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From online to offline: Exploring the role of e-health consumption, patient involvement, and patient-centered communication on perceptions of health care quality

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ABSTRACT

More adults than ever before are turning to the Internet for health information but the relation between online health information seeking, offline patient-provider communication, and patient perceptions of health care quality remains unclear. Based on channel complementarity theory and the concept of patient-centered communication, we propose that e-health consumption positively predicts patient involvement in seeking health information from doctors. The effect of patient involvement on patient perceptions of health care quality is moderated by doctors' patient-centered communication. We analyzed data from Cycle 3 of the 2014 Health Information National Trends Survey ($N = 3185$). Results confirmed that patients who consumed online health information were more involved in seeking information from their doctors. Patient involvement with doctors was positively associated with perceived health care quality but this effect was fully moderated by health care providers' use of patient-centered communication. The implications of these findings for online and offline health information seeking and patient-provider communication are discussed.

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1. Introduction

Health information is increasingly available to the public through the Internet. In fact, approximately 72% of United States adults have sought health information online (Pew Research Center, 2013). Of those online health information seekers, 77% use the World Wide Web and an additional 1% use social media like Facebook Clearly, online information seeking is prevalent but when they have a serious health issue, 70% of U.S. adults seek information offline from doctors or other health care providers (HCPs; Pew Research Center, 2013). Online and offline health information seeking are not always discreet processes as these statistics might suggest. In fact, a 2010 study found that online health information seeking led more contact with HCPs (Lee, 2008). Research about online and offline health information seeking has proliferated over the past decade, but the influence of online information seeking on

the quality of offline information seeking from HCPs remains unclear (see Lee, 2008).

Research regarding online health information seeking often looks at the quality of online health information (Benigeri & Pluye, 2003), characteristics of online health information seekers (Koch-Weser, Bradshaw, Gualtieri, & Gallagher, 2010; Laz & Berenson, 2013; Li, Theng, & Foo, 2016), and the interplay between online and offline health information seeking (Morahan-Martin, 2004; Rains, 2007; Ruppel & Rains, 2012). Research in the latter category typically focuses on how patient-provider interaction, especially patient satisfaction and provider communication, pushes patients back to the Internet for health information (for example, Hou & Shim, 2010; Rains, 2007; Tustin, 2010). Instead of HCPs pushing patients to the Internet, we investigated whether online information seeking via the Internet changes patient interactions with HCPs and influences the quality of patient-provider interactions. Modeling this relationship not only fills a gap in research but may also have practical applications, especially as Healthy People 2020 set a goal to improve both HCP's communication skills and people's Internet access so that they can manage their health information and communicate with their HCPs.

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Given the high rates of Internet usage for health information seeking and increased focus on health communication through both online and offline channels, the purpose of this study is to explore how e-health consumption influences patients' offline involvement with doctors. Based on the principles of channel complementarity theory (CCT; Dutta-Bergman, 2004a, 2004b, 2006) and patient-centered communication (PCC), we examine how e-health consumption via the Internet, online support groups, and YouTube affects patient involvement in seeking health information from doctors. We also examine how HCPs' patient-centered communication affects patient perceptions of health care quality. In order to examine these relationships, we analyzed data gathered from the Health Information National Trends Survey 4 cycle 3 (HINTS; National Cancer Institute, 2013). The results offer insight into the relationship between online and offline health information seeking and provide a better understanding of the lay public's health information seeking strategies in terms of new technology and traditional patient-doctor interpersonal communication.

2. Literature review

2.1. e-health consumption

Information plays an important role in evaluating, maintaining, and changing individuals' health beliefs and behaviors as well as managing uncertainty when individuals face health problems (Brashers, 2001; Goldsmith, 2001). Traditionally, health care providers are the primary source of health information for patients. However, the development of new technology, especially the Internet, has made medical information increasingly available outside of the doctor's office. New technology has a number of affordances such as easy access, high levels of interactivity, anonymity, and the ability to tailor messages, that may explain the surge in use of new media as a source of health information (Atkin & Rice, 2013; Cline & Haynes, 2001; Noar, Harrington, & Aldrich, 2009). Indeed, the Internet offers a number of different platforms for e-health consumption.

This study focuses specifically on e-health consumption from YouTube, online support groups, and general online health information seeking for self and others. YouTube is a video-sharing site with user-generated and professionally generated content that is free to view. Viewers can participate in comment threads for different videos. YouTube is the most popular online video platform in the United States with over a billion users worldwide (YouTube, LLC). Online support groups function as sources of social support and help individuals manage their health situations (Rains & Young, 2009). They allow for greater accessibility to others with similar health issues and are characterized by text-based interactions that reduce social cues and so require more explicit messages of support (Rains, Peterson, & Wright, 2015). In 2013, over 12 million U.S. adults had participated in an online forum or support group for people with a similar health or medical issue (National Cancer Institute, 2013). General online health information seeking is a broad construct that refers to using the Internet in order to find medical or health information for oneself or others. The Internet offers benefits for health information seekers including convenience, coverage, and anonymity (Powell, Inglis, Ronnie, & Large, 2011). An estimated 76% of U.S. adults sought health information for themselves on the Internet and an estimated 65.5% of U.S. adults sought health information for others (National Cancer Institute, 2015). Given the high numbers of adults using YouTube, online social support groups, and generally seeking health information online, as well as the unique affordances of each channel, we believe that measuring health information seeking from these channels is sufficient to represent e-health

consumption.

Even with the high usage rates and affordances new technology provides, e-health consumption has not negated the role of doctors in health information seeking. Instead new technology appears to have altered the patient-doctor relationship. Empirical studies examining the patient-doctor relationship have generally found positive outcomes resulting from e-health consumption, including increased medical knowledge, more physician information contact, and additional treatment visits (Henry & Wyatt, 2002; Lee, 2008). Lee (2008) suggests that people who consume e-health information become sensitized to their health, which leads to more frequent visits to HCPs. In this paper, we further previous studies by looking at channel complementarity theory and the concept of patient-centered communication for possible explanations of why e-health consumption seems positively related to patient-provider communication.

3. Theoretical background

3.1. Channel complementarity theory

Channel complementarity theory (CCT; Dutta-Bergman, 2004a, 2004b, 2006) clarifies the relationship between online and offline health information seeking by recognizing that different media can serve similar functions for a consumer (Dutta-Bergman, 2006). According to CCT, when an individual consumes one channel to attain specific content he or she will also consume other channels that are likely to fulfill his or her need for the specific content (Dutta-Bergman, 2006). For example, people who are committed to consuming content about health are likely to read health magazines and are also likely to search the Internet or other sources that fulfill the function of providing information about health. Rather than displacing each other, CCT suggests that patients strategically select media and health providers as complementary sources to manage medical uncertainty and satisfy information needs (Rains & Ruppel, 2016).

We suggest that complementarity between HCPs and new technology may look as follows. People may seek online health information for themselves or others but because the quality of information on the Internet is variable lay people may struggle to interpret medical information on the Internet (Freidson, 1985; Scanfeld, Scanfeld, & Larson, 2010). Individuals who are unable to understand online health information will be left with uncertainties and those who do not trust online health information will also generate more questions regarding the online information. Those uncertainties and questions will push people back to doctors for help. Doctors become a formal and final channel for patients to solve their functional needs for health information. Equipped with questions cultivated from online information, patients are likely to be more involved in seeking information at doctors' appointments, for example bringing a list of questions or concerns to doctor appointments.

Hypothesis 1. *e-health consumption is positively associated with patient involvement in health information seeking from doctors.*

Patients who are involved in seeking health information during doctor's appointments are in turn more likely to have positive perceptions of health care quality. Indeed, research has shown that patient ability to be actively involved affects patient perceptions of health care quality. Most patients expect to influence and take responsibility of the health care they receive from doctors (Staniszewska & Ahmed, 1999). And patient involvement in medical decision-making contributes to patients' satisfaction in the health care they receive (see Ottosson, Hallberg, Axelsson, & Loveén, 1997). Therefore, we propose:

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