Promoting Health among Older Adults via E-health Literacy

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Abstract
Older Adults are a growing population segment more likely to have a chronic disease thus increasing their reliance on and cost to the healthcare system. With the increased availability of online health and medical information, the question arises whether ehealth literacy can promote health. Ehealth literacy is the ability to use information technology to search, locate, process and understand health information to improve health and healthcare.

We analyzed data from a nationally representative Health Information National Trends Survey HINTS 2012. Ehealth literacy tapped six components -- basic literacy, information literacy, science literacy, media literacy, computer literacy and health literacy. Statistical analyses showed that individuals 65+ with higher ehealth literacy had better health outcomes ranging from healthy BMIs to fewer clinic visits than those with lower ehealth literacy. Ehealth literacy empowers individuals to take better care of their health and can be enhanced through training.

Introduction
In a utopian world, everyone has healthcare coverage, proficient health literacy and excellent health. Ironically, the US which is a world leader in medical and healthcare services and technology (SelectUSA, 2013) does not have universal health care coverage (Kaiser Family Foundation, 2013). More than a third of its population (36%) has limited health literacy compared to 12% with proficient health literacy and 54% with intermediate health literacy (Kutner, Greenberg, Jin, Paulsen, & White, 2006). The health of America lags behind that of our peer high-income country counterparts in nine areas ranging from infant mortality and obesity to heart disease and disability (Institute of Medicine, 2013).

With the increased availability of online health and medical information, more users have availed themselves of these sources of information. More than from other media or interpersonal sources, a majority (59%) of all adults in the U.S. looked for health information online in the “past year” (Fox & Duggan, 2013a). This was an increase from 50% in 2010 (Tu, 2011) and comprised the third most popular online activity after email and search engine use (Fox & Duggan, 2013a). Recently, Google Search Trends reported the search volume index for “health” at 89 (out of 100) compared to 75 for “celebrity” in the U.S. geographic region (Google Search Trends, 2015). Given that eight out of ten Internet users looked online for health information (Fox & Duggan, 2013a), the question arises whether ehealth literacy could narrow health disparities. Ehealth literacy is the ability to use information technology to search, locate, process and understand health information to improve health and health care (Eng, 2001). It begins with health literacy.

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.” (Ratzan & Parker, 2000). Low health literacy has been shown to correlate with...
poor health outcomes, less knowledge of health and illness management, lower compliance with therapies, lower understanding of prescriptions and health messages, more health care services use, more emergency room visits and hospitalizations, and a higher risk of death (Berkman, Sheridan, Donahue, Halpern, Crotty, 2011a; Berkman, Sheridan, Donahue et al, 2011b). Recent research found that e-health literacy extended a health information digital divide so that younger and more educated users were more active information consumers (Neter & Brainin, 2012). Older Americans are a growing population segment which is more likely to have a chronic disease, consequently limiting their physical activity, exacerbating their health decline and increasing their reliance on the healthcare system. Therefore, this study examined whether ehealth literacy can promote health among persons 65+. Specifically we analyzed the relationship between ehealth literacy and health outcomes among older adults 65+ and identified specific literacy components that would benefit from enhancement training.

We will first review the components of ehealth literacy which will lead to identifying ways to improve health outcomes. Next, we will discuss current studies demonstrating the effects of online searches on personal health management. Finally, we will profile older adults and their health status as well as their use of technology.

Ehealth Literacy

Ehealth literacy comprises six components conceptualized by Norman and Skinner (2006a & 2006b) – basic or traditional literacy, information literacy, science literacy, media literacy, computer literacy, and health literacy. Specific descriptions for these components were delineated as follows: basic literacy was “the ability to read text, understand written passages, and speak and write a language coherently” while information literacy comprised knowing “how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them.” (Norman & Skinner, 2006b). Science literacy referred to an understanding of the nature, aims, methods, application, limitations, and politics of creating knowledge in a systematic manner (Norman & Skinner, 2006b). Media literacy involved critically thinking about media content so that the individual could place information in a social and political context and consider issues such as the marketplace, audience relations, and how media forms in themselves shape the message that gets conveyed (Norman & Skinner, 2006b). Computer literacy was the ability to use computers to solve problems and required access and the ability to fully utilize it for health (Norman & Skinner, 2006b). Finally, health literacy comprised skills required to interact with the health system and engage in appropriate self-care (Norman & Skinner 2006b).

To date, health literacy has been defined cumulatively by scholars and health professionals as the extent to which individuals are able to make optimal health decisions on the basis of their ability to “obtain, process, and understand basic health information and services” (Ratzan & Parker, 2000). This definition has been used by the National Library of Medicine (National Network of Libraries of Medicine, 2012) and has been referenced in the National Action Plan to Improve Health Literacy (US HHS, 2010a). Health literacy is considered critical in attaining the objectives proposed in Healthy People 2020 (US HSS, 2010b). “Communicate” was added to the definition by the Centers for Disease Control and Prevention and is now part of the Patient Protection and Affordable Care Act of 2010 (Centers for Disease Control and Prevention, 2012). According to the American Medical
Association, a health-literate person has “a constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the health care environment. Patients with adequate health literacy can read, understand, and act on health care information.” (American Medical Association, 1999). The focus of these health literacy definitions from the leading U.S. healthcare policy, health research, healthcare and health promotion entities, is on the application of comprehension and numeracy skills to make health decisions or act on healthcare information.

Healthcare Information on the Internet
Research studies have shown that individuals used healthcare information on the Internet for making decisions and taking steps to improve their health. In a survey of 3,014 U.S. adults, although 70% obtained medical advice and information from a doctor or other healthcare professional, 35% have used the Internet and self diagnosed their medical condition with 46% of this group determining that they needed the attention of a medical professional based on the information they found online (Fox & Duggan, 2013a). In addition, 41% of the online diagnosers had their condition confirmed by their clinician (Fox & Duggan, 2013a). An earlier study of 6,413 US adults found that 55% reported making decisions about doctor visits and treatment after an online information search (Rainie & Fox, 2000). Half of these health seekers (48%) indicated that the online advice improved their health management and more than half (55%) acknowledged that using the Internet has improved their access to health and medical information (Rainie & Fox, 2000).

Among U.S. adults, 45% report living with one of more chronic conditions such as high blood pressure, lung issues, diabetes, heart disease or cancer (Fox & Duggan, 2013b). They tend to be older, have a lower education level, have faced a medical emergency in the past year and contribute to the increasing U.S. healthcare costs (Fox & Duggan, 2013b). Thirty-one percent of adults with a chronic disease have gone online to diagnose their condition and this group tended to be less likely to use the Internet compared to adults without any chronic disease (72% vs 89%). (Fox & Duggan, 2013b). However, they are more likely to talk to their medical professional about the Internet health information compared to those without a chronic condition (60% vs 48%) and are serious about searching and sharing information (Fox & Duggan, 2013b).

Older Adults and Health
As Baby Boomers born just after World War II, turned 65 in 2011, they started to swell the ranks of this demographic segment enumerated at 40 million in 2010 (U.S. Census Bureau, 2012a). The U.S. population will age rapidly as the older adults are estimated to reach 55 million in 2020 and 72 million in 2030, accounting for 21% and 25% respectively of the total adult population (U.S. Census Bureau, 2012b).

Chronic diseases are the leading causes of death and disability in the country (Centers for Disease Control & Prevention, 2014a). National statistics showed that older adults are at a higher risk for chronic diseases, particularly heart disease and cancer. Between 2007 and 2010, 70.2% of males aged 60 to 79, and 70.9% of their female counterparts, had cardiovascular disease (National Institutes of Health, 2015). The morbidity rate among the 80+ age group at 83% for males and 87.1% for females is even higher (National Institutes of Health, 2015).
Cancer incidence is age-related, with the disease disproportionately affecting men and women aged 65 and older. In 2011 (the most recent year for which statistics are available) incidence rates per 100,000 among men, increased from about 115 to 882 to 2,546 cases for age groups 20 to 49, 50 to 64, and 65+ respectively. Incidence rates per 100,000 among women increased from 199 to 756 to 1,654 cases across the respective three age groups (National Cancer Institute, 2015).

Overall, older adults 65+ are vulnerable to chronic diseases and other medical conditions. Between 2007 and 2010, 34.6% were obese (Fakhouri, Ogden, Carroll, Kit & Flegal, 2012). In 2011, individuals aged 65 to 74 had a rate of diagnosed diabetes (21.8%) more than 13 times that of younger persons aged under 45 (1.6%) (CDC, 2014b) while in the period 2010 to 2012, nearly half of older adults aged 65+ (49.7%) indicated an arthritis diagnosis (CDC, 2014c).

As the nation’s most common cause of disability and occurring more often among seniors, arthritis may severely limit activities such as climbing stairs or walking short distances (Fakhouri et al, 2012). It also inhibits health promoting physical activity which can have many benefits including reduced pain and better physical function (Fakhouri et al, 2012). The total health cost associated with arthritis and other rheumatic conditions in 2003 was $128 billion compared to $86.2 billion in 1997 (CDC, 2014c).

Older adults are heavier users of the healthcare system because of their chronic disease(s) and higher health risks, and their healthcare costs are correspondingly larger. In 2008, adults 75+ visited the emergency room one and a half times more frequently than their younger counterparts aged 25 to 44 (U.S. Census Bureau, 2012d). In 2009, 34.6% of adults aged 65 to 74, and 38.0% of adults aged 75+ visited healthcare professionals 4 to 9 times compared to 19.3% of adults aged 18 to 44 (U.S. Census Bureau, 2012c). In the same year, adults aged 65+ spent 34.9% of their healthcare expense on inpatient services compared to 25.8% by the 18 to 64 age group (West, Cole, Goodkind & He, 2014). Between 2007 and 2009, the average annual healthcare expenditure by the 65 to 74 and 75+ age groups were $4,906 and $4,779 per individual, respectively, which represented 11.4% and 15.1% of their total annual expenditure (U.S. Census Bureau, 2012e). The comparable figure for the overall U.S. citizen’s annual healthcare expenditure was $2,985 per individual comprising 6% of their total annual expenditure (U.S. Census Bureau, 2012e).

The Internet provides access to a wealth of health and medical information and has enabled users to obtain health information and make appropriate decisions about health and healthcare. Ehealth literacy includes computer literacy and older adults 65+ are generally late adopters of technology (Smith, 2014). Could this barrier be surmounted?

**Older Adults and Technology**

Technology adoption among adults aged 65+ has been increasing with 59% using the Internet in 2013 (Smith, 2014) compared to 22% in 2004 and 14% in 2000 (Fox, 2004). In 2013, 27% of the total senior group used social media such as Facebook (Smith, 2014). However, senior adults’ technology usage trails behind the total adult population where 86% go online and 73% used social media in 2013 (Smith, 2014). Additionally, senior adults’ smartphone adoption remained low at 18% in 2013, compared with the national adoption level of 55% (Smith, 2014). Overall, seniors seemed more likely to use tablets or
e-readers than smartphones as 27% seniors owned tablets or e-readers in 2013 (Smith, 2014).

A few barriers can account for the lag in technology adoption among older adults 65+. First, seniors’ technology usage can be limited by deteriorated physical and mental functions, including chronic disease pain (Gatto & Tak, 2008), “visual and auditory deficits”, as well as memory decline (Parker, Jessel, Richardson & Reid, 2013). Senior adults are also found to encounter frustrations during the process of learning technology (Parker et al, 2013) such as getting upset about the length of time it takes them to learn, and the lack of time to practice at home (Gatto & Tak, 2008). Privacy and security concerns, such as worry about online identity theft, are also keeping senior adults from using technologies (Gatto & Tak, 2008). Some other barriers include concern about online source credibility (Gatto & Tak, 2008), additional cost of adopting new technologies (Parker et al, 2013) and the difficulty of keeping updated with the fast changing technologies (Maloney, 2014).

In spite of these challenges, prior studies have pointed out that senior adults are willing to use new technologies if they obtain proper instruction (Gatto & Tak, 2008; Parker et al, 2013). Tailored interface designs which consider senior adults’ deteriorated functional abilities, can also facilitate their adoption of technologies (Parker et al, 2013). Additionally, family and friends’ encouragement can be another facilitator as one prior study indicated that 45% participants (aged 60 and above) reported that their starting of using computers and internet were motivated by adult children while 28% said to be motivated by friends (Gatto & Tak, 2008). Therefore, the question arises whether ehealth literacy which includes computer literacy can narrow health disparities to build a bridge to improve health among older adults. Can ehealth literacy promote better health behaviors among older adults?

The specific hypotheses guiding the study focused on adults 65+ were as follows:

H1: A higher e-health literacy is related to better health status.
H2: A higher e-health literacy is related to fewer visits to the health professional.
H3: A higher e-health literacy is related to a healthier body mass index.
H4: A higher e-health literacy is related to consuming more fruit.
H5: A higher e-health literacy is related to consuming more vegetables.
H6: A higher e-health literacy is related to exercising more frequently.
H7: A higher e-health literacy is related to better mental health.

Method
We analyzed data from a national representative survey conducted by the National Cancer Institute – 2012 Health Information National Trends Surveys – HINTS4. Data were obtained from 3,935 adults in 2012. Beginning in 2003, the Health Information National Trends Survey collected nationally representative data about the American public's access to and use of cancer-related information. HINTS data are collected by the National Institutes of Health, National Cancer Institute. Each survey assesses the impact of the health information environment and provides updates on changing patterns, needs, and information opportunities in health. In addition, it identifies evolving trends and practices in communications, assesses cancer information access, usage and perceptions of cancer risks, and finally, it presents opportunities for testing new health communication theories (HINTS, 2008). The overall response rate was 36.67% for the 2012 survey. HINTS data are freely available to scholars from the National Cancer Institute for further analysis. Table 1 summarizes the respondent demographics.
Variables
We looked for items that occurred in both surveys and identified conceptually equivalent measures. For basic literacy, two 4-point Likert-scaled questions (1=strongly agree to 4=strongly disagree) best reflected the ability to read and understand written materials. They were, “Based on your recent search for information about health and medical topics, how much do you agree or disagree: 1) The information you found was hard to understand. 2) You felt frustrated during your search for the information.” The two measures were highly correlated (r=0.637, p=.001) and were summed and averaged so that a higher score represented higher basic literacy.

Information literacy was measured with one 5-point confidence measure about getting advice or information about health or medical topics. Scores ranged from 1= not at all to 4= very confident. Higher scores indicated higher information literacy.

Science literacy was measured with a single 4-point Likert-scaled item regarding the statement: “There are so many different recommendations about preventing cancer, it’s hard to know which ones to follow.” Strongly agree was coded 1 while strongly disagree was coded 4. A higher score indicated higher science literacy.

Media literacy focused on three questions related to health or medical topics presented by three media sources: 1) newspapers or magazines (print media), 2) radio and 3) television. Respondents evaluated how much they “trusted information about health or medical topics” from each of the three media sources. The responses, 1= not at all, 2= a little, 3= some and 4= a lot, were recoded in line with the European Association for Visual Interest (EAVI, 2011) recommendation for scoring media trust as a measure of media literacy. The report observed that, “a total belief in the reliability of media is never advisable in any context…on the one hand, that media in general rarely are totally unreliable and, on the other, that lack of any opinion at all is not conducive to taking a critical stance.” (p. 153). Therefore the “not at all” and high trust ratings of 1 and 4 were scored 0, the “a little trust” rating of 2 was scored 1 and the “some trust” rating of 3 was scored 1 in order to reflect a sound skepticism about media and a critical sensibility. A higher score reflected higher media literacy in each medium. Overall, a media literacy score was created by summing these trust responses to the three media questions. Cronbach’s alpha for this component was 0.725.

Computer literacy comprised two questions. 1) Selecting “internet” as the response to the question where the respondent went to first in the most recent search for information about health or medical topics, and 2) Indicating “yes” to going online to access the internet or world wide web or to send/receive email. The appropriate response was coded 1 and all other answers coded 0. Scores to the two questions were summed so that the higher the score a person obtained, the more computer literate s/he was considered. The two items had a correlation of 0.492, p=.001. Likewise, a conceptually approximate health literacy measure focused on making good decisions about health and comprised a single 5-point degree of confidence item, “Overall, how confident are you about your ability to take good care of your health?” Scores were coded 1= not confident at all, 2= a little confident, 3= somewhat confident, 4= very confident, and 5= completely confident. Higher scores reflected higher health literacy.
Health literacy, as defined in this analysis, represented the degree of confidence in the subject’s ability to take care of his/her health and was predicated on two assumptions: the presence of 1) basic literacy i.e., the ease in understanding information about health and medical topics and the ease in searching for this information, and 2) information literacy, i.e., confidence in the subject’s ability to obtain health/medical advice or information when it was needed. Logically, it would be challenging to make good healthcare decisions without having and understanding the requisite health or medical information. The assumptions were supported in the correlation results between health literacy and basic literacy (r=.24, p=001), and between health literacy and information literacy (r=.37, p=.001).

The ehealth literacy measure consisted of summing the six literacy components. Cronbach’s alpha for ehealth literacy was .643 which reflected some multidimensionality. Higher scores represented higher ehealth literacy with a range of 7 to 23. High and low categories of ehealth literacy were created by dividing the scores into two groups with 17 the median as the dividing point. Health behaviors comprised six measures: health status, frequency of visiting a health care provider, body mass index, fruit consumption, vegetable consumption, exercise frequency and mental health issues. Health status was a self reported measure with five levels of health coded 5= excellent, 4=very good, 3=good, 2=fair and 1= poor. Frequency of health provider visit was the number of times in the past 12 months that respondents visited a health professional. Healthy individuals would be less likely to have illnesses and therefore correspondingly less likely to visit their healthcare provider. Body mass index (BMI) scores were based on the following function calculated from a person’s respondent weight and height (Centers for Disease Control and Prevention, 2013).

\[ \text{BMI} = \frac{\text{weight (lb)}}{[\text{height (in)}]^2} \times 703 \]

The scores were interpreted as underweight (<18.5), normal (18.5 to 24.9), overweight (25.0 to 29.9), and obese (>30.0). Since the proportion of underweight was small (0.7%), this was coded as missing data.

Both fruit and vegetable consumption was measured by the number of cups consumed each day from 0=none to 6=four or more cups of vegetable or fruit. US dietary guidelines for Americans issued by the US Department of Health and Human Services encourage increasing vegetable and fruit consumption (US HHS, 2010a). Specific recommended amounts are daily intake of two to 4 cups of vegetables and 1.5 to 2.5 cups of fruit (US DHHS, 2010b). Exercise referred to the number of days in a typical week during which physical activity or exercise occurred with responses ranging from 0=”none” to 7="7 days a week.” Americans are recommended to engage in the equivalent of 150 minutes of moderate–intensity activity each week or exercise 30 minutes, five days a week (US DHHS, 2010a). Mental health issues comprised the average of four variables: being bothered in the past two weeks by 1) little interest or pleasure in doing things, 2) feeling down/depressed/hopeless, 3) feeling nervous, anxious or on edge, and 4) not being able to stop or control worrying. These were assessed on a scale of 1 to 4 with 1= “nearly every day,” 2= ”more than half the days,” 3=”several days” and 4=“not at all.” Therefore, a high score would represent good mental health while a low score would represent poor mental health. Cronbach’s alpha for the mental health composite measure was 0.90.

**Statistics**
Frequency distributions were examined for the health behaviors and t-tests were used to test the differences between high and low ehealth literacy groups in the health behaviors -- health status, frequency of visiting a health care provider, body mass index, fruit consumption, exercise frequency and mental health. Probability levels were set at p=.05.

**Results**

Figures 1 to 7 report the health behaviors of the older adults (see Figures 1 to 7). A majority (80.9%) reported “good to excellent” health while nearly one fifth (19.1%) had “fair to poor health.” (Figure 1). Nearly half (47.8%) visited his/her healthcare provider four or more times a year. About a third (33.1%) went two or three times a year and less than ten percent (8.5%) went once. Nearly ten percent (9.6%) did not go at all. (Figure 2). Because doctor visits invariably cost money in the US, this factor may have inhibited individuals from seeing a healthcare professional and not because they were ill. For this reason, we excluded the respondents who did not go the doctor at all from further analysis.

Less than a third had a healthy weight. (Figure 3) Two thirds (66.5%) were overweight or were obese and a tiny group was underweight. Again in view of good to excellent health among 4 out of five individuals, health status may be perceived subjectively. It certainly has social desirability.

The good news is about half (52%) of older adults were consuming the recommended USDHHS amount of 1.5 to 2.5 cups of fruit a day. The bad news is that the other half (48%) was not. The average was 2.5 or about one cup of fruit per day. (Figure 4).

When it comes to vegetables, the good news is about a quarter (26.6%) of older adults consumed the recommended USDHHS amount of 2 to 4 cups of vegetables a day. However, a majority, about three-quarters (73.4%) were not eating enough vegetables. The mean of 2.8 was about one cup a day. (Figure 5.) Combined, older Americans were eating about two cups of fruits and vegetables a day when they needed to consume 3.5 to 6.5 a day.

Older Americans were not getting the recommended amount of weekly exercise. Nearly a quarter (23.5%) met the recommended level of 5 days a week and (hopefully) 30 minutes of moderate activity to meet the 150 minutes a week. A third (32.3%) did not exercise at all and this could be because of limitations on physical mobility or other reasons. The mean was 2.5 days which was half the recommended frequency. (Figure 6)

Mental health issues comprised being bothered by apathy, depression, anxiety and constant worrying. About half (52.3%) did not experience any of these problems. More than a third had these experiences several days over the past two weeks and a little over 10% (11.6%) experienced this more than half the days or every day in the past two weeks. The average of 3.57 was between “several days” and “not at all.” (Figure 7).

T-test results showed that all the hypotheses except for one were supported. The exception was the frequency of eating fruit. Both groups ate an equivalent amount of fruit (2.5 vs 2.7 mean or about 1 cup a day). Older adults with higher ehealth literacy levels reported having better health-related behaviors than those with lower e-health literacy. These included better health status ($M=3.7, SD=0.89; M=3.76, SD=0.79$) $t(7.04, p=0.01, d=.32)$, lower frequency of
health professional visits (M=3.40, SD=1.59; M=3.74, SD=1.53, t=2.23, p=.03, d=.11),
healthier BMI M=27.17, SD 4.99; M=28.32, SD=5.69, t=2.28, p=.03, d=.11), eating more
cups of vegetables daily (M=3.08, SD 1.11; M=2.76, SD=0.22, t=2.99, p=.01, d=.35),
exercising more days a week (M=3.16, SD 2.26; M=2.49, SD=2.31, t=3.09, p=.01, d=.15),
and experiencing better mental health (M=3.75, SD 0.44; M=3.46, SD=0.72) t=5.64, p=0.01,
d=.24). See Figure 8.

Discussion
The present study found that a majority of older adults (four out of five) reported good to
excellent health and that those with lower ehealth literacy were more likely to have visited
their healthcare provider in the past year. Nearly half of the older adults visited his/her
healthcare provider four or more times a year; another a third went two or three times a year;
and less than 1 in five reported one visit or none. This suggested that other factors could
account for visiting/not visiting the health professional such as access, convenience or
possession/lack of insurance coverage, age, income or ethnicity and cost because in the US,
every visit to the doctor’s clinic costs money.

In view of the result that less than a third of seniors had normal healthy body mass index
scores, two-thirds were overweight and obese, “good to excellent,” health status seemed to be
perceived subjectively, possess social desirability and was reported by those who are
overweight or obese.
As hypothesized, older adults with higher ehealth literacy levels had better health behaviors
than those with lower ehealth literacy scores. The behaviors were general health status,
frequency of going to the healthcare provider, BMI, vegetable consumption, exercise
frequency and mental health. Both groups had a similar fruit consumption pattern of eating
one cup of fruit a day. Overall, older Americans did not meet the recommended US HHS
levels of fruit (1.5 to 2.5 cups a day) and vegetable (2.5 to 4 cups a day) consumption or
exercise frequency (5 days a week). Instead, they are averaging 1 cup of fruit, 1 cup of
vegetables and 2 days of exercise. Much more can be improved.

These findings underscored the benefit of promoting ehealth literacy. Presumably, persons
with higher ehealth literacy scores would be more knowledgeable in using the computer to
search the internet for specific and relevant health information, understand the science and
logic of the material obtained, use the content to make decisions about his/her health and
ultimately be more likely to have a normal healthy weight/BMI, visit their health
professional, demonstrate a healthier lifestyle in vegetable consumption and exercise
frequency and have better mental health. Using information technology to search for health
and medical information helps individuals to be more ehealth literate. Therefore, there is a
need to provide appropriate technological education and training programs in searching for
health and medical information among older adults as they comprise a population with a high
incidence of chronic disease, limited physical mobility and higher healthcare costs. Ehealth
literacy can be a means to promote health among this group and other population segments.

Limitations And Future Research
The present study utilized the 2012 HINTS data to develop, test and apply the ehealth literacy
measure and its six components. It identified survey measures that were conceptually
equivalent to the ones proposed by Norman and Skinner (2006a, 2006b). As a result, ehealth
literacy was measured and found to be related to improved health behaviors. Since the results
are from a cross-sectional study, further study is needed to ascertain the extent to which ehealth literacy can be enhanced through training and indeed will result in a higher frequency of healthy behaviors.

Future research should examine the impact of ehealth literacy training programs among older adults as this group stands to reap the most benefits from using information technology to obtain health and medical information from the Internet to improve health and healthcare. In addition, the relationship of ehealth literacy with other health outcome measures should be explored to confirm the former’s impact. These health outcomes include other wellness behaviors and disease prevention behaviors. Further comparative analyses of persons with high vs low ehealth literacy would yield specific profiles of population segments that may benefit from ehealth literacy promotion/training efforts. In 2011, 59% of the US population searched for online health information compared to 24% in 2000 (Pew Research Center, 2009; 2011). More individuals will continue to use the Internet as a source for health information. Therefore, promoting and training ehealth literacy can only serve to enhance the quality of the health of the nation.

References


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TABLES AND FIGURES

Table 1. Older adults sociodemographic characteristics (HINTS 2012)

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Figure 1. Profile of Health Status

Figure 2. Visits to Health Professional

Figure 3. Body Mass Index Profile

Figure 4. Fruit Consumption

Figure 5. Vegetable Consumption

Figure 6. Exercise Frequency

Figure 7. Mental Health Issues
Figure 8. T-test Results

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<td>2.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Vegetable consumption</td>
<td>2.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Exercise</td>
<td>2.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Mental health</td>
<td>3.8</td>
<td>3.8</td>
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</table>

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