more difficult because the issue of payment for participation was “often raised”. Several American studies aimed at low-income minorities paid participants between \$5 and \$50 at each data collection point (Goldfinger, Arniella, Wylie-Rosett, & Horowitz, 2008; Kaholokula et al., 2012; Parikh et al., 2010; Zoellner et al., 2007). Conversely, two of the sustained exercise interventions required financial commitment from the participants themselves: participants in Triangle

Ystradgynlais were required to pay to attend the exercise sessions after the six week intervention and continued to do so for 7 years until the most recent follow up, and some very substantial financial contributions were made by community members to Neighborhoods on the Move.

Limited anthropometric and physiological benefit in poorer communities

Many of the lifestyle interventions targeted at poorer communities were cultural adaptations of the Diabetes Prevention Programme (DPP), which reported in 2002 (Knowler et al., 2002). The DPP recruited overweight patients with impaired glucose tolerance and consisted of 16 lessons given over 24 weeks followed by a monthly contact session; patients were followed for an average of 2.8 years. The DPP's target weight loss was 7% of body mass, this had been achieved by 50% of participants at 24 weeks and 38% by the end of the study. The average weight loss was 5.6kg and there was a significant reduction in mean fasting glucose and glycosylated haemoglobin compared to controls. Because these results are the justification for the scaling up of lifestyle interventions in at-risk individuals, they should probably be the standard against which similar programmes are compared.

Diet and exercise interventions that targeted overweight/at risk individuals and measured anthropometric or physiological outcomes are summarised in Table 3. While Project HEAL and FEDS had satisfactory results, the other five interventions had anthropometric and physiological results that were less

encouraging or showed no improvement. Despite the acceptability of culturally tailored lifestyle programmes and efforts made to overcome barriers to attendance, the anthropometric and biochemical results in poorer communities were generally inferior to those achieved by the DPP. The high level of participation by community leaders in FEDS has been discussed above and it should be noted that in Project HEAL, a church group had approached the academics with a request for a weight loss intervention rather than forming a passive intervention target.

Interventions targeted at individuals vs. communities

Community-wide lifestyle programmes are challenging. Neither of the community-wide projects in Tonga and Canada was felt by their authors to have been a success, and although the Looma project showed some limited and unsustained physiological benefits in a targeted high-risk group, this was not apparent when the intervention was extended population wide.

DISCUSSION

The growing prevalence of cardiometabolic disease in poorer communities and the apparently good fit of participatory research techniques to bring about behaviour change have been the motivation for several community based lifestyle modification programmes. They merit systematic analysis but it is a challenge to review systematically a group of papers with a rich content of qualitative data but little consistency in study design or outcome measures. Realist synthesis is a promising approach but it is new, still subject to methodological controversy and uncertainty, and probably has not reached its full potential. In a review of 1395 publications that claimed to use realist methodology to examine health systems issues, Marchal et al were only able to find 7 that fully described a realist evaluation (Marchal et al., 2012). One difficulty may be the uncovering and identification of hidden mechanisms (Astbury & Leeuw, 2010). In a recent realist review of 7758 participatory research publications, Jagosh et al were able to find only 23 studies that could be subjected to a formal realist evaluation, and published studies had to be supplemented by notes and transcripts from the research teams (Jagosh et al., 2012). A realist synthesis that searches for mechanism-context regularities must be highly selective in the literature chosen for review, this risks the loss of important data and may limit the practical utility of a conceptually valuable approach.

For the present analysis, realist methodology was used to generate a data matrix of context and outcome variables that was used to code selected papers with the

help of qualitative software. Despite the identification of several recurrent associations of context and outcome, the matrix is incomplete. The term “poorer communities” masks a very heterogeneous grouping where there will be a variable degree of social solidarity, community leadership, cultural dislocation, marginalisation, inequity with respect to the broader society and so on, all of which may have an influence on health behaviour. It was not possible to determine these context factors and they do not appear in the data matrix. However, although this review did not produce a full raft of context-mechanism-outcome configurations for healthy lifestyle programmes, it is a starting point that highlights the importance of gender, age, local leadership and the external policy environment.

Most authors reported success in creating acceptable, culturally adapted, targeted lifestyle interventions, with good completion rates. The lack of participation by men and the young is a concern, however. It is not clear whether men do not participate as a result of scheduling that is not compatible with employment, or whether these types of group based activities are not compatible with male norms and standards. However it is important that at-risk men are not excluded from potentially beneficial lifestyle interventions. The young were said to be less enthusiastic about participation but it is not clear whether they find the activities unappealing, or whether they are less concerned about long term health problems.

Several studies were limited by factors outside the study design. While teachers embraced the Power Up study for overweight children and attempted to engage

the parents, few obese children lost weight. It is likely that the children continued their unhealthy lifestyles outside the programme and possible that they had little control over family food choices. External factors had an impact on other programmes aimed at youth; the ideology behind “bottom up” approaches is popular, but the limitations imposed by policy frameworks, particularly in schools, mean that “top down” approaches must not be dismissed and may be crucial in creating an environment in which the “bottom up” approaches can work.

Few studies that measured anthropometric and physiological outcomes approached the standard set by the Diabetes Prevention Programme, and most did not have a longer term follow up. None of the studies that attempted to produce a community-wide lifestyle change in poorer communities were able to show anthropometric or physiological improvements. Some of the most reflective, informative papers reviewed were those where a well planned, culturally sensitive programme that followed the “norms” of a participatory process had outcomes that were clearly a disappointment to their investigators – the Ma’alahi Youth project and the Okanagan Diabetes Project are good examples of this. When the putative programme theory is examined by empirical context-outcome regularities, it is found to be lacking: the evidence does not support the theory that communities provided with relevant information and culturally sensitive diet and exercise programmes that address external barriers will have sustained health benefits; the programme theory proposed above must be modified.

The realist approach tells us that mechanisms must be examined in order to understand what worked (or didn't work) and it is useful at this point to refer to behavioural models that may explain why people make the choices they do.

There are many models of behaviour and behaviour change, these have been reviewed elsewhere (Darnton, 2008a; Prager, 2012) but there are some common underlying themes to the models. One is that behaviour is largely rational and utility maximising – in other words that people tend to do what they think is good for them. While there is an emerging school of thought that believes humans are “predictably irrational” (Ariely, 2008), some irrational (non utility maximising) elements appear in the best known rational models.

Two behavioural models explicitly include the individual's belief that they are capable of achieving a particular behaviour and that it will result in the desired outcome. Ajzen calls this “perceived behavioural control” (Darnton, 2008a) and Bandura calls it “self efficacy” (Bandura, 1994). Importantly, self efficacy influences health behaviours – weight management, physical activity, smoking and drug cessation and AIDS prevention, and is lower in those living in poor communities (Boardman & Robert, 2000).

A less commonly used but intuitively appealing model is Triandis' theory of interpersonal behaviour, which adds affect and habit as determinants of behaviour (Darnton, 2008a). While social norms, affect, habit and self-efficacy should also be considered as candidate determinants of health behaviour that are not addressed in the programme theory proposed above, the data examined did not support context-mechanism-outcome configurations involving these

mechanisms. An additional insight is offered by Adoption Theory, which indicates that behaviour change is influenced by the extent to which an issue is perceived as a problem (Prager & Posthumus, 2010). When examined together, the data do support a role for what can be called “problematization”. The more successful programmes – in terms of sustainability and measureable achievement - were initiated at the request of community members who then played a major role in implementation. The participants had already been through the process of “problematizing” their reality and had taken ownership of that problem; the academic team was merely there to help them meet their goals. Interventions where a concerned researcher had produced a culturally sensitive adaptation of a lifestyle programme were, on the whole, less successful. Phrasing this finding as a “context-mechanism-outcome” configuration, healthy lifestyle interventions are more likely to result in significant, measureable physiological benefit when they have been initiated by participants because the issue has been “problematized”.

It is also interesting to speculate on the re-fashioning of the power relation between researcher and participants that, in theory, underpins participatory methodologies and the issue of payment for participation raises a dilemma: while researchers are naturally unwilling that participants should be “out of pocket” for assisting their research, when payment is made there are implications for the power relation between the parties, and the message given regarding in whose interests the intervention is taken. While the data indicate that financial commitment from participants may indicate ownership and be

associated with sustainability, there are insufficient cases to propose this as a context-mechanism-outcome configuration.

It was the Brazilian educator Paolo Freire who described the profound effect of poverty on an individual's sense of self worth and belief in their capacity to achieve (Freire, 1970). Building on the work of John Collier, Ronald Lippitt (Cook, 2002) and Kurt Lewin (Lewin, 1946), his philosophy informed the school of action research and participatory action research; in these approaches, a process of critical reflection that challenges what has been accepted as normal and "problematizes reality" is considered a prerequisite for effective action (Freire, 1970). Although there has been a rising interest in community based participatory methodologies in recent years, most of these have dropped the explicit requirement for the process of reflection and insight that Freire calls "conscientization" (Montero, 2000).

On first reading, Freire's work on the psychological emancipation of the poor seems rather dated in the 21st century. However it has resonance with a critical review of interventions designed to address socially determined health issues in the poor. In this context, the contemporary implementation of community based participatory research may be inferior to its more powerful parents - action research and participatory action research - because it substitutes consultation for what the Latin American action researchers call "conscientization" (Freire, 1970). There may be issues related to poverty itself that drive unhealthy lifestyles and which remain poorly defined, we know too little about how the poor prioritise healthy lifestyles, or about the effect of other psychological

stressors on eating habits and motivation to exercise. We also do not know how credible it is to promote a healthy lifestyle as an investment in the future when people's environments and life chances may not condition them for optimism.

This realist review supports “problematization” and/or “ownership” as potential mechanisms that determine the success or failure of healthy lifestyle interventions. It is necessary to be realistic about what can be achieved by interventions that address the external barriers to behaviour change when researchers identify problems in the communities of others.

TABLE 1: DATA MATRIX FOR STUDY ASSESSMENT

Context

- Power relationship
 - Community targeted
 - Who initiated study?
 - Who did the action?
- Financial relationship
- Cultural sensitivity
- Community's previous experience with partnerships
- Duration of intervention
- Type of intervention
- Social component of intervention

Mechanism

?

Outcome

- Acceptability
- Feasibility
- Sustainability
- Self reported changes in lifestyle
- Self reported health benefits
- Improvement in physiological or anthropometric measures

LIFESTYLE INTERVENTIONS TARGETING HIGH RISK LOW INCOME INDIVIDUALS

Project Name	Year	Community	Intervention	Duration	Follow up?	
Making the Connection (Ruggiero, Oros, & Choi, 2011)	2011	Urban Hispanic minority	Comprehensive lifestyle intervention for diabetics	6 months	12 months	Weight, self reported diet and activity
Family education diabetes series (FEDS) (Mendenhall et al., 2012)	2012	Urban American Indians	Comprehensive lifestyle intervention for diabetics	4 years		Feasibility and metabolic control
PILI Ohana (Mau et al., 2010)	2010	Pacific islanders in Hawaii	Diet and exercise promotion	12 weeks	12 weeks	Anthropometry, self reported diet and activity
PILI Ohana (Kaholokula et al., 2012)	2011	Pacific islanders in Hawaii	Programme to prevent weight regain	6 months		Weight
Project HEED (Parikh et al., 2010)	2010	Low income Hispanic urban minority	Training workshops	10 weeks	12 months	Weight, metabolic control, self-reported diet and activity
Project HEAL (Goldfinger et al., 2008)	2008	Low income African American urban minority	Peer led training course	10 weeks	12 months	Weight, self reported diet and health
Rochester Healthy Community Partnership (Wieland et al., 2012)	2011	Immigrant and refugee women in the US	Diet and exercise promotion	6 weeks	8 weeks	Attendance, satisfaction and weight
Health is Wealth (Leake et al., 2012)	2012	Filipino Americans	Training workshops	6 months		Attendance and satisfaction
Healthy Homes/Healthy Families (Kegler et al., 2012)	2012	Rural community largely African American	Coaching for healthier lifestyle	6 weeks		Self reported diet and exercise

LIFESTYLE INTERVENTIONS TARGETING INSTITUTIONS

SALAD (Khunti et al., 2008)	2007	UK inner city schools serving ethnic minorities	Diet and exercise promotion	1 year		Self reported diet and activity
Power-up (Choudhry et al., 2011)	2011	African American School Children	Healthy schools intervention	14 weeks	14 weeks	Anthropometry
(UCLA School of Public Health) (Siegel, Prelip, Erausquin, & Kim, 2010)	2010	School employees in Los Angeles	Comprehensive health promotion	2 years		Weight, self reported diet and activity
(University of Oklahoma Prevention Research Center (Farag et al., 2010)	2010	School employees rural Oklahoma	Physical activity promotion	6 months		Weight, physiology, self reported diet and activity

LIFESTYLE INTERVENTIONS TARGETING WHOLE COMMUNITIES

Ma'alahi Youth Project (Fotu et al., 2011)	2011	Youth in Tonga	Comprehensive diet and exercise promotion	3 years		Anthropometry, quality of life
Looma Healthy Lifestyle (Rowley et al., 2000)	2000	Rural Australian aboriginal community	Comprehensive diet and exercise promotion	4 years	4 years	Anthropometry, physiology, self reported diet and activity
Okanagan Diabetes Project (Daniel et al., 1999)	1999	Rural Canadian aboriginal community	Comprehensive diet and exercise promotion	16 months	2 years	Anthropometry, physiology, self reported diet and activity

COMMUNITY EXERCISE INTERVENTIONS

Walk Kansas (Estabrooks, Bradshaw, Dziewaltowski, & Smith-Ray, 2008)	2008	Unselected largely Caucasian community	Exercise programme	6 months	5 years	Self reported activity
Neighborhoods on the move (Suminski, Petosa, Jones, Hall, & Poston, 2009)	2009	Urban mixed population	Comprehensive community exercise programme	12 months		Feasibility
Walk with us (Riley-Jacome, Gallant, Fisher, Gotcsik, & Strogatz, 2010)	2010	Urban mixed population	After hours walking programme in schools	9 weeks		Feasibility and self reported health
Fit for Life (Zoellner et al., 2007)	2007	Low income African American rural	Coach led walking intervention	6 months	No	Physiology, weight, self reported activity and stages of change
Triangle Ystradgynlais (Davies et al., 2008)	2008	Older participants post industrial community South Wales	Indoors fitness class	6 weeks	7 years	Feasibility
High Point Walking For Health (Krieger et al., 2009)	2009	Public housing revitalisation project mixed community	Community exercise promotion	3 months		Feasibility, self reported activity and health


TABLE 2: STUDIES REVIEWED

PROJECT NAME	Physiological/anthropometric measure	Time to result	Result
Project HEAL	Mean weight change	1 year	-4.45kg
	Mean % weight change	1 year	-5%
PILI Ohana	Mean % weight change	3 months	-1.5%
	% participants losing >5% weight		11%
Making the Connection	% participants losing >7% weight	6 months	20%
		12 months	17%
Looma	Body mass index	1 year	No change
	Fasting glucose		No change
	Triglycerides		No change
Okanaga	Mean Body mass index	16 months	No change
	Mean Glycosylated Hb		+0.38%
	Mean Systolic BP		-12mmHg
FEDS	Mean weight change	6 months	-6.5kg
	Mean % weight change		-6.8%
	Mean Glycosylated Hb		-0.46
	Systolic BP		NS
	Diastolic BP		-5mmHg
Los Angeles Schools	Mean BMI	18-24 months	-0.14kg/m ²
Power Up	Age appropriate weight; percentage overweight/obese	14 weeks	Obese girls declined from 52% to 46% Boys no change

TABLE 3: PHYSIOLOGICAL AND ANTHROPOMETRIC OUTCOMES

PART D: APPENDIX

Author Information Pack: Social Science and Medicine.




SOCIAL SCIENCE & MEDICINE

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

• Description	p.1
• Audience	p.1
• Impact Factor	p.2
• Abstracting and Indexing	p.2
• Editorial Board	p.2
• Guide for Authors	p.4



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PART E: POLICY BRIEF

South Africa is facing a growing burden of “diseases of lifestyle”. Chronic, non-communicable diseases associated with obesity have a greater impact in poorer communities and are a cause for concern in an already overburdened public health system. The Diabetes Prevention Programme demonstrated the significant health benefits of a diet and exercise programme and has stimulated interest in community lifestyle intervention programmes, many based on community participatory methodology. A systematic review of these programmes may be useful if a “scale up” or “roll out” of lifestyle programmes is considered. However, the different programme contents, contexts and outcome measures mean that a traditional “Cochrane type” review is inappropriate. The present study is a review in two parts. Firstly, the rationale and mechanisms behind the available tools are explored; secondly, this understanding is used for a critical assessment of published lifestyle interventions in a variety of communities.

The first part of the literature review explores the history of participatory methodologies in the 20th century. Early developers of action research explicitly stated that participants needed to realise and own problems themselves as a prerequisite to meaningful action; this philosophy was further informed by the work of Paolo Freire, who described the effect of poverty on the individual’s sense of self worth and belief in their capacity to achieve. There is some indication that this understanding has been lost in the more recent literature, and a process of consultation for researcher-defined problems has replaced what Freire describes as “conscientization”.

A review of the available tools for programme evaluation indicates that theory based evaluation is appropriate for the systematic evaluation of this type of literature, and that the realist approach has the capacity to synthesise the outcomes of programmes sited in widely different contexts. The realist approach involves the identification of a raft of “context-mechanism-outcome” configurations that indicate what works for whom, in what circumstances and

why. However, while the principles are appealing, in practice there is a great deal of methodological uncertainty and there are few published examples of the realist approach. In order to use the logic of realist enquiry to review the outcome of lifestyle interventions, a modification of the methodology is proposed. The original description of realist evaluation involved the identification of mechanism-outcome regularities. One of the difficulties of this approach is the hidden nature of the mechanism. In this review, the much more accessible context-outcome regularities were identified and used as a basis to consider mechanisms.

Twenty two reports of lifestyle interventions in a variety of communities were examined and several regularities were identified. Most reported success in creating a culturally acceptable programme with good completion rates, however participation by men was very limited and completion rates were worse in the young. Physiological and anthropometric outcomes were best when a group of motivated individuals approached researchers with a request for a partnered programme, but only two of eight programmes that measured physiological and anthropometric parameters had short term results approaching those of the Diabetes Prevention Programme.

Programmes provided on a community basis had worse outcomes than those targeted at high risk individuals; although exercise-only programmes in mixed income communities experienced good participation, the three diet and exercise programmes provided on a community wide basis showed minimal or no physiological and anthropometric benefits.

Several programmes were sustained after the intervention, the quality of community leadership was regularly linked with sustainability. The success of some interventions was limited by factors outside the study, and the nature of the wider policy environment had an impact on programme success, particularly for school-based programmes.

The generally disappointing outcomes of many of these programmes indicates that promotion of healthy lifestyles with attention to financial and environmental barriers and cultural norms is generally insufficient to produce measureable health gains. The most successful programmes had been initiated by community members themselves. This indicates that “problematization” of lifestyle may be an important mechanism determining the effectiveness of a programme.

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