

# Online information seeking behaviour among people living with HIV in selected public hospitals of Tanzania

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## Abstract

**Purpose** – This paper aims to determine factors that influence people living with HIV (PLHIV) to engage in internet-based HIV information seeking behaviour in selected Tanzanian public regional hospitals.

**Design/methodology/approach** – The authors conducted a questionnaire-based survey to 221 PLHIV in two regional public hospitals in Mwanza and Dar es Salaam, Tanzania. They assessed the validity and reliability of the measurement model by using exploratory factor analysis and also used hierarchical regressions to examine the research hypotheses by using Statistical Package for Social Science.

**Findings** – The study found that there is low usage of internet (24.3 per cent) to search online HIV information. Factors related to attitude and information source accessibility predicted usage intentions of internet, while facilitating conditions, information source accessibility and usage intention of internet determined actual use of internet among PLHIV. Age moderated the effects of information source quality and social influence on usage intention of internet, and the effects of the information source accessibility and social influence on actual use of internet. The findings imply that younger PLHIV were more likely to use internet to access HIV information than the older respondents due to perceived ease of accessing information and quality of the online content. Further, older PLHIV were more influenced by the views of others when making decisions to use internet.

**Practical implications** – Health-care providers and libraries need to conduct regular studies on health needs of patients, and promote benefits of accessing online information; website designers need to design user-friendly databases; public libraries need to include a section on health information; hospital and public librarians need to provide catalogues of health information resources on their websites; and health-care providers need to improve technological infrastructure.



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**Originality/value** – This is a comprehensive study that provides empirical findings to better understand the HIV information seeking behaviour from actual internet users, particularly factors that may influence PLHIV to seek online information in Tanzania.

**Keywords** Information behaviour, Tanzania, Internet, Information seeking behaviour, Health information, HIV information

**Paper type** Research paper

## Introduction

Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) is one of the serious public health threats in the world. In 2015, approximately 36.7 million people were infected with HIV worldwide, and more than two-thirds of these live in sub-Saharan Africa (SSA) ([The Joint United Nations Programme on HIV/AIDS, 2016](#)). In Tanzania, there were about 1.4 million people living with HIV (PLHIV), and 36,000 HIV/AIDS deaths occurred in the country in 2015 ([The Joint United Nations Programme on HIV/AIDS, 2016](#)). Scale up of anti-retroviral therapy (ART) has shown increased life expectancy in some parts of SSA, and therefore, ART is likely to turn the disease into a chronic infection ([Bor \*et al.\*, 2013](#)). About 10.3 million (54 per cent) people were accessing ART in eastern and southern Africa ([The Joint United Nations Programme on HIV/AIDS, 2016](#)). Despite the fact that we need socio-economic and political measures to lower the HIV burden, access to relevant and timely HIV information by PLHIV can enable them to make strategic choice and decisions to live a healthy life.

When engaged in information seeking process, PLHIV are more likely to increase their level of knowledge, make informed decisions, change their behaviour, increase ability to self-care and more committed to treatment, reduce level of their anxiety and fear and increase quality of their health, hope and empowerment ([Zare-Farashbandi and Lalazaryan, 2014](#)). Information seeking is a process in which a person engages to find information to fulfill their needs and meet some goals ([Albright, 2007](#)). In the process of seeking information, an individual may encounter formal sources of information (e.g. health-care providers) or informal sources of information that she/he interacts with everyday ([Kuhlthau, 1991](#)).

Advancements in internet technologies have immensely increased access to information including that on health ([Boot and Meijman, 2010](#); [Chang and Im, 2014](#); [Kalichman \*et al.\*, 2002, 2005](#)). Tanzania has 7.5 million internet users, with a penetration rate of 14.5 per cent as of June 2016 ([Internet World Stats, 2016](#)). Previous studies ([Chilimo and Nawe, 2004](#); [Mboera \*et al.\*, 2007](#); [Montez, 2011](#); [Mosha and Sulemani, 2012](#); [Mwaiswelo and Masalu, 2008](#)) in Tanzania have shown that the general health information seeking behaviour of patients is characterized by a preference for inter-personal communication with Human Resource for Health (HRH) and patients' close contacts and their networks, and mass media, especially radio. Consistently, studies on HIV showed a similar pattern that the main sources of HIV information were direct contacts with HRH, relatives and mass media. A study of PLHIV in Iringa revealed that health-care providers, television, radio, relatives and religious leaders were the major sources of HIV information ([Rumisha \*et al.\*, 2006](#)). Another study in Kilimanjaro showed that the major sources of HIV information and young people were print materials (such as books, journals, magazines and research reports) and other sources (television, internet, DVD/CD, radio) ([Mosha and Manda, 2012](#)). These studies demonstrate that internet technologies are yet to be fully used by PLHIV in Tanzania to get access to HIV information. Likewise, research on general health information seeking behaviour revealed that advanced technologies such as internet and SMS-text messaging were rarely used ([Montez, 2011](#)). Nonetheless, internet and mobile phones can contribute to improved

patients' health outcomes through resource-efficient, yet effective interventions (Saberi and Johnson, 2015; Shet *et al.*, 2014). Hence, it is imperative to assess whether internet is a significant source of information to PLHIV to better understand whether those users without access are underprivileged.

Previous research on HIV information seeking behaviour in Africa is scarce and tends to focus on preferences of information sources, and effects of demographic factors on information seeking behaviour (Bastien *et al.*, 2009; Moshia and Manda, 2012; Rumisha *et al.*, 2006). Little attention is given to online information seeking behaviour, outcomes associated with online information seeking behaviour and factors that enhance usage intentions and actual usage of internet to get access to HIV information. It is critical to understand HIV information seeking behaviour and usage intentions of online HIV information from the PLHIV perspective. Moreover, information can serve as a baseline for proper strategies, policies and multi-sectoral approaches for improved quality of health care and service delivery. This study addressed such a gap by assessing the usage intentions and actual usage of internet to get access to HIV information among PLHIV in two selected regional hospitals in Tanzania. In particular, our paper assessed the information seeking behaviour of PLHIV; outcomes related to the use of online information; and factors enhancing usage intentions and actual usage of internet to access HIV information.

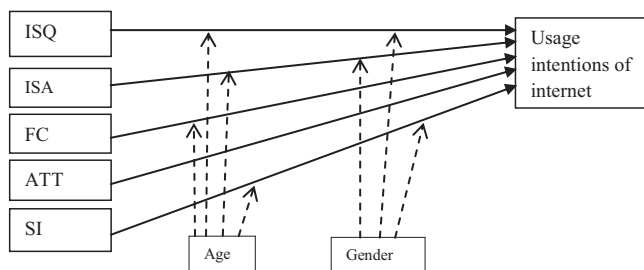
### **Conceptual framework and hypotheses development**

There are several models and theories in health information seeking behaviour, including stress, appraisal and coping theory (Folkman and Lazarus, 1988); Miller's monitoring and blunting hypothesis (Muris *et al.*, 1994); Lenz's information seeking model (Lenz, 1984); Freimuth *et al.*'s health information acquisition model as cited in Zare-Farashbandi and Lalazaryan (2014); Johnson's comprehensive model of information seeking (Johnson, 1997); Longo *et al.*'s expanded model of health information seeking behaviours (Longo *et al.*, 2010); trans theoretical model of health behaviour change (Wathen and Harris, 2005); and conceptual framework of health information-seeking behaviour on the Web (Marton, 2011). Despite these various models and theories, this study developed its conceptual framework from both health information seeking models and technology adoption theories to better understand the online information seeking behaviour of PLHIV in the Tanzanian context. Therefore, study draws from the conceptual framework of health information-seeking behaviour on the Web (Marton, 2011), and the extended unified theory of technology acceptance and use (UTAUT2) (Venkatesh *et al.*, 2012).

Marton's framework is based on theories of information seeking behaviour and scholarly work on information source characteristics (Marton, 2011). The study adapted Marton's model because it is rooted in health information seeking behaviour, whereby uncertainty arising from information needs can influence an individual to seek information. In addition to information needs, information source characteristics, social norms and socio-demographics have been identified as essential factors for individuals to engage in information seeking process (Marton, 2011). Further, we used this model because it has been used to study information seeking behaviour in the online environment (Marton, 2011), which is relevant to context of the present study. The framework proposes the relationships between the dependent variable, which is the frequency of seeking health information online, and seven independent variables, namely, health information need, family care giving, Web self-efficacy, two attributes of information source quality (relevance and reliability) and two attributes of information source accessibility (physical access and cognitive access) (Marton, 2011).

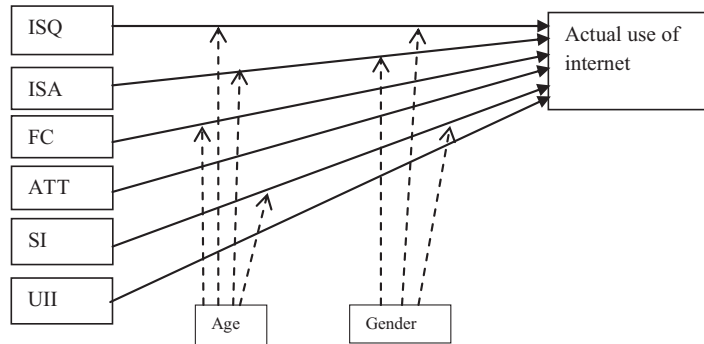
The study adapted UTAUT2 to better explain technological adoption factors that can influence PLHIV's intentions to seek online HIV information. UTAUT2 was developed from other existing models and theories that assessed technology acceptance (Venkatesh *et al.*, 2012). These include the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), Technology Acceptance Model (TAM) (Davis, 1986), social cognitive theory (Bandura, 1986), Theory of Planned Behaviour (TPB) (Ajzen, 1991), the Model of Personal Computer Utilization (Thompson *et al.*, 1991), diffusion of innovations theory (Rogers, 2017.), the model combining TAM and the Theory of Planned Behaviour (Taylor and Todd, 1995), TAM2 (Venkatesh and Davis, 2000) and UTAUT (Venkatesh *et al.*, 2003). A two-stage online survey research that validated UTAUT2 found a substantial improvement of the theory, which can account for 74 per cent of the variance in behavioural intention and 52 per cent of actual use of technology, compared to UTAUT (Venkatesh *et al.*, 2012). UTAUT2 assesses the individual's usage intentions and actual usage of an information system. The seven factors are key determinants of user intention, which include performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit. The effects of usage intentions and actual usage of technology are moderated by variables, namely, gender, age and experience (Venkatesh *et al.*, 2012).

From UTAUT2, the study adopted two factors, namely, facilitating conditions and social influence. In Marton's model, the study adopted information source quality, and information source accessibility factors. We added attitude as an independent variable because other studies (Dulle and Minishi-Majanja, 2011) have established that attitude has strong effects on the adoption of new technology in Tanzania. As the study intended to investigate the acceptance and usage of online HIV information, the "usage intentions of internet" factor and "actual use of internet" were added as a dependent variable as shown in Figures 1 and 2. The proposed conceptual framework (Figure 1) assumes that dimensions of the model influence "intentions to use internet" and "actual use of internet" to get access to HIV information. The independent variables include information source quality, information source accessibility, attitude, social influence and facilitating conditions. Further, gender was conceptualized to have various moderating effects on all main constructs, while age had moderating effects on information source quality, information source accessibility, attitude and social influence towards the acceptance and usage of internet among PLHIV.



**Notes:** ISQ, information source quality; ISA, information source accessibility; FC, facilitating conditions; ATT, attitude; and SI, social influence

**Figure 1.**  
The influence of ISQ, ISA, FC, ATT and SI on usage intentions of internet and the moderating role of gender and age



**Notes:** ISQ, information source quality; ISA, information source accessibility; FC, facilitating conditions; ATT, attitude; SI, social influence, UII, usage intentions of internet

**Figure 2.**  
The influence of ISQ, ISA, FC, ATT and SI actual use of internet and the moderating role of gender and age

#### *Information source quality*

Information source quality assesses the extent to which relevance and reliability drive information seeking behaviour (Marton, 2011). If users found that the quality of an information source is not reliable or accurate, they “regard the source as lacking credibility” (Wilson, 1997). A survey of internet users in Hong Kong revealed that usage of internet was positively related with the quality of online health information (Leung, 2008). Similarly, a study in South Korea revealed that information credibility was a “key factor for participants’ attitude and intention to use internet for disease information” (Yun and Park, 2010). Similar findings were revealed in a study of 264 women in the USA (Marton, 2011). Thus, information source quality can influence PLHIV’s usage intention of internet and consequent actual usage of internet to search HIV information. Hence, the study posed the following hypotheses:

- H1. Information source quality has a significant positive relationship with usage intentions of internet by PLHIV.
- H2. Information source quality has a significant positive relationship with actual use of internet by PLHIV.

#### *Information source accessibility*

Information source accessibility investigates the extent to which physical access and cognitive aspects of understanding the information obtained (Marton, 2011). Wilson and Walsh (1996) emphasizes that information source accessibility is a key requirement for effective information seeking behaviour, and thus, “lack of an easily accessible source may inhibit information-seeking altogether, or may impose higher costs than the enquirer is prepared to pay” (Wilson, 1997). Information source accessibility is almost similar to effort expectancy variable as conceptualized by Venkatesh *et al.* (2003). Effort expectancy refers to the “degree of ease associated with the use of the system” (Venkatesh *et al.* 2003, p. 450). Information source accessibility looks at the financial and time costs and the degree of ease or difficulty to locate information online. A study of 264 women in the USA revealed that information source accessibility positively influenced frequency of seeking online health

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information (Marton, 2011). Therefore, information source accessibility can influence PLHIV's intentions and consequent actual use of internet to search HIV information. Thus, the following hypotheses were posed:

- H3. Information source accessibility has a significant positive relationship with usage intentions of internet by PLHIV.
- H4. Information source accessibility has a significant positive relationship with actual use of internet by PLHIV.

#### *Facilitating conditions*

Facilitating conditions relate to the "degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh *et al.*, 2003, p. 453). Most technology adoption studies found that facilitating conditions had a positive impact on actual usage of technology rather than intention of using technology (Dwivedi *et al.*, 2011; Venkatesh *et al.*, 2003). Another study found that facilitating conditions had positive impact on usage intentions of internet among Chinese older adults (Pan and Jordan-Marsh, 2010). Therefore, the facilitating conditions factor was conceptualized to influence both PLHIV' usage intention and consequent actual use of internet to retrieve HIV information. Hence, the study posed the following hypotheses:

- H5. Facilitating conditions have a significant positive relationship with usage intentions of internet by PLHIV.
- H6. Facilitating conditions have a significant positive relationship with actual use of internet by PLHIV.

#### *Attitude*

This refers to the "individual's overall affective reaction to using a system" (Venkatesh *et al.*, 2003, p. 455). A study in South Korea revealed that attitude influenced intention to use internet to seek health information (Yun and Park, 2010). Technology adoption studies in Tanzania revealed that positive attitude influences intention to use technology (Dulle and Minishi-Majanja, 2011; Lwoga and Questier, 2014). Therefore, attitude and perceptions of a PLHIV can influence their intentions and actual use of internet to search HIV information. Thus, the following hypotheses were posed:

- H7. Attitude has a significant positive relationship with usage intentions of internet by PLHIV.
- H8. Attitude has a significant positive relationship with actual use of internet by PLHIV.

#### *Social influence*

Interpersonal interaction may enable an individual to obtain several sources of information (Wilson, 1997). Social influence refers to the way PLHIV's decision to seek online HIV information is influenced by other individuals, which may include peers, relatives/friends, social leaders, HRH and public and private institutions that advocate for access to HIV information. Various studies have found that social influence positively relates to the usage intentions of technology in Tanzania (Dulle and Minishi-Majanja, 2011; Lwoga and Questier,

2014). Similarly, a study of Chinese older adults found that subject norms positively predicted usage intentions to the use of internet (Pan and Jordan-Marsh, 2010). Therefore, social influence can positively affect PLHIV's intentions and actual use of internet to retrieve HIV information. Hence, the study proposed the following hypotheses:

- H9. Social influence has a significant positive relationship with usage intentions of internet by PLHIV.
- H10. Social influence has a significant positive relationship with actual use of internet by PLHIV.

#### *Moderating effects of demographic variables*

Demographic characteristics can indirectly and directly moderate the usage intention and actual use behaviour of technology (Venkatesh *et al.*, 2003). In this study, age and gender were conceptualized to have moderating effects on main constructs regarding the behavioural intention and actual usage of internet to access HIV information.

#### *Age*

Previous technology adoption studies found that age moderated the influence of perceived ease of use, facilitating conditions and social influence on usage of technology, whereby "younger people are more likely to use internet than older people" (Dulle and Minishi-Majanja, 2011; Venkatesh *et al.*, 2003). Several studies have also reported that age moderates social influence acceptance and usage of internet across various cultures, whereby the effect will be much stronger for older people than younger people (Dulle and Minishi-Majanja, 2011; Venkatesh *et al.*, 2003). According Venkatesh *et al.* (2003, p. 453), "older workers are more likely to place increased salience in social influence, with the effect declining as experience technology usage increases". This study conceptualized age to moderate information source quality, information source accessibility and facilitating conditions on intentions and actual usage of internet, such that the effect will be stronger for younger PLHIV. This study also conceptualized age to moderate social influence on usage intentions and actual usage of internet, such that the effect will be stronger for older PLHIV. Hence, the study proposed the following hypotheses:

- H11. The effect of information source quality on usage intentions of internet will be stronger for younger than for older PLHIV.
- H12. The effect of information source quality on actual use of internet will be stronger for younger than for older PLHIV.
- H13. The effect of information source accessibility on usage intentions of internet will be stronger for younger than for older PLHIV.
- H14. The effect of information source accessibility on actual use of internet will be stronger for younger than for older PLHIV.
- H15. The effect of facilitating conditions on usage intentions of internet will be stronger for younger than for older PLHIV.
- H16. The effect of facilitating conditions on actual use of internet will be stronger for younger than for older PLHIV.

H17. The effect of social influence on usage intentions of internet will be stronger for older than for younger PLHIV.

H18. The effect of social influence on actual use of internet will be stronger for older than for younger PLHIV.

### *Gender*

Previous research found that men are more likely to use technology driven by instrumental and productivity-related characteristics, while women are influenced by process features when using technology (e.g. ease of use, social influence) (Pan and Jordan-Marsh, 2010; Venkatesh *et al.*, 2003, 2012). This study conceptualized gender to moderate the effects of information source quality, information source accessibility and social influence on usage intentions and actual usage of internet among PLHIVs, such that the effects will be stronger for women.

Hence, the study proposed the following hypotheses:

H19. The effect of information source quality on usage intentions of internet will be stronger for female than for male PLHIV.

H20. The effect of information source quality on actual use of internet will be stronger for female than for male PLHIV.

H21. The effect of information source accessibility on usage intentions of internet will be stronger for female than for male PLHIV.

H22. The effect of information source accessibility on actual use of Internet will be stronger for female than male PLHIV

H23. The effect of social influence on usage intentions of internet will be stronger for female than for male PLHIV.

H24. The effect of social influence on actual use of internet will be stronger for female than for male PLHIV.

### *Usage intention of internet*

Usage intention of technology refers to the “favourable attitude of the user towards the technology that result in repeated use behaviour of the technology” (Venkatesh *et al.*, 2003). Previous studies found that usage intention is a significant determinant of technology acceptance by users (Dulle and Minishi-Majanja, 2011; Venkatesh *et al.*, 2003). Chang and Im (2014) also found that usage intentions of internet strongly predicted internet-based health information seeking behaviour of older adults. These studies indicate that usage intention of internet is a significant determinant of actual usage of the system to access HIV information. Thus, the following hypothesis was tested:

H25. Usage intention has a significant positive relationship with actual use of internet by PLHIV.

### **Research methods**

A questionnaire-based survey was conducted among PLHIV in two regional hospitals in Tanzania, namely, Sekou-Toure (Mwanza Regional Hospital) and Mwananyamala hospital



in Dar es Salaam. These hospitals have the largest clinics offering HIV/AIDS treatment services in Tanzania. The services offered at clinics included HIV counseling, testing and continued adherence counselling, medical treatment of PLHIV including treatment of opportunistic infections and provision of antiretroviral drugs. The sample sizes of PLHIV were calculated based on the prevalence of people accessing health information on the internet which is 11 per cent as determined by another Tanzanian study (Montez, 2011). We determined the sample size by using Kish formula for cross-sectional studies (Kish, 1965). Hence, minimum sample size was 259. This study used a stratified random sampling to select PLHIV (both males and females) who are HIV-positive patients aged 18 years or above attending one the selected HIV clinics. Only PLHIV who gave consent to participate in the study were included. Data collection was completed before or after the respondent's appointment in either the exam room or in the patient waiting areas. Questionnaires were pre-tested at the Muhimbili National Hospital for reliability among 30 PLHIV. Ethical approval was obtained from Muhimbili University of Health and Allied Sciences Review Board, and necessary permissions were obtained from the local health authorities.

The questionnaire consisted of three sections:

- (1) demographic data such as gender, age, education level and income;
- (2) information seeking patterns and outcomes associated with information seeking behaviour; and
- (3) factors affecting usage intentions of internet to access HIV information.

The items in the questionnaire were developed by adapting existing measures validated by other researchers in information seeking behaviour and technology adoption studies. Attitude was measured using five items which came from Venkatesh *et al.* (2003). Social influence was measured using three items which came from Venkatesh *et al.* (2003), Wang and Shih (2009) and Chong *et al.* (2010). Four items selected from various scholars (Dulle and Minishi-Majanja, 2011; Venkatesh *et al.*, 2003) were used to measure facilitating conditions. Information source quality was assessed with three items, which were taken from Marton (2011). Five items were used to measure information source accessibility, and they were derived from Marton (2011). Three items were used to measure usage intention of internet, and they were derived from Yun and Park (2010).

We assessed the internal reliability of the measurement model by using exploratory factor analysis (EFA). The study performed EFA by using principal components analysis and varimax rotation. Table I lists the indicators which were used to measure the five research constructs. The five independent variables in the questionnaire were measured using three to five items presented as statements, followed by a five-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. The first dependent variable which assessed the usage intention of internet was measured by using a five-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. The second dependent variable assessed whether (1) or not (0) respondents had used internet to access HIV/AIDS information.

Prior to factor analysis, we performed the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test to agree whether it was significant to conduct factor analysis. According to Field (2006), the KMO values should be above the criterion level of 0.5, while Bartlett's test needs to be significant and a value of less than 0.05. In the present research, the KMO measure of sampling adequacy was 0.823, and the Bartlett's test of sphericity was significant (Chi-square = 2563.44,  $df = 190$ ,  $p = 0.000$ ). These results indicated that data was adequate to perform factor analysis. The EFA resulted into six factors with a total of 20

**Table I.**  
Factor analysis and  
reliability

Factors	Factor loadings	Cronbach's alpha
<i>Attitude</i>		
Access to HIV information on the internet is more interesting	0.86	0.926
Access to HIV information on the internet is fun	0.89	
I like accessing HIV information on the internet	0.891	
I believe that seeking HIV information on the internet is a good idea	0.874	
It is pleasure for me to use the Internet to access HIV information	0.707	
<i>Facilitating conditions</i>		
Lack of an internet cafe at the hospital discourage me to seek information on the internet	0.796	0.849
Guidance is available for me to use the internet effectively for information access	0.906	
Internet health sites understand and adapt to the user's specific needs	0.845	
Internet health sites can be dependent upon to provide what is promised	0.652	
<i>Social influence</i>		
I would access HIV information if my close friend/family/colleagues search HIV information on the internet	0.738	0.792
I would access HIV information if my doctor or other health workers told me to search HIV information on the internet	0.87	
People who influence my behavioural think that I should use the internet to access HIV information	0.851	
<i>Information source quality</i>		
The HIV information on the internet is not accurate	0.762	0.708
The HIV information on the internet is relevant	0.771	
I do not trust the internet-based information	0.738	
<i>Information source accessibility</i>		
Learning to use health websites would be easy for me	0.647	0.814
I can use the internet in a manner that allows me to obtain the HIV information I want	0.659	
Internet operate reliably	0.813	
Internet is user-friendly	0.794	
Generally, I find the internet easy to use to access HIV information	0.775	

items as intended in the questionnaire. All items in six constructs attained a required communality of 0.5, and all factor loadings were above the recommended level of 0.5 (Hair *et al.*, 2010). All of the factors had eigenvalues greater than 1.0 as suggested in the scholarly literature (Hair *et al.*, 2010).

We estimated that internal consistency of the Likert-type scales by using Cronbach's alpha coefficient, which is used to examine reliability by estimating the degree of interrelatedness among a set of items. In the present study, all factors had alphas above the set criterion of 0.70, as suggested in the literature (Cronbach, 1951). The average score of the factors was used for further analysis.

We performed the hierarchical regression analysis to examine the study hypotheses by using the Statistical Package for Social Science (SPSS) software version 20. The study used the hierarchical regression analysis to test relationships between different determinants and user intention, and actual use of internet to access HIV information. This method is suitable in "testing theoretical assumptions and examining the influence of several predictor

variables in a sequential way” (Petrocelli *et al.*, 2003). This technique is appropriate for assessing the “effects of control variables and the independent variables separately” (Chong *et al.*, 2012). In the hierarchical regression analysis, demographic variables were first entered to assess their effects on the PLHIV’s usage intention and actual use of internet to access HIV information. In Model 2, the determinants of PLHIV’s usage intention and actual use of internet were entered to allow the investigation of any increase in the explained variance over that contributed by the demographic variables. In Model 3, seven interaction factors were added to assess their effects in the research model.

### Results

A total of 221 PLHIV participated in the study with a return rate of 85.3 per cent. More females (58.4 per cent,  $n = 129$ ) participated in the study compared to males. The average age was 41 years, with most (47.3 per cent,  $n = 104$ ) respondents aged between 36 and 45 years. A large proportion (60.6 per cent,  $n = 134$ ) of PLHIV had primary level of education. There were more PLHIV from Mwananyamala Hospital (59.3 per cent,  $n = 131$ ). Median income of most study participants was as low as 150,000 Tanzanian Shillings which was equivalent to about US\$75 during the time of the study. Slightly less than half (44.3 per cent,  $n = 98$ ) of the respondents were married (Table II).

#### *Information seeking patterns of people living with human immunodeficiency virus*

The study findings showed that most PLHIV mainly relied on radio (86.2 per cent,  $n = 187$ ) as their primary source of HIV/AIDS information, followed by face-to-face contact with HRH (83.9 per cent,  $n = 182$ ) and family/friends (56.2 per cent,  $n = 122$ ). Television (53.50 per cent) and print newspapers (47.70 per cent) were also regarded as essential sources of information to PLHIV. Electronic sources of information, related to online journals, internet websites, online books and CDRoms were ranked low (Table III).

#### *Online information seeking behaviour of people living with human immunodeficiency virus and outcomes related to the knowledge gained on the internet*

The study findings indicate that PLHIV used internet to search for HIV information at a low rate (24.3 per cent,  $n = 50$ ). These online information seekers mainly used mobile phones (96.7 per cent,  $n = 29$ ) to access online HIV information, followed by those who used desktop computers (36.7 per cent,  $n = 11$ ), laptops (26.7 per cent,  $n = 8$ ) and tablets (13.3 per cent,  $n = 4$ ). Table IV shows that internet-based HIV information helped PLHIV to acquire new knowledge and innovative ideas, understand their health condition much better and see the doctor when they have problems, with a score of 94 per cent ( $n = 16$ ).

#### *Prediction of usage intentions of internet*

This study employed hierarchical logistic regression analysis to assess whether the proposed model would predict usage intention of internet among PLHIV. The results demonstrate that demographic characteristics contributed only 3 per cent, other key five factors predicted 27.6 per cent, and other interaction effects predicted 29.9 per cent of PLHIV’s usage intention of internet (Table V). Model 1 showed that males had significantly higher odds of adopting the internet than females, while age had negative effects on usage intention of internet among PLHIV. Model 2 showed that both age and gender became insignificant when other five predictors were added. Both attitude and information source accessibility had a significant positive relationship with PLHIV’s usage intentions of internet, and thus  $H3$  and  $H7$  were supported. Other factors related to facilitating

Demographic variables	No.	(%)
<i>Gender</i>		
Male	92	41.6
Female	129	58.4
<i>Age</i>		
25 years and below	9	4.1
26-35 years	51	23.1
36-45 years	104	47.1
46-55 years	39	17.6
56 years and above	18	8.1
<i>Hospital</i>		
Mwananyamala	131	59.3
Sekou Toure Hospital	90	40.7
<i>Education level</i>		
No education	13	5.9
Primary school dropout	11	5.0
Primary school	134	60.6
Ordinary secondary school	55	24.9
High level secondary school	3	1.4
Post-secondary/tertiary training	5	2.3
<i>Income</i>		
>300,000	142	64.3
300,001-600,000	24	10.9
600,001-900,000	5	2.3
900,001-1,500,000	3	1.4
<1,500,000	47	21.3
<i>Marital status</i>		
Not married	53	24
Married	98	44.3
Widowed	29	13.1
Divorced	41	18.6

**Table II.**  
Demographic  
characteristics

conditions, social influence and information source quality had no significant effect on PLHIV's usage intentions of internet, and thus *H1*, *H5* and *H9* were not supported. In Model 3, where the seven interaction factors were added, the coefficients for attitude remained significant, while information source accessibility was not significant, and information source quality became significant. In addition, the effects of the information source quality on usage intention of internet were significantly stronger for younger PLHIV than for older PLHIV, and thus *H11* was supported. Further, the effects of the social influence on internet use intention were significantly stronger for older PLHIV than for younger PLHIV, and thus *H17* was supported. Other interaction effects that we hypothesized were not significant, and thus *H13*, *H15*, *H19*, *H21* and *H23* were not supported.

#### *Prediction of actual use of internet*

This study used hierarchical logistic regression analysis to determine whether the proposed model would predict actual usage of internet among PLHIV. As indicated in [Table V](#),

**Table III.**  
Information seeking  
patterns of PLHIV

Information sources	No.	(%)
Radio	187	86.20
HRH	182	83.90
Family/friends	122	56.20
Television	116	53.50
Print newspapers	104	47.70
Video	71	32.90
Print books	57	26.30
Ward/community/village leaders	51	23.50
Online journals	23	10.60
Internet websites	23	10.60
Online newspapers	21	9.70
CDROM	19	8.80
Traditional healers	19	8.70
Online books	16	7.40
Librarians	15	6.90

**Table IV.**  
Outcomes related to  
the knowledge  
gained on the  
internet

Categories of outcomes related to the knowledge gained on the internet	No.	(%)
Reduce my anxiety	12	71
I understand information received from a doctor	13	77
Help others with health issues	13	77
Improve my relationship with my doctor	13	77
Improve communication with my doctor	13	77
I feel reassured	14	82
Follow doctors' advice	14	82
I have sought a second opinion	14	82
Recommend the HIV information to others	14	82
Ask questions during doctors' visits	14	82
Share HIV information with others	15	88
Acquire new knowledge and innovative ideas	16	94
I understand the health condition much better	16	94
See the doctor when I have problems	16	94

demographic characteristics contributed only 3.3 per cent, while other key five factors predicted 14.5 per cent, and other interaction effects predicted 18.5 per cent of PLHIV's actual use of internet. Model 1 showed that age had negative effects on the actual usage of internet among PLHIV. In Model 2, when other six key predictors were added, facilitating conditions, information source accessibility and usage intention of internet had significant positive effects on actual use of internet, and thus *H4*, *H6* and *H24* were supported. In Model 3, where other interaction effects were added, the coefficients for information source accessibility and usage internet intension remained significant, while facilitating conditions were not significant, and gender became significant. In addition, the effects of the information source accessibility on actual use of internet were significantly stronger for younger PLHIV than for older PLHIV, and thus *H14* was supported. Results also show that the effects of social influence on actual use of internet were significantly stronger for older PLHIV than for younger PLHIV, and thus *H18* was supported. Other interaction effects had no significant effect on PLHIV's actual use of internet, and thus *H12*, *H16*, *H18*, *H20*, *H22* and *H24* were not supported ([Table VI](#)).

**Table V.**  
Hierarchical  
regression analysis

Factors	Usage intention of internet			Actual use of internet		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Gender	0.441**	0.24	-1.959	0.11	0.07	0.876*
Age	-0.168*	-0.065	1.044*	-0.084**	-0.055	0.177
ATT		0.401***	0.376***		-0.053	-0.035
FC		-0.104	0.602		0.093*	0.092
SI		0.007	0.003		0.009	-0.157
ISQ		0.094	0.588*		-0.019	0.126
ISA		0.441***	0.044		0.112**	0.408**
UII					0.062*	0.061*
Gender × SI			0.07			-0.098
Gender × ISQ			0.273			-0.109
Gender × ISA			0.216			-0.007
Age × FC			-0.24			0
Age × SI			0.009*			0.073*
Age × ISQ			-0.185*			-0.038
Age × ISA			0.12			-0.092*
F-value	4.892	12.665	7.518	4.704	5.53	4.229
Df	2	7	14	2	8	15
Adjusted R2	0.035	0.276	0.299	0.033	0.145	0.185

Notes: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

**Table VI.**  
Hypotheses testing

Hypothesis	Usage intention of internet	Hypothesis	Actual use of internet
H1	Not supported	H2	Not supported
H3	Supported	H4	Supported
H5	Not supported	H6	Supported
H7	Supported	H8	Supported
H9	Not supported	H10	Not supported
H11	Supported	H12	Not supported
H13	Not supported	H14	Supported
H15	Not supported	H16	Not supported
H17	Supported	H18	Supported
H19	Not supported	H20	Not supported
H21	Not supported	H22	Not supported
H23	Not supported	H23	Not supported
		H24	Supported

## Discussion

It is evident from the study findings that PLHIV mainly relied on radio and personal contact with HRH and family/friends. These findings support a number of prior studies (Chilimo and Nawe, 2004; Montez, 2011; Moshia and Sulemani, 2012; Rumisha *et al.*, 2006) which reported that patients mainly rely on interpersonal communication with family or friends, and radio to fulfill their health information needs. Similarly, previous studies (Mboera *et al.*, 2007; Rumisha *et al.*, 2006; Mwaiswelo and Masalu, 2008) showed that patients mainly relied on HRH to access health information. In this study, television and print newspapers were perceived as essential sources of information to PLHIV. This finding is consistent with

previous studies (Mboera *et al.*, 2007; Montez, 2011) that reported print newspapers as important sources of information.

The study findings indicate that electronic sources of information such as online journals, websites, online books and CDROMs were poorly used for accessing HIV/AIDS information. Previous studies (Mboera *et al.*, 2007; Rumisha *et al.*, 2006; Mwaiswelo & Masalu, 2008) in Tanzania have reported similar findings. This low use of electronic sources of information is a result of the fact that a large proportion of PLHIV had low level of education and income, and thus they faced several barriers in accessing online information including lack of awareness and skills on how to search online information as well as inability to purchase smart phones and pay for airtime to access online information. Thus, they mainly relied on their informal networks of friends and families and old ICTs such as radio to access HIV information. Further, the study was conducted at the regional public hospitals where the services for PLHIV are provided for free, and that is why most of patients were those with low levels of income and education.

Interestingly, the present study has shown that mobile technology was used at a relatively high rate for accessing online HIV information. This finding suggests that the widespread access to internet through cell-phones can enhance access to HIV information even to disadvantaged people. The findings indicate that internet-based HIV information enabled PLHIV to acquire new knowledge and innovative ideas; understand their health conditions much better; and meet doctors when they have problems. It is therefore important for health education and promotion programmes to use multiple sources of information including internet and mobile phones to enhance access to information.

The study findings revealed that two factors related to attitude and information source accessibility tend to increase usage intention of internet to access HIV information. PLHIV's attitude towards technology played a key role in internet usage intention to seek HIV information among PLHIV. This finding is inconsistent with a study by Venkatesh *et al.* (2003) which reported that the attitude factor has no significant impact on intention of technology usage. Nevertheless, other studies (Dulle and Minishi-Majanja, 2011; Lwoga and Questier, 2014) carried out in Tanzania found that individuals' attitudes predicted technology usage intention. This suggests that PLHIV are more likely to use internet to access information once they understand its implications and benefits. It is therefore important to educate PLHIV on the importance of internet-based information to enhance usage of this technology.

Information source accessibility had positive effects on usage intention and actual usage of internet to seek HIV information among PLHIV. Similarly, previous studies found that information source accessibility had a significant effect on actual usage of internet to search health information (Marton, 2011). The findings also suggest that internet has to be reliable and HIV-related websites need to be simple, user-friendly, easy to operate and be in local languages to enable PLHIV to easy access to HIV information.

Facilitating conditions had positive effects on actual use of internet among PLHIV. These findings corroborate results of previous studies (Dwivedi *et al.*, 2011; Pan and Jordan-Marsh, 2010; Venkatesh *et al.*, 2003) that reported on the positive influence of facilitating conditions on intention to use technology. The implications of these findings are the need for the improvement of ICT infrastructure in public hospitals for effective exploitation of internet-based HIV information among PLHIV. There is also a need to promote the use of mobile phones to enhance accessibility to online HIV information among PLHIV.

Usage intention positively predicted actual usage of internet to access HIV information among PLHIV. This finding is consistent with the findings from earlier studies (Dey *et al.*, 2008) conducted in Australia which reported that usage intention of internet had positive

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relationship with actual access of internet among women attending a breast screening service. This implies that PLHIV are already willing to use internet to access HIV information, and therefore, it is important to continue promoting the benefits of accessing internet-based information among PLHIV.

Age had negative effects on PLHIV's internet usage intention and actual use of internet. However, the effect of age became non-significant when the proposed five key factors were added to the predictive model. Similar findings were revealed by another study (Pan and Jordan-Marsh, 2010) that age became insignificant when other four key predictors were added to the research model of internet use intention among Chinese older adults. These findings suggest that the effects of age may be controlled by other factors assessed in this study and thus indirectly affecting internet usage intention. Future studies may need to assess whether such relationship exists between age and internet usage intention in low income countries.

In this study, gender had positive effects on usage intention of internet. However, the effect of gender became non-significant when the proposed five key determinants were entered into the predictive model. This is contrary to previous studies (Bastien *et al.*, 2009; Pan and Jordan-Marsh, 2010) which showed that gender influenced information seeking behaviour of young people. The findings imply that the gender effect may be mediated by some key predictors tackled in this study, thus indirectly affecting usage intentions of internet. Future studies may attempt to examine whether such a relationship exists among these variables.

When assessing the interactive effects of age and gender on the five predictors of the proposed research model, the effects of information source quality on internet usage intention were significantly stronger for younger PLHIV. This implies that there is a need to emphasize the importance of relevance, accuracy and reliability of online HIV information. HRH can play a key role in this by promoting the use of reliable health websites to PLHIV. Further, the effect of the information source accessibility was significantly moderated by age. Younger PLHIVs are more likely to use internet to access HIV information. There is therefore a need to emphasize the ease of internet use when promoting it among PLHIV across all age groups. Interfaces of health website should be user-friendly to enhance access to HIV information. Unlike other previous studies (Pan and Jordan-Marsh, 2010), this study did not find the moderating role of gender. These findings suggest that the gender digital divide is increasingly decreasing. In addition, the findings show that age moderated the effects of social influence on usage intention and actual use of internet such that the effects were stronger for older PLHIV. This is similar to previous studies (Dulle and Minishi-Majanja, 2011; Venkatesh *et al.*, 2003) which reported that the effect of social influence was stronger for older respondents. This suggests that older PLHIV are more influenced by the opinions of others when deciding to use new technology as compared to younger PLHIV.

The findings show that social influence and information source quality had no effects on usage intentions and actual usage of internet to search HIV information. These findings are contrary to previous studies (Dwivedi *et al.*, 2011; Pan and Jordan-Marsh, 2010; Venkatesh *et al.*, 2003) which found that social influence had positive impact on usage intention of technology. These findings suggest that most respondents and the people surrounding PLHIV were not familiar with internet and therefore they could not influence each other's to use internet. It is also clear that HRH were not recommending PLHIV to use internet for accessing online HIV information. The findings are also inconsistent with previous studies (Leung, 2008; Marton, 2011; Yun and Park, 2010) which found positive impact of information source accessibility on internet usage. PLHIV could not ascertain the quality of information sources due to lack of awareness about the importance of internet-based information. This



lack of awareness could be due to many other factors such as low level of education, and further lack of skills on how to use internet which are yet to be determined.

### **Practical, policy and theoretical implications**

The findings of this study have important implications for health-care practitioners, researchers, educators, librarians and policy makers and all those who deal with provision of health education and health information services. The study has several practical implications:

- The study findings require health-care providers, public health educationists and libraries and information providers to regularly assess the health information and communication needs of patients to provide relevant information using suitable communication channel.
- Health-care providers, public health educationists and libraries and information providers need to use multiple means including electronic media to provide access to HIV information. In particular, health interventions for HIV care and treatment should prioritize the use of internet and mobile phones for wider coverage and impact.
- Health-care providers, public health educationists and information providers should promote the benefits of accessing online HIV information because the present findings show that attitude predicted internet usage intentions. Patients would access online information once they know that this information is beneficial to their health. Health-care providers, public health educationists, libraries and information providers should create awareness on the availability of relevant information on online sources.
- The information source accessibility predicted internet usage intentions of HIV patients. This necessitates a need for website designers to design a user-friendly interface to enable PLHIV to enhance access to online information. These websites should be available in local language (such as Kiswahili for Tanzania) to enable patients with low level of education to access online information.
- Public libraries should include a section on health information to enable patients to have access to relevant information.
- Public and hospital librarians with adequate knowledge and skills need to select relevant e-resources and upload them on their library/hospital websites, and provide remote access to e-resources even their outside institutions. Reference librarians should be available to assist patients to have access to relevant print and online health information including HIV information.

On policy implications, policy makers and health-care providers should improve access to technological infrastructure such as internet café/telecentres, and adequate technical support. Further, health-care providers need to establish information centres in their hospitals to enable patients to access both print and electronic sources of information more effectively.

Theoretically, this study was guided by the Conceptual Framework of Health Information-Seeking Behaviour on the Web (Marton, 2011) and the UTAUT2 model (Venkatesh *et al.*, 2003). Although these models are built from two different perspectives (information science and technology adoption), they were relevant in explaining the HIV information seeking behaviour of PLHIV in the surveyed hospitals in Tanzania. This study

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contributed to the [Marton's \(2011\)](#) model and UTAUT2 by revealing that attitude and information source accessibility factors predicted usage intentions of internet, while facilitating conditions, information source accessibility and usage intention of internet determined the actual use of internet among PLHIV. Age moderated the effects of information source quality and social influence on usage intention of internet, and the effects of the information source accessibility and social influence on actual use of internet. The study also contributed to the models by revealing factors such as social influence and information source quality that had no effects to users' usage intentions of online information.

### **Conclusion**

The study findings showed that PLHIV in Tanzania still rely on radio and personal contact with HRH and family/friends to obtain HIV information. Despite the increased availability of internet-based HIV information, access and use of this information is very limited due to low level of education and income among the surveyed PLHIV. Nonetheless, there is considerably high use of mobile phones to access to internet-based HIV information. The study found that attitude and information source accessibility predicted usage intentions of internet, while facilitating conditions, information source accessibility and usage intention of internet determined actual use of internet among PLHIV. When assessing the interactive effects of age and gender on the five predictors of the proposed research model, age moderated the effects of information source quality and social influence on usage intention of internet, and the effects of the information source accessibility and social influence on actual use of internet. The findings imply that younger PLHIV were more likely to use internet to access HIV information than the older respondents due to perceived ease of accessing the system and quality of the online content. Further, older PLHIV were more influenced than younger PLHIV by the views of others when making decisions to use internet. This study provides empirical findings that contribute to a better understanding of HIV information seeking behaviour, particularly factors that may influence PLHIV to seek online information. Overall, this study makes an important contribution to the research on PLHIV's interaction with online HIV information.

### **Study limitations**

This study excluded very sick patients who would not be at the best to provide information, but they could be a source of systematic error as such a group potentially has different characteristics affecting both their health outcomes as well as information seeking behaviour. Differences in individual ability to recall events in the past are a potential cause for errors in our study. However, this bias if present, is likely to occur randomly and therefore no potential directional bias. Moreover, we limited the questionnaire to four months to reduce such type of error. Further, the options that measured attitudinal factor only reflected positive attitude; therefore, it is recommended for future studies to evaluate both positive and negative attitudes in assessing the use of online information seeking behaviour among PLHIV. Future studies should also focus on the impact of other socio-demographic characteristics such as level of education and income on the online information seeking behaviour of PLHIV. It would also be important to combine both qualitative and quantitative methods when studying online information seeking behaviour of PLHIV to be able to generalize findings and at the same time to provide a deep explanation and description of the context of the study.

## References

- Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Process*, Vol. 50 No. 2, pp. 179-211, available at: [www.sciencedirect.com/science/article/pii/074959789190020T](http://www.sciencedirect.com/science/article/pii/074959789190020T)
- Albright, K. (2007), "HIV/AIDS information seeking and healthcare communications in Sub-Saharan Africa", *World Library and Information Congress: 73rd IFLA General Conference and Council 19-23 August 2007, Durban*, pp. 1-12.
- Bandura, A. (1986), *Social Foundations of Thought and Action: A Social Cognitive Theory*, Vol. 1, PrenticeHall Series in Social Learning Theory, Upper Saddle River, NJ.
- Bastien, S., Leshabari, M.T. and Klepp, K.-I. (2009), "Exposure to information and communication about HIV/AIDS and perceived credibility of information sources among young people in northern Tanzania", *African Journal of AIDS Research*, Vol. 8 No. 2, pp. 213-222, available at: <http://doi.org/10.2989/AJAR.2009.8.2.9.861>
- Boot, C.R.L. and Meijman, F.J. (2010), "The public and the internet: multifaceted drives for seeking health information", *Health Informatics Journal*, Vol. 16 No. 2, pp. 145-156, available at: <http://doi.org/10.1177/1460458210364786>
- Bor, J., Herbst, A.J., Newell, M.-L. and Barnighausen, T. (2013), "Increases in adult life expectancy in rural South Africa: valuing the scale-up of HIV treatment", *Science*, Vol. 339 No. 6122, pp. 961-965, available at: <http://doi.org/10.1126/science.1230413>
- Chang, S.J. and Im, E.-O. (2014), "A path analysis of internet health information seeking behaviors among older adults", *Geriatric Nursing*, Vol. 35 No. 2, pp. 137-141, available at: <http://doi.org/10.1016/j.gerinurse.2013.11.005>
- Chilimo, W. and Nawe, J. (2004), "The role of nutritional information in addressing under-five child malnutrition in Tanzania", *University of Dar Es Salaam Library Journal*, Vol. 5 No. 2, pp. 82-92, available at: <http://doi.org/10.4314/udslj.v5i2.26611>
- Chong, A., Chan, F.F.T.S. and Ooi, K.K.-B. (2012), "Predicting consumer decisions to adopt mobile commerce: cross country empirical examination between China and Malaysia", *Decision Support Systems*, Vol. 53 No. 1, pp. 34-43, available at: <http://doi.org/10.1016/j.dss.2011.12.001>
- Chong, A., Darmawan, N., Ooi, K. and Lin, B. (2010), "Adoption of 3G services among Malaysian consumers: an empirical analysis", *International Journal of Mobile Communications*, Vol. 8 No. 2, pp. 129-149, available at: <http://inderscience.metapress.com/index/T7W111M8781NT801.pdf>
- Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297-334, available at: <http://doi.org/10.1007/BF02310555>
- Davis, F. (1986), *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*, Massachusetts Institute of Technology, Cambridge, MA, available at: [www.researchgate.net/publication/35465050\\_A\\_technology\\_acceptance\\_model\\_for\\_empirically\\_testing\\_new\\_end-user\\_information\\_systems\\_theory\\_and\\_results\\_/file/9c960519fbaddf3ba7.pdf](http://www.researchgate.net/publication/35465050_A_technology_acceptance_model_for_empirically_testing_new_end-user_information_systems_theory_and_results_/file/9c960519fbaddf3ba7.pdf)
- Dey, A., Reid, B., Godding, R. and Campbell, A. (2008), "Perceptions and behaviour of access of the internet: a study of women attending a breast screening service in Sydney, Australia", *International Journal of Medical Informatics*, Vol. 77 No. 1, pp. 24-32, available at: <http://doi.org/10.1016/j.ijmedinf.2006.12.002>
- Dulle, F. and Minishi-Majanja, M. (2011), "The suitability of the unified theory of acceptance and use of technology (UTAUT) model in open access adoption studies", *Information Development*, Vol. 27 No. 1, pp. 32-45, available at: <http://doi.org/10.1177/0266666910385375>
- Dwivedi, Y., Rana, N., Chen, H. and Williams, M. (2011), "A meta-analysis of the Unified theory of acceptance and use of technology (UTAUT)", *Governance and Sustainability in Information Systems. Managing the Transfer and Diffusion of IT*, Springer, Heidelberg, Berlin, pp. 155-170.
- Field, A. (2006), "Factor analysis using SPSS", available at: [www.sussex.ac.uk/users/andyF/factor.pdf](http://www.sussex.ac.uk/users/andyF/factor.pdf)
- Fishbein, M. and Ajzen, I. (1975), "Belief, attitude, intention and behavior: an introduction to theory and research", available at: <http://trid.trb.org/view.aspx?id=1150648>

- 
- Folkman, S. and Lazarus, R.S. (1988), "The relationship between coping and emotion: implications for theory and research", *Social Science and Medicine*, Vol. 26 No. 3, pp. 309-317, available at: [http://doi.org/10.1016/0277-9536\(88\)90395-4](http://doi.org/10.1016/0277-9536(88)90395-4)
- Hair, J., Black, W., Babin, B., Tatham, R. and Anderson, R. (2010), *Multivariate Data Analysis*, Prentice Hall, Upper Saddle River, NJ, available at: [www.lavoisier.fr/livre/notice.asp?ouvrage=1115189](http://www.lavoisier.fr/livre/notice.asp?ouvrage=1115189)
- Internet World Stats (2016), "Africa internet usage, Facebook and population statistics", available at: [www.internetworldstats.com/stats1.htm](http://www.internetworldstats.com/stats1.htm) (accessed 23 July 2012).
- Johnson, J.D. (1997), *Cancer-Related Information Seeking*, Hampton Press Cresskill, NJ, available at: [www.getcited.org/pub/100228460](http://www.getcited.org/pub/100228460)
- Kalichman, S.C., Cain, D., Cherry, C., Pope, H., Eaton, L. and Kalichman, M.O. (2005), "Internet use among people living with HIV/AIDS: coping and health-related correlates", *AIDS Patient Care and STDs*, Vol. 19 No. 7, pp. 439-448, available at: <http://doi.org/10.1089/apc.2005.19.439>
- Kalichman, S.C., Weinhardt, L., Benotsch, E., DiFonzo, K., Luke, W. and Austin, J. (2002), "Internet access and internet use for health information among people living with HIV-AIDS", *Patient Education and Counseling*, Vol. 46 No. 2, pp. 109-116, available at: [www.ncbi.nlm.nih.gov/pubmed/11867240](http://www.ncbi.nlm.nih.gov/pubmed/11867240)
- Kish, L. (1965), *Survey Sampling*, Wiley Interscience Publication, New York, NY.
- Kuhlthau, C. (1991), "Inside the information search process: information seeking from the user's perspective", *Journal of the American Society for Information Science and Technology*, Vol. 42 No. 5, pp. 361-371.
- Lenz, E.R. (1984), "Information seeking: a component of client decisions and health behavior", *Ans. Advances in Nursing Science*, Vol. 6 No. 3, pp. 59-72.
- Leung, L. (2008), "Internet embeddedness: links with online health information seeking, expectancy value/quality of health information websites, and internet usage patterns", *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, Vol. 11 No. 5, pp. 565-569, available at: [www.ncbi.nlm.nih.gov/pubmed/18771393](http://www.ncbi.nlm.nih.gov/pubmed/18771393)
- Longo, D.R., Schubert, S.L., Wright, B.A., LeMaster, J., Williams, C.D. and Clore, J.N. (2010), "Health information seeking, receipt, and use in diabetes self-management", *Annals of Family Medicine*, Vol. 8 No. 4, pp. 334-340, available at: <http://doi.org/10.1370/afm.1115>
- Lwoga, E.T.E. and Questier, F. (2014), "Faculty adoption and usage behaviour of open access scholarly communication in health science universities", *New Library World*, Vol. 115 Nos 3/4, pp. 116-139, available at: <http://doi.org/10.1108/NLW-01-2014-0006>
- Marton, C. (2011), "Understanding how women seek health information on the web", University of Toronto, Toronto, available at: <https://tspace.library.utoronto.ca/handle/1807/29808>
- Mboera, L., Rumisha, S., Senkoro, K., Mayala, B., Shayo, E. and Kisinza, W. (2007), "Knowledge and health information communication in Tanzania", *East African Journal of Public Health*, Vol. 4 No. 1, pp. 33-39.
- Montez, B.D. (2011), "Identifying health information needs in Tanzania: evidence from the audiencescapes national survey", available at: [www.audiencescapes.org/sites/default/files/AudienceScapes\\_Tanzania\\_HealthCommunication\\_Montez.pdf](http://www.audiencescapes.org/sites/default/files/AudienceScapes_Tanzania_HealthCommunication_Montez.pdf)
- Mosha, N. and Manda, P. (2012), "HIV/AIDS information and changing sexual behaviour among undergraduate students in Tanzania", *Aslib Proceedings*, Vol. 64 No. 5, pp. 509-518, available at: <http://doi.org/10.1108/00012531211263120>
- Mosha, N. and Sulemani, S. (2012), "Health information needs and health information seeking behavior among small farmers at Kilimanjaro region-Tanzania", *Scholarly Journal of Medicine*, Vol. 2 No. 6, pp. 77-83, available at: [www.scholarly-journals.com/sjm/2012/September/MoshaandSulemani.pdf](http://www.scholarly-journals.com/sjm/2012/September/MoshaandSulemani.pdf)

- Muris, P., Van Zuuren, F.J., De Jong, P.J., De Beurs, E. and Hanewald, G. (1994), "Monitoring and blunting coping styles: the miller behavioural style scale and its correlates, and the development of an alternative questionnaire", *Personality and Individual Differences*, Vol. 17 No. 1, pp. 9-19, available at: [http://doi.org/10.1016/0191-8869\(94\)90257-7](http://doi.org/10.1016/0191-8869(94)90257-7)
- Mwaiswelo, R.O. and Masalu, J.R. (2008), "Oral health knowledge and behavior among pregnant women in Kyela district, Mbeya, Tanzania", *Tanzania Dental Journal*, Vol. 14 No. 2, pp. 47-52, available at: <http://doi.org/10.4314/tdj.v14i2.37570>
- Pan, S. and Jordan-Marsh, M. (2010), "Internet use intention and adoption among Chinese older adults: from the expanded technology acceptance model perspective", *Computers in Human Behavior*, Vol. 26 No. 5, pp. 1111-1119, available at: <http://doi.org/10.1016/j.chb.2010.03.015>
- Petrocelli, J.V., Cohen, B.H. and Wampold, A. (2003), "Hierarchical multiple regression in counseling research: common problems and possible remedies", *Measurement and Evaluation in Counseling and Development*, Vol. 36, pp. 9-22.
- Rogers, E. (2017), *Diffusion of Innovations*, 4th ed., The Free Press, New York, NY.
- Rumisha, S.F., Senkoro, K.P., Ngadaya, E., Shayo, E.H., Mayala, B.K. and Mtandu, R. (2006), "Community knowledge and information communication gaps on HIV/AIDS in Iringa municipality, Tanzania", *Tanzania Journal of Health Research*, Vol. 8 No. 2, pp. 101-108, available at: <http://doi.org/10.4314/thrb.v8i2.14281>
- Saberi, P. and Johnson, M.O. (2015), "Correlation of internet use for health care engagement purposes and HIV clinical outcomes among HIV-positive individuals using online social media", *Journal of Health Communication*, Vol. 20 No. 9, pp. 1026-1032, available at: <http://doi.org/10.1080/10810730.2015.1018617>
- Shet, A., Costa, A.D., Kumarasamy, N., Rodrigues, R., Rewari, B.B., Ashorn, P. and Diwan, V. (2014), "Effect of mobile telephone reminders on treatment outcome in HIV: evidence from a randomised controlled trial in India", *BMJ*, Vol. 347 No. aug06 2, pp. g5978-g5978, available at: <http://doi.org/10.1136/bmj.g5978>
- Taylor, S. and Todd, P. (1995), "Understanding information technology usage: a test of competing models", *Information Systems Research*, Vol. 6 No. 2, pp. 144-176.
- The Joint United Nations Programme on HIV/AIDS (2016), "Global HIV statistics", available at: [www.unaids.org/en/resources/fact-sheet](http://www.unaids.org/en/resources/fact-sheet)
- Thompson, R.L., Higgins, C.A. and Howell, J.M. (1991), "Personal computing: toward a conceptual model of utilization", *MIS Quarterly*, Vol. 15 No. 1, pp. 124-143, available at: <http://doi.org/10.2307/249443>
- Venkatesh, V. and Davis, F. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol. 46 No. 2, available at: <http://mansci.journal.informs.org/content/46/2/186.short>
- Venkatesh, V., Thong, J. and Xu, X. (2012), "Consumer acceptance and user of information technology: extending the unified theory of acceptance and use of technology", *MIS Quarterly*, Vol. 36 No. 1, pp. 157-178, available at: <http://ezproxy.library.capella.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=iib&AN=71154941&site=ehost-live&scope=site>
- Venkatesh, V., Morris, M., Davis, G. and Davis, F. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478, available at: [www.jstor.org/stable/10.2307/30036540](http://www.jstor.org/stable/10.2307/30036540)
- Wang, Y.-S. and Shih, Y.-W. (2009), "Why do people use information kiosks? A validation of the unified theory of acceptance and use of technology", *Government Information Quarterly*, Vol. 26 No. 1, pp. 158-165, available at: <http://doi.org/10.1016/j.giq.2008.07.001>
- Wathen, C. and Harris, R. (2005), "Transtheoretical model of the health behavior change", *American Journal of Health Promotion*, Vol. 12 No. 1, pp. 38-48.

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- Wilson, T. (1997), "Information behaviour: an interdisciplinary perspective", *Information Processing & Management*, Vol. 33 No. 4, pp. 551-572, available at: <http://informationr.net/tdw/publ/infbehav/chap3.html>
- Wilson, T. and Walsh, C. (1996), "Information behaviour: an interdisciplinary perspective", *Information Processing & Management*, University of Sheffield, Department of Information Studies, Sheffield, Vol. 33, pp. 551-572, available at: <http://informationr.net/tdw/publ/infbehav/chap3.html> (accessed 26 July 2012).
- Yun, E.K. and Park, H.-A. (2010), "Consumers' disease information-seeking behaviour on the internet in Korea", *Journal of Clinical Nursing*, Vol. 19 Nos 19/20, pp. 2860-2868, available at: [www.ncbi.nlm.nih.gov/pubmed/20598000](http://www.ncbi.nlm.nih.gov/pubmed/20598000)
- Zare-Farashbandi, F. and Lalazaryan, A. (2014), "A review of models and theories of health information seeking behavior", *International Journal of Health System and Disaster Management*, Vol. 2 No. 4, p. 193, available at: <http://doi.org/10.4103/2347-9019.144371>

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