Computers in Human Behavior 58 (2016) 240–248

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Full length article

Health literacy and the internet: An exploratory study on the 2013 HINTS survey

Shaohai Jiang*, Christopher E. Beaudoin

Department of Communication, Texas A&M University, 102 Bolton Hall, MS 4234 TAMU College Station, TX 77843-4234, USA

ARTICLE INFO

Article history:
Received 20 October 2015
Received in revised form
2 January 2016
Accepted 6 January 2016
Available online xxx

Keywords:
Motivation
Internet use
Information overload
Health literacy
Cognitive mediation model

ABSTRACT

Health literacy rates among American and European adults remain low, with almost half of adults having only basic levels in 2012. In this digital era, the Internet has been recognized as an important medium for improving health literacy. However, little is known about the mechanisms that underlie its impact on health literacy. With a general basis in the Cognitive Mediation Model, this study empirically tested a model that included motivation for health-related Internet use, health-related Internet use, perceived health information overload, and health literacy. Structural equation modeling was used to analyze the US-based Health Information National Trends Survey (HINTS) 2013 dataset. The results support for all the paths in our posited model. The effects of motivation for health-related Internet use on health literacy were completely mediated by health-related Internet use and perceived health information overload. The findings extend the Cognitive Mediation Model to the context of health literacy and provide significant implications for the design and dissemination of online health information. Recommendations are made for future research, including further validation of the five-item scale of health literacy.

1. Introduction

Low health literacy rates pose a significant problem for population health. In the United States, levels are low, with nearly half of American adults having only basic health literacy in 2012 (Champlin & Mackert, 2015) and 20% of Medicare patients having low health literacy and 29% marginal health literacy (Mitchell, Sadikova, Jack, & Paasche-Orlow, 2012). Similar levels have been found in Europe. According to the European Health Literacy Survey, almost 1 in 2 (47%) adults have insufficient or problematic health literacy (Sørensen et al., 2015).

The Internet may pose a formidable communication channel for helping advance health literacy in the United States. During the past decade, the Internet has become an important medium in terms of population health, with its strengths well documented, including availability of a wide range of information, reduced cost, increased access, ability to overcome time and space, real–time interaction, tailoring of content, and anonymity (Murero & Rice, 2006; Rice, 2006). The progressive development of these advantages is congruent with the rapid growth in Internet use for health purposes, with 78.8% of U.S. citizens reporting having searched for health information on the Internet (National Cancer Institute, 2014). The positive outcomes of such health-related Internet use have been borne out specific to healthy literacy, including how people's online health information use can spur improvements in their medical knowledge, sense of patient empowerment, self-presentation during medical encounters, and self-management skills (Lomanowska & Guitton, 2014; Mano, 2014; Murero & Rice, 2006; Rice, 2006).

Despite this documentation of the benefits that Internet use has for health literacy, empirical results have, at times, been inconsistent. For example, a recent study investigated the associations between health literacy, health information access and Internet usage among patients in private and public health clinics, finding a non-significant relationship between Internet use and health literacy (Gutierrez, Kindratt, Pagels, Foster, & Gimpel, 2014). Even more concerning, Schulz and Nakamoto (2011) contended that Internet use can raise problems with health literacy given that inaccurate online information can result in hasty, ill-informed, and dangerous health decision making. Thus, what type of health information is available online and whether such material is adapted to a target population are critical issues in health education and promotion (Guitton, 2015). Furthermore, Josefsson (2006) indicated that different modes of information seeking behavior can lead to

* Corresponding author.
E-mail addresses: shaohai.jiang@tamu.edu (S. Jiang), beaudoin@tamu.edu (C.E. Beaudoin).

http://dx.doi.org/10.1016/j.chb.2016.01.007
0747-5632/

dissimilar health consequences, with active search, as compared to passive attention, exerting stronger impact on a health information seeker's health literacy.

Considering the inconsistent results on the degree to which Internet use can influence health literacy, there is a need for additional research in this area. This need is further underscored by the lack of research on the social mechanisms that underlie this relationship. Given these two gaps in the literature, as well as continued problematic levels of health literacy in the United States, the present study investigates the process by which Internet use facilitates the development of health literacy. Inspired by Uses and Gratifications theory (Katz, Blumler, & Gurevitch, 1973) and, more specifically, in the Cognitive Mediation Model and derivative models (Beaudoin, 2008; Beaudoin & Thorson, 2004; Eveland, 2002; Eveland & Dunwoody, 2001; Eveland, Shah, & Kwak, 2003; Ho, Peh, & Soh, 2013; Jensen, 2011; Lo, Wei, & Su, 2013), this study postulates the staged roles of motivation for health-related Internet use, health-related Internet use and perceived health information overload in predicting health literacy.

2. Conceptual framework

This study articulates a multi-step model for the development of health literacy (see Fig. 1). This conceptual model includes six integral paths: 1) motivation for health-related Internet use to health-related Internet use; 2) motivation for health-related Internet use to perceived health information overload; 3) health-related Internet use to perceived health information overload; 4) motivation for health-related Internet use to health literacy; 5) health-related Internet use to health literacy; and 6) perceived health information overload to health literacy.

The model draws generally from the Cognitive Mediation Model (CMM) (Eveland & Dunwoody, 2001), which posits that various motivations drive people to pay attention to news media and proactively process news information, which, in turn, influences their knowledge development. However, motivation is not expected to influence knowledge acquired directly and, instead, has indirect effects as mediated by news attention and news elaborative processing. CMM has been tested in different contexts with different gratifications sought and with cross-sectional and panel data (Beaudoin & Thorson, 2004; Eveland, 2001, 2002; Eveland et al., 2003). Moreover, with a general basis in CMM, Beaudoin (2008) proposed a framework that shares even greater commonality with the current model. That study tested a derivative of CMM that included four steps: 1) social resource motivation for Internet use; 2) Internet use; 3) perceived information overload; and 4) interpersonal trust. This model, thus, shares similarity with our current model in terms of steps 1, 2 and 3.

In CMM, the influence of motivation can be understood under the umbrella of Uses and Gratifications theory (U&G). U&G assumes that people are actively involved in evaluating the potential benefits of media use. They are goal-oriented and purposefully pay attention to media content that can satisfy their needs. Therefore, people's motivation plays a key role in explaining their subsequent media use, with their choice of a medium based in their sought motives (Blumler, 1979). In CMM, Eveland (2001) expanded upon this linkage between motivation and media use to include subsequent information processing and the outcome of public affairs knowledge. Thus, CMM is different from prior U&G research in that it considers cognition and final effects on knowledge development. In addition, unlike U&G, CMM posits that motivation itself does not have a direct role in media effects and, instead, activates information processing.

Thus, based on U&G and CMM, and particularly guided by Beaudoin's (2008) derivative model, this study proposes a conceptual framework in which health-related Internet use and perceived health information overload mediate the effects of Internet use motivation on health literacy.

2.1. Path 1: motivation for health-related internet use to health-related internet use

U&G theory posits that audiences are active and goal-directed. Central to this approach is the concept of motivation (Blumler, 1979). Motivation can be conceived as an impetus of action (Deci & Ryan, 1985), or a point of common ground between needs, cognitions and emotions (Reeve, 1997). Previous studies have widely demonstrated that motivation for media use is positively associated with different types of media use, including via magazines (Payne, 1988), radio (Armstrong & Rubin, 1989), and TV (Rubin, 1983). With the advent of the Internet, motivation has also been significantly correlated with email use (Cho, De Zuniga, Rojas, & Shah, 2003), instant messaging (Leung, 2001), blog use (Chung & Kim, 2008), and social media use (Park, Kee, & Valenzuela, 2009). In regards to health-related Internet use, motivation to obtain health information has been considered as a strong predictor of some Internet

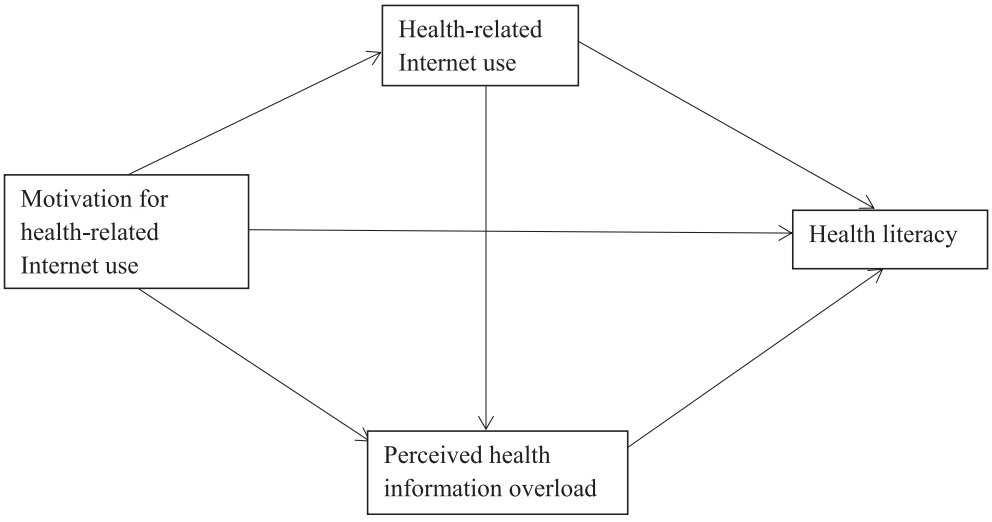

Fig. 1. Conceptual framework on development of health literacy.