AN INVESTIGATION INTO THE INFLUENCE OF INFORMATION BEHAVIOUR AND USE OF ICT ON THE QUALITY OF LIFE OF PEOPLE WITH DISABILITIES

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BY

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ABSTRACT

People with disabilities are frequently denied access to information and information technologies due to their impairments. Whereas physical impairment is a predominant, economic barriers are also a constraint for people with disabilities. The disability-poverty link hinders knowledge building resulting in a lack of information for everyday life leading to further economic poverty. Nevertheless, a paradox is observed whereby people with disabilities report a higher quality of life (QOL) than anticipated. This research explores the disability paradox by taking a hypothetico-deductive approach to investigate the influence of information behaviour on the quality of life of people with disabilities and the role that information and communication technology (ICT) contributes.

Although the majority of participants had regular access to ICT no influence on quality of life was observed for technology. Likewise, information behaviour was not observed to influence quality of life. However, the type of information needed was associated with quality of life while associations were revealed between information behaviour, ICT, and type of information needed. Six primary type of information needs - *Social Support; Independence; Finances and Employment; Attitude; Mobility;* and *Technology* - were observed to exhibit a complex relationship with disability both influencing and being influenced by quality of life. An area of concern was identified in the observation of low demand for ethical information which is arguably one of the most needed areas both in ICT and for people with disabilities today.

These findings are supported by literature which has failed to conclusively prove direct associations between ICT and QOL. Nonetheless, ICT access has been associated with information behaviour although verbal and media information sources are ranked highly. In this study, verbal communication was observed to be preferred for information sharing supporting findings that offline communication is a greater predictor of quality of life than online communication. Whilst respondents sought more information on technology they encounter barriers including economic limitations, inaccessibility of Internet content and technology, lack of training, fear of technology, and lack of knowledge of technology offerings. Furthermore, a negative perception of dependency on the technology was identified.

This study supports prior observations that people with disabilities manifest higher quality of life than expected. While technology is not directly linked to improved quality of life it was shown to support factors that improve quality of life. For people with disabilities this includes assistive technologies and ICT for information gathering and sharing, however the very disability that the technology seeks to overcome may also be a barrier to its use.

RESEARCH KEYWORDS: Information behaviour, Quality of life, People with disabilities, Information and communication technology

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I have seen things through eyes that do not see, I have heard things through ears that do not hear, and have been moved by legs that cannot walk.

Thank you.

Malcolm Garbutt
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List of Acronyms

CHP	University of Toronto Center for Health Promotion
ELIS	Everyday Life Information Seeking
GPS	Global Positioning System
ICT	Information and Communications Technology
ICF	World Health Organization's International Classification of Functioning, Disability, and Health
PAPA	Privacy, Accuracy, Property, and Accessibility Framework (Mason, 1986)
PDF	Portable Document Format
QOL.....	Quality of Life
QOLP-PD	Quality of Life for People with Physical Disabilities framework (Renwick et al., 2003)
RFID	Radio Frequency Identification Devices

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CHAPTER 1: INTRODUCTION

1.1 Introduction to the Field of Study

It is generally acknowledged that we live in an information society embodying a complex synergy of people and information facilitated by technology (Sasvari, 2013) with information technology posited as a driver of economic growth and well-being (Mansell, 2008). Information in the form of knowledge is used to create technology which, while furthering knowledge and increasing information, is instrumental in development of products and society (David & Foray, 2003). The societal perspective of information and information technology is traceable back to the 1940's seminal work of Norbert Wiener and communications work by Shannon and Weaver (Mansell, 2008) followed by social sciences' economists such as Machlup and Porat (Mansell, 2008; Sasvari, 2013), with the term 'information society' first used by Japanese scholars, although it is unclear exactly who coined the phrase (Karvalics, 2007). Even so, six decades later a single comprehensive theory of the information society is yet to be formulated (Sasvari, 2013).

The majority of theoretical underpinnings are typically techno-centric and ignore the inaugurating factors of information, knowledge and communication. According to Sasvari, frequently employed theories such as Actor-Network Theory and the Theory of the Diffusion of Innovation foster the influence of technological determinism whereby technology defines society creating a 'normative crisis' seen in copyright infringements, privacy threats, and the rise of a digital divide between those with access to technology and those without (Duff, 2008). Duff proposes that normative thinking, rooted in morality and virtue is required to counteract the pervasiveness of this technological focus.

The normative crisis of exclusion has been the focus of authors such as Mason whose Privacy, Accuracy, Property, and Accessibility (PAPA) framework seeks to deal with 'threats to human dignity' in the information age (Mason, 1986 p.5) together with a multitude of authors addressing the problem of the digital divide (Fonseca, 2010; Macdonald & Clayton, 2013; Vicente & López, 2010). As in any other society, there are people at the fringes of the information society excluded from benefits taken for granted by the majority. One such group are people with disabilities who are denied access to information due to physical impairment, social marginalization, and economic and information impoverishment (Dobransky & Hargittai, 2006). Information and communications technology has been advanced as a solution for increasing social links between people, creating income and wealth, providing employment, education and knowledge sharing, and for delivering assistive technologies to overcome physical deficiencies, however the digital divide persists especially for people with disability. This reinforces the social exclusion of people suffering from permanent disability and temporary impairments (such as healable injuries) as well as age-related diminishing of faculties (Macdonald & Clayton, 2013).

Furthermore, people with disabilities are a diverse cross-section of the population differing in type and severity of impairment necessitating different levels of support with more severe impairments requiring special nursing or specialised accommodation. Thus people with disabilities inhabit a diversity of contexts, such as care-facilities which may create an insular environment or small-world where outsiders are regarded with suspicion and information sharing is regulated by social norms (Chatman, 1996). Nevertheless, a paradox is observed whereby people with disabilities report a higher quality of life than anticipated by non-disabled people (Albrecht & Devlieger, 1999). In their research, Albrecht and Devlieger observed information as a common factor of both higher and lower levels of quality of life. Higher quality of life was associated with active information seeking and sharing while lower quality of life was associated with lack of information. By definition, a lack indicates a need, suggesting that people with higher quality of life satisfy their information needs through their information gathering and sharing. Together need, gathering and sharing of information are identified as information behaviour (Fisher & Julien, 2009) and defined by Wilson (2000, p.49) as 'the *totality of human behavior in relation to sources and channels of information*'.

The socio-economic basis of the information society posits information technology as a driver of economic growth and well-being (Mansell, 2008). Although originally considered from the societal perspective, well-being is nowadays more closely related to quality of life of the individual. This raises the question for people with disabilities whether information and information technology can provide them higher quality of life? For the past six decades, the persistent view has been that information technology does not directly influence quality of life (Dickinson & Gregor, 2006). Therefore the question changes to whether empirical evidence supports the postulation that higher quality of life is associated with information behaviour of people with disabilities and the extent to which information technology influences such behaviour.

1.2 Problem Statement

Based on the foregoing, the problem statement that guides this research design is as follows:

> *Although ICT is promulgated as beneficial to improving quality of life through reducing limitations and enhancing information seeking and sharing behaviour, there is limited understanding of the influence of ICT on the lives of people with disabilities.*

1.3 Research Questions

This leads the following research questions:

RQ 1. What information behaviours of people with disabilities influence their quality of life?

RQ 2. What relationships exist between information, information and communication technology, and the information behaviour of people with disabilities?

RQ 3. In what way do contextual factors of dwelling conditions influence the information behaviour of people with disabilities?

1.4 Aim, Objective and Outcome of the Research

The primary aim of this research is to determine associations between information behaviour, quality of life and ICT of people with disabilities recognising that people with disabilities may be denied access to information on one or more of aspects of physical, intellectual, or socio-cultural access. The objective of the research is to further the understanding of information behaviour of people with disabilities and their current and potential use of technology. A sub-objective is to afford people with disabilities a participative role in revealing information useful for the development of solutions that may enhance their quality of life.

The outcome from this research is expected to contribute to the understanding of the influence of information behaviour of people with disabilities and the level of use of information and communication technologies by them. Information gathered through the study is expected to be advantageous to service providers, policy setting agencies and activists who seek to improve access to both information and information technology for people with disabilities while having the potential to universally influence information behaviour of other people (Foley & Ferri, 2012).

1.5 Overview of the Research

This quantitative study employed a questionnaire with both closed and open questions to investigate the influence of information behaviour of people with disabilities within the context of quality of life and the role that information and communication technology plays in this interaction. The survey was completed by 70 people with disabilities residing in South Africa, the majority of whom had regular access to information and communication technology.

The study is described in the following chapters. In Chapter 2 a literature review is followed in Chapter 3 by an overview of the research and the research methodology in Chapter 4. Chapter 5 describes the findings which are discussed in Chapter 6 prior to the conclusion, implications, research limitations and call for further research in Chapter 7.

CHAPTER 2: LITERATURE REVIEW

In this chapter a review of the literature is undertaken in order to highlight gaps in the current understanding of information influenced quality of life of people with disabilities. Prior to revealing the literature gaps, background information is constructed for disability, poverty, digital exclusion, quality of life, information, communication, knowledge, information behaviour, ICT, type of information needs, and the interconnections between people with disabilities, quality of life and ICT.

2.1 Introduction

As of 2011 the estimated number of disabled people worldwide was in the order of 1 billion people or 15% of the world's population (Durocher, Lord, & Defranco, 2012). Attributed in part to birth but more to factors such as aging, poverty, armed conflict, and AIDS, disability is closely linked to poverty in a vicious cycle with poor people more susceptible to disabilities perpetuated by poverty (Barnes & Sheldon, 2010; Durocher et al., 2012 Palmer & Harley, 2011). As a consequence of such poverty traps, people with disabilities lack resources and accordingly experience inadequate access to education, transport, health, and other basic services (Statistics South Africa, 2012). Many believe that poverty can be alleviated by combining the use of information and communication technologies with action taking through learning and information gathering (Urquhart, Liyanage, & Kah, 2007). Whereas poverty is characteristically considered from economic perspectives other forms of poverty such information poverty exist according to Thompson and Afzal (2011) who describe three forms of access to information; physical information access; intellectual information access; and socio-cultural information access. Access alone however is insufficient without action resulting in observable transformations (Niemelä, Huotari, & Kortelainen, 2012).

While ICT is prerequisite for living in the information society (Selwyn, 2003), limited access to technology has resulted in restricted realization of ICT in assisting disabled people and enabling information behaviour (Hollier, 2007; UNESCO, 2009). This is demonstrated by a lower ICT adoption rate of people with disabilities when compared to non-disabled people (Hollier, 2007; Macdonald & Clayton, 2013; Riege, 2005) and predisposing people with disabilities to become 'second-class citizens of the information society' (Lazar & Jaeger, 2011, p.69) with access only available to those who can afford assistive technology (Macdonald & Clayton, 2013). Information, however, has been observed to be central to understanding the perceived disability paradox whereby, contrary to conventional thinking, people with disabilities frequently report higher quality of life (Albrecht & Devlieger, 1999).

2.2 Disability

Disability is most frequently seen and legislated as a 'problem' (Titchkovsky, 2012) with special schools and institutionalization relegating people with disabilities to the margins of society thereby remaining hidden from public and, more importantly, not being held responsible for their own lives (Ntsimane, 2012). Problems are also encountered in individual/group dynamics with disability minority-group identity juxtaposing appeals for societal inclusion (Mollow, 2004). However to understand the 'problem' of disability the meaning of 'disability' must first be ascertained.

Disability Models and Types of Disability

Disabilities take many forms differing in intensity and affecting functioning in diverse manners while originating in several ways from birth impairments through medical afflictions, injuries from wars, conflict and accidents, as well as in the normal course of aging (Durocher et al., 2012; Percival & Hanson, 2005). Consequently, defining disability is challenging with the medical model at one extreme describing disability in terms of the bodily impairment of the person with a view to adapting the person themself or by means of assistive technologies (Palmer & Harley, 2011). This positivistic and reductionist view (Edwards & Imrie, 2003; Joubert, 2011) objectively considers the body as curable of illness (Dube, 2009). At the other extreme, the social model subjects the disabled person to a societal view of inferiority as a result of deviance from 'normality' (Palmer & Harley, 2011) ignoring biological deficiencies and creating barriers to the inclusion of the person by reinforcing marginalization and inferior status. Such marginalization is exacerbated through disagreement and divisions between disability theories employed by those who are in a position to be of assistance (Edwards & Imrie, 2003). Ironically the social model can impose limitations on people who could otherwise operate with a high level of normalcy (Garden, 2010) for example, a deaf person knowledgeable in sign language who makes use of the services of a practitioner fluent in sign language would not be regarded as disabled, whereas the same person would be assumed disabled should the practitioner not be proficient in sign language. Finkelstein (cited in Davis, 1990) proposes that disability will be eliminated with changes to societal attitudes in respect of the seven hierarchical elements: *viz*. Information, Counselling, Housing, Technical Aids, Personal Assistance, Transport, and Access.

Recognition of limitations of the medical and social models has resulted in efforts to consolidate the two models although these tend to be prejudiced in favour of the medical model (Edwards & Imrie, 2003; Palmer & Harley, 2011).

Classification of Disability

Irrespective of gender, race, form or severity of disability, abled people tend to classify people with disabilities generically as disabled frequently associating physical disabilities with low intellectual capacity. The multiple types and variations of disability including impairments of learning, physical, speech, psychiatric, hearing and more, arising from multiple causes and times of life (Durocher et al., 2012; Ntsimane, 2012) necessitate a classification methodology to identify specialised needs of different people with disabilities in order to develop adequate interventions (Mitra, 2006; Palmer & Harley, 2011). Currently, the foremost classification of disabilities is the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) (World Health Organization, 2001) which takes a fine-grained approach viewing disability from a bio-psychosocial perspective factoring in the persons' health, environment, and personal context. ICF has guided subsequent research although criticised as lacking in acts, tasks, and social involvement (Badley, 2008). The ICF *function and structure* constructs are concerned only with the body and mind whereas *acts* refer to basic activities, *tasks* comprise activities of daily living, and *social involvement* include employment, leisure, community and social life. Disabilities are frequently appraised from an aesthetic perspective with 'invisible' disabilities such as asthma and psychiatric issues no less of an issue for the sufferer and their community than those with 'visible' disabilities such as a wheelchair user. Paradoxically, an elderly person using a walker is regarded merely as old (Garden, 2010).

Prevalence of Disabilities

The lack of agreement on the definition of disability renders determination of the actual number of people living with disabilities problematic. For instance, the World Bank's reported 15% of the world's population (Durocher et al., 2012) may be higher due to disability statistics ignoring impairments of a temporary nature such as a person with a broken wrist having to use a computer mouse (Foley & Ferri, 2012). The 2011 South African Census reported that less than 10% of the population suffer from 'difficulties' related to impairments preventing them from participating in life activities (Statistics South Africa, 2012) with the Census listing six categories of disabilities and adopted for this study: seeing; hearing; communicating; walking or climbing stairs; remembering or concentrating; and self-care.

Link to Old Age

Furthermore, disability is linked to aging with abilities diminishing with increasing age (Durocher et al., 2012) supporting the view that the needs of people with disabilities are comparable to the needs of older people (Williamson, Schauder, Stockfield, Wright, & Bow, 2001).

Context

Information behaviour occurs within a particular time and space which shapes the context for information seeking and sharing and either facilitating or constraining information behaviour. Savolainen (2009) cites two prominent models that offer some clarification on this concept, the small world construct of Chatman (1996) and the information grounds approach advanced by Fisher (Fisher & Julien, 2009). The small world construct relates to information behaviours of a group of similar people typically bound within a persistent physical space, emphasizing physical proximity, such as a caring facility, in contrast to information grounds which relates to information behaviours of a group of less similar people meeting in a public open space such as a clinic or café on an ad-hoc basis. While both constructs can be considered from a people, places, and information aspect, the small world construct focusses primarily on people living at the edges of society and can be seen as moderately stable with changes originating mainly from temporal factors. However, in recent times ICT has facilitated expansion of settings beyond concrete structures (Savolainen, 2009).

Diversity in nature and severity of impairments requires varying levels of support with institutionalization indicated for more severe impairments. Thus people with disabilities inhabit diverse contexts which can create their own milieu, such as care-facilities where outsiders are regarded with suspicion and information sharing is regulated by social norms (Chatman, 1996). Chatman's small world theory contrasts to the information grounds construct which is informed by Granovetter's (1973) theory of the strength of weak ties formed between acquaintances and distant friends providing valuable information supported and validated by family and close friends who are seen as strong ties (Williamson & Roberts, 2010; Savolainen, 2009). The relevance of these theories is seen in research showing that 'other people' are 'key source[s] of information' thereby highlighting the importance of social contact (Williamson & Roberts, 2010). For people with disabilities, especially those with mobility issues, the small world construct may influence their information behaviour, however aspects of their lives such as clinic visits can bring them into contact with information grounds whereby other information behaviours are effected. Of late the increased use of technology and the rapid growth of virtual spaces is challenging the small world construct and making information grounds more accessible (Williamson & Roberts, 2010).

2.3 Disability and Poverty

Poverty is inextricably linked to disability with poor people especially susceptible to disabilities which perpetuate their poverty (Barnes & Sheldon, 2010; Durocher et al., 2012). Barnes and Sheldon view poverty as a milieu of social exclusion explaining that income is only part of the poverty predicament and that education, employment, housing, transport, built environments, leisure, family life, gender, disability, and social relationships are rooted in structural inequalities and social processes rather

than disabling attitudes and prejudice. Palmer (2011) explains this in systemic terms as a vicious cycle of poverty whereby poverty results in a lack of adequate nutrition, facilities, health care, and increased family violence contributing to disability by intensifying poor health, lack of education and limited employment opportunities.

Understanding Poverty

Palmer (2011) criticizes the economic needs approach for people with disabilities which ignores severity of impairment and tends to underestimate needs. He defines poverty from three perspectives: basic needs approach; capability approach; and economic resource approach. The basic needs approach is difficult to determine and exhibits a contextual, materialistic view with poverty described as a lack of shelter, food and information, whereas the capability approach is based on Amartya Sen's (1994) contention that poverty is determined by the lack of capability to produce commodities to cover the person's needs rather than the needs themselves. The economic resources approach calculates a theoretical cost of living adjustable to circumstances, below which people are considered poor. Palmer suggests that low human capital of health, education, and labour combined with low social capital leads to low earning abilities which may be worsened by social exclusion if the families of people with disabilities are unable to contribute to the community.

Information Poverty

The narrow view of poverty considers only the economics, however people may experience other forms of poverty such as information poverty according to Thompson and Afzal (2011) who discuss the reciprocal relationship between information access and information possession. Prior to possession of information it must be accessible and, because possession is influenced by access, the study of information poverty is one way of creating a richer understanding of information access. Urquhart et al. (2007) propose the use of ICT as a solution by gathering information relevant to people with disabilities to alleviate poverty leading to the question of what and how much information is needed.

Poverty and Social Exclusion

Poverty, according to Coleridge (2006), can be directly linked to social exclusion. He describes poverty as 'best understood as a complex matrix of social exclusion that extends beyond income to encompass access to education, employment, housing, transport and the built environment, leisure, family life and social relationships' (Barnes & Sheldon, 2010 p.774). Social exclusion is understood as pushing individuals to the 'edge of society' thereby preventing them from full participation in social activities by reason of poverty, lack of competencies, education or discrimination (Douglas, Corcoran, & Pavey, 2007). Consequently their ability to exploit ICT to better their lives and the lives of their communities is hindered. Such social exclusion-ICT discourse is well supported by literature with for instance, low mobility seen as a form of social exclusion (Kenyon, 2011). Although Kenyon

does not advocate the use of virtual mobility, areas of social exclusion such as social contact, education and access to information may be addressed by technology (Foley & Ferri, 2012) and while social exclusion is not limited to technological exclusion (Chigona, Beukes, Vally, & Tanner, 2009), digital inclusion has been equated with social inclusion.

2.4 Digital Exclusion

Digital technologies are typically designed by and for people without impairments resulting in barriers for people with disabilities (Macdonald & Clayton, 2013) necessitating additional, typically expensive, technology for digital inclusion which creates additional barriers for people who are inevitably less able to afford them. Macdonald and Clayton promote the development of digital technology to break down social exclusion barriers conceding that this is unlikely to be actioned quickly. For disabled people this creates a double dichotomy through separating, firstly, people with disabilities from able-bodied people and secondly, people with disabilities who can use ICT from those who cannot (Gorski & Clark, 2002). Contradictory views regarding ICT and technological divide observes optimists considering ICT a potential solution for all problems and pessimists arguing that increased ICT will increase marginalization of already marginalized groups. Realists take the middle ground suggesting that because ICT supports society, society will adapt to technology (Polikanov & Abramova, 2003) however, from a societal perspective, disabled people feel excluded with disability policies formulated by non-disabled people wishing to maintain the status quo and control social change (Davis, 1990).

The digital divide in South Africa is considered to extend to at least 95% of the South African population (Singh, 2010) ascribed to a techno-centric approach resulting in limited ICT use in rural areas. Four key factors are alleged to be inadequately addressed; community participation, innovative technologies, applications related to community needs and sustainability (Conradie, Morris, & Jacobs, 2003) with human needs contended to be the primary aim of any technological intervention. Social relations require constant attention with on-going training while factors such as security and ownership in communities must be addressed together with sustainability of the project. Conradie et al. warn that ICT must be seen as an enabler of social change and not an end in itself, while warnings at the global macro level caution that if Africa remains a user and does not fully integrate ICT a form of ‘cultural imperialism’ will be created entrenching African dependency and deepening the digital divide (Polikanov & Abramova, 2003, p.51). Although digital inclusion is believed to improve social wellbeing and standards of living though global interaction, commerce and information sharing (Dewan & Riggins, 2005) together with alleviation of poverty through learning and knowledge gathering, it necessitates action-taking in addition to availability of technology (Urquhart et al., 2007).

The combination of people with disabilities and ICT in a social context is complex as exemplified by research observing information sharing on social networks being facilitated by disabled youths concealing their disabilities and disabled adults seeking out support groups (Soderstrom, 2009). Social networking can result in further exclusion through 'negative social capital' (Johnston, Tanner, Lalla, & Kawalski, 2011, p.26) and the emphasis on insiders versus outsiders while Warschauer (2003) warns of online access leading to the narrowing of social contact due to interactions less rich than face-to-face exchanges, anonymity bringing out the worst in people, and excessive time online limiting offline social contact.

2.5 Quality of Life

The presumption that people with disabilities are functionally limited, slow of mind, underprivileged and experience a low quality of life is being challenged with findings revealing that people with disabilities exhibit a much higher quality of life than anticipated (Albrecht & Devlieger, 1999). Explained from a holistic and systemic view of balance between mind, body, and spirit, two common factors affecting positive or negative QOL are believed to be social interaction and information which is, in part, attributed to higher social interactions. Higher quality of life was reported by people with disabilities who take control of their own lives, engage in reciprocal relationships within their social network, and continually seek information to understand their capabilities in order to improve their lives while sharing this information with others. In contrast, low quality of life was associated with difficult to manage physical conditions, pain, a lack of resources, disabling physiological and social environments and lack of information. Thus, high social interaction and information seeking has been associated with higher QOL while lack of social interaction and knowledge has been associated with low QOL (Albrecht & Devlieger, 1999). Consequently, information emerges as a link between quality of life, social participation, and sense of independence (Molino, 2001) with social interaction considered an important part of information seeking and sharing of information needs. Information behaviour therefore leads to a sense of well-being with positive experiences produced by social networks and information generated from them (Williamson et al., 2001). The enabler linking quality of life and information is choice, with quality of life improved by the person's choices and information a prerequisite for making choices (Molino, 2001) supporting Albrecht and Devliegers' (1999) view that people with disabilities who exhibit a higher quality of life are often seen to actively (choose to) seek social interaction and knowledge.

Some understanding of this is offered through the ancient Greek's distillation of centuries of philosophical thought in respect of the pursuits of man, the least understood and integrated of which is aesthetics which is fundamental to quality of life (Ackoff, 1976). According to Kitto's commentary on the ancient Greeks (cited by Pirsig, 2000) the Aristotlean source of virtue is arête or

'excellence' implying an excellent quality of living in the form of duty to one's person. Disabled people who exhibit high quality of life through social interaction and use of knowledge therefore excel by having a high arête.

Acknowledging the complexity of the definition of quality of life, Renwick et al. (2003) use the Toronto University's Center for Health Promotion (CHP) Quality of Life model in the development and empirical testing of their Quality Of Life for People with Physical Disabilities (QOLP-PD) model. Summarised in Table 1, the QOLP-PD model describes three domains, Being, Belonging, Becoming. ***Being*** relates to the person themself, ***Belonging*** to their relationship with their community, while ***Becoming*** relates to a persons' goals, aspirations, and growth (Renwick, et al., 2003).

Domains	Sub-domains	Description	Content of items in sub-domains
Being		Who I am as a person	
	Physical Being	My body, physical health, physical well-being	Appearance, grooming, hygiene, nutrition, fitness, mobility, sleep
	Psychological Being	My psychological well-being and view of self	Psychological health and adjustment, feelings, self-concept, self-esteem
	Spiritual Being	My values and standards	Spiritual beliefs, personal values, standards of conduct, hope for the future
Belonging		How good the fit is between me and my environment	
	Physical Belonging	My connections with important places in my life	Relationship with physical environments: Home, neighbourhood, community, work
	Social Belonging	My connections with important people in my life	Relationships with others: Partner/spouse, friends, family, co-workers, neighbours, groups
	Community Belonging	My connections to resources, services and events in my community	Access to public events and resources (work, income, services/programs, community events)
Becoming		What I do to reach my goals, aspirations and hopes	
	Practical Becoming	My daily activities related to work/school and self-care	Daily/regular activities: Domestic, voluntary, work, school, attending appointments (health)
	Leisure Becoming	What I do for fun, leisure and relaxation	Leisure and recreational activities: Hobbies,socializing, vacations, holiday activities
	Growth Becoming	New things I learn to promote my growth and development as a person	Improving/learning skills, adapting to life's changes, trying new things, problem-solving
The CHP quality of life model: domains and sub-domains.			

Table 1. Domains and Subdomains of the QOLP-PD model based on the original CHP model (adapted from Renwick et al., 2003).

2.6 Information and Communication Technology

Characteristically ICT refers to computers and Internet technology although it can include audio and video tape, postal services, telephones, television and radio (Kenny, 2002). Kenny's recommendation that radio be used as a ubiquitous, cheap, powerful, and sustainable direct poverty alleviation resource is likened to mobile technologies which are a ubiquitous and affordable means of bridging the digital divide (Chigona et al., 2009; Vicente & López, 2010).

Multiple benefits of using ICT have been advocated including lowering costs, such as medical and institutionalized living, increasing output in the labour market (Vicente & López, 2010), and for breaking cultural barriers, increasing education, health-care, social networking, and quality of life, thereby fostering economic equality, e-democracy, and economic growth (Fong, 2009; Halewood & Kenny, 2008). These benefits are particularly relevant for disabled people affected by the disability divide and suffering social exclusion (Singh, 2010) with ICT capable of assisting disabled people by compensating for physical and functional limitations and for providing access to information (Hollier, 2007; UNESCO, 2009). ICT is therefore beneficial in bridging the digital divide through improving economic situations, enhancing political participation, and facilitating social interaction (Chigona et al., 2009) however worldwide adoption of ICT by people with disabilities is lower than for non-disabled people (Hollier, 2007; Riege, 2005).

2.7 Information and Knowledge

Information and knowledge exhibit a complex relationship interlinking data, information, communication and knowledge (Sasvari, 2013) with knowledge regarded as subjective information linked to a person and to context, intangible and partially communicable. In contrast, information is tangible and transmissible comprising data as a form of knowledge requiring context and understanding to be of value. According to Polyani (1969) tacit knowledge includes experience and is difficult to articulate comprising information stored and used by individuals who gather and share explicit knowledge which alone is definable and reproducible in observable form (Nakamori, Wierzbicki, & Zhu, 2011). Acknowledging the complex and multi-faceted in nature of knowledge, Alavi and Leidner (2001) describe data as raw numbers and facts, information as processed data, and knowledge as information authenticated in the minds of individuals. Knowledge is considered a paradox as both a product (knowledge-that) and a process (knowledge-how) (Snowden, 2002). This broad general definition of knowledge may not be useful in daily living as it is only valuable when translated into action according to Niemelä et al. (2012) who differentiate enactment from simple interest describing it as 'concrete, visible, and observable actions and activities' (p.213).

Wilson favours the term information over knowledge believing that knowledge being explicit can only be known to the knower thus only information can be stored and transferred to another person. He views information as a second order need after primary information needs of food and shelter which, following Dervin's (1998) sense making model, is useful for bridging the gap between a situation and an outcome. Reminiscent of Albrecht & Devlieger's (1999) observations of people with disabilities with higher QOL seeking information and avoidance of information by people with lower QOL people, Wilson (2000) suggests that people either give attention to or avoid acquiring information.

2.8 Information Behaviour

The nexus of information need, gathering, storing, use, and sharing combined with the use of information technology is referred to as information behaviour (Fisher & Julien, 2009) although most models focus on information seeking alone (Godbold, 2006) with storing of information explicitly addressed by only a few such as Krikelas (1983). Information behaviour is embedded in social interaction with significant amounts of information transfer resulting from interpersonal communication (Williamson & Roberts, 2010). Thus gathering and sharing information is enacted at by individuals who provide knowledge within groups with the groups dependent on the knowledge of the individual (Sabherwal & Becerra-Fernandez, 2003). This has inspired the term human information behaviour which is the behaviour of humans satisfying their information needs for everyday life characterized by seeking and sharing information (Beverley, Bath, & Barber, 2007). Information behaviour is an important aspect of human living fulfilling a variety of functions, including providing support, clarification, and understanding while supporting decision making and problem solving and driven by factors such as the need to satisfy information required to make informed choices leading to the improvement of an individual's well-being (Moore, 2002). Moore's complex social information needs framework for everyday living which is considered appropriate for the study of information behaviour of disabled people (Beverley et al., 2007) comprises six different, yet interdependent dimensions – function; form; clusters; agents; users; and mechanisms - (Moore, 2002).

1. Function (why people need information) distinguishes two roles of people: both as citizens, requiring information about the world around them and consumers for consumption of personal goods and services.
2. Form (what kind of information people need) acknowledges two forms of information gathering: passive environmental scanning acquiring data from the social environment; and active information seeking to answer specific problems. This correlates to incidental information acquisition and purposeful information seeking constructs of Williamson (1998) with environmental

scanning postulated as providing 80% of everyday information (Williamson & Roberts, 2010) which may be denied people with disabilities due to their impairments.

3. Clusters (what people need information about) allude to grouping or clustering of information for access. Moore cites two global clusters, Maslow's hierarchical human needs of physiological; safety; affection and belongingness; esteem; and self-actualization needs; and Susan Tester's clusters of information associated with changes in the lives of people recognising limitations of the theory due to its focus on major life events and overlooking individual response to life events.

4. Agents (who initiates information activity) distinguishes three categories: seekers, providers; and processors. Information seekers obtain information actively through seeking and passively by absorption with information providers supplying a continuum from purely making information available to actively promoting information while processors, such as mass media and consumer groups, assimilate and restructure information functioning between seekers and providers.

5. Users (how needs differ between different groups of people) have inherently different needs posing difficulties in defining information needs for any specific group of people. However by focussing on a limited attribute, for instance visual impairment, key factors may be determinable.

6. Mechanisms (which mechanisms can be used to meet information need) identify four methods for meeting information needs – recording; reproducing; transmitting; and customizing. Although susceptible to becoming out-of-date digital media is superseding the traditional domain of printed materials. While reproducible easily and inexpensively the process of digital storage, copying, and transmission raises various legal issues.

2.9 ICT and Information Behaviour Barriers

The usefulness of both information behaviour and ICT are limited by individual and technical barriers which include low appreciation of the value of the individuals' knowledge to others, poor communication skills, education level differences, lack of recognition, lack of trust in people and accuracy of the information, differences in individuals background, and lack of social networks (Riege, 2005). Amongst older people, additional barriers to ICT such as lack of interest, feelings of being too old, fear of technology, lack of skills and experience, functional restrictions, and cost aggravated by lack of awareness of ICT and potential benefits of its use have been observed (Morris, Goodman, & Brading, 2006). Arguing that online technologies need to be made accessible to disabled people, researchers appeal for increased accessibility to technologies that facilitate social support (Chandrasekaran et al., 2003; Williamson & Roberts, 2010).

2.10 Needs of People with Disabilities

Clusters of needs of people with disabilities are recurrent issues in disability studies (Moore, 2002) with themes including economic poverty, education, employment, housing, transport (Barnes & Sheldon, 2010), participation in policy making (Prince, 2012), and civil rights (Davis, Kendall, & Meeks, 2002) with transport, housing, health and welfare services, recreation and media and cultural representation considered critical to wellbeing (Thomas, 2004). The need for self-determination, social identity, reciprocity and valued contribution, participatory expectations, and psychological safety (Milner & Kelly, 2009) are supported by the United Nations Convention on the Rights of Persons with Disabilities QOL domains of self-determination, social inclusion, rights and physical well-being (Verdugo, Navas, Gómez, & Schalock, 2012). Edwards and Imrie (2003) describe marginalization of people with disabilities by non-disabled people in terms of Bourdieu's habitus indicating that by viewing their bodies as superior non-disabled people have higher physical capital through which they can acquire higher levels of other capital, such as economic, cultural (education), and social capital. Social interaction and higher social capital is contended to be a factor in the perception of the Internet improving quality of life of people with disabilities (Gorski, 2005) while Albrecht & Devlieger (1999) believe that quality of life extends beyond simple wellbeing regarding social standing as important as other measures.

2.11 Information and Disability

Disability Knowledge

Prince (2012) encourages the gathering and sharing of historical disability information to encourage social action and improvement of governmental policy for empowerment of people with disabilities with Molino (2001) expanding the definition of disability knowledge to include information required by any person whether disabled or not. Likewise Garden (2010) observes people embracing their impairments and appeals for narratives of disability and the overcoming of limitations to counteract prevailing literature which she sees as reinforcing tragic circumstances. The view that historical disability knowledge gathering perpetuates knowledge that would otherwise be lost (Prince, 2012) is supported by Reaume (2012) who suggests that the future depends on the past which is easily forgotten. He notes a paradox when comparing the cost of interpreting the past to determine future wealth of disabled communities with the lack of resources, funding and time available for the volume of work required.

Although information gathered by disabled people is not believed to be significantly different from that gathered by non-disabled people (Beverley et al., 2007; Vicente & López, 2010), three types of information needs have been observed: health (Vicente & López, 2010), economic (Urquhart, Liyanage, & Kah, 2007), and activist knowledge (Prince, 2012; Reaume, 2012). Health knowledge

may be attributable to additional medical and diet requirements of disabled persons whilst economic knowledge is vital as people with disabilities are fundamentally poorer than non-disabled people and activist knowledge is useful for overcoming the social restrictions imposed due to disabilities. Beverley, Bath, & Barber (2007) suggest that communication problems between professionals and impaired people moderates access to information which may be alleviated by applying Moore's six dimensions described previously.

Information and Power

Information is connected to power by many authors in both positive and negative contexts. Prince (2012) notes that power derived from information may adversely impact on marginalized people such as people with disabilities and Garden (2010) considers disability movements as socio-politcal organizations struggling for power and privilege while Joubert (2011) reflects on the mobilization of pressure groups exasperated with the flawed theorizing of disability leading to lack of accountability by people with disabilities thereby creating a form of hegemony by non-disabled professionals.

Power, according to Prince (2012), reflects typical patterns exhibited as power-over (domination), power-with (collaboration), and power-to (influence). Although there appears to be a prevalence of zero-sum effect of information with resultant inequalities, the ideal situation is to attain a non-zero-sum effect with all participants having their interests addressed. However Molino (2001) cautions that advice tends to be political whereas information is value-free and impartial. He suggests this to be a measure of democracy suggesting that accessibility of information is a key indicator differentiating a democratic and paternalistic society.

Access to Information

The information access theory espoused by Thompson & Afzal (2011) explains physical access, intellectual access, and socio-cultural access as equally influencing information poverty with none of the components sufficient in itself. Socio-cultural access is connected to economic poverty and physical access relates to proximity and the ability to access the technology such as reading a computer screen and typing on a keyboard, while intellectual access relates to mental skills required to acquire and process information which can be enhanced by training and education. Similarly Van Dijk & Hacker (2003) record four barriers to access: mental; material; skills; and usage access. Mental access barriers are caused by lack of experience due to lack of interest or fear of technology, material access barriers are caused by lack of possession of the technology, and skills access barriers are caused by lack of education, user interface limitations and lack of social support. Finally, usage access barriers arise due to a lack of opportunity to use the technology or due to physical limitations which may be remedied or enhanced through the use of assistive technologies.

2.12 People with Disabilities, Quality of Life, and ICT

The emergent question therefore is whether information and information technology afford people with disabilities a higher quality of life. Accepting the persistent view that ICT does not directly influence quality of life (Mansell, 2008) necessitates restructuring the question to determine if higher quality of life can be associated with other factors, such as information behaviour in turn influenced by information technology.

2.13 Literature Gaps

Information seeking behaviour is accepted as essential for daily life and arguably more important for people with disabilities (Moore, 2002) who are repeatedly excluded due to their impairments. Although ICT is posited as assisting both information behaviour and people with disabilities, the review of literature has identified a dearth of information on how disabled people gather and share information. Consequently, the relationships between disabled people, ICT, and information behaviour are fundamentally unexplored exposing a gap in understanding the information behaviour of disabled people and the role that ICT plays in their gathering and sharing of information. This is corroborated by calls for disability studies to include acquisition and storage of historical information with the aim of preparing for the future (Prince, 2012) and for the gathering of information useful in assisting with the development of solutions by identifying barriers disabled people face, technologies they use, and problems incurred in using technology (Vicente & López, 2010).

2.14 Summary

Accepting the precept that access to information is essential for achieving well-being in information societies (Mansell, 2008) and in particular amongst people with disabilities (Albrecht & Devlieger, 1999) who may be denied access to information on one or more of aspects of physical, intellectual, or socio-cultural access. It is posited that people with disabilities who exhibit a higher quality of life possess heightened capabilities of accessing and using information. This postulation is the basis for the current investigation with the primary aim of increasing the understanding of the associations between information behaviour, quality of life and use of ICT by people with disabilities.

CHAPTER 3: RESEARCH OVERVIEW

This chapter presents the conceptual model for the study and enumerates the research hypotheses that were investigated.

3.1 Research Conceptual Model

In order to test the theory formulated in this study the relationships between data variables collected during the data collection stage were examined (Saunders, Lewis, & Thornhill, 2009). Three forms of data variable are indicated in the research conceptual model in Figure 1. The dependent variable is quality of life which changes in response to the independent variable information behaviour which responds to changes in ICT and type of information needs. Finally, type of information needed are influenced by the context of dwelling conditions.

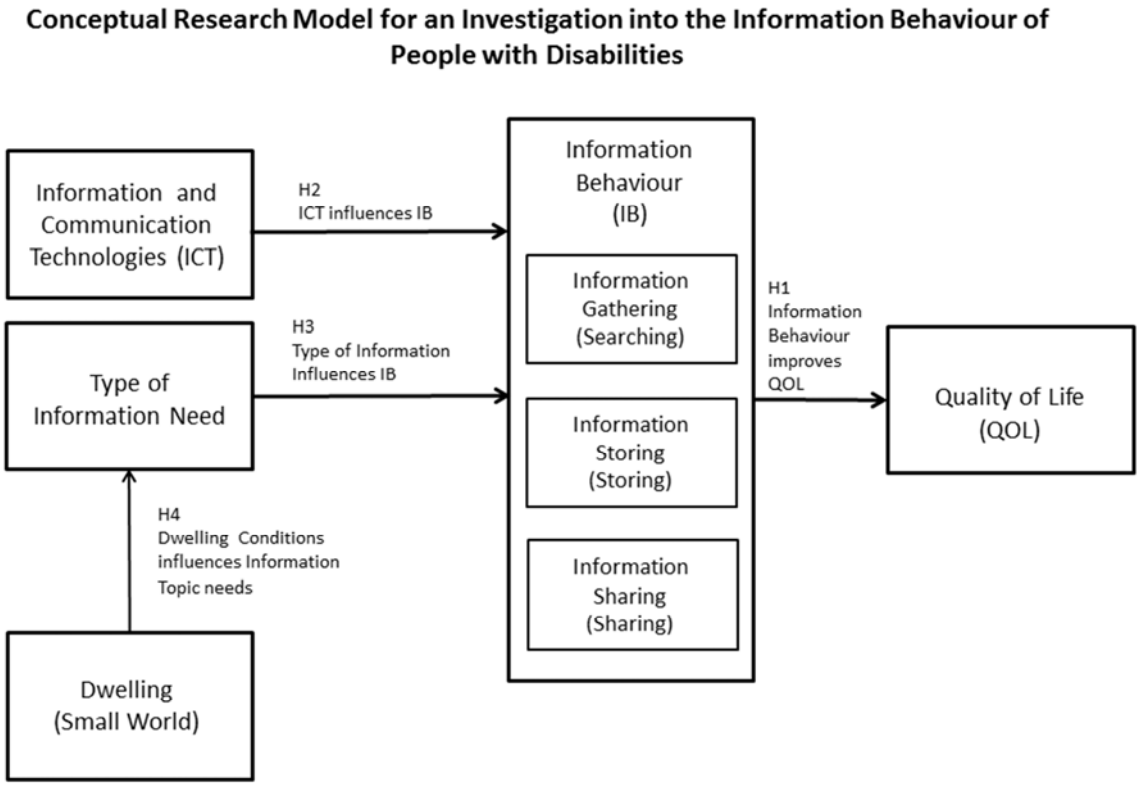


Figure 1. Conceptual Model for the Investigation into the Information Behaviour of People with Disabilities.

Definition of Constructs

Quality of Life: Quality of life is a poorly understood yet complex concept, rendering the measuring of it difficult (Ackoff, 1976). Ackoff suggests that quantitative indicators of quality of life are not available while qualitative indicators allow at best identification of problems although not enough to justify resource allocation. For this study, a foremost set of quality of life indicators for people with

disabilities which is found in the QOLP-PD model (Renwick et al., 2003) was employed to determine information need.

Information Need: Criticised for overplaying need and ignoring desires (Day, 2011) everyday life information seeking relates to searching for information in support of daily life. For people with disabilities, numerous needs have been observed with recurrent themes of economic poverty, education, employment, housing, transport (Barnes & Sheldon, 2010), participation in policy making (Prince, 2012), and civil rights (Davis et al., 2002). Correlation of these needs to quality of life has been observed with transport, housing, health and welfare services, recreation and cultural representation considered critical to wellbeing (Thomas, 2004).

Information Behaviour: Information behaviour is the behaviour of people satisfying their information needs for everyday life characterized by seeking and sharing information (Beverley et al., 2007) including storing of information for later use (Krikelas, 1983) and considered to be driven by the need to satisfy information needs required to make informed choices which leads to the improvement of an individual's well-being (Moore, 2002).

Information and Communication Technology (ICT): Typically associated with computers and Internet technologies, ICT includes audio and video tape, postal services, telephones, television and radio (Kenny, 2002). The use of ICT has been suggested for lowering costs and increasing output in the labour market (Vicente & López, 2010), for breaking cultural barriers, increasing education, health-care, social networking, and quality of life (Fong, 2009; Halewood & Kenny, 2008). Considered particularly relevant for disabled people (Singh, 2010) ICT is considered capable of compensating for physical and functional limitations and for providing access to information (Hollier, 2007; UNESCO, 2009).

Dwelling Conditions: Information behaviour is temporal and spatial, transpiring in particular times and spaces which form the context for information seeking and sharing (Savolainen, 2009). Thus accommodation, especially for mobility impaired people and people in care-facilities, can restrict where information behaviour occurs. Two prominent models of spatially influenced information behaviour are Chatman's (1996) small world construct and the information grounds approach advanced by Fisher (Fisher & Julien, 2009). The small world construct relates to information behaviour of people bound within a persistent physical space and typical of a caring facility while information grounds is associated with information behaviour of less mobility-impaired people meeting informally in open spaces. Different needs are highlighted with small world influenced by social norms limiting certain types of information sharing (Chatman, 1996) and information grounds tempered by weak ties (Granovetter, 1973). However, the lines between the two are becoming

obscured with ICT facilitating expansion of settings beyond concrete structures (Savolainen, 2009) challenging the small world construct and making information grounds more accessible (Williamson & Roberts, 2010).

Based on the discussion above, it is proposed that:

> *The quality of life of people with disabilities is improved through Information gathering and sharing based on information need, enhanced through the use of ICT, and regulated by dwelling conditions.*

3.2 Research Hypotheses

The hypotheses in the following sections are derived from the research questions and the literature review. Hypotheses are statements that are tested in order to validate or repudiate theory and must be stated in such a way as to be falsifiable (Walliman, 2011). Consequently the conceptual model hypotheses in Figure 1 are stated below as null hypotheses by phrasing the hypotheses as if the theory is an a priori fact.

RQ 1. What Information Behaviour of people with disabilities influences their quality of life?

Wilson (2000) suggests that people either give attention to or avoid acquiring information which he views as a second order need after primary needs of food and shelter. Moore (2000) sees disabled people who profess higher quality of life actively seek information and includes information behaviour in his framework of information need (Moore, 2002) while Vicente & López, (2010) suggest that information sought by people with disabilities is not significantly different to non-disabled information seeking. This leads to the first hypothesis.

- Hypothesis 1 The Information Behaviour of People with Disabilities does not influence their perceived Quality of Life.

RQ 2. What relationships exist between information, information and communication technology and the Information Behaviour of people with disabilities?

ICT is useful for searching, capturing and storing, and for meaningfully presenting information (Zack, 1999) as well as for sharing information and social networking of people with disabilities (UNESCO, 2009). However lack of awareness, technical issues and lack of skills cause barriers to the use of ICT (Morris et al., 2006; Riege, 2005) leading to the following null hypothesis based on the view that ICT is beneficial for information behaviour:

- Hypothesis 2 ICT does not influence Information Behaviour of People with Disabilities.

People with disabilities are understood to seek less types of content than people without disabilities (Dobransky & Hargittai, 2006) although a variety of information is needed (Moore, 2002). Evaluation of content is part of information literacy (Leung, 2010) which is closely linked to information seeking behaviour (Dobransky & Hargittai, 2006) and, in part, determined by information need (Leung, 2010). Nevertheless, information needs are varied and have been seen to initiate different behaviours (Elsweiler, Mandl, & Kirkegaard Lunn, 2010) leading to hypothesis 3.

- Hypothesis 3 The Types of Information needed do not influence Information Behaviour of People with Disabilities.

RQ 3. In what way do contextual factors of dwelling conditions influence the information behaviour of people with disabilities?

The context of content is important (Julien & Williamson, 2010) with context of particular significance for people in assisted living compared to those living independently with information behaviour influenced by social norms (Chatman, 1996). Moore's (2002) framework implies that information needs for any group of people are difficult to determine due to varying needs of individual members leading to the fourth hypothesis.

- Hypothesis 4 There is no significant difference between the Information needs of People with Disabilities residing in Assisted Living Facilities and those Living Independently.

These hypotheses form the statements which are tested in order to answer the research questions. Following Mingers' (2001) guidance that testing of the hypotheses be done by means of research which is structured and clearly states the researcher's viewpoint of the world the methodology and underlying philosophy for this study is discussed in the following chapter.

CHAPTER 4: RESEARCH METHODOLOGY

In this chapter the research process is described. Research philosophies, approaches, and methodologies are discussed before highlighting the philosophy guiding the research. Research reliability, validity, and ethics are then reviewed prior to detailing the research sample, research instrument, and administration methodology. Finally, the method of data analysis it described.

4.1 Introduction

With the aim of building knowledge, research must be undertaken to answer the research questions which for reliable and valid knowledge must follow a structured approach clearly presenting the researchers' view of the nature of the world and of knowledge (Mingers, 2001). The combination of views and the methods, or research paradigm, consists of a 'set of philosophical assumptions covering ontology (what is assumed to exist), epistemology (the nature of valid knowledge), ethics or axiology (what is valued or considered right), and methodology' (Mingers, 2001 p.242) for which (Saunders, Lewis, & Thornhill, 2009) suggest a pragmatic approach whereby the research question is used to determine the philosophical approach to the research. The philosophies supporting this research is described in the following sections.

4.2 Research Philosophies

Ontology

Concerned with the nature of reality, ontology customarily takes one of two stances. Objectivism believes that a 'real' reality exists with social actors independent and external to social entities and enduring even if the actors change. Objective structures are generalizable with the same structure observable in other social entities in different times and spaces. Conversely, subjectivism believes that social phenomena are continually produced and reproduced through the actions of social actors. Thus reality is seen to be socially constructed (Saunders et al., 2009) and sometimes called idealism (Walliman, 2011) in contrast to materialism or reductionism for which the latter stresses independence of mind and matter. An objective stance is taken for this study.

Epistemology

Whereas ontology is concerned with the nature of reality, epistemology is concerned with the nature of knowledge and how we 'know' things (Saunders et al., 2009). Three epistemological views are popular. At one extreme are 'resource' researchers (ibid. p. 112) who take an objectivist ontological stance viewing reality as represented by 'real' objects existing separately from the researcher while at the opposite end of the continuum 'feelings' researchers (ibid. pp 112-113) believe that reality is continually (re)constructed through the senses of actors interpreting their world. The third view is realism which combines elements of the two extremes and postulates that

reality exists beyond human cognition however human cognitive processes are required to understand the reality that may or may not be observable. Within realism, two forms are recognised, direct realism which is closer to the positivistic view holding that what is sensed is real ('what you see is what you get', ibid. p114) remaining moderately constant while critical realism experiences the world as a process discerning sensations produced by the world but using mental processes to appreciate these sensations.

Taking a positivist stance this research collects observable data to verify hypotheses that have been developed from existing theory with the resultant confirmation or refutation of the collected data useful in refining existing theory or creating further theory. A key element of the positivistic approach is the independence of the researcher who is neither influenced by the research subject nor influences it (Saunders et al., 2009).

Axiology

Axiology is concerned with the role that the researchers' values play on the research and guides the research through the values that the researcher places on the individual options. Saunders et al. (2009) advance that a statement of values within a research study by the researcher is useful for ensuring that the researcher remain cognizant of their value approach and guides them ethically while affording other researchers the opportunity to understand the researcher's values and possible differences to their viewpoint.

4.3 Research Paradigm

The provision of an explicit philosophical stance allows members of the academic or professional community to engage in dialogue with the research work through common and shared perceptions and practices. The most elemental set of assumptions that allows this is known as a paradigm comprising the researcher's perception of knowledge and how it is acquired (Hirschheim & Klein, 1989). Such a paradigm or worldview is a basic belief system that guides the knowledge seeking inquirer or researcher (Guba & Lincoln, 1994) which is useful in drawing the research philosophy together to understand and explain the observed phenomena (Saunders et al., 2009). Saunders et al. advocate the use of Burrell and Morgan's model reflecting the four paradigms illustrated in Figure 2: functionalist; interpretive; radical humanist; and radical structuralist; comprising four dimensions: objectivist; subjectivist; radical change; and regulation. The **objective** and **subjective** ontological dimensions were discussed earlier, while **regulation** studies the ways in which controls are applied and **radical change** the manner that fundamental change is made to existing reality. These four dimensions create four quadrants or paradigms which are helpful for clarification of the researcher's own philosophical views while guiding other researchers. The **functionalist** paradigm is followed in this research and takes an objective regulatory stance used in most business and management

research. The second paradigm, **interpretivist**, views knowledge as socially constructed and understood in context while the **radical humanist** paradigm takes a similar subjective position to the interpretivist paradigm attempting to make fundamental changes to the observed occurrences. Likewise, the **radical structuralist** paradigm endeavours to make fundamental changes from an objective viewpoint.

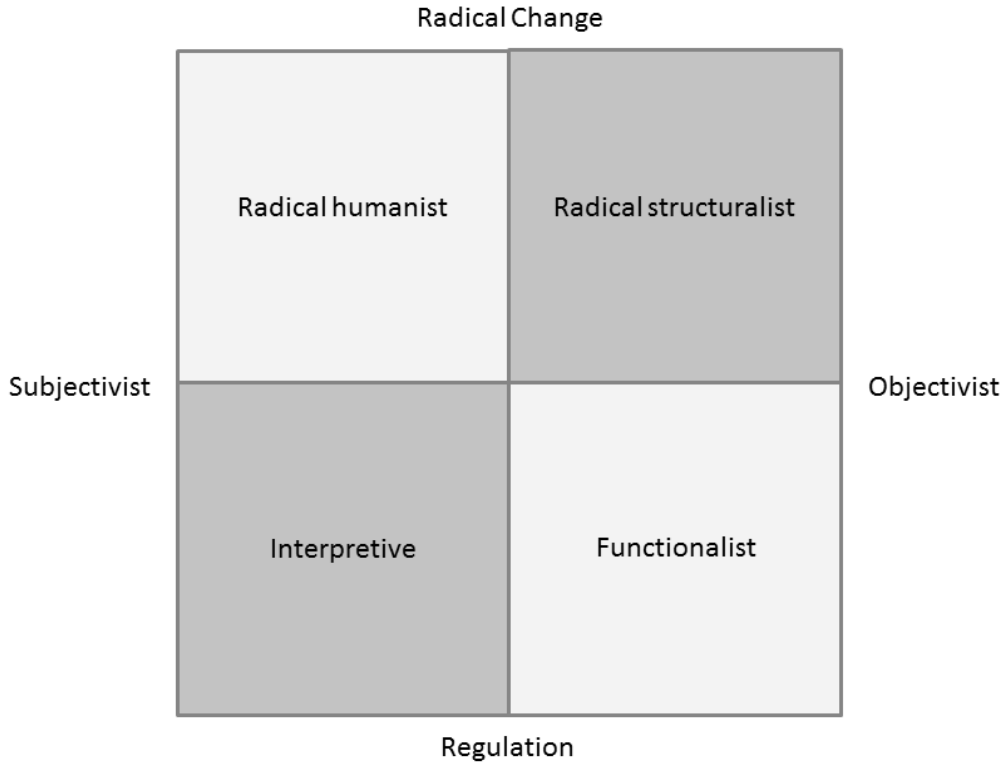


Figure 2. Burrell & Morgan's 1982 Four Paradigms for the Analysis of Social Theory (Saunders, Lewis, & Thornhill (2009)).

4.4 Research Approaches

Research is approached from diverse positions with regard to theory, primarily deductive by confirming (or refuting) existing theory, as in this study, or inductive by building theory from observation. Induction takes an interpretive subjective philosophy in endeavouring to understand meanings that humans attach to events through the use of qualitative data with the researcher part of the context sensitive research and not readily generalizable. Using quantitative data, the deductive approach is generalizable with the researcher independent of the research taking a structured and reductionist approach to understand the whole by breaking the situation up into parts and studying the parts prior to reassembling the whole. This is accomplished by developing a conceptual model from existing theory and deducing hypotheses which are tested and analysed

from which the results are used to confirm or modify the original theories employed (Saunders et al., 2009).

4.5 Research Methodology

The research methodology presented below describes the methods by which knowledge is built in a way that minimises human shortcomings of poor observation, overgeneralizing, selective perception, illogical beliefs, ego, prejudice, and mystification (Case, 2007).

Research Purpose

Saunders et al. (2009) describe three classifications of research purpose: exploratory, descriptive, and explanatory. **Exploratory research** seeks to find out more about situations or phenomena and is useful for clarifying understanding of a problem primarily through reviewing literature, interviewing experts, and conducting focus group interviews. **Descriptive research** provides detail of the observed phenomena and can be either a forerunner to or an extension of the other forms of research while **Explanatory research** has the objective of explaining the relationships between variables in a situation. The two are often co-joined in research and termed **descripto-explanatory** which has been established as applicable in IS research for explaining and predicting (Gregor, 2006).

This study emphasises the descripto-explanatory aspect. Exploratory research in the form of literature review was undertaken to develop the conceptual model with a combination of exploratory and descriptive research used for determining the information behaviour of disabled people and their use of ICT. Finally correlations were used to explain the conceptual model's relationships between the practices of people with different impairments and the influence of ICT on information behaviour.

Strategy

Surveys are the most frequently used method in business and management research (Saunders et al., 2009) and information systems research (Guo & Sheffield, 2008). **Sample surveys** require more effort in setting up but are a relatively easy and economic manner of collecting large amounts of data from a large population. Quantitative data collected from questionnaire surveys are easier to analyse than other methods while affording control over the research process and presenting the opportunity to create models and generalise the findings. However surveys encounter limitations as they are not as far-reaching as other methods and may be limited by poor design and sampling.

Method

Saunders et al. (2009) describe three choices of research method. **Mono-method** uses a single data collection method, while multi-method and mixed methods use multiple methods. **Multi-method** uses two or more methods with the same approach and can be separated more accurately as multi-

method quantitative and multi-method qualitative studies while **mixed methods** approaches use data collection methods from both quantitative and qualitative approaches.

This research took the form of a mixed-method quantitative sample survey providing better and more consistent results while taking into account the varied aspects of environment, physical, social, personal, processes and context (Mingers, 2001).

Time Horizon

Research may be undertaken as either a snapshot (cross-sectional) or as a longer term study (longitudinal) (Saunders et al., 2009). **Longitudinal studies** are effective in studying change over time whereas cross-sectional examine phenomena at a single point in time. **Cross-sectional studies** typically take the form of surveys as is the case of this study.

4.6 Philosophies Underpinning this Research

Taking an objective, positivist, value-free, functionalist, and deductive cross-sectional approach the guiding philosophical stance for this study is summarised in Table 2.

Philosophy	Research Paradigm	Approach
Ontological Assumption	Nature of reality	Objective
Epistemological Assumption	Relationship of Researcher	Positivist
Axiological Assumption	Role of Values	Value-free, Unbiased
Research Approach	Research Paradigm	Functionalist
	Process of Research	Deductive, Quantitative and Qualitative
	Purpose	To explore and describe phenomena.
Timeframe	Time-horizon	Cross-sectional

Table 2. Research Philosophies.

Order, external reality, reliability, parsimony, and generality are the underlying assumptions of the functionalist view according to (Walliman, 2011, ebok location 513) and summarised for this research is in Table 3.

Assumption	Description	This Research
Order	Underlying rules or laws can be discovered (or uncovered) for the universe which is considered an ordered system.	Information has order as it is understood as objects comprising data elements useful for creating knowledge by and for the use by people. Disabled people fit into the order of people albeit with different attributes from the norm.
External reality	All humans have a common reality which is understandable independently of our existence. Information can be shared equally.	Information and disabled people are understood from an objective resource-based-view which exists independently of human cognition. Even if it were possible for all human minds to stop, information and disabled people would continue to exist.
Reliability	Our senses are dependable in interpreting reality and producing our knowledge of the world.	Reality as experienced is reliably interpreted by the senses of humans. Information is thus interpreted the same way for disabled people as well as for non-disabled people.
Parsimony	Explanations and consequently theories must be stated as simply as possible.	The theory developed in this research is stated in simple terms as: The quality of life of disabled people can be enhanced and information behaviour assisted by the use of ICT.
Generality	Discovered and uncovered rules and laws of the universe are not temporally and spatially limited and can be applied generally to similar situations.	Similar impairments are believed to affect people in similar ways while information is gathered and shared in comparable ways by all peoples.

Table 3. Order, External Reality, Reliability, Parsimony, and Generality of this Study.

4.7 Research Approach Credibility

For research to be credible and generalizable it must be both valid and reliable. While validity is concerned with ensuring that observed findings are accurate, reliability concerns the ability to replicate the findings in a similar study (Saunders et al., 2009). While valid tests are necessarily reliable, reliable tests are not necessarily valid as a weak assumption may lead to a poor yet consistent measure (Jackson, 2011). Collectively reliability and validity are significant determinants of the choice of methods and measures as they 'determine how compelling the results' of a study are (Case, 2007, p.181).

Validity

Four type of validity are prevalent for questionnaires. **Internal validity** is the accurateness of the actual findings in relation to the intended findings. **Content validity** concerns the level to which the survey's questions cover the research question and **criterion-related** or **predictive validity** is the ability of the measures to make valid predictions. Finally, the form used in this study, **construct**

validity concerns the ability of the questions to measure the intended measurements (Saunders et al., 2009). Mitchell (1996) indicates that a factor analysis may be indicative of construct validity which was employed for this study with a principal component analysis resulting in eight factors as described in section 5.3.2.

Reliability

Consistency of intended answers determines the robustness of the questionnaire and can be tested in three manners. **Test-retest** administers the survey more than once, **alternative form** compares similar questions in alternative forms within the same questionnaire, and finally, the preferred method of **internal consistency** makes use of Cronbach's alpha (Mitchell, 1996; Saunders et al., 2009). Internal consistency tests for reliability were used in this research with three reliability tests undertaken. First the eighteen subdomains of the QOLP-PD were tested as they are both a measure of quality of life and the basis for determining information needs of people with disabilities producing an Cronbach alpha of 0.844. The second test assessed information behaviour and ICT resulting in an Cronbach alpha of 0.705 while the third test combined all of the above and produced an alpha of 0.801 after excluding access to computers which had a zero variance. By including perceived quality of life, Cronbach alpha reduced to 0.788 remaining in an acceptable range above 0.6 (Mitchell, 1996). Consequently the instrument was accepted as reliable.

4.8 Research Approach Ethics

Research ethics are applicable at each stage of research from the start of a research project to end. The overarching internal ethical issues are the sponsor's right to useful research and the researcher's rights to absence of coercion and safety. Although external to the research process, ethics concerns the participants whose rights of safety, informed consent, deception, confidentiality, safety and the right to withdraw must be protected (Jackson, 2011; Saunders et al., 2009). This research subscribes to each of these with the research project approved by the University of Cape Town Ethics Committee for research. All participant information was treated in accordance with the professional code of conduct for social researchers and treating the identity of the individuals and organizations participating in the study as confidential. The completed Ethics Committee Application Form is attached as Appendix B together with the approval notice supplied by the University of Cape Town Department of Commerce Ethics Committee.

4.9 Research Sample

Inasmuch as it is impractical to survey the entire population of disabled people, this research surveyed a sample of the population. There are two types of sampling techniques, probability or representative sampling and non-probability or judgemental sampling (Saunders et al., 2009). **Probability sampling** identifies a sampling frame, determines an adequate sample size and selects a

sampling technique before testing for representativeness of population. This allows statistical inferences to be made from the data limited by fundamental requirements of an accurate definition of the sampling frame, the size of the population and that a statistically random sample is actually possible. Where the population size is unknown or is poorly defined, such as in the case of disabled people, **non-probability sampling** provides a range of techniques for selecting a sample although not every individual has an equal opportunity of being included (Jackson, 2011). Jackson describes two non-probabilistic sampling techniques, convenience and quota. ***Quota sampling*** is similar to probabilistic sampling although the result may not be truly representative of the population while ***convenience sampling*** or haphazard sampling selects samples in the most convenient manner available to the researcher. This method randomly or haphazardly uses whoever is available and willing to participate (Jackson, 2011; Saunders et al., 2009) and may include groups that are deemed by the researcher as representative of the population. Saunders et al. describe three sampling techniques that lie between the extremes of convenience and quota sampling. ***Purposive sampling*** is useful for small sample sizes and is applied typically in case studies and grounded theory research. ***Snowball sampling*** identifies initial participants who identify further candidates and ***self-selection sampling*** which uses advertising to garner participants. Self-selection is particularly useful for internet surveys with requests posted to user groups and internet newsgroups. As not all disabled people are equally accessible some groups or individuals may not stand an equal chance of being selected for this research thus the use of non-probabilistic sampling and a combination of administration techniques were utilised. Purposive convenience was followed in approaching disability organisations and people who had known associations with potential participants while self-selection was used when posting requests on an internet disability forum. The people thus contacted referred other respondents to the researcher thereby making use of snowball sampling.

4.10 Research Instrument

The research instrument was a quantitative questionnaire developed from the hypotheses presented in chapter 3. The questions were developed using a data requirement built from the research questions, objectives and hypotheses (Saunders et al., 2009) and converted into the questionnaire presented in Appendix A.

Sample Survey

The questionnaire comprised 45 questions in five sections to collect data in order to answer the research questions and worded to limit bias and allow for easy understanding by the respondents. The survey was structured in subsets (Jackson, 2011) with Section A eliciting personal information and section B investigating the impairments and difficulties experiences by the respondents. Section C gathered data about information needs based on quality of life while section D garnered data

about the information seeking and sharing activities of the respondents. Finally, section E gathered data about the use of ICT and role it plays in disabled people's information behaviour. Contrary to Jacksons recommendations demographics were placed at the beginning of the survey with sensitive information ensuing directly for two reasons. Firstly, as most surveys were completed in dialogue with participants the demographic section facilitated building rapport with the respondent and in a number of cases resulted in a sense of pride shown by the participant for their achievements despite impairments, for example owning a home or completing post-graduate studies. Secondly, the assumption that the demographic section placed at the end the structure may draw focus away from the topic thereby reducing the impact of the final question was borne out in the interviews when respondents relaxed and readily answered sections C, D, and E as well as freely supplying more open question information when compared to the email responses. Whereas Section B requested information of a potentially sensitive nature, it was readily answered being in line with the study and the participants' situation. The closed-ended questions made use of a Likert-type scale from 1 to 5 allowing for neutral answers (Jackson, 2011). Although more difficult to analyse statistically, open-ended questions were used to augment the closed-ended question which are prone to limiting responses (Jackson, 2011).

Limitations to Sample Survey

The sample survey exhibits some limitations, notably in respect to the quality of life measure (Appendix A Question A12), dwelling conditions (Appendix A Question A4), and information searching and use (Appendix A Question C1).

Quality of Life – In order to obtain a binary response to this question, responses of 'Good' and 'Excellent' were combined into 'Higher Quality of Life' and responses of 'Poor', 'Fair' and 'Neutral' were combined into Lower Quality of Life. The low number if respondents indicating lower quality of life justifies the inclusion 'Neutral' in this category however in larger samples 'Neutral' may need further examination.

Dwelling Conditions – Dwelling condition responses were combined to indicate independent living and assisted living conditions. Independent living comprised responses of 'Own House or Flat', Rented House or Flat', and 'Shared Accommodation' while assisted living included 'Lives with Family' and 'Care Facility'. This was based on the assumption that people with disabilities living independently have limited external care needs and assisted living enjoys care either formally (nursing) or informally (family). The potential of cross-over (family care within own house or independence when living with family) constitutes a limitation to this approach. However this

approach was considered fair as the construct was used as an indicator of small-world environment rather than physical care.

Information searching and use – Construct C1 contains a measurement for two items (information searching and information use) and as such is not suitable to measure either item individually.

4.11 Administering the Survey

The sample survey was administered through mail, email, and telephonic interviews (Jackson, 2011; Saunders et al., 2009) and internet survey tools (Saunders et al., 2009). While mail and email limit researcher bias they also have low response rates which can be increased when using telephonic interviews although these may induce positive responses. Internet surveys combine the use of email and online survey instruments (Saunders et al., 2009) and are similar in action to postal questionnaires however low response rates to emails may be followed up more easily than mail surveys.

A total of 70 people with disabilities completed the survey with 1% (n=1) by mail, 16% (n=11) by email, 39% (n=27) in face to face interviews, 24% (n=17) by telephone interview, and 20% (n=14) through an internet survey tool [RationalSurvey.com]. Respondents were initially recruited through three South African disability organisations, a national disability internet forum and disability units of three Western Cape universities. Secondary respondents were obtained via references from the initial respondents.

The survey was prepared in three formats, (a) as a regular Microsoft Word document depicted in Appendix A, (b) the same document formatted as a screen-reader friendly version and (c) in the form suitable for the Internet survey tool [RationalSurvey.com]. Due to physical impairment limitations many participants preferred direct contact in completing the survey as noted by the high percentage of interviews undertaken with most interviews lasting between 45 minutes and an hour. A number of ancillary issues were discussed during the closing section of the survey which supplied further insight into the information needs of people with disabilities in their daily lives.

4.12 Data Analysis

Analysis of the participant's completed surveys was conducted to confirm support of the research questions and hypotheses with the objective of investigating the information behaviour of people with disabilities in relation to their quality of life and the role of ICT following Gregor's (2006) primary goal of theory, analysis and description. The survey responses were captured into Microsoft Excel spreadsheets with the closed question responses subsequently imported into IBM SPSS Statistics 19 package for analysis and tested for reliability and validity. Open-ended questions

followed Thomas' General Inductive Approach to produce common themes (Thomas, 2006). Lists were compiled which were read and re-read to identify commonalities in the text and revised to produce common topics which were combined into themes. The findings from these data analyses is described and discussed in the following chapters.

4.13 Summary

The research methodology supported by the philosophical foundations of this research presented in this chapter incorporate the researcher's ontological, epistemological, and axiological stances together with the research approach. The results from this ontologically objective, epistemologically positivist, axiologically value-free and functionalist paradigm study is described below. The deductive research process used quantitative and qualitative data at a single point in time for the purpose of describing the information behaviour of people with disabilities in the context of their perceived quality of life and the role played by information and communication technology.

CHAPTER 5: RESEARCH FINDINGS

This chapter describes the findings from the application of the research instrument. Demographics are summarised before presenting a correlation review and factor analysis in preparation for testing the hypotheses. After reporting the findings from the hypothesis testing, additional findings from the research are described.

5.1 Introduction

Seventy participants completed a survey investigating the information behaviour and quality of life of people with disabilities and the role of ICT. The data gathered from these surveys were explored based on the methodology described in the previous chapter with the findings presented below.

5.2 Demographics

Quality of Life

Quality of Life for this study was categorised as Poor, Fair, Neutral, Good, or Excellent. No participant selected Poor, while 6% indicated Fair (n=4), 17% Neutral (n=12), 51% Good (n=36), and 26% Excellent (n=18) together rendering a mean of 3.971 with a standard deviation of 0.816 as shown in Table 4.

Description	Valid N	Percentage
Poor	0	
Fair	4	6%
Neutral	12	17%
Good	36	51%
Excellent	18	26%
Total	70	

Table 4. Quality of Life Distribution.

Fair and Neutral responses were combined to provide a Lower Quality of Life indicator while Good and Excellent were combined to provide a Higher Quality of Life indicator. The results are summarised in Table 5 which indicates 77% (n=54) of participants reporting higher quality of life.

Description	Valid N	Percentage
Lower QOL	16	23%
Higher QOL	54	77%
Total	70	

Table 5. Higher versus Lower Quality of Life.

Type of Disability, Severity and Onset

The categories for the type of impairment were based on the 2011 South African Census groupings (Statistics South Africa, 2012). As some respondents suffer more than one disability they are included in multiple disability groupings depicted in Table 6. A total of 81% (n=57) of participants reported difficulties with sight, 11% (n=8) with hearing, 26% (n=18) with mobility (walking and climbing stairs), and 17% (n=12) disclosed self-care difficulty. As no respondents indicated either Communicating or Remembering and Concentrating as significant factors these are excluded from Table 6.

Disability	N	%
Sight	57	81%
Hearing	8	11%
Mobility	18	26%
Self-Care	12	17%

Table 6. Types of Disability.

Disability was further analysed by severity which was determined from the response ranked highest by each individual independent of the type of disability. The results, depicted in Figure 3, show 60% (n=42) incapable of performing at least one of the disability types and 36% (n=24) having a lot of difficulty in at least one type of disability.

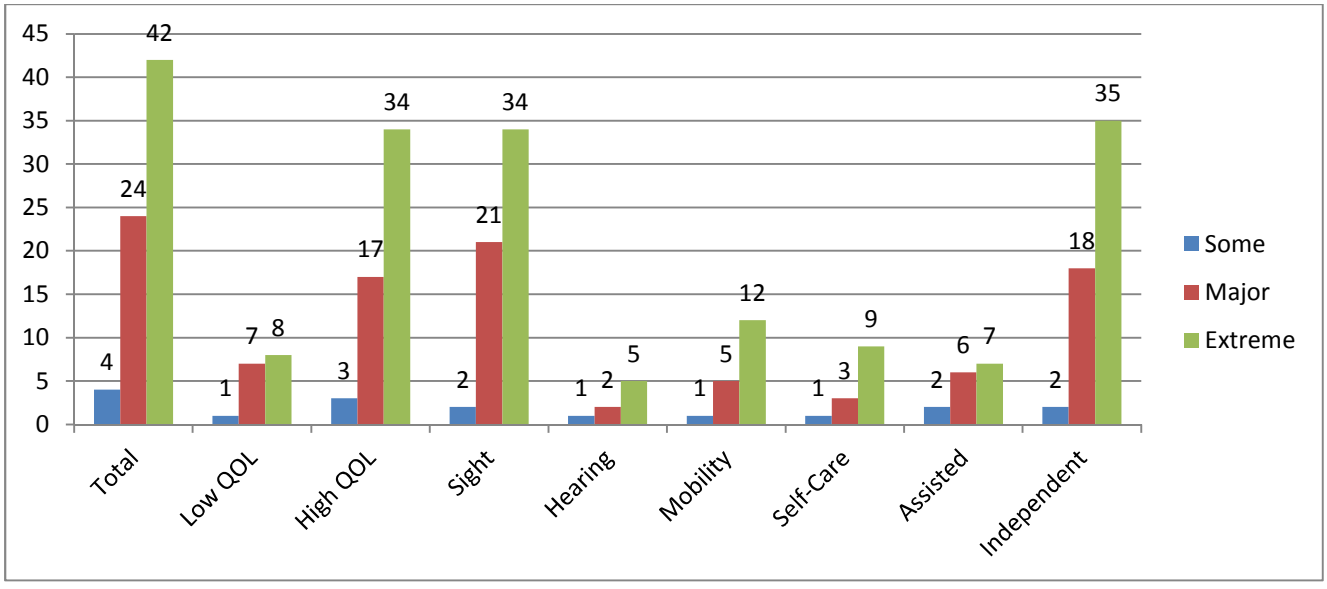


Figure 3. Severity of Disability Distribution.

The age of the onset of impairment was predominantly below 21 years of age (77%, n=53) as illustrated in Figure 4.

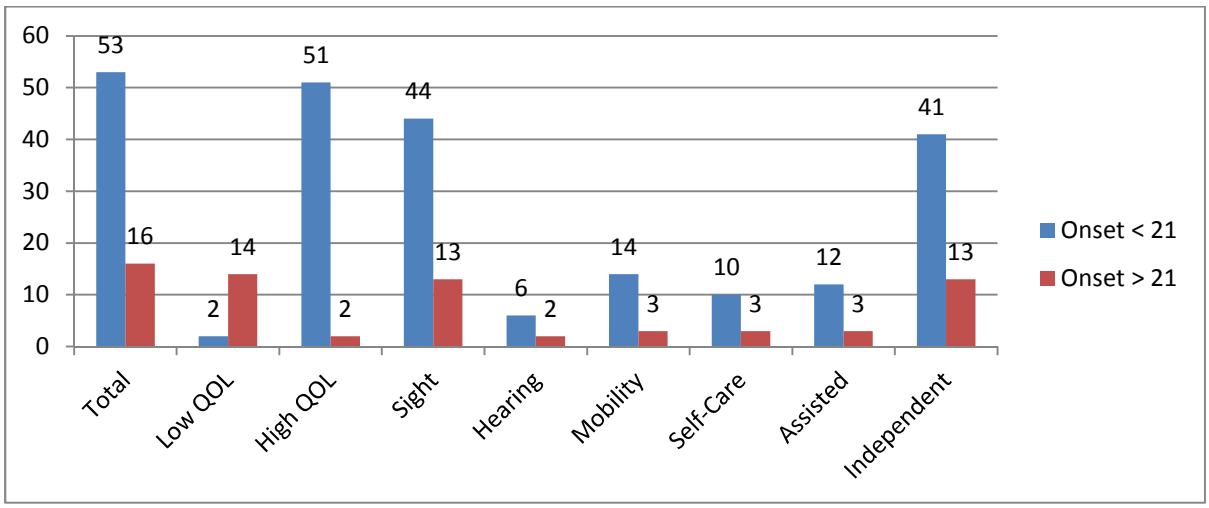


Figure 4. Onset of Disability Distribution.

Dwelling Conditions – Small World

The majority of participants live independently (79%, n=55) with 21% (n=15) residing with family or in care facilities as shown in Figure 5. Although marginal, only amongst people with self-care difficulties did assisted living exceed independent living. It is an understanding of this study that assisted living creates small world environments as described by Chatman (Chatman, 1996).

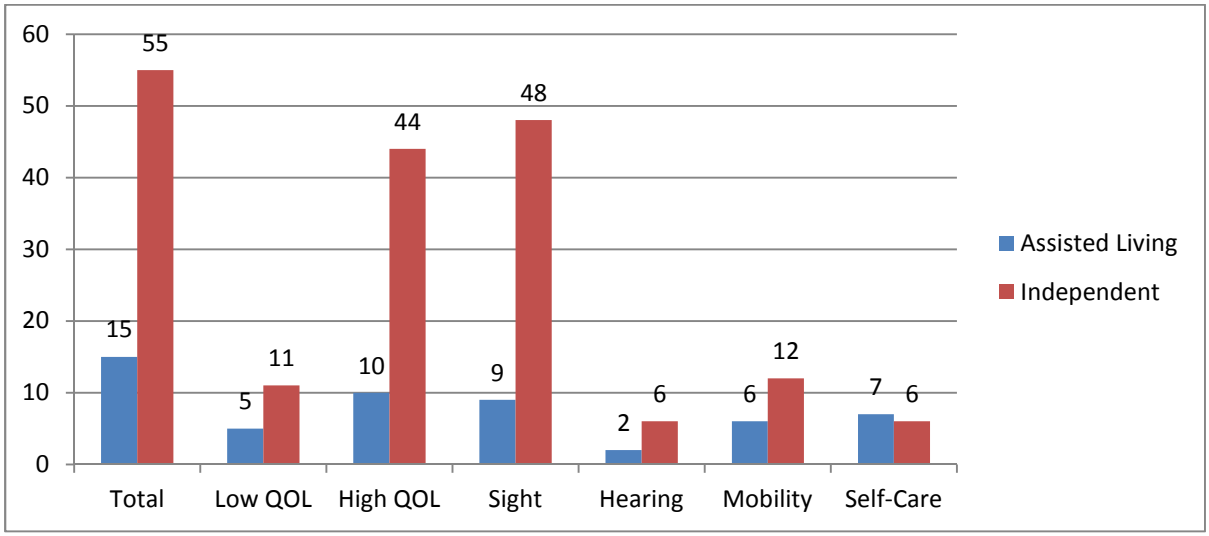


Figure 5. Dwelling Conditions Distribution.

Gender and Age

Sixty-nine of the respondents indicated their gender with slightly more males (55%, n=38) than females (45%, n=31) completing the questionnaire. This trend remained consistent across the dimensions of higher quality of life, type of impairment, and form of accommodation as illustrated in Figure 6.

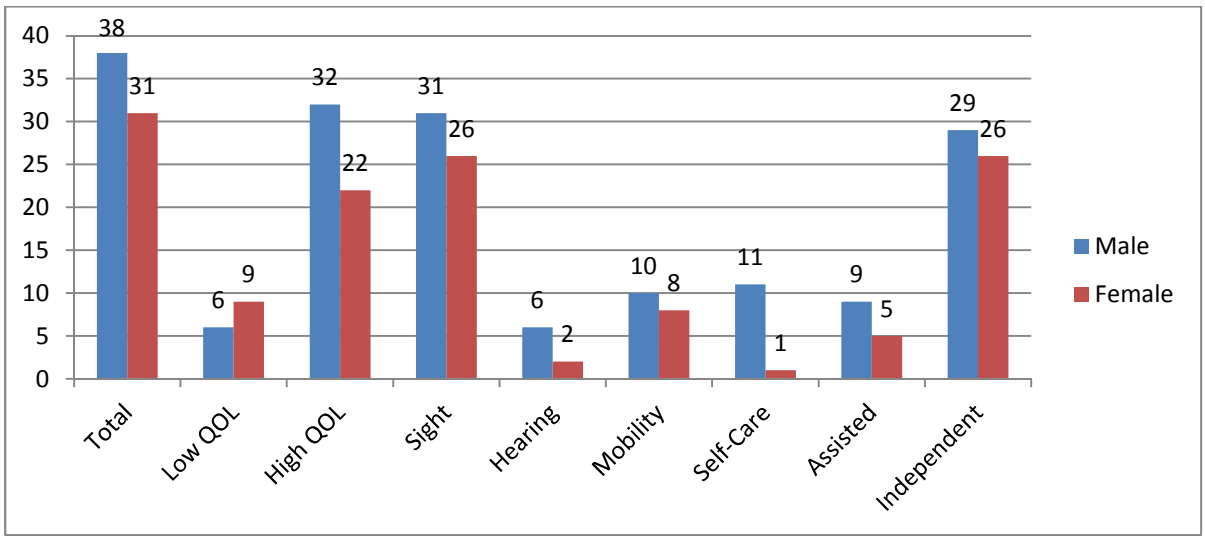


Figure 6. Gender Demographics.

The majority of participants were under 45 years of age (66%, n=46) as shown in Figure 7 with no respondent over 45 accommodated in assisted living environment, although this may be the result of sampling shortcomings.

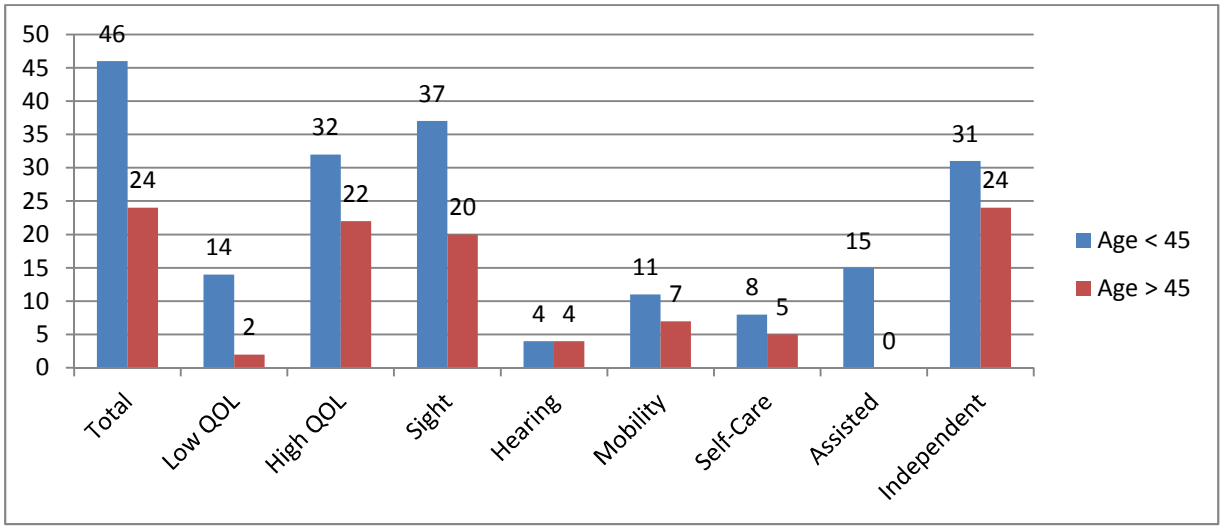


Figure 7. Age Demographics.

Education

Education of the respondents was spread between not finishing school and post-graduate studies. 33 Respondents (47%) have a highest qualification of Grade 12 while 37 (53%) furthered studies, of whom 20 (29%) have completed post-graduate studies. People who indicated lower quality of life, sight impairments, and residents in assisted living environments revealed lower education levels as seen in Figure 8.

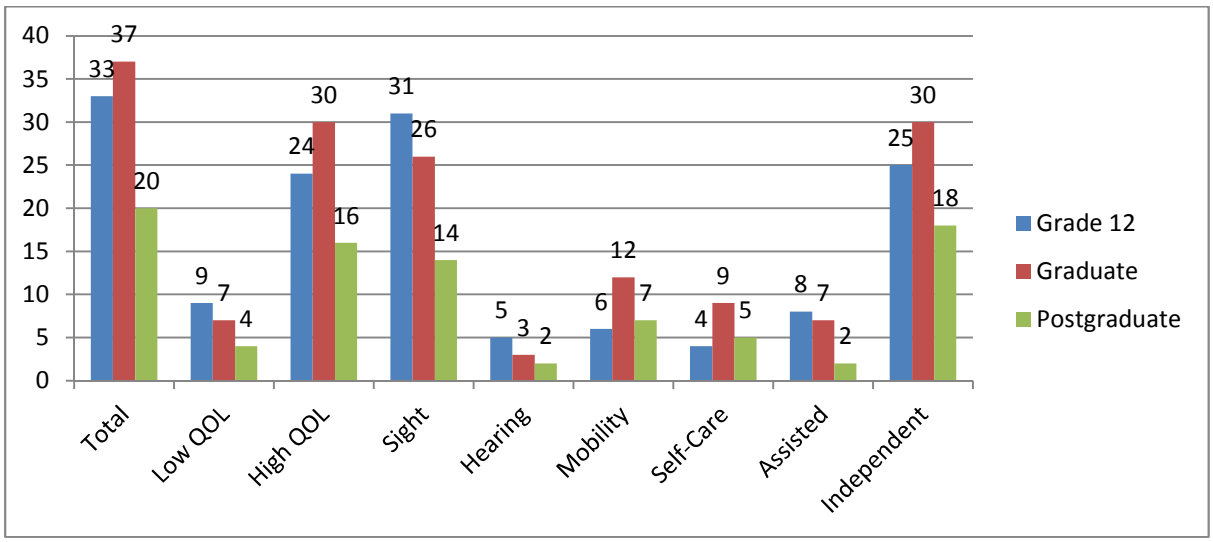


Figure 8. Education Demographics.

Information Needs for Quality of Life

Respondents ranked the importance of 18 types of information needs based on the QOLP-PD profile (Renwick et al., 2003). These information types are based on the 9 sub-domains rolled up to 3 domains as determined by Raphael, Renwick, Brown, and Rootman (1996) and validated for people with disabilities by Renwick, et al. The findings of this study were compared with the QOLP-PD study as presented in Table 7. The overall mean for information demand of 2.640 (sd=0.632) was similar to the QOLP-PD mean of 2.610. The resultant domain ranking in descending order of importance was Becoming (mean=2.933, sd=0.797), Belonging (mean=2.600, sd=0.783), and Being (mean=2.386, sd=0.765). This diverged from Renwick, at al.'s (2003) ranking of Belonging and Being prior to Becoming which may be explained by QOLP-PD measuring the importance of the *existing domains* of Quality of Life whereas in this study the *demand for information* was the measure. Put another way QOLP-PD measures what people ***have*** while this study measured what people ***need***.

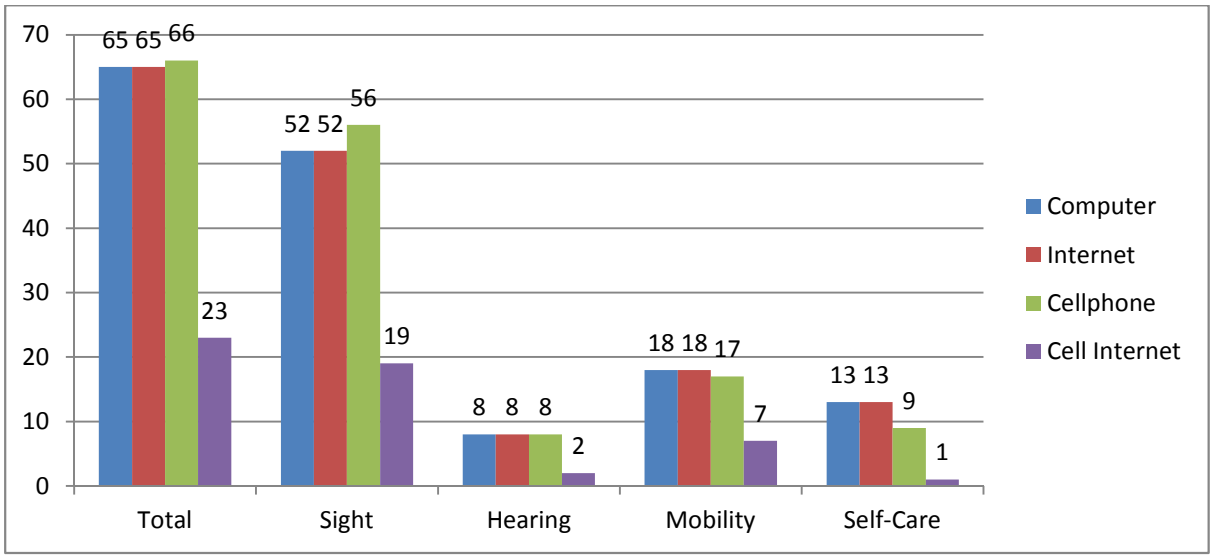
	All		**Renwick* QOLP-PD**
Valid N	**70**		
Variable	**Mean**	**Std.Dev.**	**Mean**
Becoming	2.933	0.797	2.200
Practical	3.136	1.042	2.210
Leisure	3.043	0.973	2.050
Growth	2.621	1.020	2.340

Belonging	2.600	0.783	2.830
Community	2.843	0.976	2.240
Social	2.629	1.230	2.750
Physical	2.329	1.049	3.510
Being	2.386	0.765	2.800
Physical	2.700	1.088	2.050
Spiritual	2.486	1.164	2.650
Psychological	1.971	0.932	3.710
Total QOL	2.640	0.632	2.610

Table 4. Comparison of QOLP-PD Means.

Information and Communication Technology

ICT was well represented with 93% (n=65) of participants indicating regular access to both computers and the Internet and 94% (n=66) having their own mobile phone. The high level of ICT access is due to the research's focus on people with access to ICT and is therefore not accepted as representative of all people with disabilities who are less likely to have computer access than people without disabilities (Dobransky & Hargittai, 2006). Figure 9 illustrates the consistency of ICT access across type of impairment, quality of life, and lodging. Slightly more than a third (35%, n=23) of participants with mobile phones (n=66) use their mobile phones for internet access. In the interviews, two reasons for not using this technology was indicated by participants, (i) high costs limiting the ability to acquire a suitable phone and to afford the data usage, and (ii) physical difficulties limiting access due to screens viewed as too small or eliciting tactile difficulties.



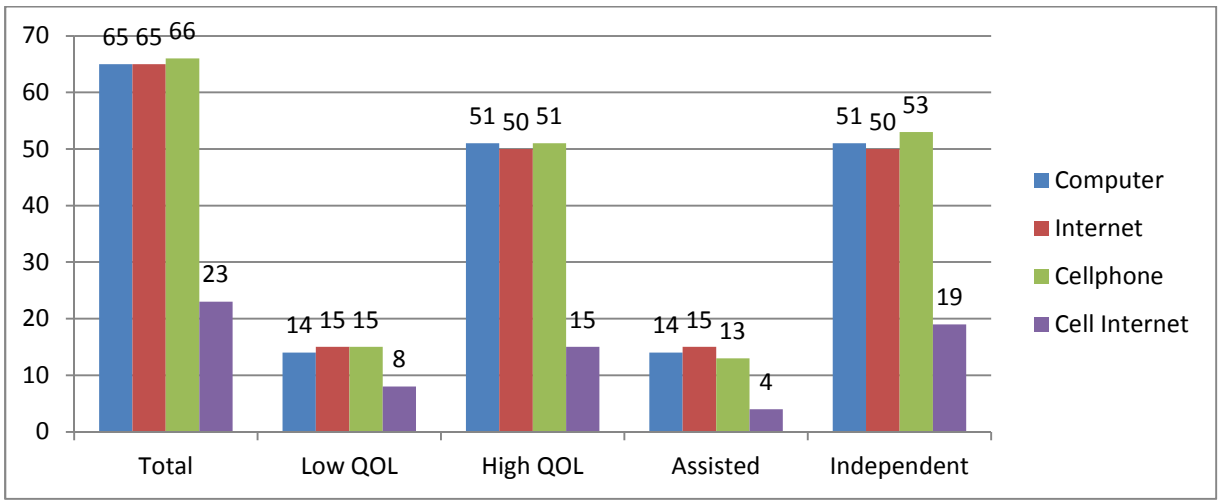


Figure 9. Information and Communication Technology access.

5.3 Correlation Review and Factor Analysis

The results from a correlation review and a factor analysis used for reliability and validity testing of the research are presented below.

Correlation Review

The results from a 2-tailed bivariate correlation analysis conducted are displayed in Table 8 with all correlations at $p < 0.01$. With correlations above 0.7 ranked as Strong, above 0.5 as Moderately Strong, above 0.3 as Moderate, and below 0.3 as Weak (Dancey & Reidy, 2004) the following relationships were observed:

Variable	Age	Education	Dwelling Conditions	Onset	QOL	Computer	Internet
QOL				-.695**			
Computer		.365**					
Internet		.365**				.785**	
Search							.356**
Store							.326**
Mobility Information			.367**				
Stress Information		-.338**	-.501**		-.377**		
Mood Information	-.373**		-.426**		-.378**		
Employment Information	-.321**						
Health Information				-.326**			

Table 5. Correlations Review ICT and Quality of Life (Significant at $p < 0.01$).

- Quality of life was negatively associated with onset of disability (-0.695) indicating that higher quality of life is associated with onset of disability earlier in life.
- Quality of life was negatively associated with need for stress (-0.377) and mood information (-0.378) indicating that higher quality of life is associated with lower needs of stress and mood information.
- Stress and mood information needs are negatively associated with dwelling conditions (-0.501 and -0.426 respectively) indicating a higher need of stress and mood information for people living in shared accommodation.
- Stress information was negatively associated with education (-0.338) indicating that people with lower education levels have a higher need for stress information.
- Mood information was negatively associated with age (-0.373) indicating that older people with disabilities have less need for mood information.
- Dwelling and mobility information were positively associated (0.367) indicating that people in assisted dwelling conditions have less need for mobility information.
- Employment information was negatively associated with age (-0.321) indicating that younger people require more employment information.
- Health information and onset of disability (-0.326) are negatively associated indicating that people with more recent disabilities need more health information.
- Internet access exhibits a strong positive association with computer access (0.785) indicating that people using a computer to a greater extent will use the Internet to a greater extent.
- Internet access is positively associated with information behaviour for both searching for information (0.356) and storing Information (0.326) indicating that greater Internet access is associated with greater information behaviour.
- Education was positively associated with computer access (0.365) and Internet access (0.365) indicating that people with higher education are more likely to use computers and the Internet.

Factor Analysis

A Principal Component Analysis (PCA) shown in Table 9 was performed for Quality of Life where QOL was reported to be Good or Excellent and limited to Eigenvalues greater than 1. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy result greater than 0.50 (0.554) at $p > 0.05$ for Bartlett's Test of Sphericity confirmed the suitability of the data for factor analysis (Williams, Brown, & Onsman, 2012). Rotating the PCA using Varimax rotation with Kaiser Normalization resulted in eight factors as indicated on a Scree Plot shown in Figure 10 and accounting for 76.7% of the variance as shown in Table 10. Loadings were limited to 0.60 or higher which is advocated as minimum for smaller

samples such as the current one (Reise, Waller, & Comrey, 2000). Although the eighth factor comprised only a single component it was retained due to its significant loading (0.876).

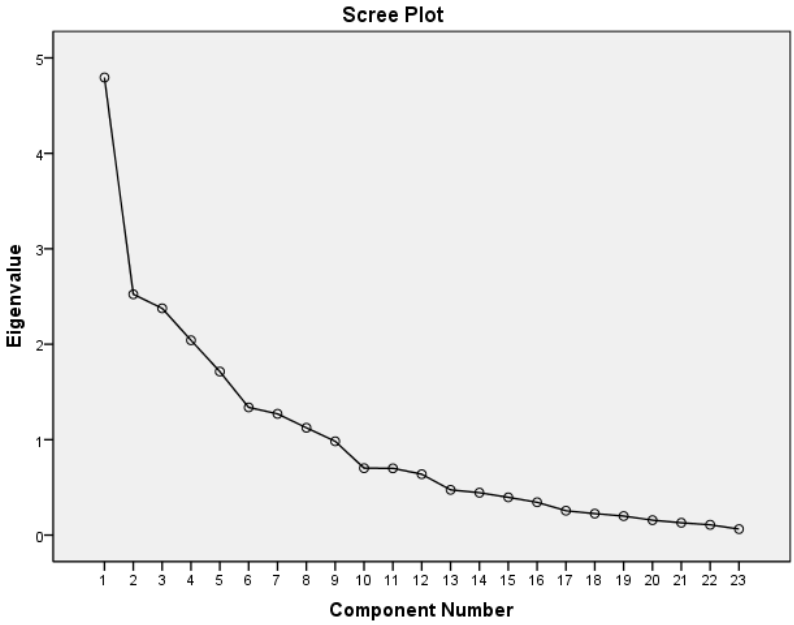


Figure 10. Scree Plot for Higher Quality of Life Factors.

Component	Domain	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Dwelling Information	Bl_Phy	0.863							
Community Information	Bl_Phy	0.841							
Information Storing	IB		0.813						
Information Searching	IB		0.733						
Computer-Aided Information Searching	IB/ICT		0.702						
Information Sharing	IB		0.642						
Nutritional Information	Be_Phy			0.802					
Health Information	Bc_Gro			0.743					
Stress Information	Be_Psy				0.845				
Mood Information	Be_Psy				0.790				
Dwelling Conditions	Context				-0.778				
Family Communication Information	Bl_Soc					0.893			
Friends Communication Information	Bl_Soc					0.846			
Ethics Information	Be_Spi						0.865		
Spiritual Information	Be_Spi						0.859		
Finances Information	Bl_Com							0.826	
Professional Information	Bl_Com							0.709	
Handiwork Information	Bc_Pra								0.876

(Be-Phy – Physical Being, Be-Psy – Psychological Being, Be-Spi – Spiritual Being, Bl-Phy – Physical Belonging, Bl-Com Community Belonging, Bl-Soc – Social Belonging, Bc-Pra – Practical Becoming, Bc-Lei – Leisure Becoming, Bc-Gro – Growth Becoming, ICT – Information and Communication Technology, KP – Information behaviour, Context – Residence or Dwelling Conditions.)

Table 6. Rotated Component Matrix limited to High Quality of Life (> 4) and High Loadings (> 0.6).

- Factor 1 – Physical Belonging

  The association of Dwelling Information (0.863) and Community Information (0841) is corroborated by the QOLP-PD sub-domain Physical Belonging (Renwick et al., 2003).

- Factor 2 – Information behaviour and ICT

  Information behaviour elements of Storing of Information (0.813), Searching for Information (0.745), and Computer-assisted Information Searching (0.702) were associated demonstrating the link between information behaviour and ICT for people with disabilities who acknowledge a higher quality of life.

- Factor 3 – Health and Nutrition (Physical Being and Growth Becoming)

  Factor 3 associates Nutritional Information (0.802) (Physical Being) with Health Information (0.743) (Growth Becoming). Representing the first and last constructs of the QOLP-PD model this exposes a potential for further investigation.

- Factor 4 – Psychological Being and Dwelling Conditions

  Factor 4 associates the QOLP-PD Psychological Being sub-domains Stress Information (0.845) and Mood Information (0.790) negatively with Dwelling Information (-0.778) indicating that higher levels of dwelling conditions (independent living) is associated with a lower need for stress and mood information. Conversely lower level of dwelling conditions (assisted living) is associated with a higher need for stress and mood information.

- Factor 5 – Social Capital

  Factor 5 encompasses the QOLP-PD construct Social Belonging associating Family Communication Information (0.893) and Friends Communication Information (0.846).

- Factor 6 – Spiritual Being

  Factor 6 encompasses the QOLP-PD construct Spiritual Being associating Ethics Information (0.779) and Spiritual Information (0.792).

- Factor 7 – Community Belonging

  Factor 7 encompasses the QOLP-PD construct Community Belonging associating Finances Information (0.863) and Professional Information (0.715).

- Factor 8 – Practical Becoming

  Although Factor 8 comprises a single variable Handiwork Information (0.876) (QOLP-PD construct Practical Becoming) retained due to the significance of the loading.

The factor analysis included all of the QOLP-PD factors in the influence of higher quality of life of people with disabilities and is consistent with similar quality of life research identifying five factors

influencing QOL: psychological; environment; social; opportunities for growth; and health (Meuleners, Lee, Binns, & Lower, 2003) with supplementary influences found in the internal association of information behaviour and ICT access.

Total Variance Explained [a]

Component	Description	Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %
1	Physical Belonging	2.587	11.250	11.250
2	Information Behaviour and ICT	2.463	10.710	21.959
3	Health and Nutrition	2.431	10.568	32.528
4	Psychological Being and Dwelling Conditions	2.323	10.099	42.626
5	Social Capital	1.927	8.379	51.005
6	Spiritual Being	1.923	8.359	59.364
7	Community Belonging	1.910	8.305	67.670
8	Practical Becoming	1.618	7.036	74.706

Extraction Method: Principal Component Analysis.

a. Only cases for which QOL > 3 are used in the analysis phase.

Table 7. Explanation of Variable for Higher Quality of Life factors.

5.4 Hypothesis Testing

Four hypotheses were proposed to answer the research question of what information behaviour of people with disabilities influences their quality of life and the relationship between information behaviour and ICT.

- Hypothesis 1 The Information Behaviour of People with Disabilities does not influence their Quality of Life.
- Hypothesis 2 ICT does not influence Information Behaviour of People with Disabilities.
- Hypothesis 3 The Types of Information needed do not influence Information Behaviour of People with Disabilities.
- Hypothesis 4 There is no significant difference between the Information needs of People with Disabilities residing in Assisted Living Facilities and those Living Independently.

Test for Normality and Means Test

Prior to testing the hypotheses, normality of the data was tested revealing that all variables except severity of impairment, mood information and ICT factors are within the standard error of skewness normal range of less than 3.29 deemed suitable for samples greater than 50 and less than 300 (Kim, 2013). Similarly, for all variables except gender and ICT access the absolute values for each standard error of Kurtosis were less than 3.29.

Means Tests for Information Needs

Highest means were observed in the need for employment and mobility information whilst lowest means were observed for the need for mood information and for stress information as shown in Table 11. Only 5 means were greater than 3.00 of which the majority relate to the QOLP-PD Becoming domain. The prevalence of low mean values may indicate a number of causes, for example, information avoidance (Wilson, 2000), information already stored in memory (Krikelas, 1983) or lack of access to information (Lazar & Jaeger, 2011).

Variable	TQOL	N	Mean	S.D.	Skewness	Kurtosis
Employment Information	Bc_Pra	70	3.26	1.35	-0.41	-1.04
Mobility Information	Be_Phy	70	3.11	1.27	-0.09	-1.08
Outdoor Leisure Information	Bc_Lei	70	3.09	1.14	-0.11	-0.60
Handiwork Information	Bc_Pra	70	3.01	1.23	-0.08	-0.86
Indoor Leisure Information	Bc_Lei	70	3.00	1.33	-0.23	-1.18
Professional Information	Bl_Com	70	2.89	1.08	0.09	-0.85
Finances Information	Bl_Com	70	2.80	1.21	0.15	-0.95
Health Information	Bc_Gro	70	2.77	1.21	0.20	-0.73
Friends Communication Information	Bl_Soc	70	2.73	1.34	0.07	-1.18
Spiritual Information	Be_Spi	70	2.63	1.32	0.37	-0.98
Family Communication Information	Bl_Soc	70	2.53	1.28	0.27	-1.03
Community Information	Bl_Phy	70	2.49	1.15	0.48	-0.33
Coping Information	Bc_Gro	70	2.47	1.19	0.55	-0.51
Ethics Information	Be_Spi	70	2.34	1.24	0.68	-0.53
Nutritional Information	Be_Phy	70	2.29	1.23	0.68	-0.58
Dwelling Information	Bl_Phy	70	2.17	1.12	0.87	0.34
Stress Information	Be_Psy	70	2.10	0.98	0.65	-0.08
Mood Information	Be_Psy	70	1.84	1.00	1.13	0.64

Table 8. Information Type Means Analysis.

Hypothesis 1 – The Information behaviour of People with Disabilities does not influence their perceived Quality of Life

The variables search, store, share, and computer-aided searching were grouped by high quality of life (QOL >= 4) and low quality of life (QOL < 4) and used in an independent samples T-Test to test the null hypothesis that information behaviour of people with disabilities does not influence their perceived quality of life as shown in Table 12.

	High QOL Mean	Low QOL Mean	t-value	df	p
Search	3.87	3.50	-1.071	21.225	0.296
Store	3.61	3.63	0.052	29.775	0.959
Share	3.54	3.44	-0.328	22.394	0.746
Computer Search	4.35	4.50	0.446	20.715	0.660

Table 9. Independent Samples T-test comparing Information Behaviour between Higher and Lower Quality of Life.

No significance was observed and therefore the null hypothesis that information behaviour does not affect the quality of life of people with disabilities is accepted.

Hypothesis 2 - ICT does not influence Information behaviour of People with Disabilities

The null hypothesis that information and communication technologies do not influence the information behaviour of people with disabilities was tested using independent samples T-tests to compare participants with regular access and those without regular access to (i) a computer; (ii) the Internet; (iii) a cellphone; and (iv) the Internet via cellphone as depicted in Table 13.

	Factors Compared	ICT Access mean	No ICT Access Mean	t-value	df	p
Search	No Computer vs Computer	3.00	3.85	-1.813	4.746	0.133
Store	No Computer vs Computer	3.00	3.66	-1.934	5.462	0.106
Share	No Computer vs Computer	2.60	3.58	-3.599	6.202	0.011*
Computer Search	No Computer vs Computer	2.00	4.38	-3.033	4.245	0.036*
Search	No Access vs Internet Access	2.40	3.89	-2.841	4.504	0.041*
Store	No Access vs Internet Access	2.40	3.71	-3.124	4.796	0.028*
Share	No Access vs Internet Access	2.80	3.57	-3.269	7.594	0.012*
Computer Search	No Access vs Internet Access	2.20	4.37	-2.900	4.294	0.041*
Search	No Cellphone vs Cellphone	3.00	3.83	-1.008	3.151	0.384
Store	No Cellphone vs Cellphone	3.50	3.62	-0.184	3.238	0.865
Share	No Cellphone vs Cellphone	2.50	3.58	-2.094	3.345	0.118
Computer Search	No Cellphone vs Cellphone	3.75	4.24	-0.513	3.161	0.641
Search	No Access vs Mobile Internet Access	3.74	3.87	-0.431	39.601	0.669
Store	No Access vs Mobile Internet Access	3.51	3.83	-1.200	44.197	0.236
Share	No Access vs Mobile Internet Access	3.45	3.65	-0.781	39.461	0.439
Computer Search	No Access vs Mobile Internet Access	4.06	4.52	-1.580	58.572	0.120
Computer Search	Increasing ICT Use vs No Increase	4.59	3.50	3.239	62.000	0.002*

Notes: * indicates $p < 0.05$

Table 10. Independent Samples T-test comparing Information Behaviour between ICT Access and No ICT Access.

Computer and Internet Access

Significance at $p < 0.05$ was detected between regular computer access and sharing of information ($p = 0.011$) as well as for computer-aided searching for information ($p = 0.036$) indicating that regular internet access may have an influence on information behaviour.

Cell-phone and Mobile Internet Access

Conversely, no significance was found for either cellphone access or mobile internet access for information behaviour.

Desire to Increase Use of ICT

The desire to increase the use of ICT for computer aided information behaviour was found to be significant at $p < 0.05$.

The significance observed between computer access, internet access and the desire to increase use of ICT observed at a significance level of $p < 0.05$ supports the rejection of the null hypothesis that information and communication technologies do not influence the information behaviour of people with disabilities.

Hypothesis 3 – The Types of Information needed do not influence Information Behaviour of People with Disabilities

Table 14 depicts the results from independent samples T-tests used to test the null hypothesis that the types of information needed do not influence the information behaviour of people with disabilities.

Demand was compared with no demand for types of information needed following the QOLP-PD framework for information behaviour of searching, storing, sharing, and computer-aided searching for information: Demand was the sum of the measures 'Extreme amount', 'A lot', and 'Moderate amount' while No Demand included 'Not at all' and 'A little' from Section C and E1 of the questionnaire (Appendix A).

	Information Demand	Demand Mean	No Demand Mean	t-value	df	p
Being						
Search	Mobility Information	3.90	2.88	2.239	8.254	0.055
Store	Mobility Information	3.65	3.38	0.565	8.122	0.587

Share	Mobility Information	3.61	2.75	2.401	68.000	0.019*
Computer Search	Mobility Information	4.50	3.43	2.573	63.000	0.012*
Search	Nutritional Information	3.70	3.96	-0.917	68.000	0.362
Store	Nutritional Information	3.55	3.74	-0.746	51.707	0.459
Share	Nutritional Information	3.47	3.61	-0.602	54.046	0.549
Computer Search	Nutritional Information	4.32	4.52	-0.716	40.031	0.478
Search	Stress Information	3.77	3.82	-0.168	40.802	0.868
Store	Stress Information	3.63	3.59	0.120	36.467	0.905
Share	Stress Information	3.56	3.41	0.595	40.082	0.555
Computer Search	Stress Information	4.30	4.57	-1.010	45.172	0.318
Search	Mood Information	3.81	3.76	0.204	67.997	0.839
Store	Mood Information	3.59	3.64	-0.167	67.599	0.868
Share	Mood Information	3.32	3.73	-1.738	67.998	0.087
Computer Search	Mood Information	4.32	4.45	-0.472	62.478	0.638
Search	Spiritual Information	3.81	3.71	0.356	28.493	0.724
Store	Spiritual Information	3.57	3.76	-0.582	21.762	0.567
Share	Spiritual Information	3.40	3.88	-1.792	68.000	0.078
Computer Search	Spiritual Information	4.44	4.24	0.736	35.533	0.466
Search	Ethics Information	3.84	3.67	0.676	51.515	0.502
Store	Ethics Information	3.61	3.62	-0.023	33.236	0.981
Share	Ethics Information	3.43	3.71	-1.110	68.000	0.271
Computer Search	Ethics Information	4.36	4.43	-0.256	55.565	0.799
Belonging						
Search	Dwelling Information	3.91	3.52	1.559	54.959	0.125
Store	Dwelling Information	3.55	3.74	-0.697	43.212	0.490
Share	Dwelling Information	3.40	3.74	-1.338	68.000	0.185
Computer Search	Dwelling Information	4.33	4.50	-0.631	47.325	0.531
Search	Community Information	3.87	3.50	1.298	27.986	0.205
Store	Community Information	3.59	3.69	-0.341	27.475	0.735
Share	Community Information	3.46	3.69	-0.921	31.865	0.364
Computer Search	Community Information	4.37	4.43	-0.189	24.438	0.852
Search	Family Communication Information	3.96	3.38	2.076	37.546	0.045*
Store	Family Communication Information	3.67	3.48	0.694	34.476	0.492
Share	Family Communication Information	3.47	3.62	-0.577	68.000	0.566

Computer Search	Family Communication Information	4.33	4.53	-0.772	46.590	0.444
Search	Friends Communication Information	3.92	3.42	1.738	32.391	0.092
Store	Friends Communication Information	3.65	3.53	0.378	26.061	0.708
Share	Friends Communication Information	3.53	3.47	0.208	68.000	0.836
Computer Search	Friends Communication Information	4.40	4.35	0.153	34.317	0.879
Search	Professional Information	3.84	3.17	1.366	5.817	0.222
Store	Professional Information	3.61	3.67	-0.160	6.703	0.878
Share	Professional Information	3.53	3.33	0.347	5.472	0.742
Computer Search	Professional Information	4.35	4.80	-1.825	9.077	0.101
Search	Finances Information	3.85	3.45	1.144	14.499	0.271
Store	Finances Information	3.61	3.64	-0.084	15.421	0.934
Share	Finances Information	3.53	3.45	0.228	14.674	0.823
Computer Search	Finances Information	4.36	4.56	-0.694	15.169	0.498
Becoming						
Search	Handiwork Information	3.85	3.40	1.136	11.636	0.279
Store	Handiwork Information	3.70	3.10	1.501	11.176	0.161
Share	Handiwork Information	3.55	3.30	0.994	16.988	0.334
Computer Search	Handiwork Information	4.44	4.00	1.085	9.150	0.306
Search	Employment Information	3.90	3.18	2.187	14.872	0.045*
Store	Employment Information	3.69	3.18	1.366	12.906	0.195
Share	Employment Information	3.58	3.18	1.341	15.362	0.199
Computer Search	Employment Information	4.48	3.57	2.766	8.990	0.022*
Search	Outdoor Information	3.86	3.14	1.494	7.054	0.179
Store	Outdoor Information	3.63	3.43	0.461	7.160	0.659
Share	Outdoor Information	3.52	3.43	0.294	8.390	0.776
Computer Search	Outdoor Information	4.42	4.00	0.792	5.752	0.460
Search	Indoor Information	3.79	3.79	0.000	28.206	1.000
Store	Indoor Information	3.59	3.71	-0.473	25.696	0.640
Share	Indoor Information	3.57	3.29	1.025	21.610	0.317
Computer Search	Indoor Information	4.40	4.33	0.210	20.025	0.836

Search	Health Information	3.86	3.42	1.223	15.066	0.240
Store	Health Information	3.69	3.25	1.240	14.819	0.234
Share	Health Information	3.52	3.50	0.072	23.583	0.943
Computer Search	Health Information	4.40	4.30	0.238	11.490	0.816
Search	Coping Information	3.91	3.38	1.661	22.981	0.110
Store	Coping Information	3.69	3.38	0.976	22.285	0.340
Share	Coping Information	3.54	3.44	0.379	27.763	0.708
Computer Search	Coping Information	4.40	4.31	0.267	17.261	0.793

Notes: * indicates P < 0.05

Table 11. Independent Samples T-test for type of information influence on information behaviour.

Relationships were observed for information behaviour and the demand for Mobility Information; Family Communication Information; and Employment Information.

- ***Mobility Information (Being)***

  Sharing of information and computer-aided searching for mobility information was observed to be significant for equal variances (p=0.019 and p=0.012 respectively – Levene's equality p=0.006 and p=0.000 respectively). Thus a relationship was observed between information for mobility and ICT based searching and sharing of information.

- ***Family Communication Information (Belonging)***

  Searching of information was seen to be significant for not equal variances (p=0.045 – Levene's equality p=0.337). Thus a relationship was observed between information for communication with family and searching for information.

- ***Employment Information (Becoming)***

  Searching for information and computer-aided searching for employment information was seen to be significant for not equal variances (p=0.045 and p=0.022 respectively – Levene's equality p=0.876 and p=0.696 respectively). Thus a relationship was observed between employment information and both searching for information and ICT based searching for information.

Based on these findings, the null hypothesis that the type of information does not influence the information behaviour of people with disabilities is rejected.

Hypothesis 4 - There is no significant difference between the Information needs of People with Disabilities residing in Assisted Living Facilities and those Living Independently.

The null hypothesis that there is no significant difference between the type of information needed by people with disabilities residing in assisted-living facilities and those living independently was tested by means of independent samples T-tests with the results summarised in Table 15.

	Accommodation	Independent Mean	Assisted Mean	t-value	df	p
Being						
Mobility Information	Independent vs Assisted	3.29	2.47	2.138	20.345	0.045*
Nutritional Information	Independent vs Assisted	2.33	2.13	0.536	22.070	0.598
Stress Information	Independent vs Assisted	1.87	2.93	-4.123	68.000	0.000*
Mood Information	Independent vs Assisted	1.62	2.67	-3.955	68.000	0.000*
Spiritual Information	Independent vs Assisted	2.51	3.07	-1.238	18.489	0.231
Ethics Information	Independent vs Assisted	2.40	2.13	0.761	23.290	0.454
Belonging						
Dwelling Information	Independent vs Assisted	2.36	1.47	2.904	68.000	0.005*
Community Information	Independent vs Assisted	2.64	1.93	2.396	26.269	0.024*
Family Communication Information	Independent vs Assisted	2.40	3.00	-1.540	20.776	0.139
Friends Communication Information	Independent vs Assisted	2.65	3.00	-0.874	21.915	0.392
Professional Information	Independent vs Assisted	2.84	3.07	-0.692	20.887	0.497
Finances Information	Independent vs Assisted	2.71	3.13	-1.045	18.865	0.309
Becoming						
Handiwork Information	Independent vs Assisted	2.93	3.33	-0.975	18.770	0.342
Employment Information	Independent vs Assisted	3.22	3.40	-0.461	22.305	0.649
Outdoor Information	Independent vs Assisted	3.16	2.80	1.138	23.389	0.267
Indoor Information	Independent vs Assisted	2.98	3.07	-0.218	22.322	0.829
Health Information	Independent vs Assisted	2.80	2.67	0.377	68.000	0.707
Coping Information	Independent vs Assisted	2.44	2.60	-0.404	18.754	0.690

Notes: * indicates $p < 0.05$

Table 12 .Independent Samples T-test testing Information behaviour and Dwelling Conditions.

Relationships were observed for Mobility Information; Stress Information; Mood Information; Dwelling Information; and Community Information.

- ***Mobility Information***

  A significant relationship ($p < 0.05$) was observed between information for mobility and dwelling conditions ($p = 0.045$).

- ***Stress Information***

  A significant relationship ($p<0.001$) was observed between information for mobility and dwelling conditions ($p=0.000$).

- ***Mood Information***

  A significant relationship ($p<0.001$) was observed between information for mobility and dwelling conditions ($p=0.000$).

- ***Dwelling Information***

  A significant relationship ($p<0.05$) was observed between information for mobility and dwelling conditions (p 0.005).

- ***Community Information***

  A significant relationship ($p<0.05$) was observed between information for mobility and dwelling conditions ($p=0.024$).

Based on significant relationships between the need for information and the accommodation arrangements of people with disabilities the null hypothesis that there is no significant difference between the type of information needed by people with disabilities residing in assisted-living facilities and those living independently is rejected.

Hypotheses Findings Summary

While information behaviour of people with disabilities was not found to influence their quality of life (accept hypothesis 1), the types of information needed were found to influence information behaviour (reject hypothesis 3). Information and communication technologies were also observed to influence information behaviour (reject hypothesis 2). For people in assisted accommodation information needs were observed to be significantly different from those living independently (reject hypothesis 4).

Figure 11 graphically depicts the findings from the hypothesis testing with information behaviour of people with disabilities influenced by the type of information and information and communication technologies. Type of information, in turn, was influenced by dwelling conditions. While ICT and Types of information needed influence Information Behaviour no association was observed for the Quality of Life dependent variable of the conceptual model.

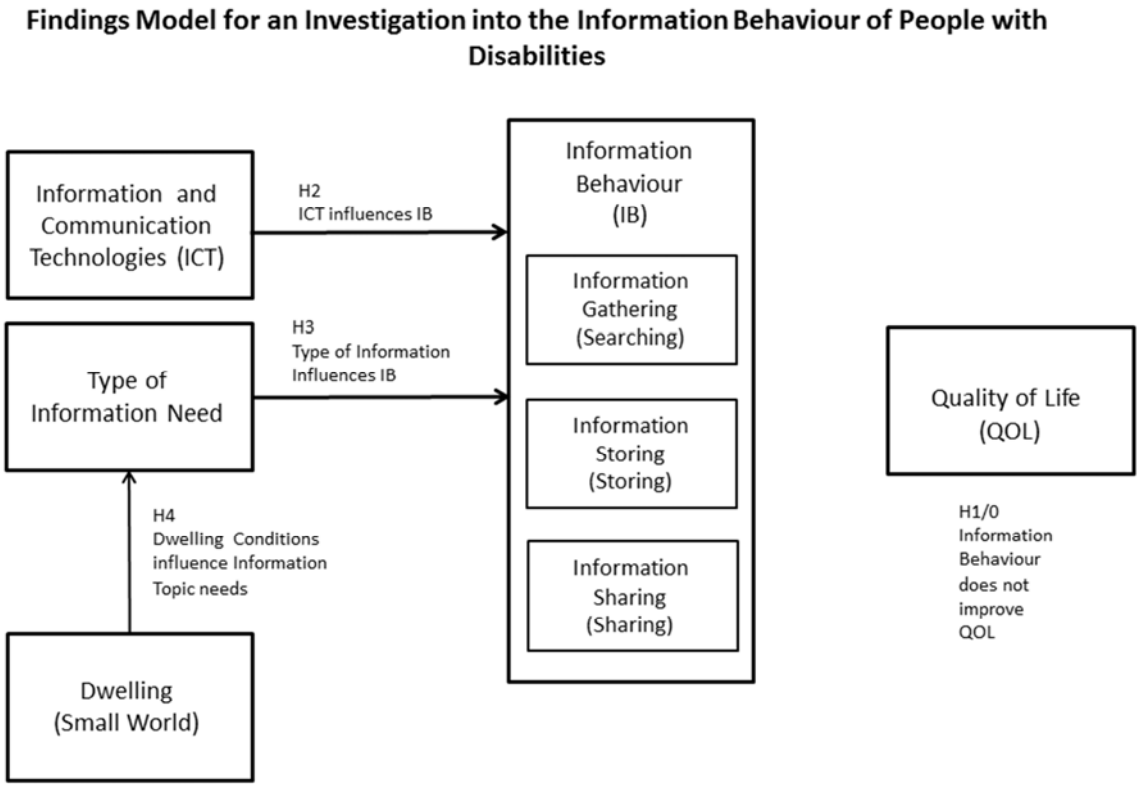


Figure 11. Hypothesis Testing Findings Model.

5.5 Additional Findings

Additional information was collected from the respondents by means of open questions. These were analysed and coded based on the General Induction Theory of Thomas (2006). Each coding was counted and grouped as shown in the tables below with codings kept unique by including only one coding per respondent per open question. This ensured that responses carry similar weight by moderating participants who were passionate about particular topics and remarked on them several times.

Quality of Life Influencers

Reasons for perceived level of quality of life were supplied by 94% (n=66) of the participants as summarised in Table 16. The primary influences on quality of life (above 30% of respondents) were identified as Social Support (47%, n=31), Independence (35%, n=23), Financial and Employment (33%, n=22), and Attitude (33%, n=22).

Rank	QOL Influencer	Total	
	Responses	66	94%
1	Social Support	31	47%
2	Independence	23	35%
3	Financial / Employment	22	33%
4	Attitude	22	33%
5	Mobility	18	27%
6	ICT / Technology	7	11%

Table 13. Frequency of QOL influencers.

Social support was observed to be the most common influence ('*Being part of community…*' – Respondent 11, *'…Social interaction; people in life..*' – Respondent 13) with ***Independence*** found to be a significant influence epitomised by a C-4 Quadriplegic participant who was emphatic about his excellent quality of life due to a *'[high] level of decision making and high level of independence*' (Respondent 53) followed by ***Financial and Employment*** *('…if you are going to be blind you must be rich…'* – Respondent 28*, '...financial ability by means of a relatively good job...*'- Respondent 50 , *'..working all my life..*'- Respondent 44, ' *…The ability to find employment…*' – Respondent 34).

Attitudes comprise positive attitude of the person with disability *('..positive attitude..*' - Respondents 37 and 44, '*Ability to participate in all aspects of life that I choose to*' - Respondent 27) and negative attitudes from abled people *('…treat them as a lesser human with a severe lack of any brains*' - Respondent 34, [at a Municipal Electric Department] *'...why does a blind person need electricity*?' – Respondent 31).

Secondary influences were found to be ***Mobility*** *('...quick in getting to know unknown areas..*'- Respondent 12, '*…travelling is difficult*' – Respondent 19), and ***ICT/Technology*** (11%, n=7) *('…cannot live without electronic devices…*' – Respondent 28).

Other Required Information

Respondents were asked to detail any additional information that they may require on a regular basis that was not sufficiently clear in the questionnaire or which received too little emphasis. Table 17 presents the summarized findings from the 48 (69%) participants who responded to this question.

	Other Information Required	Total	
	Total Respondents	70	
	Responses	48	69%
1	Mobility	16	33%
2	Technology	13	27%
3	Medical/Disability	12	25%
4	Shopping	10	21%

Table 14. Frequency of Other Information Required.

The top five additional information requirements garnered from this were: Information on ***Mobility*** (33%, n=16); ***Technology*** (27%, n=13); ***Medical/Disability*** (25%, n=12); ***Shopping*** (21%, n=10); and ***Accessible Books*** (19%, n=9).

Shopping information was highlighted due to physical difficulties of browsing and inaccessibility of product information and specials. Accessible product descriptions and special offers are particularly problematic for visually impaired people. While Shopping was an unexpected finding, other findings highlight the lack of understanding and provision of information for people with disabilities. For example, an unanticipated observation came from 2 visually impaired ladies (one under 30 and the other over 60) who find a paucity of fashion and make-up information available to visually impaired people.

Information Behaviour

The following sections summarise the responses by participants to the questions of (a) how people with disabilities currently search for information, (b) what they do with existing information, (c) how they store information, (d) how they prepare index for retrieval, and (e) how they share information.

Information Searching

Table 18 summarises the frequency of methods of searching for information. ***Internet*** searching was ranked first (80%, n=56) amongst respondents, followed by ***verbal*** communication with friends and family (66%, n=46) and finally ***media*** in the form of books, articles, and newspapers (37%, n=37), Radio/TV (27%, n=19), and Social Media (13%, n=9).

	Search Method	Total	
	Responses	70	100%
1	Internet Search	56	80%
2	Verbal Friends/Family	46	66%
3	Books/Articles/ Newspapers	26	37%
4	Radio/TV	19	27%
5	Social Media	9	13%

Table 15. Frequency of How Information is Searched for.

Information Use

Table 19 summarises the frequency of what people with disabilities do with information they have gathered. Of the 64 participants responding to this question, 66% (n=42) indicated that they use or apply the information gathered, while 55% (n=35) store it for later use, and 39% (n=25) indicated that they share the information. Of note were the 6% (n=4) participants who revealed that they evaluate the information first.

	Do What	Total	
	Responses	64	100%
1	Use/Apply	42	66%
2	Store	35	55%
3	Share	25	39%
4	Evaluate	4	6%

Table 16. Frequency of How Information is Used.

Information Storing

Table 20 summarises how people with disabilities store the information that they have gathered with 79% (n=55) indicating that they stored the gathered information on their computer. Although only 13% (n=9) indicated storing information in paper format, 34% (n=24) revealed that they memorize the information.

	Store - How	Total	
	Respondents	70	100%
1	Electronic	55	79%
2	Memory	24	34%
3	Paper	9	13%

Table 17. Frequency of How Information is Stored.

Information Retrieval

Table 21 summarises how people with disabilities prepare gathered information for later retrieval. Two techniques were indicated by the 66 respondents who completed this section – electronic storage (73%, n=48) (computer then cellphone) and memory triggers (5%) characterised by visually impaired respondent 2: *'to recall I remember where I was and the atmosphere, voices or songs and imagine writing it down'*.

Electronic storage and preparation for later access was further described by 42 respondents (73% of responses to this question). Named files and folders were indicated by 86% (n=36) with 21% (n=9) indicating that they use built-in search functions to find the information that they have previously stored.

	Indexing	**Total**	
	Respondents	70	
	Responses	66	94%
1	Electronic Storage	48	73%
	Storage Methods	42	88%
a	- Named File/Folders Structure	36	86%
b	- Search Functions	9	21%
2	Memory Triggers	3	5%

Table 18. Frequency of How Information is Indexed for Later Reference.

Sharing Methods

Table 22 summarises the frequency of the methods of sharing information. Verbal sharing was ranked highest (79%, n=55) followed by mail (56%, n=39) and social media (37%, n=26). Sharing of information was also found to be undertaken by means of authorship (10%, n=7) with respondents writing journal articles, reports, and newsletters.

	Share - How	**Total**	
	Respondents	70	100%
1	Verbal Friends/ Family (Including SMS)	55	79%
2	Internet - Email	39	56%
3	Internet- Social Media	26	37%
4	Books/Articles/ Newsletters	7	10%

Table 19. Frequency of How Information is Shared.

Summary of Information behaviour

In the open questions information was observed to be used, stored, and disseminated. People with access to the internet primarily gathered information using internet search engines, followed by verbal questioning, mass media sources and finally social media. Disseminating this information was found to be principally through verbal means, followed by email, social media, and mass media. Gathered information was stored in electronic form, in memory, and to a lesser extent paper with

retrieval facilitated by use of naming conventions for electronic files and folders, and cues or triggers for memory storage.

ICT Barriers

Barriers to the use of ICT provided by respondents is summarised in Table 23. The most significant barrier to accessibility was found to be ***accessibility of technology*** (76%, n=53) which was explained by *physical limitations* of the person (94%, n=50), *inaccessible websites* (40%, n=21), *PDF documents/eBooks* (17%, n=9), *touchscreens* (11%, n=6), *slow access speeds* (11%, n=6), *graphics* (9%, n=5), and *Captcha codes* (4%, n=2).

Ranked after accessibility of technology were ***financial barriers*** (57%, n=40), ***training*** (21%, n=15), ***fear of technology*** (13%, n=9), and ***lack of knowledge of available technology*** (7%, n=5).

	Barriers	Total	
	Respondents	70	100%
1	Accessibility	53	76%
2	Financial	40	57%
3	Training/Learning	15	21%
4	Attitude/Fear/ Dependency	9	13%
5	Knowing What is available	5	7%

Table 20. Frequency of Barriers to ICT Usage.

	Accessibility	53	
1.1	Physical Limitations	50	94%
1.2	Websites	21	40%
1.3	PDF/eBooks	9	17%
1.4	Touchscreen	6	11%
1.4	Speed (Slow)	6	11%
1.6	Graphics	5	9%
1.7	Captcha	2	4%

Other Mentions

Further information shown in Table 24 was supplied by 12 respondents who indicated that cinema and television movies and television advertisements (33%, n=4) are often inaccessible to visually impaired and hearing impaired people. Inadequate signage (25%, n=3) in a method accessible for the person's disability (e.g. for visually impaired people, sounds at escalator denoting up escalator or down escalator) were mentioned, while textbooks for students (17%, n=2) are a constant cause of concern especially for visually impaired people as not all books are available electronically and Braille printed is cumbersome and costly.

Other	Total	
Respondents	12	
TV/Movies	4	33%
Signage/Mobility	3	25%
Braille Textbooks Printing	2	17%

Table 21. Frequency of Other Issues Mentioned.

5.6 Summary

In summary Figure 12 extends the findings model (Figure 11) with the above quality of life influences observed in the qualitative findings. The dotted line between quality of life and the type of information needed indicates the link between QOL and psychological information observed in Section 5.3 above.

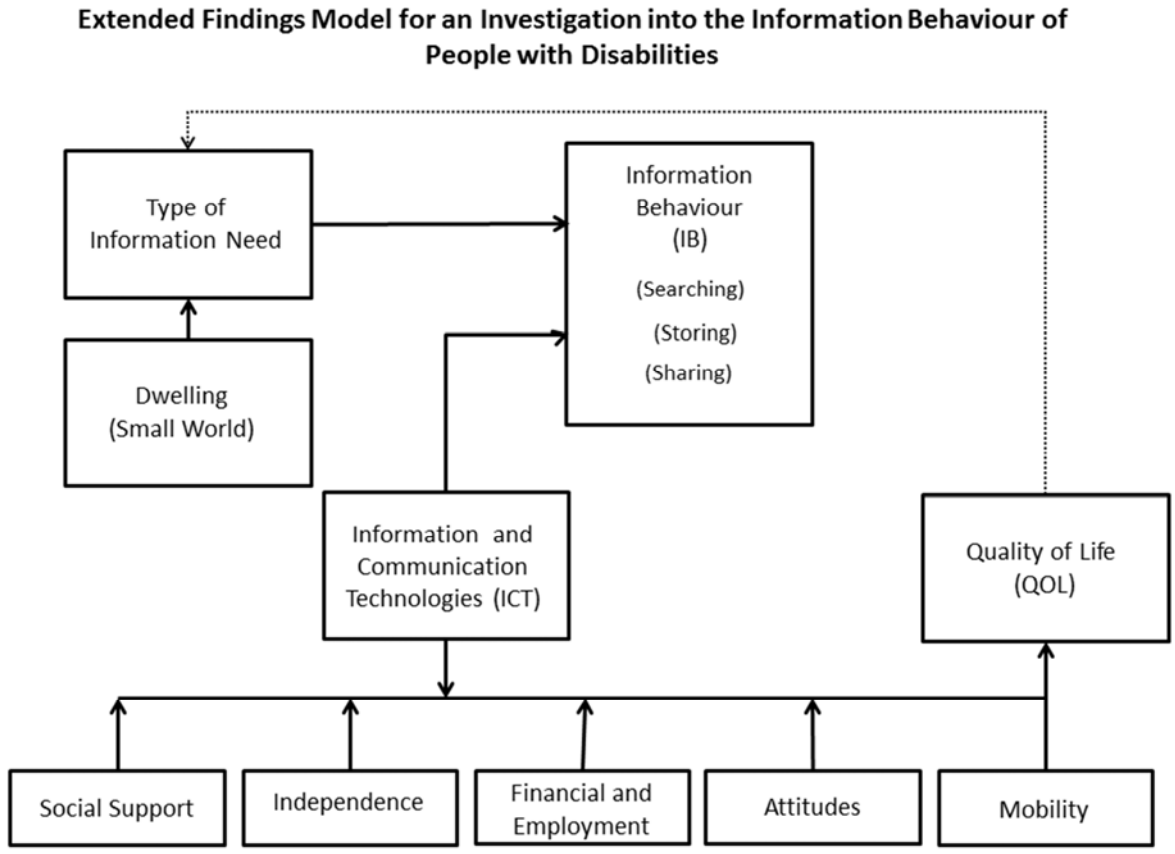


Figure 12. Extended Findings Model including Qualitative Data.

This chapter described the findings for the study. An overview of the study's demographics, was followed by a correlation review and a factor analysis, the hypothesis tests, and finally additional observations. These findings are discussed in the next chapter.

CHAPTER 6: DISCUSSION OF THE RESEARCH FINDINGS

This chapter discusses the outcome and implications of the research findings, examining quality of life, types of information needed, information behaviour, ICT, and dwelling conditions and ending with a synopsis of the factor analysis.

6.1 Introduction

This study set out to investigate the relationship between information and communications technology, information behaviour, and quality of life for people with disabilities based on 'Accessibility' derived from Mason's Privacy Accuracy Property and Accessibility (PAPA) Framework (Mason, 1986). According to Mason, access to information is gained through literacy, access to the technologies that store information and access to the information itself. He indicates a paradox between decreasing costs of information globally based on computational cost per million instructions per minute and increasing for the individual based on the comparison of the cost of personal computing to free library access. According to Mason, literacy is a 'function of both the knowledge level and the economic level of the individual' (Mason, 1986 p.7). For people with disabilities, economics is of relevance due to inherent poverty in this sector (Dobransky & Hargittai, 2006) while physical access is a foremost constraint (Agarwal, Xu, & Poo, 2011; Foley & Ferri, 2012; Vigo & Harper, 2013). Although technology is cited as a method of overcoming impairments, technological barriers intensify the limitations particularly when considering the shift from face-to-face interaction to online communication (Macdonald & Clayton, 2013).

This study was informed by the 'disability paradox' whereby people with severe disabilities report a higher quality of life than anticipated (Albrecht & Devlieger, 1999) combined with the belief that people require information for higher quality of life (Gianinazzi et al., 2014; World Health Organization, 1997). Information needs were developed from domains observed to signify higher quality of life by Renwick et al. (2003) in their quality of life model for people with disabilities (QOLP-PD) while information gathering and sharing is postulated to be aided by the use of information and communication technology (Halewood & Kenny, 2008).

The aim of the research was to gather information about the technologically assisted information behaviour of people with disabilities from the perspective of higher quality of life and the barriers to information access encountered by them. The study is informed by Kuhlthau's call for the pragmatic application of information behaviour research (Kuhlthau, 2014) in focussing on a group of people typically situated on the fringes of society who are denied access to information taken for granted by the majority of society. The objective of the research was to raise awareness amongst information

providers who in turn may be empowered to provide for the information needs of people with disabilities (Williamson 1998) which provoked three questions:

1. What information behaviours of people with disabilities influence their quality of life?

2. What relationships exist between information, information and communication technology, and the information behaviour of people with disabilities?

3. In what way do contextual factors of dwelling conditions influence the information behaviour of people with disabilities?

A survey instrument was constructed to answer these questions and administered to 70 people with disabilities using a snowball approach which is deemed a suitable sampling method for hard to reach populations such as those with health issues and difficulties (Atkinson & Flint, 2001; Faugier & Sargeant, 1997). The survey was completed by means of self-completion by respondents, on-line survey, telephonic interviews, and face-to-face interviews with the resultant quantitative data analysed through the IBM SPSS Statistics 19 statistical package and qualitative data from open questions explored following Thomas' General Induction Approach (Thomas, 2006). The findings from this investigation are described in the preceding chapter and discussed below.

6.2 Quality of Life

Consistent with Albrecht and Devlieger's findings, the majority of respondents (77%, n=54) indicated a higher quality of life with 26% (n=18) describing their quality of life as excellent. Confirming the applicability of the QOLP-PD profile of Renwick et al. (2003) based on the CHP model of Raphael et al. (1996) the study observed the reversed significance of the QOLP-PD domains. Means score tests ranked the three QOLP-PD domains as Becoming (M=2.933, sd=0.797), Belonging (M=2.600, sd=0.783), and Being (M=2.386, sd=0.765) compared to the CHP model's Being, Belonging, Becoming (Raphael et al., 1996). Although Renwick et al.'s ranking put Being fractionally ahead of Belonging (2.830 versus 2.800) with Becoming lagging at a mean of 2.200, the overall mean of 2.610 is similar to this study's 2.640 (sd=0.632) as shown in Table 25. The inverted finding reflects the CHP model assessment of the importance of the *existing influences* of the person whereas in this study the *demand for information* was determined. Thus whereas QOLP-PD and CHP measured what people ***have*** this study measured what people ***need*** resulting in a higher needs ranking for that which they do not have. This resulted in Becoming needs ranked higher than Being or Belonging needs.

	All		Renwick* QOLP-PD
Valid N	**70**		
Variable	**Mean**	**Std.Dev.**	**Mean**
Becoming	2.933	0.797	2.200
Practical	3.136	1.042	2.210
Leisure	3.043	0.973	2.050
Growth	2.621	1.020	2.340
Belonging	2.600	0.783	2.830
Community	2.843	0.976	2.240
Social	2.629	1.230	2.750
Physical	2.329	1.049	3.510
Being	2.386	0.765	2.800
Physical	2.700	1.088	2.050
Spiritual	2.486	1.164	2.650
Psychological	1.971	0.932	3.710
Total QOL	2.640	0.632	2.610

Table 22. Means Tests for QOLP-PD factor.

No influential relationship was observed between quality of life and information behaviour of people with disabilities which may be understood by Wilson's postulation that information needs are secondary to fundamental human needs (Wilson, 1981) rendering information behaviour secondary to the fulfilment of fundamental needs. Likewise the anticipated and persistent view that ICT does not directly influence quality of life (Dickinson & Gregor, 2006) was confirmed.

Quality of life was however found to exert an influence on information needs, specifically stress information and mood information. Psychological (mood and stress) factors are documented within QOL research (Amundson, 2010; Meuleners et al., 2003). However the need for stress and mood information was ranked lowest in this study which may be linked to the high ratio of respondents exhibiting higher quality of life. This may be understood through the negative correlation finding that higher quality of life is associated with lower need for psychological information. Quality of life was thus found to influence information needs although the fulfilment of these needs is not directly responsible for improving quality of life which is consistent with other studies suggesting that whereas QOL is customarily perceived as the dependent variable a mindset change is required to view QOL as an independent or a mediating variable (Gilhooly, Gilhooly, & Jones, 2009). In contrast, some studies appear to contradict this finding, such as the strong links observed between information literacy and quality of life combined with associations between Internet connectedness

and information literacy (Leung, 2010). While Leung describes the typical information literate person as actively using critical literary skills together with social activities on the Internet based on positive previous experiences, he admits that he found a stronger prediction of quality of life in the person being female, older, and well-educated. This suggests that other factors may influence information literacy which in turn (or in conjunction) predict quality of life such as Erickson and Johnson's (2011, p.205) suggestion of 'a third, unmeasured variable' required to explain links between Internet connectedness and well-being.

Accepting that information behaviour does not directly influence quality of life of the person, the question then turned to what people with disabilities believe influences their quality of life. While belief is personal and subjective it remains in line with the information behaviour paradigm regarding information behaviour as cognitive (Savolainen, 2007). Respondents indicated six primary influences on their quality of life: Social Support, Independence, Finances and Employment, Attitude, Mobility, and Technology and are found to correspond to the ICF framework (World Health Organization, 2001)

- ***Social Support*** is well recognised in QOL research for people in general (Gilhooly et al., 2009; Leung, 2010), as well as people suffering from serious illnesses (Marrie, Salter, Tyry, Fox, & Cutter, 2013) and people with disabilities (Kemp, 1999). By providing social environments, even leisure activities such as collective hobbies have been observed to improve quality of life (Chaumon, Michel, Bernard, & Croisile, 2013). Paradoxically, a greater need for social information was observed for people in assisted living conditions where a higher social interaction is assumed for which a possible explanation may be found in Chatman's Theory of Information Poverty whereby outside help is sought by insiders due to social norms (Chatman, 1996).
- ***Independence*** was linked to mobility, and with self-determination (Dobransky & Hargittai, 2006), and interestingly encountered to a lesser extent amongst assisted living and higher amongst mobility impaired people.
- ***Financial and employment*** factors may be considered complementary, however strong links have been observed between employment and social support (Leung, 2010)) suggesting that employment may be more closely linked to social interactions than for economic requirements. Research has observed participants with intellectual disabilities in supported employment who, while satisfied with their material well-being, report higher satisfaction in terms of place in community (Beyer, Brown, Akandi, & Rapley, 2010). Similarly employment is believed to provide social contact and social status besides future financial security (Bakula, Kovačević, Sarilar, Žarković Palijan, & Kovač, 2011). Quality of life has been

associated with employment as a 'social factor' (Amundson, 2010 p.375) while subjective QOL is hypothesised to be primarily influenced by wealth, health, and social relations (Gilhooly et al., 2009).

- ***Attitude*** comprises positive attitude of the person with disability and improves quality of life (Leung, 2010) whilst negative attitudes from non-disabled people imposes barriers (Faria, Silva, & Ferreira, 2012) often linked to social support, independence, and mobility.
- ***Mobility*** is an indisputable issue for people with disabilities (Fürst & Vogelauer, 2012) and recognised as an influencer of quality of life (Bakula et al., 2011).
- ***Technology*** is in line with limited evidence of ICT as an influencer of QOL (Dickinson & Gregor, 2006) indicating that ICT may at best be a secondary factor useful for supplying the infrastructure for other QOL influencers such as social support (Gilhooly et al., 2009).

Accordingly a pattern within perceived QOL influencers emerges. High levels of social support and independence are indicated as influencers of QOL and yet the two are inter-related especially with people who value independence remaining reliant on others. Positive attitude is rationally linked to social support (agreeableness and extraversion according to Xia, Ding, Hollon, & Wan, (2013 p.411)) while mobility requires positive attitude especially amongst people most affected by poor social attitudes. Thus social support appears as a prominent indicator of quality of life. Amundson (2010) reveals links between employment and social support for improved quality of life while Leung (2010) records people who rate higher quality of life using the Internet for social support, and Dickinson and Gregor (2006) report on studies indicating improved positive attitudes and higher social support for people learning to use the Internet while warning that that the real benefit may arise due to support from others and not the technology itself concluding that well-being (of older) adults may not be directly influenced by computer-use.

Higher quality of life was observed to be associated with increased age and earlier onset of disability, together with lower requirements for information pertaining to stress, mood, finances, and coping information. While there is evidence confirming quality of life increasing with age it is more likely due to other factors. Behari, Srivastava, and Pandey (2005) found higher QOL for emotional functions but not for overall QOL (including increased age) while Bakula et al. (2011) contrasted this with younger people indicating higher QOL than older. One explanation may be the attribution of QOL improving over time due to adaptation (Buhse, Banker, & Clement, 2014) partly explaining higher quality of life observed for earlier onset of disability (Bakula et al., 2011; Uppal, 2006). Higher requirements for information pertaining to health is consistent with other findings (Gianinazzi et al., 2014) for which the Internet may be an initial information source but is not as trusted as medical professionals (Marrie et al., 2013). Lower requirements for information pertaining to stress and

mood have been observed amongst people with positive attitude and previous success in using the Internet for reducing stress and for mood-management (Leung, 2010) while lower requirements for information pertaining to finances may be explained by the high level of employment amongst the participants for this study and consistent with findings that employed persons have higher self-esteem and lower financial needs (Bakula et al., 2011). Associating coping with stress, Wilson's stress-coping theory may explain lower requirements for coping information in terms of the associated lower requirements of stress information (Wilson, 1999). According to Attribution Theory, stress and mood may affect information seeking behaviour rather than be a target of information seeking (Savolainen, 2013) resulting in hindrances to information seeking (Wilson, 1999). Further explanations may be found in mood being influenced by stress which has been shown to decrease with increasing age which is attributed to better coping strategies and improved understanding of stressful events (Cohen & Janicki-Deverts, 2012).

Research into the quality of life of people with disabilities found that quality of life was influenced by 'feelings of well-being, control and autonomy, a positive self-perception, a sense of belonging, participation in enjoyable and meaningful activity, and a positive view of the future.' (Connell, Brazier, O'Cathain, Lloyd-Jones, & Paisley, 2012, p.15) thereby reinforcing independence, mood, social aspects, positive attitude, and meaning for improving quality of life.

6.3 Information Need

A means analyses for information needs of people with disabilities is depicted in Table 26 showing highest means for the need for employment and mobility information while lowest means were observed for mood and stress information. Research has shown both employment and mobility to be important for people with disabilities (Bakula et al., 2011) and are logically related as greater mobility facilitates access to employment with employment information well documented as a need for people with disabilities (Bakula et al., 2011; Leung, 2010). Studies in job-seeking have revealed the complexity of the topic especially from a psychological standpoint which may be exacerbated in people with disabilities given the negative impact of failing to find employment (Savolainen, 2014).
Information needs of employment, mobility, health, and finances are consistent with other research such as The Royal National Institute of the Blind's inclusion of these topics as four of eight clusters of information needed by visually impaired people (Moore, 2000). The remaining four clusters are the condition itself, aids and equipment, housing, and services and facilities, all of which were indicated to a lesser extent in this study.

Mobility findings reinforce the recurring association of mobility with higher quality of life (Bakula et al., 2011) with further analysis finding that the majority of these participants exhibit a higher perceived quality of life indicating that people with a higher quality of life desire greater mobility.

Likewise, mobility information was positively associated with accommodation arrangements indicating the lower need for mobility information for people in assisted living which may be attributed to higher proportion of people with a lower quality of life accommodated in assisted living conditions for which mobility is provided. In a recent study of community care amongst aged people, mobility was the primary unmet yet expected care need (Harrison, Low, Barnett, Gresham, & Brodaty, 2014). Mobility was also linked to health information in the factor analysis which is consistent with other research (Burkell, Wolfe, Potter, & Jutai, 2006; Dobransky & Hargittai, 2006; Gilhooly et al., 2009; Leung, 2010).

The QOLP-PD domain of Becoming, which includes employment, handiwork, and leisure information was observed to be most significant in the means test which may be explained by the observation of Thomas (1996) (cited in Elm & Johnson, 2000) who indicates that people keep on 'growing' or becoming until their demise. Lesser information needs include information regarding coping associated with mood and stress (Savolainen, 2013) which considered jointly with the observed low means for dwelling information, nutrition information, and community information may be attributable to the personal/impairment circumstances of the respondents taking cognisance of the incidence of the QOLP-PD sub-domain 'Physical' for each of these areas.

Variable	TQOL	N	Mean	S.D.	Skewness	Kurtosis
Employment Information	Bc_Pra	70	3.26	1.35	-0.41	-1.04
Mobility Information	Be_Phy	70	3.11	1.27	-0.09	-1.08
Outdoor Leisure Information	Bc_Lei	70	3.09	1.14	-0.11	-0.60
Handiwork Information	Bc_Pra	70	3.01	1.23	-0.08	-0.86
Indoor Leisure Information	Bc_Lei	70	3.00	1.33	-0.23	-1.18
Professional Information	Bl_Com	70	2.89	1.08	0.09	-0.85
Finances Information	Bl_Com	70	2.80	1.21	0.15	-0.95
Health Information	Bc_Gro	70	2.77	1.21	0.20	-0.73
Friends Communication Information	Bl_Soc	70	2.73	1.34	0.07	-1.18
Spiritual Information	Be_Spi	70	2.63	1.32	0.37	-0.98
Family Communication Information	Bl_Soc	70	2.53	1.28	0.27	-1.03
Community Information	Bl_Phy	70	2.49	1.15	0.48	-0.33
Coping Information	Bc_Gro	70	2.47	1.19	0.55	-0.51
Ethics Information	Be_Spi	70	2.34	1.24	0.68	-0.53
Nutritional Information	Be_Phy	70	2.29	1.23	0.68	-0.58
Dwelling Information	Bl_Phy	70	2.17	1.12	0.87	0.34
Stress Information	Be_Psy	70	2.10	0.98	0.65	-0.08
Mood Information	Be_Psy	70	1.84	1.00	1.13	0.64

Table 23. Means Analysis for Information Needs of People with Disabilities.

Of particular note in this quadrant is the low mean observed for ethics information. The limited demand for information in respect of ethics is a cause concern given the contemporary ethical challenges facing humanity and highlighted by Leung (2010). Aristotle's Nicomachean Ethics is often used as a background to ethics or virtue studies appropriately combining well-being and ethical actions (De Vos, Schwanen, Van Acker, & Witlox, 2013; Huta & Waterman, 2013) often focusing on limited accessibility to 'good' information such as health needs and increased access to 'bad' information such as cultural taboos. Ethics in the use of technology is a controversial topic resulting in world-wide deliberation (Capurro, 2013) which according to concerned activists is lacking in the ICT setting (Moor, 2005).

For people with disabilities, ethics may be of particular relevance considering the potential use of biotechnology in the modification ('correction') of the person's body or mind. One aspect is invasion of privacy, while techno-biological changes in the form of nanotechnology and neurotechnology impact people as both agent and beneficiary of ethical principles leading to ontological apprehensions with regard to the modifications, including reality changes, of the modified person affecting, or being affected by, such ethical principles (Moor, 2001). Likewise, ethical questions are raised for people with disabilities such as surveillance of individuals through the use of GPS (global positioning system) devices for navigation or monitoring and RFID (radio frequency identification devices) implants for the assistance of disabled people such as tracking of Alzheimer patients (Battaglia & Iannizzotto, 2012; Domingo, 2012; Capurro, 2013).

Other mentions in the open questions included shopping information which is supported by research such as (Harrison et al., 2014) who found high needs by ageing people for home needs including shopping. This is similar to the ICF domain Domestic Life which also incorporates shopping (World Health Organization, 2001). Motion pictures and TV advertisements which are largely inaccessible to visually and hearing impaired people were indicated as was inadequate signage hindering mobility. Further findings highlight the lack of understanding and provision of information for people with disabilities, for example, the two visually impaired ladies who revealed a paucity of fashion and make-up information available to visually impaired people. According to Williamson (1998) the responsibility rests with information providers to provide information that may improve [incidental] information acquisition and thus satisfy information needs which at minimum may *satisfice* needs suggesting that while the information may not completely *satisfy* the information need it should *suffice* (Savolainen, 2014).

Textbooks were a cause of concern for visually impaired students as not all books are available electronically and Braille printed is cumbersome and costly (Guerreiro et al., 2013). Therefore books are read onto tape, reproduced as PDF, or sections are printed in Braille raising ethical issues in terms of copyright infringement which has, in part, been addressed by the ratification of the 2013 'Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind, Visually Impaired, or otherwise Print Disabled' which waives copyright laws and allows for the reformatting of copyrighted books into an accessible format for people with disabilities (Nicholson, 2013).

Recognizing the need for information is the initial step which must be translated into action (Niemelä et al., 2012) to engage in the information behaviour process discussed in the next section.

6.4 Information Behaviour

The hypothesis that people with disabilities practice information behaviour in the form of searching for information, storing information, and sharing information is confirmed with relationships observed between topics of information and information behaviour. The topics included associations of information behaviours with mobility, employment, family communication, and health information. With the lowest mean scores, stress and mood information were not observed to influence information behaviour, however emotional outlooks may reduce information behaviour with the resultant low demand for stress and mood information (Savolainen, 2014). Other influences for not seeking or avoiding similar information have been observed, such as Chatman's 1992 observations (cited by Prigoda & McKenzie, 2007) of elderly ladies in a retirement community who due to social norms would not admit to requiring personal information.

Searching For Information

Searching for information was associated with higher levels of internet access and the need for mobility and employment information while communication needs were associated with non-Internet searching for information. Internet connectivity and information seeking behaviour are linked through information literacy which includes information needs and searching (Krikelas, 1983; Leung, 2010) while mobility as a functional capacity is well recognised as having an influence on quality of life (La Grow, Yeung, Towers, Alpass, & Stephens, 2013). Likewise employment and social activities, which include communication, are recognised as influencing quality of life, all of which are included in Moore's (2000) eight clusters of information need.

Respondents indicated that their most common means of searching was the Internet. Given the prevalence of respondents with ICT access this finding may not be widely generizable, nevertheless it reinforced the premise that higher levels of ICT use are associated with higher levels of information behaviour. The ensuing most frequent information sources were verbal and media (printed and

Radio/Television) which is consistent with literature and research into information seeking behaviour. Agarwal et al. (2011) classify information sources as interpersonal-impersonal and physical-electronic specifically mentioning face-to-face, phone, online chat, email, online forums, books, and online information, while Williamson's Ecological Model of Use of Everyday Life Information reproduced in Figure 13, developed prior to the ubiquitous nature of the internet of today, shows the levels of information sources for knowledge seeking (Williamson, 1998). Central to the model is the user surrounded by their personal network, increasing to include wider personal networks, mass media and institutional sources surrounded by contextual factors. Each layer up to mass media in the original model affords information from purposeful seeking as well as incidental acquisition.

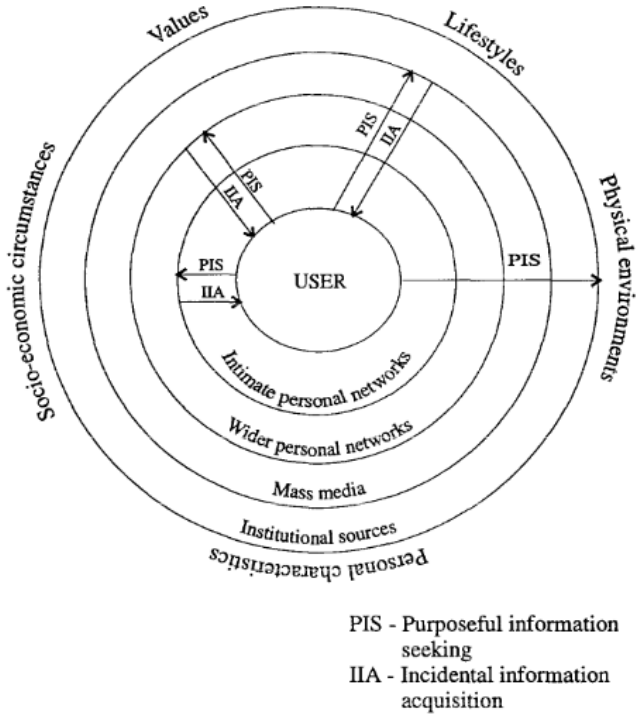


Figure 13. Williamson's 1998 Everyday Life Information Model.

Storing of Information

Higher levels of storing of information were associated with higher levels of internet access suggesting that once people have used the Internet to search for information they store it for later use which is consistent with Leung's (2010) concept of information literacy incorporating storing information, retrieval of information and Internet connectedness. The ranking of electronic means of storage as the most popular method of storing information confirms the premise that ICT is associated with higher levels of information behaviour amongst people with disabilities. Although paper storage methods were acknowledged, a number of respondents revealed that they memorize information. This finding is consistent with theories that information is stored in both personal files

and memory and accessed when required (Krikelas, 1983). Dervin's (1998) information gap theory suggests that information seeking is triggered when the individual realises that they need information not available in memory while Godbold (2006) postulates that memory of earlier behaviour may influence behavioural patterns.

Two techniques for storing of information were identified – electronic on computer and cellphone - and memory triggers. File and folder naming conventions to categorize stored information for later retrieval by means of built-in search utilities was the preferred method observed for electronic storage while memory triggers appear to be supported by Godbold's (2006) reference to the recollection of a previous behaviour and Aristotle's explanation of recollection which he sees as being enacted or complemented by 'residual perceptive images' or 'phantasms' (Bynum, 2006, p.160) which are clearly cognitive. An alternate explanation is found in transactive memory systems whereby information is accessed from the memories of others either directly or from the knowledge of where to access the required information (Wegner, Erber, & Raymond, 1991).

Sharing of Information

Mobility information was observed to be significantly associated with sharing of information. The importance of mobility to people with disabilities is well documented (Moore, 2000; Norgate, 2012) and closely linked to quality of life (Webber, Porter, & Menec, 2010) yet many unexplored well-being benefits remain (Nordbakke & Schwanen, 2014).

Verbal information sharing was ranked highest with email and social media ranked second and third. As both email and social media use ICT the premise that higher levels of ICT are associated with information behaviour is reaffirmed although verbal sharing remains primary. While higher levels of sharing information were associated with higher levels of access to computer and to cellphones, no significant relationship between Internet access and sharing of information were observed. These findings are consistent with the hypothesis that offline face-to-face communication is a greater predictor of quality of life than online Internet communication (Lee, Leung, Lo, Xiong, & Wu, 2011).

Use of Information

Discovering precise information usage remains challenging due to information seeking being temporal and spatial (Savolainen, 2006), task related, often undertaken in dialogue (Savolainen, 2007), and frequently only useful at a later time (Williamson, 1998). Combining this with the belief that Incidental Information Acquisition is more likely than Purposeful Information Seeking (Williamson, 1998), limited enactment (Niemelä et al., 2012) and inadequate research addressing information processing triggering action (Lioutas, 2014) renders this onerous. Although models such as the Acquisition, Cognition, Application model of Saracevic and Kantor (1997) highlight information use, information gathering does not necessarily signify usage or enactment which Niemelä et al.

(2012) define as '…information behavior [which] leads to observable actions'. This is supported by the finding that a greater number of the respondents indicated storing information than those indicating sharing information. However, not all information is suitable or acquired for use with people seeking information purely for keeping informed (Saracevic & Kantor, 1997; Williamson & Asla, 2009). This is typified by people watching television in their leisure as a technique of being informed (Elsweiler et al., 2010) while television viewing has been observed as useful in predicting quality of life for leisure activities (Leung, 2010). An unexpected finding in this research identified a small contingent who evaluate information consistent with literature from a literacy perspective (Tuominen, Savolainen, & Talja, 2005) as well as efficacy of information sources (Dervin, 1998).

6.5 ICT and Information Behaviour

Statistically significant relationships between ICT and information behaviour were observed for people with disabilities who have access to computers and the Internet albeit mobile Internet access was observed to be limited due to high costs and physical access impairments. Internet access was however found to have an overall relationship to information behaviour with associations between Internet access and searching, storing, sharing, and computer-assisted searching while computer access was associated with information sharing and computer-assisted information searching. A further relationship was found between computer-aided searching and the desire to increase the use of ICT. Together these findings are consistent with literature (Fisher & Julien, 2009; Hasler, Ruthven, & Buchanan, 2014), however the readily accessible online data has led to concerns amongst professionals as to efficacy and of adherence to advice (Hay, Strathmann, Lieber, Wick, & Giesser, 2008). According to Bates (2010) technology comes in waves affecting information behaviour but reverting to underlying human intervention and while it may result in enhanced speed of access and ease of use it retains human behaviours. This is exemplified by studies of health information seeking behaviour of technologically aware adolescents who use mobile technology to access the Internet as their preferred source of information but rely on face-to-face contact with trusted people to validate or further satisfy their information need (Okoniewski, Lee, Rodriguez, Schnall, & Low, 2013) and consistent with the view that face-to-face communication is a greater predictor of quality of life than online communications (Lee et al., 2011).

While a number of respondents sought more information on technology, indicating the possible perception that technology will improve lives (Gilhooly et al., 2009), ICT in itself has never been conclusively proven to directly improve QOL according to Dickinson and Gregor (2006) who warn that findings of QOL influenced by technology may be the effect of personal contact rather than due to the technology. Likewise Leung (2010) observes no direct link between Internet connectedness and quality of life, although his observation of links between Internet connectedness and

information literacy and between information literacy and quality of life support the view of the information as a second order need.

Computer and Internet access were both positively correlated to education indicating that a higher level of education is associated with a higher use of ICT and is consistent with other research findings. Education, employment and income have been observed to be affected by ICT usage (Dobransky & Hargittai, 2006) and linked to quality of life of people with disabilities (Moore, 2000) thus indirectly implicating ICT in QOL of people with disabilities who have access to ICT. However information behaviour models highlight barriers, such as Wilson's model of information seeking behaviour which describes three forms of barrier: personal (of the person themselves), role-related (interpersonal activities), and environmental (the person in context) (Wilson, 1999). A significant portion of disability research is dedicated to environmental barriers in respect of quality of life (Albrecht & Devlieger, 1999; Amundson, 2010) often viewed from the perspective of the social model of disability (Braithwaite & Mont, 2009). The most significant barrier to technology was found to be accessibility of the technology itself, followed by financial barriers, the need for training, fear of technology, and not knowing what technology is available thereby confirming observations of accessibility and financial barriers as the most commonly cited barriers to ICT for people with disability (Macdonald & Clayton, 2013; Urquhart et al., 2007).

The markedly vague concept 'accessibility' was further examined in this study with the intention of determining more precisely the barriers encountered. In line with other research, barriers were found to be physical limitations of the person (Wilson, 1999), inaccessibility of website pages (Vigo & Harper, 2013), inaccessibility of PDF documents/eBooks (Southwell & Slater, 2013), touchscreens, slow access speeds, graphics, and Captcha codes (also known as human-interaction proof tools) (Sauer, Holman, Lazar, Hochheiser, & Feng, 2010). These persistent limitations take on a systemic perspective, for example, website accessibility difficulties were observed to negatively influence user's perceptions and further limiting access creating a reinforcing loop (Aizpurua, Arrue, & Vigo, 2013). A recognized barrier is lack of training (Hallows, 2013; Williamson et al., 2001) and likewise fear of technology (Selwyn, 2003), especially amongst older people, engendering further accessibility issues (Carpenter & Buday, 2007). Lack of knowledge of technology offerings (Macdonald & Clayton, 2013; Wagner, Hassanein, & Head, 2010) may be aggravated by limited accessibility due to assistive technology failure or limited availability of relevant information (Childers & Kaufman-Scarborough, 2009) with Williamson (1998) suggesting that the onus rests on information providers who should be aware of the needs of users and provide knowledge in such a manner as to enable incidental information acquisition. An interesting concern encountered in this study was that technology may

result in dependency which is confirmed in the literature (Macdonald & Clayton, 2013) and cited in connection with the use of assistive technologies (Söderström & Ytterhus, 2010).

In addition to physiological and psychological limitations, Selwyn (2004) mentions two significant concerns in non-use of ICT, ambivalence and relevance. Ambivalence arises from the societal portrayal of the usefulness of technology contrasted to the limited usefulness of technology supporting everyday life information seeking (ELIS) requirements, thereby decreasing the relevance of ICT however, questions remain regarding the relevance of ELIS itself with suggestions that ELIS overplays need and ignores desires (Day, 2011).

6.6 Dwelling Conditions

The differences observed between assisted and independent dwelling conditions of mobility information, community information, and dwelling information are supported by findings of satisfaction with accessibility to local dwelling and neighbourhood (community) (Bakula et al., 2011). Corroboration of the differences observed in stress information and mood information has been observed amongst disabled people in general (Chao, 2014) and in small world environments (Tu, Lai, Shin, Chang, & Li, 2012) with Tu et al. positing literacy as a modifier of mood. Citing Chatman's 1992 study of elderly women in a retirement residence Savolainen (2014) indicates that stress and fear may lead to information avoidance even though the same ladies relied on their community for everyday support (Prigoda & McKenzie, 2007). This study led to the development of Chatman's Theory of Information Poverty (Chatman, 1996) which suggests that by refusing needed information from outsiders due to social norms and other factors which may affect social status insiders within a community can reify information poverty. Today the small worlds theory is being challenged with technology making information grounds less dependent on physical places (Allen, Karanasios, & Slavova, 2011; Savolainen, 2009) which is confirmed by findings that ICT stimulates interconnectedness and social interaction of people in care facilities (Chaumon et al., 2013).

6.7 Factor Analysis Synopsis of Findings

The complex nature of information behaviour (Bystrom & Jarvelin, 1995; Vakkari, 1999) which is intensified when combined with disability, quality of life, and ICT (Buntinx & Schalock, 2010), is emphasised in the factor analysis which suggests higher quality of life is influenced by a number of interrelated factors. Permutations of in-the-home activities and neighbourhood involvement, health and nutrition, accommodation moderated psychological needs, social capital, community belonging, handiwork, together with information behaviour and ICT are indicated as influences of higher quality of life in people with disabilities. These factors indicate a broad engagement by people with disabilities with information needs, information behaviour, and the use of technology in their daily lives. All QOLP-PD factors influencing the quality of life of people with disabilities (Renwick et al.,

2003) except Leisure Becoming were found to be augmented by information behaviour. The factor analysis is consistent with quality of life research amongst people with disabilities, three of which are used in support of the findings as shown in Table 27. The first was derived from research amongst people in long-term care facilities (Van Malderen, Mets, & Gorus, 2013), the second concerns information needs of visually disabled people (Moore, 2000) and the third incorporates the activities and participation domains of the ICF (World Health Organization, 2001). While Moore is highly focussed and exhibits the least associations to the factor analysis, Van Malderen et al. show associations to all but Spiritual Being which is in evidence in the ICF domain Community, Social and Civic Life. The ICF includes Internet connectivity and ICT in their Communication domain of Activities and Participation indicating it as both facilitator and barrier to the environment in which the person lives while addressing physical, social and attitudinal settings (World Health Organization, 2001). Leung (2010) associates Internet connectivity and information behaviour suggesting higher information literacy positively influences quality of life which is consistent with the social environment of Van Malderen et al. (2013).

	Factor	Moore (2000)	Van Malderen et al., (2013)	ICF - World Health Organization (2001)
1	Physical Belonging		Physical environment	General tasks and demands, Domestic life, Community, social and civic life
2	Information behaviour	Aids, adaptations and equipment.		Learning and applying knowledge
3	Health and Nutrition	General health care	Behavioural determinants	Mobility, Self-care
4	Psychological Being and Dwelling Context	General health care, Housing and accommodation	Psychological factors	General tasks and demands
5	Social Capital		Social environment	Communication, Interpersonal interactions and relationships
6	Spiritual Being			Community, social and civic life
7	Community Belonging	Benefits and money, Health and social care services and facilities.	Economic determinant, Care	Major life areas, Interpersonal interactions and relationships
8	Practical Becoming	Housing and accommodation, including performing household chores.	Participation	General tasks and demands, Domestic life

Table 24. Factor Analysis for Quality of Life of People with Disabilities.

6.8 Summary

For people with disabilities higher quality of life has been shown to be influenced by social support, independence, finances and employment, attitude, mobility, and technology. While technology has the potential to improve quality of life, ICT has been shown to be a secondary influence supplementing primary human needs. Similarly information behaviour is a secondary need supporting the information needs and desires of people. Fundamental needs such as those found in the QOLP-PD Model are supported with emphasis on particular information needs. Overall, highest means were observed for the need for employment and mobility information and lowest for stress and mood while social and health information were highlighted for people with disabilities. A relatively unexplored information need was discovered in the low demand for ethics information relevant to both ICT use and disabilities.

Gathering and sharing of information to satisfy information needs were found to be supported by ICT with the Internet associated with higher searching and storing of information and computers and cellphones associated with information sharing. Preferred methods of information gathering were observed to be the Internet, verbal communication and books and media, with sharing of information was found to be verbal, email, social media, and printed articles. While the observed desire to increase ICT use suggests that technology is perceived to improve peoples' lives, barriers to ICT use were observed in economic factors, physical limitations of the person, inaccessible websites, documents and graphics, slow Internet access speeds, lack of training, fear of technology, and limited knowledge of technology offerings. With regards to dwelling conditions, information behaviour was found to be the same for people in assisted living as for those living independently however differences in information needs highlight the requirement to recognise relevance of context of information behaviour if it is to be useful for improving quality of life of people with disabilities.

CHAPTER 7: RESEARCH SUMMARY, LIMITATIONS AND CONCLUSION

In this chapter a summary of the research is provided together with the implications of the study. Limitations to the study are then acknowledged prior to suggestions for further research.

7.1 Summary

Accessibility, the fourth factor of Mason's PAPA ethical framework, is of particular relevance to people with disabilities as access to information, information technologies and to information itself is frequently denied them. Many accessibility limitations can be rationalised by virtue of economics combined with the knowledge level of the individual according to Mason (1986). Poverty limits access to information technologies and information thereby constraining knowledge building resulting in a lack of information for everyday life which increases economic poverty. Physical access is a constraint for people with disabilities for which technology is cited as a solution although it has been observed to compound limitations due to physical impairment and dependency on the technology. Consequently, ICT which may aid in gathering and sharing information is limited by physical and financial barriers for people with disabilities who have been observed to exhibit a higher quality of life than anticipated given their situations.

Investigating the perceived higher quality of life in people with disabilities and the role that information behaviour and ICT plays in their lives, this study administered a survey to 70 people with disabilities. Gender of the participants was proportionately spread with two-thirds of participants under 45 years of age and more than three quarters indicating onset of impairment below 21 years of age. Half of the respondents had completed further studies with almost a third having completed post-graduate degrees and slightly less than 80% indicating that they live independently. High levels of impairment were observed with 60% of participants incapable of performing at least one function of seeing, hearing or mobility. The findings confirmed that people with disabilities on average report a higher quality of life than expected with no influence of ICT on quality of life observed even though the majority of participants had regular access to ICT. Likewise, no influence of information behaviour on quality of life was noticed, however associations were observed between information behaviour, ICT and type of information required on a regular basis while type of information needed was associated with quality of life and dwelling conditions. The ethical aspects of this study were emphasised with ethical issues exposed, such as copyright infringement in the demand for books in accessible formats and the observation of low demand for ethics information. Although controversial (Capurro, 2013) ethics are arguably one of the most needed areas in ICT nowadays (Moor, 2005).

Correlating information need to the QOLP-PD model of fundamental needs influencing quality of life of people with disabilities (Renwick et al., 2003) this study corroborates the observation that

information needs are secondary to fundamental human needs (Wilson, 1981). Six primary influences on quality of life comparable to the ICF framework, were observed: *Social Support, Independence, Finances and Employment, Attitude, Mobility, and Technology*. Overall quality of life was observed to exert an influence on the type of information needed, in particular stress information, mood information, and health information which is consistent with similar work (Amundson, 2010). Observations of the lowest means for mood and stress information and highest means for employment and mobility information are consistent with works such as that of Moore (2000) who includes employment, mobility, health, and finances as clusters of information need of visually impaired people. Information needs of people living in assisted accommodation compared to independent living were observed with differences in needs for mobility information, community information, and dwelling information. However, determining precise information usage is shown to be challenging with information either not suitable or acquired for later use (Williamson, 1998) and exacerbated by limited research addressing information processing that triggers action (Lioutas, 2014). Although accessibility to information alone does not necessarily lead to action (Niemelä et al., 2012), action through information behaviours of searching, storing, and sharing information was found to be influenced by types of information needed in particular mobility information, employment information, social information, and health information. Higher levels of Internet access were associated with searching for information followed by verbal and media information sources. Internet access was further associated with higher levels of storing of information with electronic means of storage preferred. This was accomplished through the use of file and folder naming conventions to categorize stored information for later retrieval by means of search utilities. Verbal means were favoured for information sharing with computers and cellphones ranked second thus confirming findings that offline communication is a greater predictor of quality of life than online Internet communication (Lee et al., 2011).

While ICT in itself has never been conclusively proven to directly improve QOL (Dickinson & Gregor, 2006) a number of respondents sought more information on technology indicating the possible perception that technology will improve lives (Gilhooly et al., 2009) however they encounter barriers in using the technology due to their disabilities. Commonly cited barriers to ICT for people with disabilities are financial and accessibility obstacles (Macdonald & Clayton, 2013) with this study identifying persistent barriers of physical limitations of the person, inaccessibility of website pages, inaccessibility of PDF documents/eBooks, difficulty in using touchscreens, slow Internet access speeds, graphics, and Captcha codes. Furthermore barriers of lack of training, fear of technology, and lack of knowledge of technology offerings were documented. One conceivable solution to these shortcomings is for information providers to make information available in such a manner as to enable incidental acquisition (Williamson, 1998) with the caveat that use of ICT may be constrained

by ambivalence of the user and lack of relevance of the information (Selwyn, 2004). A further constraint identified in this study is the negative perception of dependency on the technology.

The holistic nature of disability is emphasised in this work. While Albrecht and Devlieger (1999) consider disability from body, mind, and soul perspective, thousands of years ago ancient philosophers took a broader view than today in describing the pursuits of man. They determined four interrelated pursuits: scientific – the pursuit of truth or knowledge; political-economic – the pursuit of power and plenty; ethical-moral – the pursuit of goodness and virtue; and aesthetic – the pursuit of beauty (Ackoff, 1976). Although aesthetics is played down in everyday life, holistically the four work in conjunction and are represented in this work. Pursuit of truth is found in information behaviour, power and plenty is observed in societal and poverty adversities, ethics in access limitations, while quality of life is the pursuit of beauty together supporting prior observations that people with disabilities manifest higher quality of life than expected. While not directly observed to influence quality of life, ICT was seen to promote information behaviour facilitating higher quality of life. Although a broad range of information is required for everyday life of people with disabilities, employment, health, mobility, and social information in particular were observed to exhibit a complex relationship with disability. Information needs influence quality of life and are influenced by quality of life for people with disabilities while being influenced by the person's impairment and information behaviour which in turn is assisted by technology. Thus while technology is not directly linked to improved quality of life it has been shown to support factors that do improve quality of life. For people with disabilities this includes assistive technologies and ICT for information gathering and sharing, however the very disability that the technology seeks to overcome can become a barrier to its use.

7.2 Implications of the Research

The QOLP-PD approach has proved to be a valid foundation for quality of life studies for people with disabilities through the provision of clusters of need that influence quality of life. Quality of life however was found to be conceptually misinterpreted in this research which originally considered it a dependent variable. It was subsequently observed to be an independent variable [linked to psychological information needs] and is consistent with Gilhooly et al. (2009) who suggest that although frequently considered a dependent variable, it should be understood as an independent or moderating variable. Simialrly, Ackoff (1976) views QOL as a process more than a product. Except for the variable quality of life, the conceptual model was validated in this study which could be repeated with a larger sample to verify the findings. Repeating the study with a less technologically aware sample will provide additional findings while temporal limitations of information behaviour may be reduced by a longitudinal study. Researchers with limited experience of working with people with

disabilities wishing to repeat the study are advised to allow additional time for building rapport with disability groups and doing one-on-one interviews.

The research has practical implications for service providers, policy setting agencies, and activists who can employ the findings in improving accessibility for people with disabilities. Persistent needs of employment, social interaction, mobility, and health information are observed in this research, as are limitations in accessibility of information technology, against which policy setting agencies and activists can campaign with the caveat that intended beneficiaries must have a participatory role in such action (Ackoff, 1976). The positive links between quality of life and access to information through ICT highlights the imperative of making ICT accessible to people with disabilities by relieving financial barriers, supplying training, reducing fear of technology, and making information of available technology available. Focus of such initiatives should firstly address mobility issues without ignoring employment, education, health, and social interaction. While social interaction is vital with employment satisficing economic and some social needs this cannot be effective if the facilities and essential information are not in place for the person to function in the social and employment spaces. Meanwhile, service providers who supply information and can resolve the technical barriers must secure participation of people with disabilities.

7.3 Limitations to the Research

Limitations for this study arise from the use of convenience and snowball sampling techniques and a cross-sectional view of this study. High levels of education and employment were observed in the sample comprising predominantly active ICT users. Thus, although the findings are supported in literature, caution must be exercised as this sample may not be representative of all people with disabilities.

7.4 Further Research

A number of areas for additional research were exposed in the study.

The weak finding of technology influencing quality of life deserves more attention given the lack of empirical evidence (Dickinson & Gregor, 2006).

Research into understanding of what initiates information behaviour action is required (Lioutas, 2014) while paucity of the controversial topic of ethics (Capurro, 2013) is revealed especially in the ICT arena (Moor, 2005).

Further research into appropriate mechanisms for the supply of information in a manner that may be acquired incidentally (Williamson, 1998) is vital especially for mobility information which for people with disabilities is crucial (Nordbakke & Schwanen, 2014).

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APPENDIX A: SURVEY INSTRUMENT

Questionnaire

Overview of the Study

People with disabilities require more information than people without disability due to their disability as well as to the prevalent tendency of exclusion from Western society. Such exclusion makes the supply of information and methods of making information available to people with disabilities more difficult as those people who have the ability to provide such information and methods tend to remain unaware of the information needs of people with disabilities.

This study attempts to (a) define what information people with disabilities obtain and share, (b) how people with disabilities obtain and share information, and (c) the current use of Information and Communication Technologies by people with disabilities . The goal of the study is to understand the information requirements of people with disabilities and how it is currently obtained and shared with the view to making useful information available to people (both people with disabilities and people without disability) who are in a position to make information and information sharing mechanisms available to people with disabilities in a usable format.

Section A. Background Information						
A1	Age	Under 20	21-30	31-45	45-60	60+
A2	Gender	Male		Female		
A3	Education Level	Less than Grade 12	Grade 12	Diploma	Degree	Post-Graduate
A4	Dwelling Conditions/Accommodation	Own House or Flat	Rented House or Flat	Shared Accommo-dation	Lives with Family	Care Facility

		Difficulty Level				
	Impairment	Incapable	Lots	Some	Slight	None
A5	Seeing	1	2	3	4	5
A6	Hearing	1	2	3	4	5
A7	Walking and Climbing Stairs	1	2	3	4	5
A8	Communicating	1	2	3	4	5
A9	Remembering and Concentrating	1	2	3	4	5
A10	Self-care	1	2	3	4	5
A11	Onset of Impairment	Birth	Under 20	21-40	40-60	60+

	Quality of Life					
A12	How would you describe your quality of life or wellbeing?	Excellent	Good	Neutral	Fair	Poor
A13	In your opinion, what influences your wellbeing or quality of life?					

	Technology		
A14	I have regular access to a computer	Yes	No
A15	I have a mobile telephone	Yes	No

A16	I have regular Internet access	Yes	No
A17	I use my mobile telephone to access the internet	Yes	No

Section B. What Information is Obtained and Shared

The following questions ask how much information of different types you *REQUIRE* on a regular basis. Please choose the answer that appears most appropriate. If you are unsure which response to give then the first response that you think of is often the best one.

I regularly need information relating to the following:

			Never	Seldom	Quite Often	Very Often	Always
		Physical Being					
B1		Physical movement problems	5	4	3	2	1
B2		Nutritional problems	5	4	3	2	1
		Psychological Being					
B3		Worry and stress	5	4	3	2	1
B4		Poor moods	5	4	3	2	1
		Spiritual Being					
B5		Hope for the future - this life and the next	5	4	3	2	1
B6		My Values - what is right and wrong	5	4	3	2	1
		Physical Belonging					
B7		My accommodation or dwelling space	5	4	3	2	1
B8		My neighbourhood	5	4	3	2	1
		Social Belonging					
B9		Family communication	5	4	3	2	1
B10		Close friends communication	5	4	3	2	1
		Community Belonging					
B11		Professional help and assistance	5	4	3	2	1
B12		Money and finances	5	4	3	2	1
		Practical Becoming					
B13		Home repairs and handiwork	5	4	3	2	1
B14		Employment or Studies	5	4	3	2	1
		Leisure Becoming					
B15		Outdoor activities (walks, holidays, etc)	5	4	3	2	1
B16		Indoor activities (TV, reading, etc)	5	4	3	2	1
		Growth Becoming					
B17		Improving health and wellness (exercise and diet)	5	4	3	2	1
B18		Coping with changes in my life	5	4	3	2	1
B19	Other	(Please specify)					

Section C. Information Use						
	The following questions ask how you *OBTAIN* and *USE* information. How much you obtain, store and share information. Please choose the answer that appears most appropriate. If you are unsure which response to give then the first response that you think of is often the best one.					
		Not at all	A little	A moderate amount	Very much	An extreme amount
C1	I constantly search for and actively use information	5	4	3	2	1
C2	When I get new information I store it to use again later	5	4	3	2	1
C3	I regularly share my information with friends and acquaintances	5	4	3	2	1

Section D. Information behaviour	
	The following questions ask about your *INFORMATION BEHAVIOUR*. Please try to answer as many of the questions as you can. You may leave those that are not applicable to your situation blank.
D1	How do you find the information that you require?
D2	When you find relevant information what do you do with it?
D3	How do you store or save new information?
D4	How do you index or cross-reference it to other information?
D5	How do you share information with other people?

Section E. Electronic Mode of Information behaviour						
	The following questions ask about to what extent you currently use *ELECTRONIC DEVICES* for information behaviour and how much you would like to use such devices in future. Please choose the answer that appears most appropriate. If you are unsure which response to give then the first response that you think of is often the best one.					
		Not at all	A little	A moderate amount	Very much	An extreme amount
E1	I currently use a computer or electronic device to obtain and share information	5	4	3	2	1
E2	In the future I would like to use (or increase my use) of electronic devices to obtain and share information	5	4	3	2	1
E3	What limits you from using an electronic device for obtaining and sharing information?					

APPENDIX B: ETHICS APPROVAL

UNIVERSITY OF CAPE TOWN
FACULTY OF COMMERCE
Igniting Knowledge and Opportunity

Commerce Faculty Ethics in Research Committee

1. PROJECT DETAILS			
Project title:	**An investigation into the knowledge practices of Disabled People and the role of ICT in these practices.**		
Principal Researcher/s:	**Malcolm Garbutt**	**Email address(es):**	**malcolmg@worldonline.co.za**
Research Supervisor:	**Prof Mike Kyobe**	**Email address(es):**	**Michael.Kyobe@uct.ac.za**

Brief description of the project:

The purpose of the study is to understand what knowledge is required by people with disabilities and how it is obtained and shared with the view that this information will assist in making knowledge and knowledge sharing mechanisms available to people with disabilities.

Data collection: ☐Interviews ☒Questionnaire ☐Experiment ☐Secondary data ☐Observation ☐ Other (please specify): _____

Procedure:

The sample survey takes the form of a quantitative questionnaire using 45 questions in a combination of closed and open questions and administered through mail, email, and telephonic interviews and internet survey tools. Wherever possible, email and internet survey tools will be used. However, for disabled people who may not have email access due to impairments or their economic situation mail surveys will be utilized. Telephonic interviews will be conducted with those who wish to participate but are unable to read.

There are no identified risks from participating in this research. The survey will take approximately 10 minutes to complete and is confidential and participation completely voluntary. Respondents will receive no compensation for participating in the research study. Responses to the survey will only be reported in aggregated form to protect the identity of respondents. The data collected from this study will be kept in a locked cabinet for three years. To insure safe and proper research procedures, the regulatory authorities of the University of Cape Town will be granted direct access to the research data without violating the confidentiality of the participants.

2. PARTICIPANTS

Characteristics of participants:

Gender:	All
Race / Ethnicity:	Not Applicable
Age range:	All
Location:	South Africa
Other:	

Race / Ethnicity:

Have you included a "**Prefer not to Answer**" response category in your questionnaire? (please select)

☐Yes ☐No ☒Not applicable If you answered 'No' why not?

Affiliations of participants:(please select)

☐Company employees ☒General public ☐UCT staff ☐UCT Students ☐ Other (please specify):

If your sample includes children (aged 18 and below), mentally incompetent persons, or legally restricted groups please explain below why it is necessary to use these particular groups. If subjects are minors or mentally incompetent, please describe how and by whom permission will be granted? If you are including children under the age of 18 and are not getting parental consent, please explain why you believe that their parents would consent if it was possible to contact them.

☒Not applicable

3. ORGANISATIONAL PERMISSION

If your research is being conducted within a specific organisation, please state how organisational permission has been obtained:

Not Applicable

Are you making use of UCT students as respondents for your research? ☐Yes ☒No

Are you making use of UCT students as respondents for your research? ☐Yes ☒No

4. INFORMED CONSENT

What type of consent will be obtained from study participants?

☒Oral Consent

☒Written Consent

☐Anonymous questionnaire (covering letter required, no consent form needed)

☐ Other (please specify):

If you are making use of oral consent, please explain by written consent is not an option:

Visually impaired respondents and others who may respond by means of telephonic interview.

How and where will consent/permission be recorded?

On the cover letter accompanying the survey.

5. CONFIDENTIALITY OF DATA

What precautions will be taken to safeguard identifiable records of individuals? Please describe specific procedures to be used to provide confidentiality of data by you and others, in both the short and long run. This question also applies if you are using secondary sources of data that is not anonymous.

Data will be aggregated and signed cover letters stored separately from the completed surveys.

6. RISK TO PARTICIPANTS

Does the proposed research pose any physical, psychological, social, legal, economic, or other risks to study participants you can foresee, both immediate and long run? (please select)

☐Yes ☒No

7. AUTHORSHIP

What authorship agreement have you reached with your co-researchers or supervisor?

☐ This research is not intended for publication

☒Standard authorship agreement (principal researcher first author, co-researcher(s) and supervisor(s) co-authors)

☐Customised agreement (please specify below):

8. DECLARATION

I certify that we have read the theUCT Authorship Policy, and Commerce Faculty Authorship Guidelines ☒ (http://www.commerce.uct.ac.za/Commerce/Information/research.asp)

I certify that that the material contained herein is truthful and that all co-researchers and supervisors are ☒aware of the contents thereof.

I understand that it is my responsibility to conduct research in accordance with the ethical requirements of ☒UCT.

Signed by candidate Signature Removed

Applicant's electronic signature

Date:14 April 2013

UNIVERSITY OF CAPE TOWN

Faculty of Commerce
Ethics in Research Committee

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UCT/COM/129/2013 3rd May 2013

Malcolm Garbutt
University of Cape Town
malcolmg@worldonline.co.za

Dear Researcher,

Project title: An investigation into the knowledge practices of Disabled People and the role of ICT in these practices

This letter serves to confirm that the project entitled, **"An investigation into the knowledge practices of Disabled People and the role of ICT in these practices"** as described in your final submitted protocol 2013, has been approved. You may proceed with the research.

Please note that if you make any substantial change in your research procedure that could affect the experiences of the participants, you must submit a revised protocol to the Committee for approval.

Best wishes for great success with your research.

Regards,

Harold Kincaid

Professor Harold Kincaid
Commerce Faculty Ethics in Research Committee