An Integrated Perspective on Factors Influencing Online Health-Information Seeking Behaviours

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Abstract

Today medical practice has turned to the development of online health systems and models aimed at helping people to become more independent in managing their well-being and care. Health-information seeking is a key aspect of these new models of engagement, yet studies show there is a decline in health-seeking behaviour (HISB). Focusing on online channels, this research-in-progress paper brings together theoretical insights from the Health Belief Model, the Theory of Reasoned Action and prior work on information channel characteristics to identify key drivers of online health-information seeking. The paper reports the preliminary results of model assessment using data collected from 94 respondents. The results contribute to current understanding of what motivates online HISB and the relative importance of these factors in motivating seeking behaviour.

Keywords: Online health information, health information seeking behaviour, e-Health

1 INTRODUCTION

Lifestyle choices and behaviours of individuals affect their health. Medical practice has moved away from models of interaction where the medical practitioners direct the health management of patients. Current models aim to improve patient participation and independence and allow individuals to take greater responsibility for their health (Anker et al. 2011, CDHB vision). Health information seeking is a critical determinant of health behaviour (Johnson and Meischke 1993). It can lead to more informed decision making, better adherence to treatment, change in health behaviour, increased quality of life and affective outcomes such as decreased anxiety and stress (Lambert and Loiselle 2007).

Online resources play an increasing role in these new health care models in supporting information flow and interaction between patients and practitioners (Tu and Cohen 2008). However, some studies have found a decline in online health information seeking behaviour (HISB) (Tu 2011; Weaver et al 2010). A study of users in Iceland found the majority of participants preferred not to use internet sources even though internet access was not an issue in the country (Palsdottir 2008). These studies highlight the need for research which extends our understanding on what drives individuals to use or ignore online health resources.

Research in health information seeking behaviour has demonstrated that personal characteristics and situational factors impact on channel selection and HISB through different channels (Anker et al 2011; Johnson and Meischke 1993; Lambert and Loiselle 2007; Wilson, 1997). Personal factors include sociodemographic characteristics and situational factors include access to the information, characteristics of the information source and support from family and friends. Most studies examine HISB across many channels (e.g. leaflets, TV) but do not evaluate the effects of the information channel characteristics (e.g. De Vries et al., 2005).

The aim of this paper is to bring together research in health education and information systems to provide further understanding of what motivates individuals to seek health information online. It builds on the Health Belief Model and Theory of Reasoned Action. This study proposes and tests an integrative framework which examines online HISB. Unlike previous studies, it focuses on one channel of information – the internet and introduces new constructs to existing HISB frameworks.

2 PRIOR RESEARCH

Health information seeking behaviour (HISB) refers to the use of actions and methods to acquire health-related information. It is an active and goal-oriented effort rather than passive exposure to information (Anker et al 2011). HISB varies on two dimensions: extent (scope and depth) and method (information source used). In this study we limit HISB to seeking health-related information online.

HISB is initially motivated by a need for information – a perceived gap in the existing *knowledge* and what is required to achieve a goal (Griffin et al. 1999). HISB can occur in the context of a health-threatening situation, participation in health decision making or in terms of behaviour change (Lambert and Loiselle 2007). In other words information can help people to cope with an illness, to make informed decisions about their health or to change their behaviour and lifestyle to prevent illness. However, although the perceived information gap has been found to be important, it is not sufficient to motivate individuals to seek information.

Prior research has focused on the effect of characteristics of information seekers on their HISB both in terms of method and channel. Previous studies have found that gender, education, and health literacy impact HISB (Anker et al 2011; Weaver at al 2010). Specifically females with higher level of education and a higher level of health literacy are more likely to seek health information online (Lambert and Loiselle, 2007, Weaver et al 2010)

One framework which has significantly enhanced understanding of health information seeking is the Health Belief Model (HBM). HBM is a social cognition model which hypothesizes that behaviours depend on two variables: 1) the perceived value of goal and 2) perceived likelihood that an action will achieve this goal (Janz and Becker 1984). Applied to the health context the goal relates to the value of preventing or curing an illness and the value of the goal is related to threat perception. These variables are distilled into four dimensions, namely perceived susceptibility to and, perceived severity of an illness, perceived benefits of a preventative action and perceived barriers to this action. As such, individuals are more likely take action if they perceive a stronger threat of an illness (susceptibility and severity) and believe the benefits of taking action to address the threat outweigh the costs (barriers).

Johnson and Meischke (1993) used the HBM to extend the theoretical work on HISB and proposed a comprehensive model. In addition to the HBM factors they included two information carrier factors –

utility and characteristics. The authors applied the model to a study of women seeking information on mammography. The health-related factors were not as strong as expected and the authors called for further research on characteristics related to the information-carrier (source).

Characteristics of information sources have been examined in research on consumer health information needs. Common characteristics are access and credibility (Wilson, 1997). Indeed, a fundamental requirement of a source is that it is easily accessible. Source credibility refers to the trustworthiness and reliability of the source of information. Related to source credibility is the quality of information provided by the source. Xiao et al (2014) found that ease of access to the internet and source credibility influence online information health searching.

Yoo and Robinson (2008) studied women seeking health information online. The survey data results confirmed positive relationships between predictors and behaviour intention to use a health related web site. The predictor variables include past experience with the health related website (HRW), attitude towards HRW, gratification sought and perceived behavioural control.

There is a large body of research in the area of preventative health behaviours such as participations in screening programmes and immunisations. For example, Cummings et al (1980) reviewed 14 health behaviour models which included 109 variables. They recruited 11 expert judges to evaluate, sort and group variables in categories according to their similarity. This sorting process resulted in six distinct factor categories which included accessibility, attitude to health care, perceptions of disease threat, knowledge about disease, demographics and social network characteristics. The cognitive factors including attitude, perceptions and knowledge have been used in a number of models predicting health behaviour.

In summary, the review of prior research has identified a number of factors which may influence the willingness of individuals to seek health information online. There are a few empirical studies and they focus on a limited number of antecedents. This study aims to integrate prior research by including factors related to the information source and cognitive factors related to prior knowledge and past use. Next, we present the proposed model, followed by the research method, data analysis and findings.

3   RESEARCH MODEL

To develop an integrative view of the factors that motivate individuals' willingness to seek health information online, this study will draw on the HBM and the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975). The TRA assumes that an individual's intention to engage in behaviour is the immediate determinant of the action. Behavioural intention in turn, is determined by various beliefs including one's attitude toward performing the behaviour, while attitude is determined by the individual's beliefs that performing the behaviour will lead to certain consequences and the individual's evaluation of those consequences. Prior studies of HISB show attitude is by far the most influential in explaining behavioural intention (Yoo and Robbins, 2008).

As a generic model of behaviour, both the TRA and its successor, the Theory of Planned Behaviour (TPB), have been used to explain many different behaviours including HISB (Marton and Chin, 2012). But neither model specifies the beliefs that impact the key factors leading to intentions. This leaves room for using other theories to specify those salient beliefs.

In addition to attitude, models of HISB in particular, the Health Belief Model signal that in order for individuals to take actions to address a health-related issue or concern they must believe that (1) they are personally *susceptible* to the health-related concern, (ii) that there would be some level of *severity* (or seriousness) associated with the problem, and that (iii) taking action would have a *beneficial outcome*. At the same time, some actions may have *negative consequences* such as psychological barriers to address (Rosenstock, 1974). This study includes these four elements as determinants of attitude - *perceived susceptibility*, *perceived severity*, *perceived benefits* and *perceived barriers*.

3.1 Attitude

The relationship between attitude and intention to seek online health information is supported by the underlying premises of the TRA and studies of HISB (Smith-McLallen et al 2011; Yun and Park, 2010). Many studies support the link between attitude and intention to use online technologies. For example in a study of Korean health websites, Yun and Park (2010) showed that attitude impacts intention to use online health information. Hence:

H1: Attitude is positively related to online HISB intention.

3.2 Perceived Benefits and Perceived Barriers

Perceived benefits refer to a person's beliefs about the benefits of available actions to reduce the perceived threat of a disease of condition (Champion and Skinner 2008). It is expected that a person would evaluate an action as favourable if they believe it would benefit them in reducing the threat of a disease. Champion and Skinner (2008) further argue that potential negative aspects of a health action (i.e. *perceived barriers*) are likely to act as an impediment to a person undertaking the recommended behaviour. In the case of HISB negative aspects such as unpleasantness or inconvenience that may arise from information seeking may lead to a negative evaluation of the consequences of seeking health information online. Hence it is expected that:

H2: Perceived benefits are positively related to attitude towards online HISB.
H3: Perceived barriers are inversely related to attitude towards online HISB.

3.3 Perceived Susceptibility and Perceived Severity

Perceived susceptibility refers to an individual's beliefs about their likelihood or risk of contracting a disease or condition, while *perceived severity* concerns the degree of seriousness that contracting a disease or condition or leaving them untreated may create (Champion and Skinner, 2008). A meta-analysis of preventative and treatment behaviours using the HBM, showed a relationship between perceived severity and likelihood of taking up a particular behaviour and between susceptibility beliefs and behaviour (Carpenter, 2010). These studies did not consider information-seeking behaviour.

Rosenstock (1974) further suggested that the combination of perceive susceptibility and perceived severity may provide the impetus needed for a person to take action in relation to a health concern. As such, it is expected that the more susceptible one is to a disease or condition and the more severe that disease or condition the more one is likely to have a positive evaluation of HISB, and perceive a benefit in seeking health information online and in exerting the effort needed to overcome barriers to actions (such as emotional arousals). Hence it is expected that:

H4a: Perceived susceptibility is positively related to attitude towards online HISB.
H4b: Perceived severity is positively related to attitude towards online HISB.
H5a: Perceived susceptibility is positively related to perceived benefits of online HISB.
H5b: Perceived severity is positively related to perceived benefits of online HISB.
H6a: Perceived susceptibility is positively related to perceived barriers of online HISB.
H6b: Perceived severity is positively related to perceived barriers of online HISB.

3.4 Information Channel

Few studies have examined the impact of the characteristics of the information channel on HISB. Those that do have signalled a positive effect between channel characteristics such as channel accessibility, perceived usefulness, ease of use, information quality and source credibility (Johnson and Meischke, 1993; Wilson, 1997; Xiao et al. 2014).

There are many studies that support the relationship between perceived usefulness and attitude towards technology use (Davis, 1989), including online health-information seeking (Yun and Park, 2010). Studies show strong support for the linkages between source credibility and perceived usefulness and attitude. For example, Wilson and Lankton (2004) found perceived usefulness impacted attitude towards e-Health system use. Yun and Park (2010) also found in a study of factors impacting individuals' disease information-seeking behaviour that both perceived usefulness and source credibility had a significant impact on attitude towards HISB. No studies were found that have empirically examined the impact of perceived usefulness and source credibility on perceived benefits. Nonetheless, it is expected that if a person considers an online health information system as useful and the source of information provided as credible (Yun and Park, 2010) they are likely to perceive benefits in online HISB in helping them to reduce threats of disease (Champion and Skinner, 2008). Hence:

H8a: Perceived usefulness is positively related to attitude towards using online HISB.
H8b: Perceived source credibility is positively related to attitude towards using online HISB.
H9a: Perceived usefulness is positively related to perceived benefits of using online HISB.
H9b: Perceived source credibility is positively related to perceived benefits of using online HISB.

Another key aspect of the information channel lies with ones' perceptions of the quality of the information provided by a system (Cline and Haynes, 2001). Information quality is shaped by many factors such as the accuracy, currency and presentation of information. Prior studies suggest that these qualities can represent a set of cognitive-based attitudes that shape behavioural beliefs. As such the quality of the information that a system provides is likely to influence one's perceived usefulness of the

system (Wixom and Todd, 2005). The higher the quality of health information provided online the more one is likely to evaluate the source as credible (Bates et al. 2006), and the online system as useful for enhancing ones' effectiveness in the health-information seeking process. Hence:

H7a: Information quality is positively related to perceived usefulness of online HISB.

H7b: Information quality is positively related to source credibility of online HISB.

3.5 Past Use

It is generally expected that when a behaviour is repeated often enough, that the actions taken are likely to be repeated in the future (Ajzen, 2002). Given the expected impact of past behaviour on intentions and future behavior (Yoo and Robbins 2008), we control for past use to minimize over-estimating the impact of other variables (e.g., attitude) on HISB intentions. Hence it is expected that:

H10: Past information-seeking behaviour is positively related to HISB intention

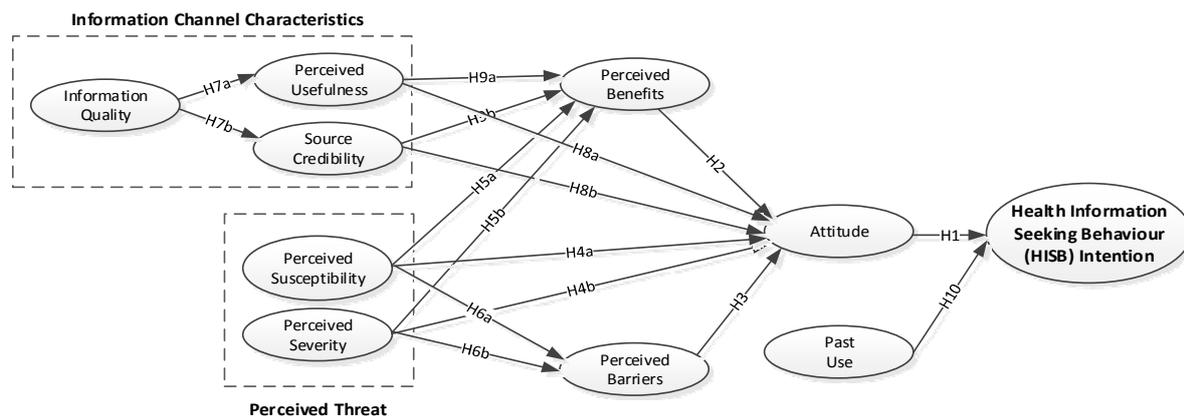Figure 2 summarise the proposed hypotheses.

Figure. 2: The Research Model

4   METHODOLOGY

Participants were recruited through advertising and referrals via social networks, and directed to complete the online survey (hosted by Qualtrics). To date 94 responses have been collected; all were usable . Of the participants, 55 (58.5%) were female and 39 (41.5%) were male. 78 (83%) were aged 35 years and under; most persons (n=45, 60.6%) were in the 20—24 year age group.

Constructs were measured using existing scales adapted to the context of health information seeking. Perceived susceptibility (3 items), perceived severity (3 items), perceived benefits (6 items), and perceived barriers (4 items) were adapted from Champion (1984) and de Vries et al. (2005). Perceived usefulness (5 items), source credibility (4 items), information quality (3 items) attitude (4 items) and intention to seek health information online (2 items) were likewise adapted from prior studies (Ajzen & Fishbein, 1980; Davis 1989; Wixom and Todd 2005).

5   DATA ANALYSIS AND RESULTS

Smart-PLS was used to evaluate the research model and bootstrapping (with 2000 resamples) used to evaluate the significance of the model paths. All item loadings were well-above the recommended threshold of 0.708 for indicator reliability (Hair et al., 2014) ranging from 0.804 to 0.963. Composite reliabilities ranged from 0.861 to 0.974 and average variance extracted (AVE) ranged from 0.715 to 0.904 exceeding recommended cut-offs of 0.70 and 0.50 (Hair et al., 2014). Using the Fornell-Larcker criterion, the results showed that for all constructs, the square root of the AVEs were greater than the correlations associated with other constructs, satisfying this test for discriminant validity.

Next, the structural model was examined. The research model accounted for 0.439 of the observed variance for health-information seeking behaviour intention, 0.509 for attitude, 0.393 for perceived benefits, and 0.206 for perceived barriers. For attitude and intention, support was provided for the proposed relationships between attitude and intention (0.284, p≤0.001) and, perceived barriers and attitude (-0.194, p≤0.05) supported H1 and H3. Hypothesis H2 concerning the relationships between perceived benefits and attitude was weakly supported (0.154, p≤0.20). Past use was significant in its impact on intention (0.481, p≤0.001), supporting H10.

The results showed significant relationships between perceived susceptibility and perceived barriers (0.338, p≤0.05), and between perceived severity and perceived benefits (0.218, p≤0.10) supporting H5a and H6b respectively. The remaining hypotheses concerning attitude and, perceived susceptibility and perceived severity (H4a, H4b), perceived severity and perceived barriers (H5b) and perceived susceptibility and perceived benefits (H6a) were not supported.

Finally the model showed that information quality explained 0.415 and 0.403 of the variance observed for perceived usefulness (0.635, p≤0.001) and source credibility (0.645, p≤0.001) respectively. The results also showed a significant relationship between perceived usefulness and, attitude (0.282, p≤0.05) and perceived benefits (0.355, p≤0.05), and between source credibility and, attitude (0.419, p≤0.05) and perceived benefits (0.249, p≤0.05). Hypotheses H7a-H9b were supported.

6 CONCLUSION

This study identifies individual and information channel factors and provides empirical evidence of their relative importance in relation to attitude and intention to seek health information online. It furthers our understanding of what motivates individual online HISB. Drawing on prior research in health behaviour and information systems, this paper provides a comprehensive model which builds on and extends current research.

The preliminary results of the model tests highlight the importance of the information channel characteristics which have not been included in most previous studies. Information quality as well as perceived usefulness and credibility of the internet source have a strong effect on the belief factors and attitude toward online HISB. This has implications for the design of internet information resources and how they promote their credibility.

Perceived susceptibility has an effect only on perceived barriers and perceived severity has an effect on perceived benefits. This implies that when individuals perceive the severity of an illness to be high, then they see more benefit in online HISB. When individuals consider themselves more susceptible towards a condition then they are likely to see higher costs of searching for information.

For this study, the sample size though adequate for model testing is relatively small. The majority of respondents were younger than 35 years; since age is related to risk perception this may impact findings. Also, this study does not distinguish between searching for wellness information and searching for illness information. Prior studies (Weaver et al 2010) indicate that seekers of illness information perceive higher threats to their health compared with seekers of wellness information, which often comprise the majority. Further data collection targeting other age groups and determining their goal in relation to HISB may provide further insights and allow for more sophisticated data analysis based on data segmentation.

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