HOW eHEALTH LITERACY IMPACTS PATIENT-PROVIDER RELATIONSHIPS: A STUDY ON TRUST, SELF-CARE, AND PATIENT SATISFACTION

Jacquelyn J. Cheun

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2017

APPROVED:

Gul Seckin, Major Professor
Susan Eve, Committee Member
Ami Moore, Committee Member
Dennis Thombs, Committee Member
Daniel Rodeheaver, Chair of the Department of Sociology
David Holdeman, Dean of the College of Arts and Sciences
Victor Prybutok, Dean of the Toulouse Graduate School

It has been well established, in the literature, the association between low health literacy rates and poor health outcomes. With the increase of technology dependence, more people are using the internet to look up health information. Research has shown that shared decision making between providers and patients can improve patients’ health outcomes. This research aims to examine whether electronic health (eHealth) literacy impacts patient-provider relationships. This research will also examine how geography specifically state residency impacts eHealth literacy rates. Data collected from a national sampling of online health and medical information users who participated in the Study of Health and Medical Information in Cyberspace \((N = 710)\) is used to construct structural equation models from SPSS AMOS v. 20.0. After path analysis, the results shown that white males with higher education were more likely to have higher eHealth literacy rates and that eHealth literacy rates are associated with better self-care, higher patient satisfaction and increased trust in provider. Also, state residency does not have an impact on eHealth literacy rates. eHealth literacy will be significant in patient-provider relationships. Program development should be established on focusing on eHealth literacy across the lifespan. Also, it will be important to review federal policy on technology disbursements in order to achieve national goals on eHealth literacy rates.
ACKNOWLEDGEMENTS

I would like to thank Gul Seckin, my dissertation chair, for providing extensive guidance for this project. She taught me to strive for excellence in my work and I have greatly benefitted from her assistance and encouragement. She also granted me access to her data, without this I would not have been able to have this dissertation. I would also like to thank the other members of my dissertation committee, Susan Eve, Ami Moore, and Dennis Thombs for their feedback throughout the creation and revision of this research and throughout my four years in the doctoral program. Their professional advice has helped me become a better researcher, a better teacher, and a better sociologist. I would also like to thank Becky Knight for being a constant pillar of support throughout my doctoral education.

I would like to thank my parents and my family, for their never-ending encouragement. My parents demonstrated the importance of hard work and discipline, and my family for their constant support and motivation. I want to thank Mark Saber for being my Brooke. Finally, I would like to thank my friends and colleagues for being there through the ups and downs during this process. It was with this great encouragement that helped me to overcome challenges and complete my doctoral education.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>vi</td>
</tr>
<tr>
<td>CHAPTER 1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Significance and Purpose of the Study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Research Questions</td>
<td>4</td>
</tr>
<tr>
<td>CHAPTER 2. LITERATURE REVIEW</td>
<td>6</td>
</tr>
<tr>
<td>2.1 Dependency on Electronic Resources</td>
<td>6</td>
</tr>
<tr>
<td>2.2 Electronic Health Literacy (eHealth Literacy)</td>
<td>11</td>
</tr>
<tr>
<td>2.3 Conceptual Model</td>
<td>26</td>
</tr>
<tr>
<td>2.4 Theory</td>
<td>26</td>
</tr>
<tr>
<td>CHAPTER 3. DATA AND METHODS</td>
<td>38</td>
</tr>
<tr>
<td>3.1 Data</td>
<td>38</td>
</tr>
<tr>
<td>3.2 Variables and Measurements</td>
<td>39</td>
</tr>
<tr>
<td>3.3 Data Analysis</td>
<td>46</td>
</tr>
<tr>
<td>CHAPTER 4. RESULTS</td>
<td>47</td>
</tr>
<tr>
<td>4.1 Descriptive Statistics</td>
<td>47</td>
</tr>
<tr>
<td>4.2 Path Analysis</td>
<td>48</td>
</tr>
<tr>
<td>CHAPTER 5. DISCUSSION</td>
<td>62</td>
</tr>
<tr>
<td>5.1 Discussion</td>
<td>62</td>
</tr>
<tr>
<td>5.2 Summary of Findings</td>
<td>63</td>
</tr>
<tr>
<td>5.3 Theoretical Implications</td>
<td>67</td>
</tr>
<tr>
<td>5.4 Limitations</td>
<td>68</td>
</tr>
<tr>
<td>5.5 Policy Implications</td>
<td>69</td>
</tr>
<tr>
<td>5.6 Future Research</td>
<td>70</td>
</tr>
<tr>
<td>5.7 Conclusions</td>
<td>73</td>
</tr>
<tr>
<td>COMPREHENSIVE REFERENCE LIST</td>
<td>75</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>3.1</td>
<td>EFA of Self-Care</td>
</tr>
<tr>
<td>3.2</td>
<td>EFA of Trust</td>
</tr>
<tr>
<td>3.3</td>
<td>EFA of Patient Satisfaction</td>
</tr>
<tr>
<td>3.4</td>
<td>19-Item eHealth Literacy Scale</td>
</tr>
<tr>
<td>4.1</td>
<td>Descriptive Statistics for All Variables</td>
</tr>
<tr>
<td>4.2</td>
<td>CFA of Dependent Variables</td>
</tr>
<tr>
<td>4.3</td>
<td>Goodness of Fit Indices of Each Model</td>
</tr>
<tr>
<td>4.4</td>
<td>Standardized Regression Results for Full Model</td>
</tr>
<tr>
<td>4.5</td>
<td>Final Model: Regression Predicting Respondents’ eHL Rate, U.S. Adults 2011</td>
</tr>
<tr>
<td>4.6</td>
<td>Indirect and Direct Effects of Trust</td>
</tr>
<tr>
<td>4.7</td>
<td>Indirect and Direct Effects of Patient Satisfaction</td>
</tr>
<tr>
<td>4.8</td>
<td>Indirect and Direct Effects of Self-Care</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Conceptual model</td>
<td>26</td>
</tr>
<tr>
<td>4.1</td>
<td>Hypothesized path model</td>
<td>52</td>
</tr>
<tr>
<td>4.2</td>
<td>Conceptual path model</td>
<td>53</td>
</tr>
<tr>
<td>4.3</td>
<td>Full path model</td>
<td>54</td>
</tr>
<tr>
<td>4.4</td>
<td>Final path model (Amos output)</td>
<td>59</td>
</tr>
<tr>
<td>4.5</td>
<td>Final model</td>
<td>61</td>
</tr>
</tbody>
</table>
1.1 Significance and Purpose of the Study

Making good healthcare choices is a challenge, but it requires a level of health literacy. Health literacy is the ability to obtain, process and comprehend basic health information that is needed to make good health decisions (US Department of Health and Human Services, 2015). For instance, it is the ability to understand prescription drug directions, to follow the discharge instructions from a healthcare provider and/or enroll in a health insurance plan. The National Action Plan to Improve Health Literacy (US Department of Health and Human Services, 2010) states 9 out of 10 people struggle with health literacy. Everyday there is an overwhelming amount of health information people must process such as reading a nutritional label, or health advertisements in the media. Individuals without proper skills to navigate through the health information could find inaccurate information which may lead to harmful health choices (Tennant, Stellefson, Dodd, Chaney, Paige, and Alber, 2015; Neter and Brainin, 2012). The need to increase health literacy across the U.S. is a well-known concern as demonstrated by the national health literacy objectives found in Healthy People 2020 (US Department of Health and Human Services, 2000).

With electronic dependency increasing, research and policy have determined the best solution is the internet (Henwood et al., 2003). People need to be more than health literate; they need to have capabilities, resources, and motivation to find, understand, and appraise health information when using digital health services (Norman and
Skinner, 2006). Previously health information was available in pamphlets and brochures in doctor’s offices, libraries, or public service facilities. Due to the Green Movement, less health information is found on paper, as records are now digital (Begany, 2014). Currently, there is no law that prevents the publication of inaccurate health information either online or in print from non-healthcare providers, however the Plain Writing Act of 2010 (Public Law 11-274, 111th Congress) does mandate government websites use plain language and be easy to understand making health information easier for those whom are health illiterate. The average reading level of American adults is at a 7th to 8th grade level (Readability, 2016) with such a low reading level there is an increasing the risk for poor health. It is well-known that there is an association between low-health literacy rates and poor health (US Department of Health and Human Services, 2010).

Since health information has been placed on the internet, healthcare decisions have become increasingly challenging. Electronic health (eHealth) information is any health information in digital form. eHealth information plays a major role in consumer health (Stellefson, Hanik, Chaney, Tennant, and Cahavarria, 2011) as, there is an assumption that patients not only have access to the internet but also have some education on health information (Karnoe and Kayser, 2015; Henwood et al., 2003). Telemedicine is being used across the country to assist in preventive and sustainable medicine; yet, some populations do not have access to a computer or internet (Srinivasan, 2014). When a person does not have access to internet or eHealth information can struggle with eHealth literacy which may cause their health to be at risk (Norman and Skinner, 2006; Mitsutake, Shibata, Ishii and Oka, 2012; Seckin et al., 2016). For example, a person may research their symptoms on the internet, find that
their symptoms correlate with ‘X’ illness, and then make a decision to act on the eHealth information they found. Based on the prevalence of eHealth, it is now critical to expand the definition of health literacy to include electronic literacy.

Due to the Patient Protection and Affordable Care Act (2010), electronic enrollment of individuals in federal and state health and human services programs is mandatory as well as health records becoming electronic\(^1\). Today, it is common after an office visit or outpatient test, for patients to be encouraged to access their charts via an online portal to look up labs results. It may also be suggested they go home and do research on their illness. For example someone with hypertension may be instructed to look for low salt diets. With the dependence on eHealth information increasing, the study of eHealth literacy (eHL) will be important to understand if eHL will become an indicator of health disparities or is an opportunity to decrease health disparities. Research already has shown there is a digital divide or communication inequalities (Mayberry et al., 2011; Viswanath and Kreuter, 2007).

With the rapid surge of eHealth information resources, it is critical to increase eHealth literacy in order to benefit overall health. This digital revolution will have an impact on how physicians and healthcare systems interact with patients (Weiner, 2012). This research will contribute to the field of medical sociology by using Parsons (1951) sick role to examine how eHL impacts provider-patient relationships. Parsons (1951) sick role created the social norms of the sick person and healthcare provider, now with the increase dependency of eHealth information the social norms have begun to change. This study looks at the changing dynamic of provider-patient relationships and

---

\(^1\) Patient Protection and Affordable Care Act, Section 1561
how Parsons sick role will need to evolve. Across the world, researchers all agree that high eHL rates are more likely to improve overall health (Mitsutake, Shibata, Ishii and Oka, 2012; Seckin et al., 2016).

The Institute of Medicine (1998) suggested to increase eHealth literacy levels (Huber, Shaprio, & Gillaspy, 2012; Norman & Skinner, 2006) as well as from Healthy People 2020 (US Department of Health and Human Services, 2000). Healthy People 2020 is a set of goals and objectives with 10-year deadlines to guide national health measurements and disease preventions to improve the health of Americans (US Department of Health and Human Services, 2000). Having a sociological perspective can allow critical analysis in social demographics such as age, socioeconomic status (SES), and education which may play in role in eHealth literacy rates. The purpose of this study is to provide better awareness and sensitivity to treat individuals and improve their overall healthcare experiences. This research has four main goals.

The first goal is to understand the impact of eHealth literacy on provider-patient relationships. Secondly, this research will examine the influence of eHealth literacy rates on trust. Third, to present the social determinants of eHealth literacy such as geographic location, gender, SES, education, race/ethnicity, and age. Fourthly, to explore the eHealth literacy among geographic location in the United States.

1.2 Research Questions

In order to reach the stated goals, the following four research questions are addressed in this study:
1. Does eHealth literacy rate have an impact on patient’s trust concerning their doctors?
2. Does eHealth literacy rate have an influence on patient’s self-care?
3. Does eHealth literacy rate have an effect on patient’s satisfaction?
4. Does geographic location have an impact on eHealth literacy?
2.1 Dependency on Electronic Resources

The United States has increased implementation of electronic infrastructure to improve the nation’s health literacy (Srinivasan, 2014). Through the Patient Protection and Affordable Care Act (2010), the U.S. Department of Health and Human Services, in partnership with the Office of National Coordinator for Health Information Technology has the authority to establish programs to improve healthcare quality, safety, and efficiency through the promotion of health IT, including electronic health records (EHRs) and private and secure electronic health information exchange. In order to reach a broader audience at an efficient rate, most of the nation’s health communication is online, for example, the Health Insurance Marketplace and Medicare enrollment. However, there is not a regulation on the accuracy of health-related information published online (Diviani, Putte, Giani and Weert, 2015). Without the eHealth literacy skills to appraise whether or not this information is accurate, the risk for poor health decisions increases. The Plain Writing Act (2010) was established to keep health information clear, easy-to-understand, and accurate on government websites (Srinivasan 2014). The U.S. Department of Labor is responsible for writing and overseeing that all government documents are using the Federal Plain Language Guidelines (Plain Writing Act of 2010, The). The increase in the amount of eHealth information that is accessible to patients has increased proportionally with the increase in the desire for patients to assume more responsibility for their health (Henwood,
Wyatt, Hart, and Smith, 2003). The government’s dependency on online enrollment has increased, even though there are still disparities in accessing the internet or computer. This was shown by the low online enrollment of health insurance through the Health Insurance Marketplace (Sun, 2013). It is important to assess to the eHealth literacy rates to improve national health.

Patients with high health literacy were more likely to adopt personal health records and engage in their health (Noblin, Wan and Fottler, 2012). Ideally, the use of internet will “lead to more informed patients who are better able to assess the risks and benefits of different treatments for themselves… [and] increase consumer control and self-reliance” (Henwood et al., 2008, p. 590). The idea is that patients/consumers will take more responsibility for their own health through self-care from the health information gathered on the internet (Henwood et al., 2008). The benefits of having health information on the internet for can range from easier access to health information for patients, the patients ability to view their personal medical records as well as improved access to healthcare providers (Gutierrez et al., 2014). Patients who were younger, lived in urban areas, educated were more likely to use the internet in making personal health choices these demographics held true when patients had chronic health conditions as well (Duplaga, 2015).

2.1.2 Digital Divide

Accessing information online is now the norm. Eight out of 10 internet users are looking online for health information (Begany, 2014); “70% of Americans used online resources for making healthcare decisions” (Gutierrez et al., 2013, p. 84). However, it is
remarkable that a large number of American citizens still have very limited or no access to the internet. People who lack access are missing out on an opportunity to improve their health and eHL (Begany, 2014). Access to and reliability of the internet varies greatly across the United States depending on geographic location, gender, race/ethnicity, age, and education; this is known as the digital divide (Srinivasan, 2014). Approximately 19 million Americans-about six percent of the population- still lack access to the internet (Begany, 2014) making it difficult to access eHealth information. In a national survey, researchers found that “74% of Americans use the internet. Non-Hispanic whites (76%), younger adults, a college education and income greater than $75,000 annually (94%) were most likely to use the internet” (Gutierrez et al., 2014, p. 84). Having access to the internet also does not ensure that broadband speed is similar across the United States. According to the National Broadband Map, the average speed is around 11.1 Mbps varying greatly from rural (less than 3 Mbps) to urban (1 Gbps) (Broadband Statistic Report 2015). Another report indicated that 62% of U.S. households had computers in their home, but 55% had internet access and 20% had broadband (Dewan and Riggins, 2005).

In addition to these- income, education, age- geographical location, race, and gender play major roles in determining who owns a home computer and who has home access to the internet (Wilson, Wallin, and Reiser, 2003; Bucy, 2000). A researcher studied college students, who have free internet access on campus, found that rural students had less internet access than students from urban areas (Wilson et al., 2003). In other research, it was also suggested that urban college students were better at obtaining eHealth information than rural; however there was no difference on the ability
to appraise the information between the group (Stellefson, Hanik, Chaney, B., Chaney, D., Tennant, and Chavarria, 2011).

It is well-known that health spending varies between states (Martin, Whittle, Heffler, Barron, Sisko, and Washington 2007). According this research study, the New England region spends the most on healthcare compared to any of the other regions; the South spends the least. This is positively correlated with higher personal income and more healthcare providers per capita (Martin et al., 2007).

Education is a major factor in whether an individual has computer access and eHL skills (Bucy, 2000; NTIA, 2000). Americans with a college education are almost six times more likely to have a home computer and internet access compared to those with an elementary education (NTIA, 2000). Bucy (2000) also confirmed that participants with a college degree reported more internet access than non-degree holders.

Some studies have shown that age is a factor in eHL (Brown and Dickson, 2010; Neter and Brainin, 2012; Seckin et al., 2016). A study by Neter and Brainin (2012) showed in a confirmatory factor analysis that younger individuals and those with more access to internet had higher eHL. In another study, age was also negatively correlated with internet meaning older participants used the internet less (Bucy, 2000). 552 individuals responded to a questionnaire that was analyzed using bivariate logistic regression. The survey of 56 questions showed that black, rural, and female participants were significantly less likely to have home internet than white, urban, male participants. After income, education, age, work status, marital status, and children living at home were controlled; the only significant variable was race (Wilson et al., 2003). In a secondary analysis of a national survey, over 5,000 adults self-reported their access to
a personal computer, Hindman (2000) found that minority, low income and residents in rural areas who were less educated lacked access to telephone, computers and internet.

Affordability is also major obstacle in gaining access to internet or a computer. The expense of owning a computer and accessing the internet may be challenging to those with lower socioeconomic status (Wilson et al., 2003). Bucy (2000) found that individuals with an annual income of $50,000 or higher use the internet more than either the middle or lower class. Approximately, 100 million Americans do not subscribe to a broadband service (NTIA, 2000) because it is too expensive. Americans can pay up to twice the amount than other countries (Begany, 2014).

One example of the benefits of eHealth Literacy was shown in a focus group, patients who have diabetes with Internet access and eHL were more likely to use their online patient charts and research diabetes medications or treatments (Mayberry, Kripalani, Rothman, and Osborn, 2011). Individuals who lack access to technology (mainly internet) are missing out on information to improve their health and lives. eHealth literacy can improve a person’s health and the lives of their loved ones. Dewan and Riggins (2005) found that one of the most important aspects of inequality has to do with the differences in computer skills. Research has discovered that even “easy-to-read” resources do not guarantee information will be accessible because of the lack of access to a computer or lack of understanding of how to access the internet (Huber et al., 2012). An online survey of sixty-three women with HIV found an association between high risk HIV behaviors and limited online access and low eHealth literacy rates (Blackstock et al., 2015). Researchers have shown that implementing successful
online interventions (by phone or computer) were challenging due to the digital divide in urban populations (Balckstock et al., 2015; Viswanath and Kreuter, 2007).

Duplaga (2015) surveyed patients with chronic diseases found that patients who were younger, more educated and living in an urban area were more likely to use eHealth services. As electronic dependency increases so does the variety of eHealth services. For instance, renewing prescription drugs, making appointments and telemedicine all can be accomplished by having access to the internet.

2.2 Electronic Health Literacy (eHealth Literacy)

In 1999, the American Medical Association defined health literacy as the “set of skills, including the ability to perform basic reading and numerical tasks, required to function in a healthcare environment” (American Medical Association, 1999, p. 553). It wasn’t until 2003 that health literacy was on the Healthy People 2010 objectives (Healthy People, 2015). Today, Healthy People 2020 still has improve health literacy rates as an objective, but now it includes increasing the proportion of people who use eHealth information and service to manage their health. Many scholars have written about how health literacy is sought and obtained. Articles have been written about a person’s ability to evaluate information, communication and make decisions (Seckin et al., 2016; Neter, Brainin, Baron-Epel, 2015). Over time the social construction of health literacy has evolved now it must include eHealth as another dimension of the evolving health literacy definition (2016; Srinivasan, 2014). In 2003, eHealth was defined as an emerging field at the intersection of medical informatics, public health, and business, and refers to health services and information delivered or enhanced through the Internet.
and related technologies (Feldman, 2003). Then almost ten years later, Srinivasan (2014) defined eHealth literacy as “the level of awareness that the individuals in a region have toward the resources, opportunities, education, and knowledge of health issues occurring around them in a digital format in any given time” (p. 24). Both of these definitions of eHealth mention the key words technology and internet; however, the current definition on health literacy does not. The US Department of Health and Human Services defines health literacy as:

Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Health literacy is a complex phenomenon that involves individuals, families, communities and systems. The concept of health literacy extends to the materials, environments, and challenges specifically associated with disease prevention and health promotion. Health literacy incorporates a range of abilities: reading, comprehending, and analyzing information; decoding instructions, symbols, charts, and diagrams; weighing risks and benefits; and, ultimately, making decisions and taking action. (Clear Communications, 2015)

Nowhere in this definition does it mention technology or internet. Scholars have confirmed the need to broaden the definition of health literacy (Neter, Branin and Baron-Epel, 2015; Seckin et al., 2016) to include modern aspects health literacy such as technology and the internet (Batterham, Hawkins, Collins, Buchbinder, and Osborne, 2016). Since health literacy is mainly determined by an individuals' characteristics (reading level, vocabulary, knowledge), and their environment, it is difficult to measure (Baker, 2006). Nutbeam (2008) discussed that health literacy needed to evolve. The original measurement of health literacy was from the US Department of Education called the National Assessment of Adult Literacy (NALS) (Huber, Shapiro, and Gillaspy, 2012). In 2006, Norman and Skinner developed an eight-item measurement to improve how health literacy was measured. The electronic health literacy scale (eHEALS) was
established to address the need for electronic literacy in the current healthcare system. Norman and Skinner (2006) created this scale by using the Lily-model and reducing it by an iterative process, sending it to various colleagues working with health literacy. During this review process, Norman and Skinner (2006) sent out a questionnaire to 89 young adults (aged 14 to 24 years) out of convenience. Subsequently, it was modified according to the feedback from their colleagues and the results from the survey participants. In its final model, eHEALS had eight items scored on a 5-point Likert scale ranging from strongly agree to strongly disagree. The following are the eight items:

Q1: I know how to find helpful health resources on the Internet
Q2: I know how to use the Internet to answer my health questions
Q3: I know what health resources are available on the Internet
Q4: I know where to find helpful health resources on the Internet
Q5: I know how to use the health information I find on the Internet to help me
Q6: I have the skills I need to evaluate the health resources I find on the Internet
Q7: I can tell high quality from low quality health resources on the Internet
Q8: I feel confident in using information from the Internet to make health decisions. (Norman and Skinner, 2006)

eHEALS was developed to measure consumers’ combined knowledge, comfort, and perceived skills at finding, evaluating, and applying electronic health information to health problems. Since this publishing of eHEALS, it has been validated globally and translated into numerous languages. Soellner, Huber, and Reder (2014) used eHEALS in Germany to study the eHealth information seeking and the appraisal of this information using the eHEALS scale. In a systematic review of eHealth literacy, Karnos and Kayser (2015) found 41 different articles using eHEALS, the original eHEALS was used on young adults, however, these articles conducted eHEALS on a variety of populations (older and minority) showing that eHEALS is versatile to any population.
Even though, eHEALS is widely used when studying health literacy, many scholars believe it is not an adequate measurement for understanding an individual’s abilities to interact with eHealth information and technology (Duplaga, 2015; Karnos and Kayser, 2015; Neter and Brainin, 2012). In 2016, Seckin and associates (2016) created a 19-item scale called electronic Health Literacy scale (e-HLs) which goes beyond the traditional measures of eHEALS by using exploratory factor analysis and confirmatory factor analysis to include interactive, communicative parts of literacy as well as the critical evaluation skills of information from internet resources.

2.2.2 Self-Care

Research has directly correlated health literacy to health information (Diviani et al., 2015; Park and Lee, 2015; Neter and Brainin, 2012), specifically consumer health information in order to make informed healthcare decisions (Huber et al., 2012). It has been established that individuals with high eHL are more likely to seek out eHealth information (Britt and Hatten, 2013). Literature has suggested that increase eHL also improves patient empowerment (Batterham, Hawkins, Collins, Buchbinder, and Osborne, 2016; Schulz and Nakamoto, 2012). Patient empowerment is a process in which patients understand their role through knowledge and skills developed by healthcare providers in order to have an active role in decisions and actions affecting their health (WHO, 2009). Literature has also shown that lower health literacy is correlated with a lower desire to participate in healthcare decisions (Ishikawa and Yano, 2008). Consistently, throughout the literature eHL is shown to have a positive effect on self-care behaviors (Blackstock et al., 2016; Park et al., 2014; Mitsutake et al., 2012).
Yet, according to the National Action Plan to Improve Health Literacy, "nine out of ten individuals have difficulty using everyday health information that is available from healthcare facilities, retail outlets, media and communities" (Huber, Shapiroll & Gillaspy, 2012, p. 439). The National Action Plan to Improve Health Literacy (2010) was created on the expectations that all people have the right to health information to help them make informed health decisions and health services should be easy to understand in a way that improves health, longevity and quality of life. From these expectations there were seven goals with strategies created to improve health literacy.

Characteristics common to a health information seeker include being educated (Duplaga, 2015; Milne et al., 2015), being of higher socioeconomic status and being white (Huber, Shapiroll & Gillaspy, 2012; Diviani et al., 2015). People with at least some college education and access to a computer are significantly more likely to have a high eHL (Milne et al., 2015). Health literacy rates fluctuate between different social factors. Age is a significant factor in health literacy rates (Paek and Hove, 2012; Seckin et al., 2016). Older adults have a lower health literacy rate than younger adults (Paek and Hove, 2012). It is no surprise that since younger generations are more active consumers of the internet and use more search strategies they have high eHL levels (Neter and Brainin, 2012). eHL rates in low-income homebound individuals were negatively associated with age and positively associated with internet usage when controlling for age (Choi and Dinitto, 2013). Households with English as a second language were also associated with lower levels of eHL (Knapp et al., 2011). Gender also is a factor however there is not a clear consensus. Cho, Park and Lee (2014) found that males and higher educated people had significantly higher eHL. While another
study found that females were more likely than males to use the internet to seek eHealth information (Tennant et al., 2015). These mixed results may be due to males being more comfortable with technology (Wilson et al., 2003), but less health seeking.

In an online survey, eHL was significant factor in health seeking behaviors (Britt and Hatten, 2013). For instance, 396 college students were surveyed about the HPV vaccine. After structural equation modeling, researchers found there was significance in the intent to get vaccinated and actually getting vaccinated ($r=.13$, $\alpha=0.93$) (Britt, Collins, Wilson, Linemeier, and Ehglebert, 2015). eHL affected the understanding of prevention, in this case HPV, without eHL the survey participants would not have a clear understanding or process the eHealth information on HPV. When Blackstock and associates (2016) studied communities with a high prevalence of HIV, researchers found that eHL was correlated with knowing HIV transmission risk behaviors. Other research shows that adults with high eHL were more likely to get Colorectal Cancer screenings (Mitsutake, Shibata, Ishii, and Oka, 2012). This likelihood increased when adults were older, married, higher educated and had a higher household income. This could be associated with access to internet or the age associated risk of Colorectal Cancer. In oral health, research has shown that increase eHL levels were associated with better oral health (Guo, Logan, Dodd, Muller, Marks, and Riley, 2014). When studying 2115 adults in a cross-sectional internet-based survey, research showed that eHL had a positive association with diet and exercise. After univariate analysis, cigarette smoking, exercise, alcohol consumption, and a balanced diet were all significantly related to eHL (Mitsutake, Shibata, Ishii, and Oka, 2016).
As mentioned previously, Britt and colleagues (2015) found a similar result when studying college students. The results showed that eHL was significantly associated with the intent to get vaccinated, but not the follow through (i.e. getting vaccinated). This may be due to the participants’ level of empowerment. When 59 respondents diagnosed with diabetes were surveyed, 23% were shown to have low eHL based on eHEALS and high computer anxiety (Mayberry, Kripalani, Rothman, and Osborn, 2011). Young adults are not the only ones with low patient empowerment. Duplaga (2015) found that patients who had positive experiences using a computer and the internet were more likely to accept eHealth solutions and services. Xie (2011) found that older adults (aged 56-91 years old) who had a positive attitude toward technology were more likely to learn about eHealth services and improve their eHL. Schulz and Nakamoto (2013) noticed that empowered patients lacking proper knowledge and appraisal skills could make dangerous choices. However, high eHL patients who lack empowerment are just as likely to need a healthcare provider to make health decisions.

It is important that providers begin to know their patients’ eHL rates prior to discharge instructions (Milne, Puts, Papadakos, Le, Milne, V., Hope, Catton, Giuliani, 2015) through improving communications with their patients. Horwitz (2016) found that more than half of the patients had difficulty carrying out discharge instructions, even though, they reported to have no difficulties understanding what to do. One of the features of eHL is the ability to apply the healthcare information that is appraised and understood to problem solving. In Horwitz (2016) study, eHL is important in order to manage care outside of the hospital and have a successful recovery. Brown and Dickson (2010) surveyed college students; they showed that the students reported
confidence in their ability to critically appraise eHealth information. However, they were less confident about the ability to use the information to make decisions without consulting a healthcare provider (Brown and Dickson, 2010). A study using eHEALS, high school students were surveyed about their eHL and knowledge about eHealth information. It was found that even though students self-reported high eHL their ability to appraise eHealth information was low (Ghaddar, Valerio, Garcia, and Hansen, 2011). It was not until after students were taught about reliable sources\(^2\) did their appraisal and eHL increase (Ghaddar et al., 2011). Paek and Hove (2012) also found that teaching what reliable sources were among middle school students improved their eHL, which suggested educators need to make eHL programs relevant to adolescents. Another study suggested that healthcare professional programs should develop their students’ ability to appraise, use and evaluate eHealth information (Stellefson et al., 2011).

Research has shown the patients with low eHL do not have the skills to use eHealth information correctly; they have difficulties formulating a search query or using a search engine, they lack the ability to critique the eHealth information, or interpret the eHealth information (Britt et al., 2015) and find relevant eHealth information (Park and Lee, 2015). It is interesting that those with low eHL have difficulties using a search engine since research has found that over half who search for eHealth information start by using Yahoo or Google (Goidel, Kirzinger, Defleur, and Turcotte, 2013). Still a lack of these skills does have an effect on a patient’s health outcomes (Park and Lee, 2015; Xie, 2011). Tennant et al. (2015) conducted a telephone survey of a random sample of older adults (mean age was 67.46 years). Using eHEALS, researchers found that as

\(^{2}\) Sources that have been vetted by the scholarly community
age increases eHL decreases, and as education increases, eHL also increase. As the number of older adults increases worldwide\(^3\), understanding how eHL impacts provider-patient relationship will be critical.

Knapp et al. (2011) studied parents whose children have special needs and looked at the impact of parents’ eHL on the health of their child. Parents may use eHealth information to help them make healthcare choices for their children- this is especially true for parents of special needs children. In cross-sectional telephone survey of parents enrolled in Medicaid and State Children’s Health Insurance Plan (SCHIP) results showed there were differences in eHL, confidence in following through with eHealth recommendations, and access to internet. 82% of the parents had access to the internet, however, about half of those had access at home, and the rest had access at work or on their mobile phones. Parents who were African-American, non-English speaking, older, and had less than a college education had difficulty using and accessing the internet (Knapp, Madden, Wang, Sloyer, and Shenkman, 2011). Those with difficulty also had a low eHL and low confidence in using the eHealth information (Knapp et al., 2011). These findings are consistent with previous research on eHL and internet access. This study highlights the influences of social environments on an individual’s health. In this case, children’s health outcomes are based on their parents’ eHL ability. Ishikawa and Yano (2008) found that those with lower literacy were more dependent on family/friends or healthcare providers to assist in making the final decision.

---

\(^3\) Over half the population in developed countries will be over the age of 65. This is also known as the Age Wave (Peterson, 1999)
2.2.3 Patient Satisfaction

Patient satisfaction is an important outcome measurement for evaluation of healthcare services (Sitzia and Wood, 1997). When Jackson, Chamberlin and Kroenke (2001) studied predictors of patient satisfaction, they found that age and timing of assessment were the biggest predictors of patient satisfaction. Other research found that patients’ expectations (Sitzia and Wood, 1997) and patients’ perception of care (Boudreaux, Ary, Mandry, and McCabe, 2000) were good determinates of patient satisfaction. A popular patient satisfaction survey is HCAHPS4 which is an inpatient-hospital based survey. It is used in over 4,000 hospitals (Giordano, Elliot, Goldstein, Lehrman, and Spencer, 2009). HCAHPS is an established national standard for collecting and reporting patients’ experiences. It was intended to assist patients in healthcare systems decision making and to incentivize healthcare systems (Giordano et al., 2009). However, outside of the hospital setting there is not a standard patient satisfaction survey. A current meta-analysis of patient satisfaction literature found five broad factors to have in a patient satisfaction measurement: (1) Communication Attributes, (2) Relational Conduct, (3) Technical Skills, (4) Personal Qualities, and (5) Availability and Accessibility (Boquiren, Hack, Beaver, and Williamson, 2015; Santos de Almeida, Bourliataux-Lajoinie and Martins, 2015).

Patient interactions with their healthcare provider, especially the one treating them, are important in shaping the healthcare experience (Platonova, Kennedy and Shewchuck, 2008) and subsequently improving health (Guo et al., 2014). There is a growing recognition of patients as “legitimate appraisers” and savvy medical users who

---

4 Hospital Consumer Assessment of Health Providers and Systems
have improved healthcare (Boquiren, Hack, Beaver and Williamson, 2015, p. 1466).
There is now a shift from users to consumers who want to be engaged and involved in their healthcare (Boquiren et al., 2015). According to research, patient engagement and participation contribute to health disparities (Johnson, Roter, Powe and Cooper, 2004).
For instance, patients who bring eHealth information with them to their visit may take up more of the provider’s time than a patient with low eHealth Literacy (Sillence et al., 2007). Johnson, Roter, Powe and Cooper (2004) researched the association of patient race/ethnicity on provider-patient relationships. A mixed-methods approach was used to determine that healthcare providers were more verbally dominant and less patient-centered with black patients than with white patients. During this study, both patient and provider demographics were controlled as well as how well the provider knew the patient. Controlling for how well the provider knew the patient is important because the longer a patient has known the provider the easier it is to communicate with them.

Currently, patient satisfaction rates are important indicators of the efficacy, quality, and feasibility of healthcare services (Boquiren et al., 2015; Giordano et al., 2009). Utilizing patient satisfaction as an indicator of reimbursement rates is used throughout the insurance companies and the government (Giordano et al., 2009). Patients value a healthcare provider who is willing to spend time with them and address their concerns, who is accessible, who can communicate information in an understandable manner (Boquiren et al., 2015; Johnson et al., 2004). Guo and associates (2014) found that higher levels of health literacy were associated with better communication between healthcare provider and patient. From previous eHL research, older, and less educated patients struggle with eHL (Britt et al., 2015) which means they
may also struggle with communicating with their healthcare provider. Ishikawa and Yano (2008) found that patients with low health literacy were less likely to adhere to treatment instructions, putting the patient at risk for an adverse outcome. Other research found that there was a greater dissatisfaction with care when eHL was low (Goidel et al., 2013). This could be due to communication barriers suggesting that increasing eHL may lead to increased patient satisfaction. Murray and associates (2003) did not find a difference in the quality of care given to the patient, when a patient brought in eHealth information. However, other research on searching for eHealth information after provider visit was due to not enough information from their provider during the visit, poor quality of care, or felt the information given was inaccurate (Bell et al., 2011). These reasons correspond to overall predictors of patient satisfactions (Jackson, Chamberlin and Kroenke, 2001).

2.2.4 Trust

Recently, medical sociologists have taken an interest in trust as it pertains to provider-patient relationships. Luhmann (1988) argues trust is the glue that holds everything together in social life because it reduces the complexity of how individuals think about the world around them. It allows them to make decisions in conditions of uncertainty. However, in health situations, there is more to trust than uncertainty, there is also risk involved (Mollering, 2001). Because of this multidimensional variable, trust becomes very difficult to measure, conceptualize, and operationalize within provider-patient relationships (Calnan and Rowe, 2005). Giddens (1994) realized that trust in

---

5 A firm belief in the reliability, truth, ability, or strength of someone or something.
healthcare was not dichotomous (only between the patient and healthcare provider), but there was also an institutional level of trust. Interpersonal trust is regarded as being negotiated between individuals and as a learned personal trait. While institutional trust is place on the institution, it is learned from by sets of institutional rules, laws and customs (Giddens, 1994; Meyer and Ward, 2013). Patients have placed their trust in healthcare providers for years and healthcare providers have learned to assume patients will trust them. According to Thom, Hall and Pawlson (2004) a patient who trusts their provider is more likely to seek care and comply with treatments compared to a patient who does not trust.

Luhmann (2005) argues that if there is no risk associated then there is confidence rather than trust. Confidence can be from familiarity or past experience. Confidence is self-assurance while trust is confidence in or reliance on another. A person who decides to trust knows they are lacking knowledge and still chooses to trust (Meyer and Ward, 2013) thus needing familiarity. From interviewing people with coronary artery disease, it was established that Luhmann (1988) was correct. The lack of risk from a health situation did not warrant consideration of trust (Meyer and Ward, 2013). Meyer and Ward (2013) found that in emergent or high risk health situations it is not trust that the patient has towards the healthcare provider, but dependence. Dependency has been shown to vary based on social factors. Factors associated with dependency are age, gender and health status (Kim, 2014). Duplaga (2015) confirmed this when studying patients with chronic conditions. It was found that the duration of the chronic disease and the length of hospital stay had a positive correlation on the adoption of eHealth services, however social determinants still played a role. Healthy
People 2020, suggest that using eHealth services will improve communication in the patient-provider relationship (U.S. Department of Health and Human Services, 2000). Patients who were more educated, younger and lived in an urban area were more likely to accept eHealth services (Duplaga, 2015). The National Action Plan of Improve Health Literacy (2010) found that without clear information and understanding of health information people were more likely to skip necessary medical tests. This shows how important eHealth literacy is on patient’s willingness to comply with their provider treatments.

Critically evaluating eHealth information can be overwhelming (Seckin et al., 2016), which may be why most patients prefer healthcare provider provided information (Silence, Briggs, Harris, and Fishwick, 2007; Bell, Hu, Orrange, and Kravitz, 2011; Gutierrez et al., 2013). Patients who are less educated, older (aged 55-70) (Manafo and Wong, 2012), and have a lower SES reported more difficulty in evaluating eHealth information (Goidel, Kirzinger, Defleur and Turcotte, 2013). Patients who have a low eHL are more likely to be less confident in the appraisal of eHealth information (Park, Moon, Baeg, 2014; Robb and Shellenbarger, 2014). One study found that 85% of healthcare providers have experienced a patient bringing in health information found on the internet and wanted to have it explained to them and wanted their provider’s opinion on it (Murray, Lo, Pollack, Donelan, Catania, Lee, Zapert, and Turner, 2003). Going to your healthcare provider is still an important part of the sick role (Parsons, 1951; Parsons, 1975). eHL rates are not an accurate predictor of self-diagnosis accuracy (Hu and Haake, 2010) patients should still to go to their healthcare provider for diagnosis and treatment. However, there is research on patients seeking eHealth information prior
to their appointment (Hu et al., 2012). Patients with high eHL turn to the internet first, in order to be informed about a topic prior to visiting a healthcare provider (Sillence et al., 2007). As stated earlier, research has shown patients still go to their provider for guidance on eHealth information (Murray et al., 2003), which shows that providers need to be up-to-date with their own eHL skills (Mills, Francis, McLeod, and Al-Motlaq, 2015) by attending continue education lessons. In a pre- and post-test study, rural nurses and midwives were placed in a continue education program on eHealth information and the internet. The results showed that participants improved their eHL and learned valuable skills enabling them to improve their patient interactions (Mills et al., 2015). A telephone survey of 793 people confirmed a positive relationship with health literacy rate and patient-dentist communications (Guo et al., 2014), however, there is no evidence to support trust in a healthcare provider would be associated with eHL rates (Hu, Bell Kravitz and Orange, 2012). In a similar study, healthcare providers felt that their authority was being challenged and time during the visit was misused when patient brought in eHealth information because it was not appropriate for their health (Murray et al., 2003). For instance, a patient who brings in Viagra information, that want to have a prescription, but who have heart problem. Another study showed a greater dissatisfaction with care was associated with low health literacy rates (Goidel et al., 2013). After their visit with their provider, a patient’s feeling about their healthcare provider may change. Bell, Hu, Orrange, and Kravitz (2011) found that of their 274 participants, 187 (68.2%) searched for eHealth information after their visit which resulted in an inverse relationship of trust with their healthcare provider and a direct
relationship with worry. The respondents stated the main reason to search for eHealth information after a visit was curiosity.

2.3 Conceptual Model

Based on the literature, Figure 2.1 is the concept model for this study.

![Conceptual Model](image)

*Figure 2.1. Conceptual model.*

2.4 Theory

A methodology review of the eHealth and health literacy research showed that there was a lack of theory in the majority of the research (93.7%) (Mackert, Champlin, Holton, Munoz, and Damasio, 2014). This study uses Parsons (1951) sick role to drive the research.
2.4.2 Parsons Sick Role

Talcott Parsons is considered “a founding father” in regard to the origin and development of medical sociology (Williams, 2005, p.123). Parsons’ functional analysis develops illness as a form of social deviance, and creates the sick role as a device to control this deviance. Parsons (1951) discussed four essential features of the sick role, which involve a balance of rights and obligations. Even though Parsons is the founding father of medical sociology, today there are sociologists who refute and criticize Parsons’ original claims. As such, there is a wide range of support and criticism for the sick role in the body of literature.

Parsons (1951) argues that being sick is a socially constructed role, which means that certain expectations come with identifying oneself as sick. According to Parsons (1951), there are four essential features of the sick role based upon an ‘abstract set of institutionalized expectations’ (Segall, 1976, p. 163). The first feature is “the exemption of the sick person from the performance of his normal social obligations” (Parsons, 1951, p. 455). However, before the sick person can be exempt, the claim for exemption (i.e. being sick) must be socially defined and validated. The second feature states that the sick person is exempted from “a certain type of responsibility for his own state,” (Parsons, 1951, p. 456) meaning that the sick person cannot be expected to pull themselves together (or get better) without assistance; they are the victim. The third feature is legitimation; there is a set time. “No one is given the privileges of being sick any longer than necessary but only so long as they cannot help it” (Parsons, 1951, p. 456). The last feature is the need for help. Specifically, help from someone who is qualified to treat the illness. The person assuming the sick role must cooperate with the
qualified person (healthcare provider) in order to get well. This person must want to get
well. Overall, the sick role theory’s main goal is to heal the person back into society and
return to normal role capacity as quickly as possible (Williams, 2005).

The sick role makes the action of the healthcare provider paramount (Frank,
2013). The healthcare provider’s role in Parsons sick role theory must apply “his
technically competent skills in order to facilitate a swift recovery, guided as he is by
professional constellation” (Williams, 2005, p. 124). The healthcare provider must focus
on the welfare of the patient. This means to ignore commercialism and give
unconditional support to the patient. This does not mean to give into all of the patient’s
wants and desires. A healthcare provider must not allow “countertransference”
(Parsons, 1951, p. 457). For example, if the patient is upset the healthcare provider may
not get upset as well. A healthcare provider should keep personal emotions to
themselves. The healthcare provider must understand they have a power of
manipulation over the patient. The healthcare provider may not use this power for
personal gain or intimacy. Lastly, a healthcare provider is qualified to care for the sick
using their scientific training and competencies.

The role of the healthcare provider is modified as the sick role changes. The
healthcare provider role evolves from giving unconditional support to allow the patient to
get better (acute illness), to minimizing the patient’s restrictions because there is no
total cure (chronic illness) (Parsons, 1975). Government and healthcare policies are
transforming to adjust for the epidemiological transition. “The trick is to help these
patients to be able to take on a job” (Mik-Meyer & Obling, 2012, p. 1035). Grootegoed &
Van Dijk (2001) cites long-term care as just one example of a policy shift. With societies
increased electronic dependency, patients are seeking health information from the internet and more health services are becoming available electronic. As discussed previously, healthcare providers will have to adjust and welcome eHealth services (Paek and Hove, 2012).

Foucault’s literature also supported Parsons’ healthcare provider’s role in the sick role model. Foucault (1973) stressed medical control and shed light on the dominance healthcare providers had over the patient; whereas Parsons has stated that the healthcare provider’s main objective is the welfare of the patient. However, Parsons and Foucault agree that the healthcare provider has the monopoly of power in the provider-patient relationship. Parsons (1951) maintained that this process gives patients access to the sick role and gives medicine its power to legitimize and construct illness. Foucault suggests that the healthcare provider is seen as an agent of social control in order to ensure individuals conform to social norms. When a suffering person does not meet the requirements to be a “legitimate patient,” this patient is dependent upon the healthcare provider’s knowledge to legitimize their sickness (Mik-Meyer & Obling, 2012, p. 1031). However, with the increase availability of eHealth information more people are seeking eHealth information to make healthcare choices without a healthcare provider’s knowledge (Huber et al., 2012).

The healthcare provider role and sick role combine to form a role-set that Parsons (1951) argues is inherently functional. In this theory, being sick is not only considered an escape from social roles that people normally perform, but it is in itself a social role, which comes with certain rights and duties. Society has constructed sickness as unwanted; if a person is sick, they are obligated to seek professional help in
order to get well as soon as possible (Van Hal et al., 2013). According to Parsons (1975) being sick is an institutionalized role. The key is that one must first admit they are sick and be validated by a person who is qualified to care for the ill. This relationship is an asymmetrical hierarchy, meaning the healthcare provider has a monopoly of power in the relationship. Parsons (1951) states it is “the healthcare provider’s obligation to use his authority in the interest of the patient to correspond to the patient’s obligation faithfully” (p. 465). Even when a healthcare provider is a sick person, his or her role is the sick role, and that person is relieved of the healthcare provider role.

In terms of functionalism, labor participation is considered to be healthy for individuals. Parsons (1964) defines health as “a state of optimum capacity of an individual for the effective performance of the roles and tasks for which he has been socialized. It is thus defined with reference to the individual’s participation in the social system” (p. 274). Hal and associates (2013) perceived labor participation as a means to include people in an individualizing society and is a “vital contribution to society’s well-being” (p. 9). Parsons (1951) sick role allows for an illness to be an integral part of the social system. He demonstrated that it was medically legitimized to be unable to work as long as it was temporary. eHealth information and services may change how the workplace handles absenteeism. By using eHealth services, employers are able to give employees better employee health services, which may lower absences.

2.4.3 Criticisms of the Sick Role

The prevalence of medically unexplainable symptoms (MUS) has caused scholars to question the usefulness of the sick role, and has caused some to outright
refute the theory. Since the sick role is socially constructed the illness must thus be
socially valid. But socially validated by whom? When studying Fibromyalgia Syndrome
(FMS), Barker (2009) raised the question of what happens when the illness is not
legitimized and remains a contested illness. Those who were suffering from FMS were
struggling to get better with the assistance of a healthcare provider because there was
no biological or physiological explanation for this disease, which caused the healthcare
provider to not care for them. As a result, there were millions of people suffering from
FMS without treatment. Bourdieu's (1984) concept of habitus assumes that a person is
predisposed to a particular behavior through socialization, their experiences, and class
circumstances. Having access to the internet gave those who suffered from FMS a
community and resources to eHealth information about FMS (Barker, 2009) which led to
them having social validation of their illness through their peers and eventually
healthcare providers. This example shows that Parsons’ sick role cannot be without the
medicalization of the illness. With increase eHealth information, it raises the question
who is medicalizing the illness?

Without a diagnosis, the sick role does not work. Ignoring patients’ symptoms
forces patients into a stigmatizing role (Sabo et al., 2000). The person is unable to
acquire answers and continuing to experience symptoms that may be frightening
because of their unknown illness; patients may see themselves as more and more
disabled and traumatized, and “begin to see themselves as chronically ill” (Sabo et al.,
2000, p. 130). The sick role is heavily medicalized by changes in the popularization of
health (Burnham, 2014) the internet may play a role in increasing or decreasing
popularity. Peter Conrad (1992) supports Parsons’ sick role theory with his work in
medicalization. Medicalization is the process of a condition or behavior becoming defined as a medical problem, requiring a medical solution (Conrad, 1992). The medicalization of life’s natural processes such as birth, aging, menopause, and baldness has paved the way to disease mongering and increased pharmaceutical sales. However, some healthcare providers may not feel that menopause warrants a drug (Bell, 1987). This idea has opened research up to demedicalization, such that “a problem is no longer defined in medical terms and medical treatments are no longer deemed to be an appropriate solution” (Conrad, 1992, p. 224). Demedicalization does not support Parsons’ sick role theory. Parsons (1951) does note a level of uncertainty, when he states “the unknown may operate at any time to invalidate expectations built upon analysis of the known…” (p. 449).

Parsons’ sick role does not apply to mental illness. Blackwell (1967) explored adult expectations about entering the sick role for physical and psychiatric dysfunctions and reported that the rights and obligations of the sick role apply directly to physical conditions, but not mental conditions. A major finding in this study was that the extent of societal agreement on the sick role decreased as the mental conditions increased. Denzin and Spitzer (1966) also found that the sick role was not useful for predicting the psychiatric patient’s role behavior. According to Parsons sick role, when something is wrong and the person cannot physically function (and they are not responsible) they would consult a healthcare provider as soon as possible. However, Segall (1976) thought when the condition has psychological connotations, the question of personal responsibility arises. While trying to get well, Blackwell (1967) suggested the importance of a mentally ill person not being exempted from all of their social responsibilities. Segall
(1976) agreed that the psychiatric patient is generally expected to be active, independent, and self-directed in interacting with the healthcare provider. Chen and Lee (2014) determined that excellent mental health has a negative effect on using eHealth information as well as eHL is a mediator in subduing that negative relationship.

The assumption that sick people eventually get well and return to their normal obligations is an essential feature in the sick role. However, it is clear that pain, suffering, and the risk of death or serious disability are common features of what it is to be sick (Williams, 2005). Frank (1995) states that Parsons’ sick role, in which illness is perceived as an interruption of normal life, is not adequate. In chronic illnesses, people never fully recover and take on the same amount of responsibility. The sick role must change there is no set timeframe for getting better, there is no exemption from social obligations, nor from being the victim when chronic illnesses are involved. The role expectations that one should try to get well, overcome the condition and resume functioning in a normal capacity are inappropriate. Chronic illnesses change the body and the identity of the sick person. The chronically ill person learns to cope and manage their illness, in order to maintain their relationships that are disrupted by their illness (Kelly and Field, 1996).

This study hypothesizes that there is a positive relationship between eHealth literacy and self-care. With access to the internet, patients have an increase in the amount of resources when making healthcare decisions (Guo et al., 2014). Research has suggested that the internet will transform the relationship between healthcare providers and their patients because healthcare providers will no longer have a
monopoly on health information (Henwood et al., 2003). It is hypothesized in this study that patients with high eHL are able to manage their health better.

A key feature in Parsons’ sick role is compliance. The sick person is to be motivated or have the willingness to get better (Parsons, 1975). However, it is estimated that over half of all patients are non-compliant meaning they do not follow through with the healthcare provider’s orders (Donovan and Blake, 1992). As mentioned previously, the patient-healthcare provider relationship is an asymmetrical hierarchy (Parsons 1975; Williams, 2005). There is an underlying belief of “mutual trust” between the patient and the healthcare provider (Williams, 2005, p. 134). The belief is that the healthcare provider is trying their best to help the patient, and in turn the patient is going to “cooperate” with them to the best of their ability (Parson, 1951, p. 464). Giddens (1991) disagrees with this premise, suggesting that since the time Parsons’ era, trust is continually active and must be won. Trust is still an important part in the provider-patient relationship (Williams, 2005). This increase in electronic dependency will have a great impact on how healthcare providers and health systems interact with patients (Weiner, 2012). This study hypothesizes that there is an inverse relationship with eHealth literacy and trust.

Key changes in medical practice since the time of Parsons’ sick role have caused a necessary re-evaluation of its use. Werner and Malterud (2003) use patient experiences in primary care to explore what it takes to be a legitimate patient in the eyes of a healthcare provider when a diagnosis is unclear. Sabo et al. (2000) states traditional medicine needs a clear diagnosis that corresponds with a particular disease, however, in order to diagnosis, more time is needed with the patient than is the current
standard. Currently, the standard healthcare provider’s appointment is 15 minutes, which is not enough time to do a complete assessment, and compromises a healthcare provider’s ability to serve in his or her role, by making an accurate diagnosis (Sabo et al., 2000). Today, a sick person may see many healthcare providers who may give conflicting advice, and have to determine which healthcare provider is correct. In these cases, patients could seek eHealth information to make a healthcare decision (Diviani et al., 2015; Park and Lee, 2015; Neter and Brainin, 2012). Donovan and Blake (1992) consider non-compliance a form of deviance or reasoned decision making. In their study, patients listen to the healthcare provider's recommendations and filled their prescriptions. However, the patients were concerned about the medicine’s side-effects and the constraints to their daily lives. The role of the healthcare provider is to “maximize health and minimize the incidence of illness” (Parsons, 1975, p. 268). Parsons (1975) states that the sick person should “have a certain amount of knowledge and understanding in matters of illness” (p. 271). eHL is important especially when patients are faced with making healthcare decisions solo or for a loved one (Knapp et al., 2011). This study hypothesizes that there is a negative relationship between eHealth literacy and patient satisfaction.

Adding to issues of compliance is the ability of patients to be perpetually better informed. Parsons (1975) suggests caution regarding patients’ who are active participants in their own care, arguing that a patient’s knowledge is limited in terms of technical competence and expertise. However, as the information revolution has evolved, we see patients becoming more and more informed. Williams (2005) discusses recent policy debates on 'expert patients’. These ‘expert patients’ are those
who are confident and in control of their lives, want to manage their illness in partnership with healthcare providers, communicate effectively with their provider, share responsibility of their treatment, and are realistic about the impact of their disease on themselves and their families (Williams, 2005). Similarly, Andreassen and Trondsen (2010) described an empowered patient the same way relieving the healthcare system of its responsibility. It has been questioned whether the ‘expert patient’ has medical dominance rather than empowerment. According to Srinivasan (2014), this ‘expert patient’ describes the ideal patient as far the U.S. government is concerned. From a Marxist perspective, the sick role is another mechanism for the social elite to control the less privileged. A good example is the digital divide, as stated earlier the lack of access to the internet is based on many social factors one being geographic location. This study hypothesizes that geographic location will have an impact on eHealth literacy.

The sick role is still an important concept. It is a reminder that the way society constructs social responses to illnesses and disability is a functional processes in society. The theory has a number of criticisms; some are more valid than others such as mental illness does not work because those suffering must be functional. Nevertheless, Parsons work should be continuously reread during the debates of healthcare. One thing that Parsons is adamant about is the asymmetrical nature of patient-provider relations and the importance of trust in this relationship. In order to act under Parsons' sick role, a person must be prepared to stop performing many daily activities, become dependent upon others for their well-being, and utilize professional medical care (Segall, 1976). Since Parsons’ sick role can be applied to many critical issues in today's realm of healthcare, there should be a wider range of behavioral expectations for the
sick role. However, many medical sociologists fail to reference Parsons in their research.

This study looks at eHealth literacy the impact it has on a patient-provider relationship from a sick role perspective. As stated earlier, Parsons sick role is important to the sociality norms of the patient-provider relationship. Since the increased dependency of electronics, one of the goals of this study is to see how Parsons sick role is changing.
3.1 Data

Data for this study was obtained from the Study of Health and Medical Information in Cyberspace, by principle investigator, Dr. Gul Seckin. Respondents were recruited by the Knowledge Networks, a nonprofit academic research firm. Respondents were randomly selected from the Knowledge Networks Panel which consists of about 50,000 US residents, aged 18 or older. In order to have a representative sample, the Knowledge Network uses address-based sampling from the US Postal Service Delivery Sequence File. The reason to use address-based sampling is because it allows households without internet, without telephone and other electronic devices, such as computers to participate. Participants who did not have internet access or other devices were provided with a Web-enabled computer with free internet service (Seckin et al., 2016). From the panel, there were 1315 participants who were randomly selected via email. Participants were then prescreened with the question, “Do you seek health or medical information on the internet for yourself and for others?” From this prescreened question, 70% of the respondents answered “yes” (n=710) and were sent a 50-question web-based questionnaire. Respondents were only allowed to complete the questionnaire once during a designated period of time and it was self-administered. Since all the Knowledge Networks Panel members were selected at random and the survey participants were also selected at random from the larger panel, the results can be interpreted with statistical confidence relative to the population of the United States.
3.1.2 Characteristics of the Sample

The sample consisted of adults between the ages of 18 and 93 years with a mean of 48.82 (SD 16.43). It is almost equally distributed between male and female with 53.7% female (381/710). About 68% (481/710) were married, and 543 of 710 (77%) were Caucasian. Almost 40% (265/710) had a college degree or higher, and 405 of 710 (57%) earned $60,000 or more. Of the 710, 259 (36%) were residents of a Southern state in the United States. According to the U.S. Census (2015), the U.S. population is half female with 77% over the age of 18, about 70% Caucasian with 30% obtaining a college degree, and the median household income $53,889. According to the Center for Disease Control (2015), 6.9 marriages per 1,000 total population. Comparing these demographics to the sample shows that this sample is a representative sample with majority of the sample earning more than the median.

3.2 Variables and Measurements

All the questionnaire items had equal weight and were measured on the same metric, a 5-point Likert measurement scale to ensure that none of the items were more influential than others when averaging an overall score for the scale. To obtain an answer to the various research questions of this study the following section will discuss the various variables used in this study.

3.2.2 Dependent

There are three dependent variables in this study: self-care, trust and patient satisfaction. The DVs for this study were obtained from the Study of Health and Medical
Information in Cyberspace and were based on the literature covering eHealth Literacy. For each DV a Cronbach’s alpha is provided, each alpha was above 0.7000, which means the items included were measuring the same phenomena (Byrne, 2010). Self-Care is conceptualized by patient health behavior as an individual’s action toward their own health. The indicators for the first factor self-care are Q12 through Q17 and Q45 through Q49 (see Table 3.1). When conducted exploratory factor analysis (EFA) for Self-Care the Cronbach’s alpha was 0.885 (see Table 3.1). Based on Parsons’ sick role, Trust was conceptualized as whether patient listens and abides by the healthcare providers’ orders. The indicators for the second factor Trust are Q7, Q9, Q10 and Q19 (see Table 2). After conducting EFA, the Cronbach’s alpha was 0.712 for Trust (see Table 3.2). After referencing the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), which is a patient satisfaction survey required by the Center for Medicare and Medicaid Services for all hospitals in the United States, the questions used to indicate Patient Satisfaction were Q38 through Q44 (see Table 3.3). The last factor was Patient Satisfaction. Patient satisfaction was conceptualized as a patient who is pleased with communication and overall experience with their doctors. The indicators for this factor were Q38 through Q44 (see Table 3 for list of questions). The EFA resulted in a Cronbach’s alpha of .861 indicating these questions were measuring the same factor, patient satisfaction.
Table 3.1  
*EFA of Self-Care*

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Question</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Do you request medications from a healthcare provider based on the Internet information?</td>
<td>0.621</td>
</tr>
<tr>
<td>13</td>
<td>Do you request medical examinations based on the Internet information?</td>
<td>0.628</td>
</tr>
<tr>
<td>14</td>
<td>Do you request treatments based on the Internet information?</td>
<td>0.667</td>
</tr>
<tr>
<td>15</td>
<td>Do you purchase medications based on the Internet information without necessarily talking to a doctor?</td>
<td>0.469</td>
</tr>
<tr>
<td>16</td>
<td>Do you treat a health issue based on Internet information?</td>
<td>0.655</td>
</tr>
<tr>
<td>17</td>
<td>Do you use information from the Internet to make treatment decisions?</td>
<td>0.69</td>
</tr>
<tr>
<td>45</td>
<td>I take better care of my health as a result of gathering health or medical information from the Internet.</td>
<td>0.608</td>
</tr>
<tr>
<td>46</td>
<td>My quality of life has improved as a result of gathering health or medical information from the Internet.</td>
<td>0.662</td>
</tr>
<tr>
<td>47</td>
<td>My health issue has improved as a result of gathering health or medical information from the Internet.</td>
<td>0.614</td>
</tr>
<tr>
<td>49</td>
<td>Gathering health or medical information from the Internet about my health issue makes me feel empowered.</td>
<td>0.555</td>
</tr>
</tbody>
</table>

Self-Care ($\alpha = 0.885$)
Table 3.2

**EFA of Trust**

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Question</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Do you consult the Internet after your visit to a healthcare provider?</td>
<td>0.446</td>
</tr>
<tr>
<td>9</td>
<td>Do you doubt diagnosis or treatment of a healthcare provider if it conflicts with information on the Internet?</td>
<td>0.608</td>
</tr>
<tr>
<td>10</td>
<td>Do you change your willingness to accept a healthcare provider's treatment after reading information on the Internet?</td>
<td>0.548</td>
</tr>
<tr>
<td>19</td>
<td>Do you change a healthcare provider’s treatment as a result of the Internet information?</td>
<td>0.454</td>
</tr>
</tbody>
</table>

Trust ($\alpha = 0.712$)

Table 3.3

**EFA of Patient Satisfaction**

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Question</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>Health or medical information on the Internet helps me to communicate more effectively with a healthcare provider during appointments.</td>
<td>0.725</td>
</tr>
<tr>
<td>39</td>
<td>Health or medical information on the Internet helps me to ask more informed questions during doctor appointments.</td>
<td>0.739</td>
</tr>
<tr>
<td>40</td>
<td>Health information on the Internet helps me to better understand what a healthcare provider is telling me during appointments.</td>
<td>0.704</td>
</tr>
<tr>
<td>41</td>
<td>I receive more attention to my questions from healthcare providers as a result of gathering health or medical information from the Internet.</td>
<td>0.761</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 3.3 (cont.).

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>I receive more information to my satisfaction from healthcare providers as a result of gathering health or medical information from the Internet.</td>
<td>0.774</td>
</tr>
<tr>
<td>43</td>
<td>Interactions of healthcare providers with me have become more respectful as a result of gathering health or medical information from the Internet.</td>
<td>0.658</td>
</tr>
<tr>
<td>44</td>
<td>Interactions with healthcare providers have become strained as a result of bringing in health or medical information from the Internet to the appointments.</td>
<td>0.106</td>
</tr>
</tbody>
</table>

Patient Satisfaction (α = .861)

3.2.3 Independent

The independent variable is eHealth Literacy. This study will use Seckin et al. (2016) reliable and validated 19-item scale of eHealth Literacy (see Table 3.4). This scale was used because the ability to seek, find, understand and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem is described by eHL. There is another scale eHEALs used through the literature from Norman and Skinner (2006), however it lacked appraisal as a skill in the eHL skills. When studying the effect of geographic location, the independent variable is the region of the U.S. where survey participants reside. Region was measured by using U.S. Census Regions and coded as 1 = Northeast, 2 = Midwest, 3 = South, 4 = West. Region was chosen in order to study the digital divide, because according to Srinivasan (2014) geographic location is expected to impact eHL.
Table 3.4

19- Item eHealth Literacy Scale (Seckin et al., 2016)

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you discuss the information you obtain from the Internet with a healthcare provider?</td>
<td>1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Most of the time, 5 = Always</td>
</tr>
<tr>
<td>2. Do you read disclosure statements on health or medical websites?</td>
<td></td>
</tr>
<tr>
<td>3. Do you check credentials and institutional affiliations of the author(s) who provide information on health or medical websites?</td>
<td></td>
</tr>
<tr>
<td>4. Do you check who owns the web sites you are using for health or medical purposes?</td>
<td></td>
</tr>
<tr>
<td>5. Do you check who sponsors the web sites you are using for health or medical purposes?</td>
<td></td>
</tr>
<tr>
<td>6. Do you check whether there is a financial tie between medical information provided (e.g., advertisements for products or medications) and sponsorship of the web site?</td>
<td></td>
</tr>
<tr>
<td>7. Do you appraise whether the author's credentials seem adequate for the type of health or medical information they post on the web sites you are using?</td>
<td></td>
</tr>
<tr>
<td>8. Do you check whether an address is listed on the web site where you can contact the author(s) to ask health related questions or to obtain more information?</td>
<td></td>
</tr>
<tr>
<td>9. Do you check whether the web site clearly states its goals and objectives?</td>
<td></td>
</tr>
<tr>
<td>10. Do you appraise whether there is clear and comprehensive coverage of the stated health or medical topic?</td>
<td></td>
</tr>
<tr>
<td>11. Do you check whether print or other web resources confirm the information you obtain from a specific health or medical web site?</td>
<td></td>
</tr>
<tr>
<td>12. Do you check whether health or medical information on the web site is current and updated recently?</td>
<td></td>
</tr>
<tr>
<td>13. Do you check whether the date of the last update of information is prominent on the web site?</td>
<td></td>
</tr>
<tr>
<td>14. Do you ask a healthcare provider for advice about where to find credible health or medical information on the Internet?</td>
<td></td>
</tr>
<tr>
<td>15. Do you trust the Internet to provide you with accurate information?</td>
<td></td>
</tr>
<tr>
<td>16. Please indicate how much you agree with the following? I tend to view information on the Internet as credible.</td>
<td>1 = Strongly Disagree, 2 = Disagree, 3 = Neither, 4 = Agree,</td>
</tr>
<tr>
<td>17. I tend to view the information on the Internet as balanced and accurate.</td>
<td></td>
</tr>
<tr>
<td>18. I tend to view information on the Internet as the same or better than what most healthcare providers supply.</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
3.2.4 Control

After reviewing the literature, age, education, race or ethnicity, gender, marriage status, income and region of state of residence were controlled. These are also considered important indicators of respondents' demographic backgrounds and socioeconomic status (Mitsutake et al., 2016). Chen and Lee (2014) found that gender and class were significant in studying eHL. Age was recoded into four categories (1=18-29, 2=30-44, 3=45-59, and 4=60+). Sex was a dichotomous nominal variable with male as the reference category (0=female, 1=male). Education was an originally an ordinal variable (1=lower than high school, 2=high school graduate, 3=some college, 4=college graduate or higher). Mile and associates (2015) found that the level of education was positively correlated with eHL. Race was a nominal variable (1=White, non-Hispanic, 2=Black, non-Hispanic, 3=other, non-Hispanic, 4=Hispanic, 5=2+Races, non-Hispanic). However, it was recoded as (1=White, 0=Minority). Income was recoded as (1=$0-29,999; 2=$30,000-59,999; 3=$60,000-99,999; 4=$100,000 and Above). Marital Status was originally coded into six groups (1=Married, 2=Widowed, 3=Divorced, 4=Separated, 5=Never Married, and 6=Living with Partner). Last, region of residence was a nominal variable (1=Northeast, 2=Midwest, 3=South, 4=West).

---

6 The dissertation committee suggested to make all controls variables dichotomous. Age was recoded into two categories (1=18-48 and 0=50+); Education (0=High Education and lower/1=Some College and Higher); Income was recoded as (0=$59,999 or lower and 1=$60,000 or higher); Martial Status (1=Married and 0=Not currently married at the time of study). However, after running the model with new recoded variable the model did not fit the data.
3.3 Data Analysis

I used IBM Statistical Package for the Social Sciences (SPSS) v. 20 and Analysis of a Moment Structures (AMOS) to analyze the data from Study of Health and Medical Information in Cyberspace. Exploratory factor analysis (EFA) was used, using principal component analysis and varimax rotation in order to identify and structure the variables ensuring confidence in the conceptualization. After performing EFA, confirmatory factor analysis (CFA), as part of structural equation modelling, is conducted to determine whether the items in our variables are supported. This approach was chosen for two reasons: (1) previous studies on eHealth literacy have supported the evidence-based assumption of 1-factorial model and (2) the comparison of previous research on health competence (Soellner, Huber and Reder, 2014) and the eHL items indicate the content-based assumption of a 3-factorial model (Seckin et al., 2016). Structural Equation Modeling (SEM) was conducted using AMOS graphics program to construct an input diagram representing the measurement model that links eHealth literacy with the dependent variables. The $R^2$ values for all indictors were generated. In order to determine if the model was significant the root mean squared error of approximation (RMSEA) value will need to be less than or equal to .11 (Comrey and Lee, 1992). Other values such as the Chi-Square value, normed fit index (NFI) value and comparative fit index (CFI) value must also be analyzed to determine if the model was a good fit.
CHAPTER 4

RESULTS

4.1 Descriptive Statistics

The mean was used to replace the missing value before any statistical analysis was conducted. The following tests were conducted on the variables: Linearity, Skewness, Kurtosis, Homogeneity, and Normality (Tabachnick and Fidell, 2007). Self-Care had good linearity based on the histogram measurements of linearity (.996), quadratic (.999) and cubic measurements (.999). Self-Care Skewness (.376), Kurtosis (-.014) and Homogeneity (F= 52.77, p = .000) were also within proper range. Trust had good linearity based on the histogram measurements of linearity (.996), quadratic (.999) and cubic measurements (.999). Trust had a Skewness (.559), Kurtosis (.841) and Homogeneity (F= 44.94, p = .000). Based on the cutoff values these were also good. Based on the histogram measurements of linearity (.984), quadratic (.993) and cubic measurements (.989) Patient Satisfaction had good linearity. Patient Satisfaction Skewness (-.766), Kurtosis (1.666) and Homogeneity (F= 26.42, p = .000) were also within proper range. However, normality was violated in all three variables which required the use of Kolmogorov-Sminov test which showed all variables were statistically significant.\(^7\) Using box plots and Mahalanobis distance, it was observed there were the outliers (26 outliers); they were removed from the dataset resulting in a sample size of n= 684.

---

\(^7\) This suggested the variables needed to be transformed. Transformation was conducted at by the square root and log of each variable (Trust, Self-Care, and Patient Satisfaction). These transformations were compared to each other and to the original variable. After comparison there was a less than 10 item difference between each transformation, resulting in the original (non-transformed) variable being kept.
The sample consisted of adults majority whom identify as female (381/710, 53.7% women), whose age ranged between 18 and 93 (mean age of 48.82 ± 16.43). About 76.5% were Caucasian (Non-Hispanic), married (60.3%) with a Bachelor’s degree (37.3%), earning over $60,000 a year (57%), living in the South (36.5 %) (see Table 4.1 for skewness, kurtosis, and other descriptive statistics).

Table 4.1

*Descriptive Statistics for All Variables*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>eHealth Literacy</td>
<td>2.53</td>
<td>0.77</td>
<td>0.179</td>
<td>-0.867</td>
<td>684</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>3.18</td>
<td>0.57</td>
<td>-0.507</td>
<td>1.08</td>
<td>684</td>
</tr>
<tr>
<td>Self-Care</td>
<td>2.24</td>
<td>0.54</td>
<td>0.34</td>
<td>-0.29</td>
<td>684</td>
</tr>
<tr>
<td>Trust</td>
<td>7.73</td>
<td>2.3</td>
<td>0.26</td>
<td>-0.42</td>
<td>684</td>
</tr>
<tr>
<td>Age</td>
<td>2.74</td>
<td>1.02</td>
<td>-0.29</td>
<td>-1.04</td>
<td>684</td>
</tr>
<tr>
<td>Gender</td>
<td>1.54</td>
<td>0.5</td>
<td>-0.14</td>
<td>-1.98</td>
<td>684</td>
</tr>
<tr>
<td>Education</td>
<td>2.65</td>
<td>0.959</td>
<td>-0.45</td>
<td>-0.94</td>
<td>684</td>
</tr>
<tr>
<td>Income</td>
<td>2.72</td>
<td>1.07</td>
<td>-0.22</td>
<td>-1.22</td>
<td>684</td>
</tr>
<tr>
<td>Marital Status</td>
<td>2.27</td>
<td>1.8</td>
<td>0.97</td>
<td>-0.74</td>
<td>684</td>
</tr>
<tr>
<td>Race</td>
<td>1.45</td>
<td>0.96</td>
<td>2.1</td>
<td>3.2</td>
<td>684</td>
</tr>
<tr>
<td>Region of U.S.</td>
<td>2.65</td>
<td>1.03</td>
<td>-0.26</td>
<td>-1.06</td>
<td>684</td>
</tr>
</tbody>
</table>

4.2 Path Analysis

The AMOS graphics program was used to construct an input diagram representing the measurement model linking the hypothesized eHealth literacy factors
with the dependent variables Self-Care, Patient Satisfaction and Trust. There was missing values within the dataset and, before conducting analysis, the missing values were replaced with the mean. CFA was conducted on the dependent variables to determine if the indicators were a good fit based on CFI, NFI and RMSEA. The indicators for Self-care are Q12 through Q17 and Q45 through Q49 (see Table 4.1); these indicators were an adequate fit ($x^2= 1351.087$, $df= 35$, $p = .000$, CFI = .641; NFI = .636; RMSEA = .235; see Table 4.2). Hooper, Coughlan, and Mullen (2008) had suggested using CFI, NFI and RMSEA as good-fit indicators. However, there is no golden rule for the assessment of model fit. The CFI, NFI and RMSEA are adequate measurements given the sample size. The indicators for the second factor Trust are Q7, Q9, Q10 and Q19 (see Table 4.2) were was a good fit ($x^2= 1.520$, $df= 2$, $p = .468$, CFI = 1.000; NFI = .998; RMSEA = .000; see Table 4.3). The last factor was Patient Satisfaction, the indicators for this factor were Q38 through Q44 (see Table 4.2). The good-fit indices showed that the indicators were a good-fit ($x^2= 395.67$, $df= 14$, $p = .000$, CFI = .850; NFI =.845; RMSEA= .200; see Table 4.3).

Table 4.2

*CFA of Dependent Variables*

<table>
<thead>
<tr>
<th></th>
<th>Trust</th>
<th>Patient Satisfaction</th>
<th>Self-Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFI</td>
<td>0.998</td>
<td>0.845</td>
<td>0.636</td>
</tr>
<tr>
<td>IFI</td>
<td>1.002</td>
<td>0.85</td>
<td>0.642</td>
</tr>
<tr>
<td>TLI</td>
<td>1.005</td>
<td>0.774</td>
<td>0.538</td>
</tr>
<tr>
<td>CFI</td>
<td>1</td>
<td>0.85</td>
<td>0.641</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0</td>
<td>0.2</td>
<td>0.235</td>
</tr>
<tr>
<td>$x^2$</td>
<td>1.52</td>
<td>395.67</td>
<td>1351.09</td>
</tr>
</tbody>
</table>

*(table continues)*

49
For testing the multiple hypotheses, a path model was developed composed of six paths (see Figure 4.1). Conceptual model is the path model with the control variables added (see Figure 4.2). Both the comparative and absolute fit indices were checked in order to evaluate the goodness-of-fit of the proposed path model: Comparative fit index (CFI; higher than .90), Tucker-Lewis fit index (TLI; higher than .90), and the root mean square error of approximation (RMSEA; lower than .10) (Hooper, Coughlan and Mullen 2008). The results from the path analysis of the conceptual model (see Figure 4.2 were not a good fit chi-square $x^2= 6615.463 \ (df=378, \ p = .000)$, the comparative fit index (CFI) = .265, normed fit index (NFI) = .256, and the root mean square error of approximation (RMSEA) = .155 (see Table 4.3).

After the literature was reviewed, conceptual model transformed into the full model and pathways were added based on the literature (see Figure 4.4). The full model appears to be an adequate fit to the data. The chi-square ($x^2$) = 2709.367 (df = 356, $p = .000$), comparative fit index (CFI) = .722, normed fit index (NFI) = .695, and the root mean square error of approximation (RMSEA) = .098. According to the modification indexes, modifications were needed to be made to improve the fit of the model. Some pathways were deleted due to weak relationships and statistically insignificant ($P > .50$). Literature suggests pathways higher than .20 should be deleted because it is an indication of an error (Hooper, Coughlan and Mullen, 2008). The pathway from Gender to Trust ($P = .938$), Education to Trust ($P = .657$), Race to Patient Satisfaction ($P = .713$), and Education to Patient Satisfaction ($P = .859$) were deleted. After rerunning SEM,
pathways with $P$ greater than .2 were deleted (Martial Status to eHL ($P = .201$), Race to Trust ($P = .219$), Region of U.S. to Trust ($P = .373$), Race to Self-Care ($P = .299$), Education to Self-Care ($P = .292$), and Region of U.S. to Self-Care ($P = .278$)). The modification indices also indicated to add a path from education to income (see Figure 4.3). The final model with post-hoc modifications is shown in an output path diagram in Figure 4.4. The final model illustrated much better model fit chi-square ($x^2$) = 2436.407 (df= 316, $p = .000$), a CFI = .746, NFI = .720 and RMSEA = .099 (see Table 4.3). The increase of these indexes show that the modifications improved the good fit of the model. Comparing the conceptual model to the final model, the chi-square significantly increased by 272.99 as the degree of freedom increased by forty units.
Figure 4.1. Hypothesized path model.
Figure 4.2. Conceptual path model.
Figure 4.3. Full path model.
### Table 4.3

*Goodness of Fit Indices of Each Model*

<table>
<thead>
<tr>
<th>Concept Model</th>
<th>Full Model</th>
<th>Final Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NFI</strong></td>
<td>0.256</td>
<td>0.695</td>
</tr>
<tr>
<td><strong>IFI</strong></td>
<td>0.267</td>
<td>0.724</td>
</tr>
<tr>
<td><strong>TLI</strong></td>
<td>0.21</td>
<td>0.685</td>
</tr>
<tr>
<td><strong>CFI</strong></td>
<td>0.265</td>
<td>0.722</td>
</tr>
<tr>
<td><strong>RMSEA</strong></td>
<td>0.155</td>
<td>0.098</td>
</tr>
<tr>
<td><strong>$\chi^2$</strong></td>
<td>6615.463</td>
<td>2709.397</td>
</tr>
<tr>
<td><strong>DF</strong></td>
<td>378</td>
<td>356</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

### Table 4.4

*Standardized Regression Results for Full Model*

<table>
<thead>
<tr>
<th></th>
<th>Trust</th>
<th>Patient Satisfaction</th>
<th>Self-Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$\beta$ ***</td>
<td>$b$</td>
</tr>
<tr>
<td>eHealth Literacy</td>
<td>0.646</td>
<td>0.463</td>
<td>0.491</td>
</tr>
<tr>
<td></td>
<td>(.038)</td>
<td>(.035)</td>
<td>(.019)</td>
</tr>
<tr>
<td>Region of U.S.</td>
<td>-.033</td>
<td>-.018</td>
<td>.030</td>
</tr>
<tr>
<td></td>
<td>(.019)</td>
<td>(.014)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.017</td>
<td>.010</td>
<td>-.006</td>
</tr>
<tr>
<td></td>
<td>(.022)</td>
<td>(.026)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.049</td>
<td>.025</td>
<td>-.039</td>
</tr>
<tr>
<td></td>
<td>(.019)</td>
<td>(.013)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.074</td>
<td>.040</td>
<td>.094</td>
</tr>
<tr>
<td></td>
<td>(.017)</td>
<td>(.021)</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Table 4.4 (cont.).

<table>
<thead>
<tr>
<th></th>
<th>Race</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.026</td>
<td>-.035</td>
<td>.011</td>
<td>-.018</td>
<td>-.014</td>
<td>-.018</td>
</tr>
<tr>
<td></td>
<td>(.050)</td>
<td></td>
<td></td>
<td>-.06</td>
<td></td>
<td>(.040)</td>
</tr>
<tr>
<td></td>
<td>.002</td>
<td>.003</td>
<td>-.019</td>
<td>-.027</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.035)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.043)</td>
</tr>
</tbody>
</table>

\[ R^2 \]

|        | .434       | .257     | .405   |

Notes: (Standardized Estimates in Parentheses) *** p < .001, ** p < .01, * p < .05

Table 4.5

Final Model: Regression Predicting Respondents’ eHealth Literacy Rate, U.S. Adults, 2011

<table>
<thead>
<tr>
<th></th>
<th>Trust</th>
<th>Patient Satisfaction</th>
<th>Self-Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td></td>
<td></td>
</tr>
<tr>
<td>eHealth Literacy</td>
<td>0.463***</td>
<td>0.49</td>
<td>0.416***</td>
</tr>
<tr>
<td></td>
<td>(.037)</td>
<td>(.035)</td>
<td>(.030)</td>
</tr>
</tbody>
</table>

\[ R^2 \]

|        | .433       | .249     | .405   |

Notes: (Standardized Estimates in Parentheses) *** p < .001, ** p < .01, * p < .05

As shown in Table 4.8, the path analysis indicated a positive relationship with eHealth Literacy and Trust (β=.463, p = .001) suggesting that the higher the levels of eHealth literacy, the higher their levels of trust. Patient Satisfaction (β = .45, p = .001) also has a positive relationship with eHealth literacy suggesting that the higher levels of eHL, higher level of patient satisfaction. These results indicate that H1 and H3 were rejected. The path analysis confirmed H2 that Self-Care (β=.386, p = .001) has a positive relationship with eHealth literacy. In the final model, eHealth literacy can explain
over 40% of Self-Care ($R^2 = .405$) and Trust ($R^2 = .433$) while explaining about 25% of Patient Satisfaction ($R^2 = .249$).

The indirect and direct effects of the independent variables are shown in Table 4.6, Table 4.7, and Table 4.8. Participants with a higher income and older in age are more likely to trust their provider. As shown in Table 10, education has an indirect effect on trust through eHL (.071). Males are indirectly more likely to trust through the mediator eHL (.053) and whites are indirectly more likely to trust their provider with high eHL (.064). Patient satisfaction is directly affected by income and age. As age and income increase patient satisfaction increases. In a positive way, through high eHL education, gender and race indirectly effect patient satisfaction. Lastly, this study showed there are no direct effects on self-care. However, there are indirect effects towards self-care through eHL. If a participant is educated, male and white they are more likely to have better self-care.

Table 4.6

*Indirect and Direct Effects of Trust*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>(.153)(.463) = 0.071</td>
<td>N/A</td>
<td>0.071</td>
</tr>
<tr>
<td>Gender</td>
<td>(.115)(.463) = 0.053</td>
<td>N/A</td>
<td>0.053</td>
</tr>
<tr>
<td>Income</td>
<td>N/A</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td>Age</td>
<td>N/A</td>
<td>0.039</td>
<td>0.039</td>
</tr>
<tr>
<td>Race</td>
<td>(.138)(.463) = 0.064</td>
<td>N/A</td>
<td>0.064</td>
</tr>
</tbody>
</table>
Table 4.7

*Indirect and Direct Effects of Patient Satisfaction*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>(.153)(.45) = 0.069</td>
<td>N/A</td>
<td>0.069</td>
</tr>
<tr>
<td>Gender</td>
<td>(.115)(.45) = 0.052</td>
<td>N/A</td>
<td>0.052</td>
</tr>
<tr>
<td>Income</td>
<td>N/A</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Age</td>
<td>N/A</td>
<td>0.065</td>
<td>0.065</td>
</tr>
<tr>
<td>Race</td>
<td>(.138)(.45) = 0.062</td>
<td>N/A</td>
<td>0.062</td>
</tr>
</tbody>
</table>

Table 4.8

*Indirect and Direct Effects of Self-Care*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indirect</th>
<th>Direct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>(.153)(.386) = 0.059</td>
<td>N/A</td>
<td>0.059</td>
</tr>
<tr>
<td>Gender</td>
<td>(.115)(.386) = 0.044</td>
<td>N/A</td>
<td>0.044</td>
</tr>
<tr>
<td>Income</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Age</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Race</td>
<td>(.138)(.386) = 0.053</td>
<td>N/A</td>
<td>0.053</td>
</tr>
</tbody>
</table>
The final path model shows (see Figures 4.4 or 4.5), the region of the U.S. where respondents lived in did not have an effect on eHealth literacy rates. Thus the original hypothesis of eHealth literacy being affected by geographic location is rejected. However, there is a relationship between gender and e-Health Literacy where, on average, males have higher eHealth literacy levels than females by .115 points.
(Gender: $\beta = 0.115$, $P = 0.045$). Education ($\beta = 0.153$, $P = 0.001$) does have an effect on eHL, as education increases so does eHL. On average Whites have a higher eHL than all other minorities by 0.138 points (Race: $\beta = 0.138$, $P = 0.048$). Age does have a positive relationship with Trust ($\beta = 0.039$, $P = 0.025$) with each 1-unit increase in the respondents’ age, trust increases by 0.039 points and Patient Satisfaction increased by 0.065 points ($\beta = 0.065$, $P = 0.002$). Lastly, income has an effect on Trust ($\beta = 0.038$, $P = 0.023$) as income increases trust increases by 0.038 points.
Notes: (Standardized Estimates in Parentheses) *** p < .001, ** p < .01, * p < .05

Figure 4.5. Final model.
5.1 Discussion

This study aimed to make the overall healthcare experience better by exploring the association between eHealth literacy and provider-patient relationships. Limited health literacy has been identified as a contributing factor to the obstacles towards a more effective healthcare delivery system and improved health outcomes (Huber et al., 2012). As healthcare systems and society become more dependent on electronics, it is now more important than ever to explore who is at risk for low eHL. In recent years, it has been well-known that low eHL is associated with poor health behaviors (Britt, Collins, Wilson, Linemeier, and Ehglebert, 2015). Currently, there are public health policies in places to improve eHL across the nation. For example, Healthy People 2020 has objectives concentrating on health communication and eHealth information (US Department of Health and Human Services, 2010). In order to improve the overall healthcare experience, this study took a closure look at the provider-patient relationships focusing on the patient’s trust, patient’s self-care and patient satisfaction.

This study improved on the prior literature by accounting for the geographic location when analyzing eHL (U.S. Region), which was provided in the data set, Study of Health and Medical Information in Cyberspace. By accounting for the geographic location, this study provides a more reliable measure of the factors influencing eHL. This study also addresses the methodological issues stemming from prior eHealth literacy literature, namely, overcoming issues with theoretical approaches. Prior studies
fail to account for theory in the research design (Mackert, Champlin, Holton, Munoz, and Damasio, 2014). This study uses Parsons (1951) sick role analyzing the results.

5.2 Summary of Findings

This study’s findings on the social determinants of eHL were consistent with previous research. This study found that gender, education, and race had an effect on eHL. Males are more likely to have a high eHL than females. This means that men are more likely to be healthier than woman. Male values may also be embedded in technology so it becomes associated with a masculine identity (Wilson et al., 2003). Prior research has shown that gender being a significant factor in eHL specifically men had better access to internet and higher eHL (Wilson et al., 2003). Other studies showed that most women still heavily rely on their healthcare providers for health information and when making healthcare decisions (Henwood et al., 2003). Education has been a factor of literacy from the beginning, not surprising since the first health literacy scale was developed by the U.S. Department of Education (Huber, Shapiro, and Gillaspy, 2012). This study found that as education increases eHL increases. It also found that Whites have higher eHL than minorities. This is constant throughout the eHL literature.

Unfortunately, after SEM was conducted on the secondary data drawn from Study of Health and Medical Information in Cyberspace, the first hypothesis was rejected. The results from this study determined that instead of a negative relationship between trust and eHL, it was actually positive. The path analysis showed that as eHL increases trust increases. Seckin and associates (2016) found that patients who worked
with their healthcare providers to assist in finding credible websites for information had a better relationship and understanding with their provider. Also, patients who have high eHL are more likely to be educated which may cause the patient have respect and understanding for the healthcare provider role. Being more educated has been associated with an increase SES, this study found that income has a positive effect on trust. Patients with adequate income can afford to pick their providers, which improves their trust of their provider.

Results show that eHL can explain 43% of patient’s trust. This should be noted when trying to improve the overall healthcare experience. As mentioned earlier, knowing what the patient’s eHL is now essential. If healthcare professionals want to expand the experience investing more on eHL is needed, based on this result it seems like a good investment. Age, also, has a positive relationship with trust. As a patient ages their trust with their provider improves. This may be due to increase interaction with healthcare providers through the aging process.

The second hypothesis was found to be correct. As eHL increases self-care improves. This is consistent with previous research. This finding is important as healthcare systems become more digital, there is an expectation that patients need to be digitally savvy and more engaged with their health as well. This is helpful during the rise of preventive medicine more patients can take charge of their own health. However, Seckin and associates (2016) found that empowerment, as a result of eHealth information increased the likelihood of noncompliance with treatment. Based, on Parsons sick role this would be deviant behavior for a patient. More research is needed
to determine whether preventive behavior is deviant behavior in terms of Parsons sick role.

With the current focus is on preventive medicine and how to help the patient help themselves. Increasing the number of proficient eHL people needs to be accomplished. Based on this study eHL accounts for over 40% of self-care behaviors. Patients are no longer needing to go to their provider’s office and if they do they will be informed, have the ability to understand the treatments and be engaged. eHL can play a vital role in lowering preventable hospitalizations and possibly unwarranted healthcare expenses.

The third hypothesis was also, rejected. The association between eHL and patient satisfaction is a direct positive relationship. As eHL increases patient satisfaction increase. Once again, healthcare professionals should invest in their patient’s eHL. eHL explains 25% of patient satisfaction. This is similar to other findings that suggest eHL improves communications with healthcare providers (Seckin et al., 2016). Previous research shows that healthcare providers are experiencing new pressures which are attributed to a rise in electronic dependency (Srinivasan 2014) and growth of healthcare consumerism (Henwood, Wyatt, Hart, and Smith, 2003). In an increasingly digital society where having information available 24-7 is a norm, having a healthcare provider available at all hours may the next step (Weiner, 2012). Lustria, Smith and Hinnant (2011) determined that gender, education and geographic location were all significant predictors of using the internet to communicate with their healthcare provider. College educated females were more likely to contact their healthcare provider via email.

With this digital age, there are more opportunities to find providers information and reviews. For instance, when using Yelp to assist in finding a provider, there is
information about what insurance is taken, hours, location, and other patients’ experiences about that provider. Being eHL has substantial benefits in finding a “good” provider as well as to learn about healthcare costs and quality (Burkle and Keegan, 2015; Goidel et al., 2013). As eHL increased, it was reported that there was a newfound respect for healthcare providers (Sillence et al., 2007). Although those who lack internet access, may not have the luxury to choose providers. Same applies to patients with limited health insurance, restricted geographic location, and low income (Lustria et al., 2011).

Age was also an indirect factor of patient satisfaction. As stated previously, this may be due the amount of time spent with the healthcare provider. Also, it could be a generational norm. As Parsons sick role suggests, a patient should abide by their provider’s orders. It could be a learned behavior to innately trust the healthcare provider.

The last hypothesis was rejected. Geographic location was not a statistically significant factor in eHL. Even though, literature on digital divide suggested that access to internet is key to high eHL. This study showed living in a specific U.S. region was not a significant factor. This could be interpreted as either across the U.S. there is equality among resources or that there is another social factor that could explain eHL better such as broadband. The Federal Communications Commission (FCC) (2017) has started to track broadband speed and health disparities in a study called Mapping Broadband Health in America. Currently, the FCC study has just started to look at chronic diseases (obesity and diabetes), preventable hospital admissions and access to
primary care providers. Another factor could be the increase in mobile phones and access to eHealth information through them, more research will be needed to confirm.

5.3 Theoretical Implications

This study showed that Parsons sick role continues to play role in provider-patient relationships. Parsons (1951) sick role allows people to be exempted from social roles as long as the “sick” are compliant and trust the healthcare provider. However, since 1951 when Parsons sick role was first presented there has been a rise in technology and electronic dependency. Parsons (1975) states the sick person should have some level of health literacy. As electronic dependency grows, the access to eHealth information on the internet increases. The number of patients seeking eHealth information prior to their appointment also increases (Hu et al., 2012). Research has shown that patients with high eHL turn to the internet first, in order to be informed about a topic prior to visiting a healthcare provider (Hu et al., 2012; Sillence et al., 2007).

This study critically analyzed whether using eHealth information would change Parsons sick role. The results of this study showed that having eHL was a key factor in patient’s self-care, patient satisfaction and trust with the provider. This suggests that obtaining eHealth information prior to provider appointments is supportive of the sick role. By being an informed patient, the patient-provider relationship is stronger. From this study, eHealth information may not be a deviant behavior as originally thought, but a key part of the sick role. It was revealed through this study that eHL improves patient self-care, which may lower the risk of getting sick.
5.4 Limitations

One of the limitations of this study is that the results are self-reported as with many eHL research studies. Similar to reporting income, research participants are likely to misreport reading difficulties (Chew, Bradley, and Boyko, 2004). Secondly, this study is not able to make inferences about causal relationships; it is only able to make correlations due to the research design not being experimental.

Another limitation is the lack of control over the questions. Since this are secondary data, the questions and the survey were already conducted. There are a few questions to this survey that could have been added. Research suggests there is a correlation between chronic and acute diseases and the likelihood of trusting healthcare providers (Duplaga, 2015). These may also increase motivation to improve their eHL (Mitsutake et al., 2012). Instead of asking what illness the patient suffered from, asking whether a patient suffers from a chronic or acute illness would have been more helpful. Patients with chronic diseases may have a stronger relationship with their provider because of the frequency of the visits with their provider compared to those with an acute illness. It would be important to ask how long participants have been visiting their healthcare provider.

This study focused on eHealth information access via the internet on a computer. However, there are other ways to access eHealth information such as the mobile phone. Future research should look at eHealth information access on the mobile phone. With the decrease of cost of mobile phones, access to them may become easier than a computer which could affect eHL.
5.5 Policy Implications

As more patients become informed- wanting more responsibility for their own health and actively searching for eHealth information outside of a doctor’s visit (Henwood et al., 2003) then there needs to be better regulations on the eHealth information. Perhaps having an icon on the website meaning this website is safe, trusted and good quality information from a third-party is needed to improve eHL. Research has shown there is improvement in eHL if individuals are shown reliable sources (Ghaddar et al., 2011; Kim, 2014).

Patient exit strategies need to evolve as the provider-patient relationship evolves especially in provider visits outside of the hospital. Currently, outside of the hospital there is not a gold standard instrument for patient satisfaction assessment; like trust, patient satisfaction is a complex multidimensional construct. Having a valid and reliable patient satisfaction scale could help improve healthcare systems overall (i.e. attitudes and use).

Improving eHealth literacy will require more than patient and healthcare providers transmitting health information. It will involve helping people develop confidence to act on that knowledge and seek support. Previous research has suggested the best way to achieve this is through community-based educational outreach (Nutbeam, 2000). However, Parsons sick role is still relevant in this electronic dependent society. Healthcare professionals should be taking the charge to help improve eHL, patients continue to seek advice and guidance from their healthcare professionals. This guidance should start in early career development stage at the college level. By
improving healthcare professionals’ eHL, they will have the confidence and knowledge to share it with their patients. Healthcare professional students need to be taught how to improve their patients’ eHL (Park and Lee, 2015). Policy should also be in place to encourage healthcare professionals to keep up with their eHL skills (Mills et al., 2015) throughout their career with the rapidly changing technology it will be important for professionals to stay current.

In the coming years, the need to design, develop, and evaluate eHealth systems will come. It will change the current provider-patient dynamic which will increase the need to learn how to effectively manage the change and distribution of eHealth services within professions, delivery systems, communities, and healthcare systems. Current focus needs to be on eHealth services that are geared towards less educated, minority and female because this study shows that these social characteristics have a lower eHL.

5.6 Future Research

eHealth Literacy should be studied at an international level. Since eHL measurements are based on individuals’ characteristics and environment, more research needs to be done on cultural factors and how they play a role in eHL. Previous research has shown that those with many symptoms are more likely to search eHealth information prior to visiting the doctor (Hu et al., 2012). Since majority of eHL literature uses survey research, a mixed-method approach might create a better understanding on motivation to use eHealth information. As noted earlier, policy implications on a
global level are not fully studied. Future research should examine how much governments should subsidize access to computers and the internet.

In research it is critical to have reliable and valid measurements, in the case of eHL, it has yet to be determined if having a standardized screening process (Horwitz, 2016) or having “universal precautions” for eHL is more effective in patient treatment plans (Baker, 2006). This research has shown how much eHL factors into patient-provider relationships, it will be important for future research to look at the best method to improve patients' overall health and readmission rate.

Research will need to investigate how community resources will interact with personal resources, skills, and attitudes in order to improve confidence of new technology. As stated earlier, research has shown that programs who are led by influential/role models have greater influence on participants (Paek and Hove, 2012). Perhaps community-based education should be with providers and/or family members to improve eHL and confidence. Xie (2011) compared individualistic learning style to collaborative learning styles and found that regardless of the learning style the most important factor was attitude toward technology and healthcare. However, other research has suggested that more tailored community-based programs aimed at age, education and gender would be more beneficial (Tennant et al., 2015). Improving confidence in technology will be an important factor to increase the access of eHealth information and ultimately improve eHL. Various social groups hold different standards for responding to a sick role (Burnham, 2014). Public health research realized these differences when trying to understand why one strategy would work and another would not. Public health theorists created the health belief model which uses the beliefs and
values to explain why people maintain and improve their health (Burnham, 2014). This was evident in Xie (2011) study on how to improve eHL in older adults. More studies with theory-driven research is still needed. According to Burnham (2014), the number of research articles published each year focusing on the sick role had decreased dramatically.

There is an urgent need to work with healthcare systems - especially those who serve the disadvantaged populations in order to help benefit all patients (Viswanath and Kreuter, 2008). Otherwise, just like many healthcare services, eHealth information may only be available to those who can afford it. This shows that the sick role is another mechanism for the social elite to control the less privileged. Even though this study did not find geographic location significant, access to the internet still plays a role in eHL rates which ultimately affect an individual’s overall health. A study comparing patients who have access to a public clinic versus a private clinic found that those with higher eHL were more likely patients of the private clinic (Gutierrez et al., 2014). As previously stated in the digital divide literature, income does improve access to the internet which increases the amount of healthcare resources available to the patient (Goidel et al., 2013).

Researchers should explore the extent and impact of the digital divide on the individual worker, the workplace and employers. Also, they should examine the incentives of business helping bridge the divide. There are business such as Intel, Microsoft and Cisco Systems who install thousands of computers in libraries across the US (Begany, 2014). These same businesses as well as many others also have employee assistance, wellness programs, and employee health programs (Conrad and
Walsh, 1992). From a sick role perspective, with more access to eHealth information will there be an increase in self-diagnosis and absenteeism in the workforce. Future study should look at eHL rates and workplace ethics.

Furthermore, research on mobile phone access and eHL is warranted. With mobile phones becoming increasingly inexpensive more people are likely to have access to eHealth information via their mobile phones. Cho, Park, and Lee (2014) found a strong positive association between eHL and health-apps on mobile phones. Research also needs to look at what happens if the digital divide is bridged. Current, policy is trying to connect Americans across the nation. For instance, the American Recovery and Reinvestment Act of 2009 provided $7.2 billion in funds for broadband and internet connectivity (Begany, 2014). Nutbeam (2000) thought eHL would be a tool that would minimize the social determinants of health.

5.7 Conclusions

In order to succeed in improving eHealth literacy- ultimately promoting a greater independence and empowerment among individuals, it is needed to acknowledge and understand the political aspects to education and focus on the social barriers to health. Improving eHealth literacy could have abundant potential to increase access to healthcare and make it more efficient, improve health outcomes, and shrink health equalities by expanding preventive services. It is apparent that many individuals agree it is important for them to have access to eHealth information and its resources. However, social access to the internet requires certain cognitive ability and technical skills as well as demands from the individual. It will be important to have community-based and
provider education programs available to everyone to meet these demands. It was shown in this study that eHealth literacy is a significant factor in a patient’s self-care, patient satisfaction and trust. In the coming years, it will be important to show awareness about this crisis by conducting more theory-driven eHealth literacy research.


characteristics, and patient perceptions. American Journal of Emergency Medicine, 18(4), 394-400.


Knowledge Network Panel. (2013). ESOMAR 28 Questions to help buyers of online samples.


