PSYCHOSOCIAL INFLUENCES OF COMPUTER ANXIETY, COMPUTER CONFIDENCE, AND COMPUTER SELF-EFFICACY WITH ONLINE HEALTH INFORMATION IN OLDER ADULTS

A DISSERTATION

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BY

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To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Adeline Yee-Mei Chu entitled "Psychosocial Influences of Computer Anxiety, Computer Confidence, and Computer Self-Efficacy with Online Health Information in Older Adults." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Nursing.

Sandra Cesario
Sandra Cesario, PhD, Major Professor

We have read this dissertation and recommend its acceptance:

Associate Dean, College of Nursing

Accepted:

Dean of the Graduate School

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ABSTRACT

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PSYCHOSOCIAL INFLUENCES OF COMPUTER ANXIETY, COMPUTER CONFIDENCE, AND COMPUTER SELF-EFFICACY WITH ONLINE HEALTH INFORMATION IN OLDER ADULTS

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There is an increased use of the Internet as a source for health information among older Americans. Numerous surveys demonstrated that older adults who took to computers and the Internet were generally more educated and well-to-do seniors residing in urban and upscale communities. On the contrary, very few programs were created to bridge the digital divide among older Americans living in underserved communities, and the impact health communication technologies had on these seniors. The purpose of the interdisciplinary health communication project was to determine the psychosocial influences of computer anxiety, computer confidence and computer self-efficacy among urban, lower socioeconomic older adults residing in the city of Houston, Texas. A randomized, control, 2 groups, pre-post repeated measure design was employed. 137 participants, ages 65 and older were recruited at 6 meal congregate sites for the study. The participants were randomized to either the intervention or control group. Participants in the intervention group completed a 5-week education intervention, based on Bandura's Self-Efficacy Model, designed to assist older adults in basic computer literacy, health information retrieval and web evaluation. The 2-hour, once a week session was

conducted at a facility of the YWCA Greater Houston. The program was not administered to the control group until the termination of the study. Three measurement scales were used to measure computer anxiety, computer confidence and computer self-efficacy, namely, the Computer Confidence Subscale; the Computer Anxiety Subscale of the Computer Attitude Scale (CAS), and the Computer Self-Efficacy Measure (SEM). The scales were administered to both groups at three time intervals: baseline, at the completion of the 5 week intervention, and 6 weeks after completion of the intervention. Repeated ANOVA findings showed significant reductions in computer anxiety ($p < .001$), an increase in computer confidence ($p < .001$), and an increase in computer self-efficacy ($p < .001$) in older adults after the completion of 5-week intervention compared to older adults not in the program. The study concluded that a well designed program was necessary for the improvement of personal and community health growth to narrow the digital gap among older Americans residing in lower socioeconomic communities.

TABLE OF CONTENTS

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

The Internet has proven immensely popular since its inception in the late 1980s. It is expanding rapidly across all geographic and demographic groups regardless of age, race, or ethnicities (VanBiervliet & Edwards-Schafer, 2004). The number of Internet users in the world has grown 183.4% from 2000-2005, with the United States leading the world as the top highest Internet users followed by China, Japan, and India (Internet World Stats, 2006).

The trend on information access through the Internet is an integral part of our society. Search engines on the web have improved greatly to serve the interests of every individual. The size of the content on the Internet has also increased tremendously with the rapid influx of information to the World Wide Web.

The Internet has been widely advertised for its efficacy in delivering health information all over the United States. National surveys conducted by Health on the Net Foundation in 2002, the Pew Internet & American Life Project in 2004, and the Health Information National Trend Survey (HINT) of 2003 and 2005 concluded that the masses of e-consumers on health-related matters has became one of the most popular online activities and the numbers are constantly rising over the years (Fox, 2004; National Cancer Institute [NCI], 2007).

Concerning older Americans, in 2003, the American Association of Retired Persons (AARP) reviewed major demographic studies of seniors and Internet use in the nation. The report showed 36 million (48%) older Americans aged 50 years and older went online. For those aged 50 to 64 years, 25 million (61%) were involved with online activities, and 11 million (32%) of the seniors aged 65 and older were online (AARP, 2003). In 2004, a comparable study by the Pew Internet and American Life Project on older Americans and the Internet reported a rise of 47% of seniors who went online between 2000 and 2004 (Fox, 2004). These survey findings were evidence that older Americans were taking on the trends of narrowing the age gap on Internet use in the United States.

The Internet has the ability to sell itself as a powerful tool by promising to extend its capability to bring information to underserved populations such as people with disabilities, those living in remote areas and socially stigmatized health condition (Wagner & Wagner, 2003). For this reason, the Internet is often quoted for its potential effect of improving the overall quality of life and social interactions among older adults (Nahm, 2002; Nahm & Resnick, 2001). By 2030, approximately 71.5 million people aged 65 years and older will account for about 20% of the total population in the US (US Census Bureau, 2005). Not only will there be a sizeable number of people living to reach 65 years in this affluent society, they will also be living longer. Older Americans are especially proactive health care consumers, and there is a need for more information in decision-making on health promotion and health-related matters.

Older adults are a part of a growing trend of healthcare consumers who use the Internet as a health information resource tool. This movement is related to the development of participative or consumer-orientate health models that raised the autonomy and rights of patients to be informed of their conditions and treatments, the cost-containment efforts from the government to reduce clinicians' time with patients, emphasis on self-care and prevention, and an increased interest in alternative approaches to health care (Cline & Hayes, 2001). The Pew Internet and American Life reported a 66% increase of wired seniors who searched for health or medical information online, which is a 13-point jump from 2000, and a growth of 25% (Fox, 2004). Similarly, a Kaiser Family Foundation survey on e-health among seniors reported one in five seniors (21%) aged 65 years and above went online to search for health information. Those between 50-64 years of age reported a 24% increase for choosing online health information to the traditional information found in books, television, radio and newspapers (Rideout, Neuman, Kitchman, & Brodie, 2005). These groups of computer-literate older Americans reportedly seemed to better manage their illnesses and treatments, make informed decisions about their health care, and take active roles in managing them (Cotten & Gupta, 2004; Detlefsen, 2004; Dickerson, Reinhart, Feeley, Bidani, et al., 2004; Höglund, Maceviciute, & Wilson, 2004; Nahm, Preece, Resnick, & Mills, 2004; VanBiervliet & Edwards-Schafer, 2004; Wagner, Baker, Bundorf, & Singer, 2004).

Problem of the Study

While there are advances in technologies and the availability of consumer health information on the World Wide Web, and the numbers of older Americans going online for health information have increased, many lacked the experience to determine the quality of health information on the Internet (Rideout et al, 2005). Most, if not all may be influenced by the subtle advertising and marketing tricks that comes with it, unknowingly endangering their own health.

One of the reasons might be the stereotyped expectation that older Americans were less responsive to innovations and technology, resulting in fewer interventions targeted at this population (Wagner & Jimison, 2003). With the growth of consumerism, it is indisputably imperative to train older adults to evaluate and retrieve credible health information on the Internet.

Computer trainings to assist older adults to locate and retrieve quality health information have reportedly shown to improve quality of life and a willingness to participate in healthcare (Alpay et al, 2004; Korp, 2006). However, most of the studies did not reflect whether the ability to locate and retrieve health information will reduce computer anxiety, increase their self-confidence and self-efficacy towards subsequent computer use, and if older adults will continue to use the health information offered online. Studies, however, showed that such brief interactions with the computers decreased feelings of depression, isolation, an increased locus of control, and provided social support among older adults (Kelly, Morrell, Park & Mayhorn, 1999; Nahm & Resnick, 2001; White, McConnell, Clipp, & Branch, 2002).

Rationale for the Study

Many older Americans are learning to use computers for the reason of seeking answers to their medical questions. With the growth of consumerism, the benefit of training older adults to evaluate and retrieve credible health information on the Internet is a focal point among librarians and healthcare providers (Strain, 1991; Turk-Charles, Meyerowitz, & Gatz, 1997; Williams, 1999; Vastag, 2001; Wagner & Wagner, 2003). On the other hand, it is not certain to what extent technology and the Internet penetrate to the older Americans residing in low socioeconomic communities, and whether older Americans in these communities benefit from computer and Internet training.

Objective 11-1 of health communication for Healthy People 2010 calls for "improving internet access in the home," which encompasses all the factors that make an Internet connection valuable, such as basic computer literacy, effectively narrowing the gap of digital divide and unequal distribution of technology and technical skills in the society (Healthy People 2010, Department of Health and Human Services, 2003). Nurses have a long history of playing a major role in health education and health promotion in terms of its design, development and implementation of innovative approaches (Lewis, 2003).

It is essential therefore, to design intervention programs for older adults to gain the skills and competence to take advantage of Internet technology that can better contribute to their health, independence, safety and well-being (Leaffer & Gonda, 2000; Hill & Weinert, 2004).

The objective of the study is to narrow the gap of digital divide and unequal distribution of technology among older adults in low socioeconomic communities by designing an intervention, based on Bandura's Self-Efficacy Model, to assist older adults to engage the skills and competence in consumer health information retrieval and evaluation online. The purpose of the study is to determine the psychosocial influences of computer anxiety, computer confidence and computer self-efficacy among older adults, 65 and above, who participate and complete a 5-week education intervention in health information retrieval and evaluation on the Internet.

A pilot study was conducted in the summer of 2006 at a senior leisure learning center located at a parish home (Appendix A). The findings in the pilot study are discussed in Chapter 3. The major study was conducted between June 2007 and February 2008 at meal congregate sites of the YWCA Greater Houston (Appendix B). The findings of the major study are discussed in Chapter 4. IRB approval from the Texas Woman's University as well as consent from the study participants were obtained before conducting these studies (Appendix C).

Theoretical Framework

Bandura's Self-Efficacy Belief

Self-efficacy is a major component of Bandura's (1977) social learning theory. Self-efficacy is a context-specific assessment of competence to perform a task in a given domain. Self-efficacy is the belief in one's capability to organize and execute the courses of action required to manage prospective situations (Bandura, 1995). Self-efficacy influences the choices an individual makes. The stronger the efficacy, the more effort and persistence a person will put forth in the face of obstacles and aversive experiences (Bandura, 1977).

Perceived self-efficacy is concerned with individuals' beliefs in their capabilities to exercise control over their own functioning and over events that affect their lives. Efficacy expectation is an individual's belief to perform a particular behavior successfully. An outcome expectation is the belief that a particular behavior will lead to a desired outcome (Bandura, 1977; Grembrowski, Patrick, Diehr, Durham, Beresford, et al., 1993). Figure 1 illustrates the difference between efficacy expectations and outcome expectations as described by Bandura (1977).

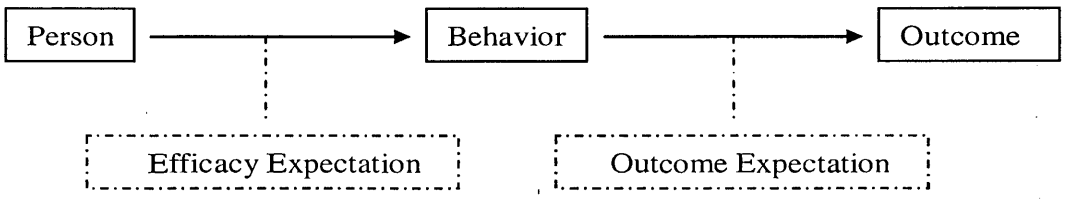

Figure 1. Diagrammatic representation of the difference between efficacy expectations and outcome expectations.

Adapted from *Social Learning Theory* (pg. 79) by A. Bandura, 1977, Upper Saddle River, NJ: Prentice Hall.

Unlike other behavioral domains, educational and socioeconomic status, there is no uniform decline in self-efficacy beliefs in advancing age. On the contrary, older persons can function at a higher level of self-efficacy when they exert their effort in an activity as compared to younger adults (Bandura, 1994).

Self-Efficacy Theory in Computer Training

The concept of self-efficacy is derived from four major sources of efficacy expectations: mastery experiences, vicarious experience, verbal persuasion and emotional arousal. The most influential source of these beliefs is the interpreted result of one's performance, or mastery experience (Pajares, 1995). The outcomes of a performance interpreted as successful will raise self-efficacy, and those interpreted as failures lower it (Bandura, 1977). When strong efficacy experiences are developed through repeated successes of a given task, occasional failures at a later stage of the performance can be overcome with sustained efforts and determination to excel.

In the case of computer training, performing a computer task successfully raises mastery experience, repeated failures lower subsequent performances. Therefore, a combination of participant modeling, performance exposure and desensitization, and self-instructed performance will enhance mastery experience (Bandura, 1977). For example, to evaluate the quality of a health website using standardized evaluation criteria, the instructor first performed the exercise in easily mastered steps, strictly following the criteria in the course content. Older adults then executed the modeled activity with appropriate guidance (participant modeling), with early mistakes and failures identified and corrected at this stage until they could perform the task confidently (performance exposure and desensitization). Joint performance with an instructor, as suggested by Bandura (1977) allows participants to engage in computer use with less anxiety and higher confidence. Reinforcement of course content with case studies and handout exercises as supplementary practices at learners' own time in the research study encouraged active participation in learning (self-instructed performance).

The second source of efficacy information is the vicarious experience of the effects produced by the actions of others. This source of information is weaker than the interpreted results of mastery experiences, but, when individuals are uncertain about their own abilities or have limited prior experience, they become more sensitive to the task at hand (Bandura, 1977; Pajares, 1995). The result of a successful vicarious experience is to have a significant model to instill self-beliefs that will influence the course and direction an individual will take (Pajares, 1995). During the course of the intervention study, every participant has access to a computer in the classroom to allow adequate

hands-on training. Live modeling with the instructor and observing other learners of a similar age group performed a computer activity with no adverse consequences created expectations among participants that they too could persuade themselves to achieve the activity performance if they intensified and persisted in their efforts in learning a new skill.

In the same manner, at the third source of efficacy expectations, individuals can come to believe that they can cope successfully through persuasive suggestions (Bandura, 1977). Although verbal persuasion is a weaker source of efficacy information than mastery and vicarious experiences, verbal persuasions play a vital role in an individual's self-belief (Pajares, 1995). Verbal persuasions include suggestion, exhortation, self-instruction and interpretive treatment (Bandura, 1977). During the course of the intervention, conveying positive appraisals and social encouragement among participants during the training program prompted learners to intensify their efforts in the pursuit of accomplishing a specific computer task and reaching higher self-efficacy belief (Bandura, 1977). Teaching strategies such as the use of questioning and return demonstrations were opportunities that the instructors used helped encourage suggestions and exhortations on a specific task performed.

Finally, the fourth source of efficacy expectations, emotional arousal includes such responses as anxiety, stress, fatigue, and mood change. These responses can provide information about efficacy beliefs because individuals have the ability to alter their own thoughts and actions (Pajares, 1995). Bandura (1977) put forward that "people rely upon their state of physiological arousal in judging their anxiety and vulnerability to stress."

(pg 82). Perceived self-efficacy to exercise control over stressors plays a central role in anxiety arousal (Bandura, 1994). When participants believed they could exercise control over learning to do Internet searches on the computer, they did not conjure up disturbing thought patterns about Internet and computer use. When individuals believed they could not manage these threats, they would experience high anxiety arousal, thus dwell on their own coping deficiencies. Therefore, attribution, relaxation, biofeedback and symbolic desensitization and exposure could influence emotional arousal (Bandura, 1977) thus enhancing optimism among older adults in the training. This process also created a positive learning environment closely related to the practice of the real world, which resulted in self-belief expectation when beset by aversive arousal leading to high anxiety and agitation (Bandura, 1986).

Model Specification

A composite model, based on Bandura's (1977) self-efficacy theory in computer training was proposed. The model hypothesized that a customized computer training that incorporates all four major components of efficacy expectations would positively influence computer confidence and lower anxiety towards computer use, leading to computer self-efficacy. Higher confidence and lower anxiety positively and simultaneously affect one another. Higher confidence positively lower anxiety towards computer, and lower anxiety positively increase confidence with computer use as shown. The model anticipated that both these variables enhanced the outcome expectation of computer self-efficacy since studies have suggested that anxiety and confidence essentially measure the same construct (Gressard & Loyd, 1986; Woodrow, 1994). Figure

2 presents the theoretical model summarizing the hypothesized relationship between the research variables.

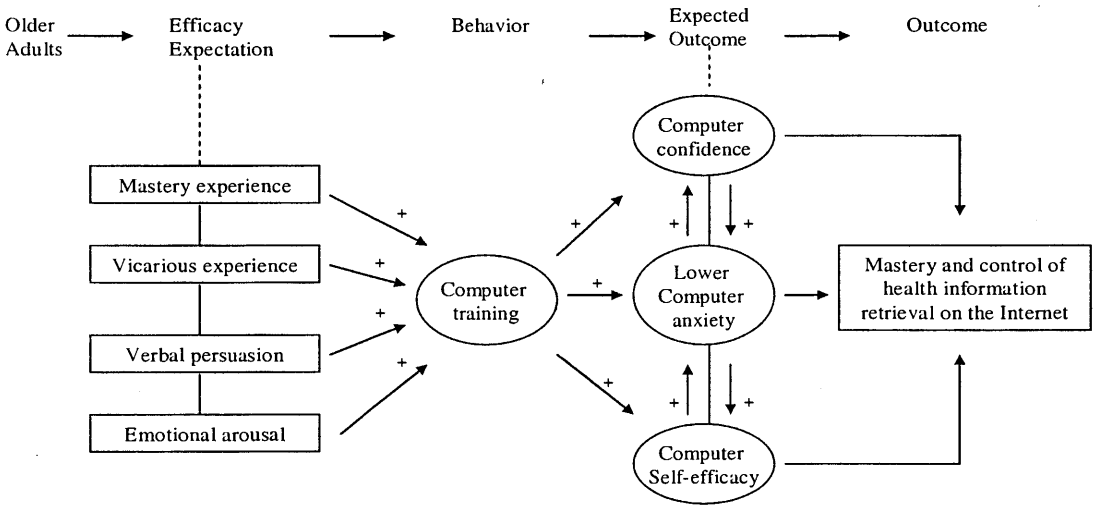

Figure 2. Hypothesized model of computer confidence, computer anxiety in the prediction of computer self-efficacy in a computer training program. + indicates positive influence

Assumptions

1. Self-efficacy behavior can be satisfied when there is sufficient incentive to perform the behavior in question
2. Self-efficacy can be predicted with the performance of necessary subskills
3. Belief in a responsive environment is a pre-requisite to formation of optimistic outcome expectation

Hypotheses

Three hypotheses were tested:

1. Older adults, ages 65 and above, who complete a 5-week education intervention in online health information retrieval at a congregate meal site will report lower anxiety towards computer use at the end of the 5-week intervention and 6 weeks after the completion of the intervention as compared to older adults who do not participate in the program.
2. Older adults, ages 65 and older, who complete a 5-week education intervention in online health information retrieval at a congregate meal site will report higher confidence towards computer use at the end of the 5-week intervention and 6 weeks after the completion of the intervention as compared to older adults who do not participate in the program.
3. Older adults, ages 65 and above, who complete a 5-week education intervention in online health information retrieval at a congregate meal site will report higher self-efficacy scores towards Internet use at the end of the 5-week program and 6 weeks after the completion of the intervention as compared to older adults who do not participate in the program.

Definition of Terms

Computer anxiety is characterized as an affective response, an emotional fear of potential negative outcomes or apprehension felt by individuals when they use computers or when they consider the possibility of computer utilization (Simonson, Maurer, Montag-Torardi & Whitaker, 1987; Hong, Othman, & Nordin, 2005).

Computer confidence is defined as the ability to use or learn the computer (Gressard & Loyd, 1986). A statement such as "I have a lot of confidence when it comes to working with computers" and "I am sure I could do work with computers" were used to measure computer confidence.

Computer self-efficacy is derived from the general concept of self-efficacy and refers to an individual's perceptions about his ability to successfully perform a computing task, and the intentions for future use of computers (Compeau & Higgins, 1995).

Consumer health information refers to a variety of medical and health information provided by librarians in response to requests from the public, patients and their families. It information can include topics related to health promotion and health prevention, determinants of health and information on accessing health care system(Baker & Manbeck, 2000). The term refers to all health-related information retrieved and analyzed through some forms of electronic exchange to improve healthcare delivery (Harrison, Fache, & Lee, 2006). This term is often linked to information related to computers, the Internet and medicine (Kwankam, 2004).

Limitations

Several methodological limitations were observed in this dissertation study:

1. Given the region from which the older adult sample was drawn, the study may not be representative of all races, socioeconomic and education levels in the city of Houston, Texas.

2. The Computer Anxiety Subscale and the Computer Confidence Subscale of the Computer Attitude Scale were developed in the 1980s. There have been no further revisions to the tools since.
3. The Computer Anxiety Subscale, the Computer Confidence Subscale, and the Computer Self-Efficacy Measure were self-reported questionnaires. They might not correspond to the perception of the participants in the study.

Summary

In summary, this chapter gave an overview of the emerging trend of Internet users in the country, and the role of internet health information in the face of a changing health care environment in the society. It also discussed at length the rationale and the theoretical framework that guided this study.

CHAPTER II

REVIEW OF THE LITERATURE

It is clear that older Americans want to make informed choices and shared decision making with their physicians to meet their healthcare needs. This chapter examined the trends of information resources on senior health on the Internet, the socioeconomic demographics of older Americans who went online, as well as an overview of the demographic and poverty rate in Texas. The literature also discussed the processes of determining the effect size, the validity and reliability of the testing instruments used for the study.

Information Resources for Older Adults

There has been an explosion of health information resources targeted specifically for older adults since the adoption of technologies in health communication. The information found on a number of these websites is reputably well researched and well developed to meet to the needs of the seniors. For instance, MedlinePlus and NIH SeniorHealth are useful health resources that cover a wide variety of topics from the aging process to fall precaution to common diseases and conditions specifically related to aging. Following the leads of these government agencies, other healthcare and non-profit organizations, societies, and commercial websites began to develop and market their own senior health information web pages to meet the demands of the society's health and lifestyle. These have led to numerous resource directories made available for the older

adults on health and senior-related issues alone. However, not all the information in the World Wide Web considered the readability, literacy level, and the quality of information posed online. Most, if not all of this information created a problem for computer savvy older adults. The quality of online information and the readability level have always been a concern to many healthcare providers and e-consumers alike. The researcher conducted a small email survey that looked at various websites that claimed to have appropriate health information catered to their online health consumers. One of the questions posed by the survey was how much of the information on their website was evaluated for readability and quality of content for older adults. The findings showed that only 2 of the 86 websites surveyed evaluated the readability and content quality before they were put on the website. The remaining government and non-profit agencies and commercial websites did not evaluate the content of their sites but assumed that the content provided adequate health information and health promotion materials to meet the target population simply because they were endorsed by health professionals (Chu, 2004).

High quality web sites that enabled users to perform information searches intuitively are essential to senior users. Many older adults have unique physical and motor difficulties, and to some extent cognitive impairment. As motor skill decreases in old age, a person may find clicking a mouse or scrolling down a page a lot more task intensive than someone who is younger. Vision may also be affected with too patterned background and fancy fonts in a page. Although the usability of health websites for older

adults have improved much in recent years, most of the websites on the Internet do have serious readability problems such as small font sizes, inappropriate instruction on how to use video streaming, and too many activities on a single web page (Nahm et al., 2004).

In addition, low health literacy among older adults can directly influence access to crucial information about their rights to health and healthcare, whether it involves following instructions to care, comprehending disease-related information or learning about disease prevention and health promotion. Low health literacy has an impact on cognitive and linguistic abilities, hence influenced a person's ability to navigate in a literate environment such as the Internet (Baker et al., 1996; Parikh, Parker, Nurss, Baker, & Williams, 1996). Most commercial health websites were in the 9^{th} to 12^{th} grade readability range, which is far above the recommended reading level for providing information to the public (Birru et al., 2004). The recommended reading level for health information is between 6^{th}-8^{th} grade (Freda, 2004).

Changes have been made to improve web access for older adults. Some examples include design issues such as increasing the font sizes to meet the aging vision of the older adults, incorporating video stream for those with literacy issues, and the addition of Spanish and other languages to meet the culturally diverse population among the seniors (Alpay et al., 2004). MedlinePlus and NIH Senior Health are examples of such improvement.

Therefore, the best option to ensure older adults have access to high quality health information through the Internet is to educate seniors how to evaluate the credibility of the information retrieved on the Internet (Bates, Romina, Ahmed, & Hopson, 2006). In

this study, MedlinePlus and NIH SeniorHealth were selected as the choice for training older adults the steps to consumer health information retrieval and evaluation. These sites have been strongly researched to provide quality health information as well as balancing the cognitive capability of the seniors. For instance, NIH SeniorHealth enables older adults to choose between small to large font sizes, turn on or shut down the speech volume, and the ability to increase or decrease the contrast of the page to increase light sensitivity and depth perception.

Socioeconomic Demographic of Seniors Online

The term digital divide is often compared to those who have access to computers and the Internet versus those who have no access because of low income, education, age and race (National Telecommunications and Information Administration, 2000). Several survey reports showed that older adults who used the Internet for health related matters and other usages were predominately white females living in rural parts of the town, had higher income and education level of at least a college degree or high school diploma, and who had access to the computer either at their work place, at the library or at home for at least once a day (Bowen, 2003; Cotton & Gupta, 2004; Dickerson et al., 2004; Meischke, Eisenberg, Rowe, & Cagle, 2005; Pandey, Hart, & Tiwary, 2003; Peterson & Fretz, 2003).

The Kaiser Family Foundation in 2005 reported about two-thirds of older Americans who depended on Medicare had annual incomes under $20, 000 per year and only 65% of the seniors whose incomes were $50, 000 per year or higher had used the Internet (Rideout et al., 2005).

The Situation in Texas

There are about two million people aged 65 years and above residing in the state of Texas (AARP, 2000). Texas is among the top ten states with the highest poverty rates for older adults at 14.4% as compared to the national rate of 10.2% (AARP, 2000). The low socioeconomic groups were largely excluded from the enjoyment of Internet health resources, causing a gap between those who have the privilege of Internet access and those who do not. Personal computers were deemed too high a price to pay for low-income populations (Lai, Arthur, & Chau, 2004; Birru et al., 2004).

There were insufficient intervention studies to date that examined how low-socioeconomic seniors take to computers and Internet searching for health related information. One reason might be the stereotyped expectation that older adults were generally less responsive to innovations and technology, resulting in fewer interventions designed for this population (Wagner & Wagner, 2003). A study conducted by Kalichman, Weinhardt, Benotsch, & Cherry (2002) reported interventions that allowed low-income HIV-positive individuals to use the Internet had the positive results of enhanced knowledge about HIV and coping with the disease.

A community-based telephone survey conducted among 60 residents ages ranging between 18-65 and older in an urban, low-income community in Chicago showed that 25 participants in the intervention group who received training and access to WebTV, a printer and researcher support resulted in positive health-related empowerment with in-home technology use as compared to the 35 participants who did not receive the intervention (Masi, Suarez-Balcazar, Cassey, Kinney, & Piotrowski, 2003). The outcome

of a cross sectional survey that measured computer and Internet access, and the use of Internet health information with low income, urban African American caregivers of pediatric outpatients reported that only 52% of the 206 participants have used the Internet for health information, and agreed that it would be ideal if they had the opportunity to connect to the Internet and access to health information online (Kind, Huang, Farr, & Pomerantz, 2005). A before-after study of 60 older adults who received a 5-week Internet training program at public libraries and community centers in greater Pittsburgh and Allegheny County region showed statistically significant findings on locus of control and health information seeking 5-weeks after the completion of the intervention (Campbell & Nolfi, 2005). The study also showed that a year after receiving Internet training, 21 of the 27 respondents reported using the Internet weekly or as needed to locate health information. With the vulnerability of the digital divide, not every older adult with lower income, lower education, and from rural parts of Texas has the opportunity to try a computer or have access to the Internet.

Efficacy of Internet Health Information

Moreover, evidence on the efficacy of Internet health information from clinical trials were few and mixed. Most of the clinical trials on Internet seeking behaviors among the older adults were conducted in Europe. Unlike in the United States, descriptive reports and surveys were still being conducted on the same issue. Given the large influx of health related materials on the Internet, there were insufficient studies to examine if these materials were indeed useful, and if older Americans have the efficacy and

confidence to use these materials for personal health management when it is so strongly advocated for its many benefits.

Although efficacy of Internet use among older adults has been discussed in a small number of research papers, the science and the understanding behind the concept is not well studied and established. There is a lack of empirical research to conclude what constitutes the cognitions and affect of Internet efficacy among older adults and how this behavior in turns influences health promoting behavior.

Health promotion and disease prevention has been identified as one of the priority areas of nursing research in the twenty-first century. Henceforth, determining the factors that contribute to promoting a certain health behavior, in this case, the area of computer confidence, computer anxiety and computer self-efficacy, are pertinent in establishing evidence-based practice in nursing science, which, at this stage is still in its infancy. Exploring the relationship between Internet efficacy and health information retrieval and evaluation among older adults opens an array of possible solutions for nursing and library personnel to develop and design health promotion and health information content that will adequately cater to the needs of the population, hence contribute to the state of nursing and library sciences.

Effect Size Determination

Many reports demonstrated positive effects of using the Internet to access consumer health information among older adults. However, of the majority of these studies were descriptive and exploratory in nature. A review of the literature in CINAHL, PubMed, EBSCO, PsyInfo, and Library Literature and Information Science databases

from 2005-2007, found several Internet intervention programs for older adults. However, these studies were often case studies and pre-post test designs with no control group comparison, thus making effect size estimation for the study extremely challenging. Moreover, meta-analysis of behavioral change outcomes on health information retrieval on the Internet was not available at the time of this report. Furthermore, email contact with authors of several potential studies for means and standard deviations were unsuccessful. Consequently, the researcher re-examined and explored related literatures with other forms of Internet instructions and accessing health related information online.

Three studies were selected to guide effect size estimation for the study. These selected articles were determined by the mean scores, and by the following factors: (a) a comparable intervention design on accessing health information on the Internet and (b) the outcome variables—empowerment and self-rated computer skills. The variables, empowerment and self-rated computer skills, measured
aspects of personal behavior as with self-efficacy. Self-efficacy belief is the result of an accomplishment based on one's own personal experiences (Bandura, 1995).

Empowerment refers to the ability of a person "to gain understanding and control over personal, social, economic, and political forces that take action to improve their life situations." (Hill, Weinert, & Cudney, 2006, p37). Similarly, self-rated computer skills are defined as the ability of a person to develop computer skills with confidence and with less anxiety, thus gained an appreciation for the wealth of health information available on the Internet (Weinert & Hill, 2005). Substantial overlaps were noted in these measures. Firstly, the intervention in the researcher's study was designed to teach individuals the

computer literacy skills as well as Internet skills necessary to retrieve and evaluate health information available on the World Wide Web, which was similar to the intervention design in the three selected studies. Chronic illnesses were more common in older adults (Ko & Coons, 2005; Liao, McGee, Kaufman, Cao, & Cooper, 1999). Hence, the focus of the dissertation study was to assist older adults to locate information to improve health outcomes, exert greater efforts to improve functioning and resistance to psychological dysfunction ill adults (Gustafson et al., 1999).

The selection of these literatures had its limitations. The study population was of a different age group (range 18-65 years and above) and in an entirely different community (rural women with chronic illness and citizen leaders in a residential community). As a result, these studies could not be extrapolated to represent the general community of older adults living in underserved neighborhoods.

Based on the above power analysis, the effect size (ES) calculation arrives at a medium effect size of 0.60-0.77. All three studies reported a significant change in the described outcome when they participated in an Internet training program. Despite a thorough literature review, there were no 2-group intervention studies to determine consumer health information retrieval on the Internet for older adults with low computer literacy in an underserved community. Since the closest studies available have their limitations in comparability, the research study utilized a conservative ES estimation of 0.60.

Sample Size Determination

Based on Lipsey (1990), an effect size of 0.60 with a 0.80 power and alpha of .05, and a 30% attrition rate, the estimated sample size required 65 participants in each arm and a total of 130 participants in the study.

Instrument(s)

Baseline Measures

A demographic data form was modified with permission from Campbell's study with the elderly and the Internet (Campbell, 2004). See Appendix D.

Evaluation Form

An evaluation form was developed to obtain feedback on the overall impression of the education intervention and to evaluate the knowledge and skills learnt from participating in the program. See Appendix E.

Computer Anxiety Subscale and the Computer Confidence Subscale

The Computer Anxiety Subscale of the Computer Attitude Scale (Gressard & Loyd, 1986) is a 10-item Likert instrument measuring computer anxiety with responses ranging from "strongly agree" to "strongly disagree". Higher scores on the scale reflected lower degree of anxiety. The Computer Confidence Subscale of the CAS is a 10- item Likert scale measuring computer confidence with responses ranging from "strongly agree" to "strongly disagree". Higher scores represented more confidence with computer use.

The reliability and factorial validity of the Computer Attitude Scale and its subscales were analyzed with elementary, middle and secondary school teachers who

were enrolled in staff development programs designed to provide computer instruction and experience (Gressard & Loyd, 1986). The scales were administered to the teachers at the beginning of the study, during the program and at termination of the program. The alpha coefficient reliabilities were .89, .89, .89, and .95 for the Computer Anxiety, Computer Liking, Computer Confidence Subscales, and the Total Scale, respectively. The three factor-solutions accounted for 54% of the total variation, and the eigenvalues of the first 3 factors from the principal component analysis were 13.09, 1.92, and 1.21, respectively. The factor loadings for the three-factor solution were with values at or above .40. Hence the reliability coefficients of the three subscales and findings of the factor analysis suggest that the scores of the three subscales are sufficiently defined to be used as separate scores.

Computer Self-Efficacy Measure

The modified Computer Self-Efficacy Measure (Campbell, 2004), a 5-item Likert scale, was employed to measure participants' levels of self-efficacy using the Internet to locate health information. All five items, which were written in question format, were changed to statements for ease of use. For example, "How confident are you that you can learn to use 'search tools' to find information on the Internet?" was changed to "I am confident I can learn to use 'search tools' to find information on the Internet," with responses ranging from "strongly agree" to "strongly disagree". Higher scores represented higher self-efficacy toward using the Internet to search for information. The scale was developed for use in a computer training program with older adults, and evaluating the self-efficacy level of those participants involved in the training program.

The items from the three measurement scales were randomly shuffled to avoid bias from respondents answering the questionnaire. See Appendix F.

Validity of Instruments

Prior to the study, a content validity study was conducted for the Computer Anxiety Subscale, the Computer Confidence Subscale, and the Computer Self-Efficacy Measure. Emails were sent to solicit potential participants inviting them to take part in the study. When individuals responded to the email request, a packet consisting of a cover letter, response forms with instructions and a brief demographic questionnaire were mailed to them. A self-addressed, stamped return envelope was also included in the packet. Using the theoretical definition provided for computer anxiety, computer confidence and computer self-efficacy, the experts rated each item to determine the item's ability to represent its respective dimension, the clarity of each item response, as well as the comprehensiveness of the entire measurements by indicating items that need to be added or deleted.

Of the 10 individuals invited to participate in the study, 9 responded to the survey. Five of the respondents were content experts and four were lay experts. All of the respondents rated the items and provided comments on how to revise the measurement. The Content Validity Index (CVI) was used to calculate for representativeness and clarity of each item on the scale and the entire measurement. The CVI was derived from the rating of the content relevance of the items on an instrument using a 4-point ordinal rating scale, where 1 connotes an irrelevant item, 2 represents major revision to an item, 3 represents minor revision to an item, and 4 an extremely relevant item. To estimate the

CVI for each item, the number of experts who rated the item as either a three or four were counted and divided by the total number of experts. The average CVI across all items were also calculated to determine the CVI for each instrument.

For the computer anxiety subscale, the CVI for the items range from .67 to 1.00 for representativeness and .78 to 1.00 for clarity. The item "I feel aggressive and hostile towards computers" was rated .67 for representativeness and .78 for clarity. Experts suggested that the items be rephrased because the word "aggressive" did not measure up to the theoretical definition for computer anxiety. The computer confidence subscale had a CVI from .67 to 1.00 for representativeness and .56 to 1.00 for clarity. The item "I am sure I could learn a computer language" was rated .67 for representativeness and .78 for clarity. The expert panel felt that the term computer language meant computer programming, which did not fit well with the intervention. The item "I don't think I would do advance computer work" was rated .56 for clarity. Experts felt that it should be rephrased to "I don't think I could do advance computer work" to better fit the definition for computer confidence. The computer self-efficacy measure had a CVI of 1.00 for representativeness and a range from .78 to .87 for clarity.

Although a few individual items in the three measurement scales were not encouraging, the overall results of the CVI for representativeness of the computer anxiety subscale, computer confidence subscale and computer self-efficacy measure yielded at .97, .93 and 1.0 respectively. The results of the CVI for clarity of items for the computer anxiety subscale, computer confidence subscale and computer self-efficacy measure were rated at .92, .87 and .87 respectively. With CVI rating >.80 for all three

measurement scales, it was determined that the items would not be revised in the current study.

The inter-rater agreement (IRA) was also assessed to determine the extent to which experts are reliable in their ratings. IRA was also calculated for representativeness and clarity. The scale for IRA is dichotomized, with values one and two combined and values three and four combined. Due to the anonymity of the raters, it was impossible to conduct the analysis separately for the professionals and lay experts. The IRA was calculated by counting the number of items that have an IRA of at least 0.80 and dividing that number by the total number of items. A less conservative approach was recommended for studies with more than five experts (Lynn, 1986). The IRA for the computer anxiety subscale, computer confidence subscale and the computer self-efficacy measure for representativeness ranged from .9, .8 and 1.00 respectively. The IRA for computer anxiety subscale, computer confidence subscale and the computer self-efficacy measure ranged from .8, .6 and .8 respectively.

Reliability

At the completion of a pilot study, the alpha coefficient reliabilities were .82, .72 and .83 for the computer anxiety subscale, the computer confidence subscale and the computer self-efficacy measure respectively.

Summary

This chapter concluded the review of the literature on senior use of the Internet for health information, and the measurement scales used for the study. The process of obtaining content validity and reliability of the three instruments were also described.

CHAPTER III

THE OUTCOMES OF ANXIETY, CONFIDENCE AND SELF-EFFICACY WITH INTERNET HEALTH INFORMATION RETRIEVAL IN OLDER ADULTS: A PILOT STUDY

Abstract

Technology has a great impact on nursing practice. With the rising numbers of older Americans using computers and the Internet in recent years, nurses have the capability to deliver effective and efficient health education to their patients and the community. Based on the theoretical framework of Bandura's self-efficacy theory, this pilot study reports the findings of a 5-week computer training program on Internet health searches for older adults, ages 65 and above at a senior activity learning center. Twelve participants were recruited and randomized to either the intervention or the control group. Measures of computer anxiety, computer confidence, and computer self-efficacy scores were analyzed at baseline, at the end of the program, and 6 weeks after the completion of the program. Analysis was conducted with repeated measure ANOVA. Findings showed participants who attended a structured computer training program on Internet health information retrieval reported lowered anxiety, increased confidence, and self-efficacy at the end of the 5-week program, and 6 weeks after the completion of the program as compared to participants not in the program ($p < .05$). The study demonstrated that a

computer training program can help reduce anxiety, increase confidence and self-efficacy in online health searches in older adults.

Background

Older adults are a part of a growing trend of healthcare consumers who use the Internet as a health information resource tool. This movement is related to the development of participative or consumer-orientate health models that raised the autonomy and rights of patients to be informed of their conditions and treatments, the cost-containment efforts from the government to reduce clinicians' time with patients, emphasis on self-care and prevention, and an increased interest in alternative approaches to health care (Cline & Haynes, 2001). Pew Internet and American Life Project reported a 47% rise in seniors who went online between 2000 and 2004 (Fox, 2006). In another report from the Kaiser Family Foundation, about one in five older adults, ages 65 and older are using the Internet (Rideout, Neuman, Kitchman, & Brodie, 2006). With reduced workload and retirement, older adults have more time to examine health information than other age groups. The most searched health topics online include alternative medicine, weight control, disease management and treatments, prescription drugs, available therapies and products to enhance health (Korp, 2006; Nicoll, 2002). Objective 11-1 of health communication for Healthy People 2010 calls for "improving internet access in the home," which encompasses all the factors that make an Internet connection valuable, such as basic computer literacy, effectively narrowing the gap of digital divide and unequal distribution of technology and technical skills in the society

(Department of Health and Human Services, 2006). It is essential, therefore, to design programs for older adults so that they may gain the skills and competence to take advantage of Internet technology that can better contribute to their health, independence, safety and well-being (Leaffer & Gonda, 2000; Hill & Weinert, 2004).

Although the numbers of older adults going online for health information have increased, many lacked the experience to determine the quality of health information on the Internet (Rideout et al., 2006). One reason might be the stereotyped expectation that older adults are less responsive to innovations and technology, resulting in fewer interventions designed for this population (Wagner & Jimison, 2003). Positive and favorable computer training can increase confidence in users, thus making them more successful in their task and increase their self-efficacy with subsequent computer interactions (Yaghmaie & Jayasuriya, 2004). With the growth of consumerism, it is indisputably imperative to train older adults to evaluate and retrieve credible health information on the Internet.

Computer trainings for older adults are usually conducted at community and leisure learning centers, assisted and independent living facilities, and public libraries. There is no one best single delivery method for computer trainings, although most of the trainings are done face-to-face in a computer lab with an instructor and a small group of learners.

Computer training is recognized as one of the factors that influences the success of users of computer and Internet. There have been reports on the different types of

computer training programs and surveys to explore how older adults locate and retrieve quality health information in order to participate in their healthcare (Alpay et al, 2004; Boering & Chauncey, 2005; Bonnin & Bui, 1996; Campbell & Wabby, 2003; Daniel, 1998; Eastman & Iyer, 2004; Edgar, Greenberg & Remmer, 2002; Kohn, Hasty & Henderson, 2005; Korp, 2006; Peterson & Fretz, 2003; Van Moorsel, 2001; Vastag, 2001) but there is less information describing the psychosocial outcomes and benefits towards such trainings.

These studies did not reflect whether the ability to locate and retrieve health information will reduce computer anxiety, increase self-confidence and self-efficacy towards subsequent computer use, and if older adults will continue to use the health information offered online. Studies, however, showed that such brief interactions with the computers decreased feelings of depression, isolation, an increased locus of control, and provide social support among older adults (Kelly, Morrell & Park, 1999; Nahm & Resnick, 2001; White et al, 2002; SeniorNet, 2004). The study aimed to determine the effect of a 5-week educational intervention in strengthening older adults' sense of mastery and control over the health-related information retrieved on the Internet, and the capability to act on them.

Three hypotheses were tested:

1. Older adults, ages 65 and above, who participate in and complete a two-hour computer training program on conducting health information searches online at a leisure learning center once a week for 5 weeks will report lower anxiety towards

computer use on the Computer Anxiety Subscale of the Computer Attitude Scale at the end of the intervention and 6 weeks after the completion of the intervention.

2. Older adults, ages 65 and older, who participate in and complete a two-hour computer training program on conducting health information searches online at a leisure learning center once a week for 5 weeks will report higher confidence towards computer use on the Computer Confidence Subscale of the Computer Attitude Scale at the end of the intervention and 6 weeks after the completion of the intervention.
3. Older adults, ages 65 and above, who participate in and complete a two-hour computer training program on conducting health information searches online at a leisure learning center once a week for 5 weeks will report higher self-efficacy scores towards Internet use on the Computer Self-Efficacy Measure at the end of the intervention and 6 weeks after the completion of the intervention.

Theoretical Framework

The pilot study is guided by Bandura's concept of self-efficacy, based on the four major sources of efficacy expectations: mastery experiences, vicarious experience, verbal persuasion and emotional arousal (Bandura, 1977). Figure 2 shows a composite model based on Bandura's self-efficacy theory in computer training (p12). The model hypothesizes that a computer training that incorporates all four major components of efficacy expectations will positively influence computer confidence and lower anxiety towards computer use, and increase computer self-efficacy, leading to mastery and

control over health information retrieval on the Internet.

In the case of computer training, a combination of participant modeling, performance exposure and desensitization, and self-instructed performance will enhance mastery experience (Bandura, 1977). For example, to evaluate the quality of a health website using standardized evaluation criteria, the instructor first performed the exercise in easily mastered steps, strictly following the criteria in the course content. Older adults then executed the modeled activity with appropriate guidance, with early mistakes and failures identified and corrected at this stage until they are able to perform the task confidently. Bandura (1977) suggests that joint performance with an instructor will allow participants to engage in computer use with less anxiety and higher confidence. Reinforcement of course content with case studies and handout exercises as supplementary practices at learners' own time enable active participation in learning.

The result of a successful vicarious experience is to have a significant model to instill self-beliefs that will influence the course and direction an individual will take (Pajares, 1995). With computer training, it is essential for every participant to have access to a computer in the classroom to allow adequate hands-on training. Live modeling with an instructor and observing other learners of similar age group perform a computer activity with no adverse consequences will create expectations among the learners that they too can persuade themselves to achieve the activity performance if they intensify and persist in their efforts in learning a new skill.

In the same manner, individuals can come to believe that they can cope successfully through persuasive suggestions. Verbal persuasions include suggestion, exhortation, self-instruction and interpretive treatment (Bandura, 1977). Conveying positive appraisals and social encouragement among participants in the computer training, prompt learners to intensify their efforts in the pursuit of accomplishing a specific computer task and reaching higher self-efficacy belief. Teaching strategies such as the use of questioning and return demonstration are opportunities to encourage suggestions and exhortations on a specific task performance.

Finally, the fourth source of efficacy expectations, emotional arousal, includes such responses as anxiety, stress, fatigue, and mood change. These responses provided information about efficacy beliefs because individuals have the ability to alter their own thoughts and actions (Pajares, 1995). Bandura (1977) put forward that "people rely upon their state of physiological arousal in judging their anxiety and vulnerability to stress" (p. 82). Perceived self-efficacy to exercise control over stressors plays a central role in anxiety arousal (Bandura, 1994). If individuals believe they can exercise control over learning to do Internet searches on the computer, they will not conjure up disturbing thought patterns about Internet and computer use. If individuals believe they cannot manage these threats, they will experience high anxiety arousal, and dwell on their own coping deficiencies. Attribution, relaxation, biofeedback, and symbolic desensitization and exposure can influence emotional arousal (Bandura, 1977), thus enhancing optimism among older adults in computer training. This process also creates a positive learning environment closely related to the practice of the real world, which will result in self-

belief expectation when overwhelmed by aversive arousal, will lead to high anxiety and agitation (Bandura, 1986).

Unlike other behavioral domains, or educational and socioeconomic status, there is no uniform decline in self-efficacy beliefs in advancing age (Bandura, 1994). On the contrary, older persons can function at a higher level of self-efficacy when they exert their effort in an activity as compared to younger adults. The model anticipates that these variables will enhance the outcome expectation of mastery and control over Internet health information.

Methodology

Design

The research design is a randomized, controlled, 2 groups repeated measure. Participants were randomly assigned to either a computer training intervention group or to a no-computer control group. The researcher administered pre-post study measures of computer anxiety, computer confidence and computer self-efficacy to both intervention and control groups before the intervention, at the end of the intervention and 6 weeks after the completion of the intervention. The intervention group attended a computer class once a week for 5 weeks. No training was administered to the control group.

Setting and Sample

The study was conducted at a parish-sponsored, senior adult leisure-learning center located in Houston, Texas. The seniors at the center are members of the parish, from nearby communities and other parishes in the area. Given that this was a pilot study, purposive samples of twelve participants in the learning center were recruited. The study

eligibility criteria required that all participants (a) read and understand English, (b) posses computer skills that include turning on and off the computer and using a mouse to navigate the arrow on the screen, and (c) self-identified ability to do simple typing on a keyboard. The participants in both groups are predominantly Caucasians and Hispanic female retirees (91.7%), ages ranging between 65-86 years old. Five of the participants have at least a college degree or higher. Of the 12 participants, 10 participants reported to have at least one current health problem. Most of the participants had prior exposure to using the computer and some degree of Internet searches.

Instruments

A demographic data form was modified with permission from Campbell's study with the elderly and the Internet (Campbell, 2004). The baseline characteristics of computer and Internet usage among participants and their acceptance towards Internet health information are presented in Table 1.

Table 1

Demographic Characteristics and Computer Usage of Participants

Characteristics	Study (n=6)		Control (n=6)	
Age				
Mean (SD)	75.33 (6.28)		75.33 (8.29)	
Range	65-83		65-86	
	n	%	n	%
Education				
High school degree	1	16.7	1	16.7
Some college or technical	1	16.7	4	66.7
degree	1	16.7	1	16.7
College degree	3	50		
Post-grad degree				
Employment				
Full-time			1	16.7
Part-time	1	16.7	1	16.7
Retired	4	66.7	4	66.7
Student	1	16.7		
Use computer	5	83.3	6	100
Use Internet to search for health information	4	66.7	4	66.7
Believe Internet can be used to manage healthcare	6	100	3	50

Three instruments were used to examine the variables computer confidence, computer anxiety and computer self-efficacy. The Computer Anxiety Subscale of the Computer Attitude Scale (Gressard & Loyd, 1986) is a 10-item Likert-type instrument measuring computer anxiety with responses ranging from "strongly agree" to "strongly disagree." Higher scores on the scale reflect lower degree of anxiety. The Computer

Confidence Subscale of the Computer Attitude Scale (Gressard & Loyd, 1986) is also a 10-item Likert-type instrument measuring computer confidence with responses ranging from "strongly agree" to "strongly disagree." Higher scores represent more confidence with computer use.

The reliability and factorial validity of the Computer Attitude Scale and its subscales were analyzed with elementary, middle and secondary school teachers who were enrolled in staff development programs designed to provide computer instruction and experience (Gressard & Loyd, 1986). The scales were administered to the teachers at the beginning of the study, during the program and at termination of the program. The alpha coefficient reliabilities were .89, .89, .89, and .95 for the Computer Anxiety, Computer Liking, Computer Confidence Subscales, and the Total Scale, respectively. The three factor-solutions accounted for 54% of the total variation, and the eigenvalues of the first 3 factors from the principal component analysis were 13.09, 1.92, and 1.21, respectively. The factor loadings for the three-factor solution were with values at or above .40. Hence the reliability coefficients of the three subscales and findings of the factor analysis suggest that the scores of the three subscales are sufficiently defined to be used as separate scores.

The Computer Self-Efficacy Measure (Campbell, 2004) is a 5-point Likert type instrument measuring participants' levels of self-efficacy using the Internet to locate health information with responses ranging from "no confidence" to "completely confident". The items are coded such that higher scores represent higher self-efficacy toward using the Internet to search for information. The scale is developed for use in a computer training

program with older adults, and evaluating the self-efficacy level of those participants involved in the training program.

A content validity study for representativeness (R) and clarity (C) of the Computer Anxiety Subscale, Computer Confidence Subscale and the Computer Self-Efficacy Measure was conducted prior to the pilot study to ensure measurements were appropriate for use with older adults. Nine of the 10 content and lay experts responded to the survey. The content validity indexes for the three measurement scales fall between 0.93-1.0 for representativeness and 0.87-0.92 for clarity. The inter-rater agreement was acceptable at .8-1.0 for representativeness and 0.60-.080 for clarity. See Table 2.

Table 2

Content Validity for Representativeness (R) and Clarity (C) for Computer Anxiety Subscale, Computer Confidence Subscale and the Computer Self-Efficacy Measure

Content validity index	CVI (R)	CVI (C)	IRA (R)	IRA (C)
Computer anxiety subscale	.97	.92	.9	.8
Computer confidence subscale	.93	.87	.8	.6
Computer self-efficacy measure	1.0	.87	1.00	.8

The alpha coefficient reliabilities were conducted for all three measurements at the end of the pilot study. Alpha coefficient reliabilities were 0.82, 0.72 and 0.83 for the computer anxiety subscale, the computer confidence subscale and the computer self-efficacy measure.

Education Intervention

The educational program was adapted with permission from Campbell's study with older women and the Internet (Campbell, 2004). The content of the program was not changed. Some of the materials such as website addresses and website examples have been changed with permission to suit the culture and pattern in the local population. Classes were conducted 2 hours, once a week for 5 weeks. A lecture and demonstration were delivered in the first hour, followed by hands-on class activities and case studies. Every participant had a computer to work with. Emails and phone-calls were made during the week to participants in the study group to reinforce teachings.

Data Collection Procedure

Permission to conduct the pilot study was obtained from the Institutional Review Board at the Texas Woman's University. Written permission was obtained at the senior lifelong learning center. Participants, age 65 and above, are recruited by one of the two methods: (a) distribution of flyers at the learning center and (b) presentation of proposed research study at selected meetings at the center. Potential participants were contacted and assessed for eligibility. Informed consents were signed during one-on-one interviews, followed by administration of computer anxiety, computer confidence and computer self-efficacy measurements and demographics. Randomization to either the study or control group was conducted using computer random number generator. Post-tests measurement of computer anxiety, computer confidence and computer self-efficacy were administered at the end of the 5-week training and 6 weeks after the completion of the 5-week program for both groups (Figure 3).

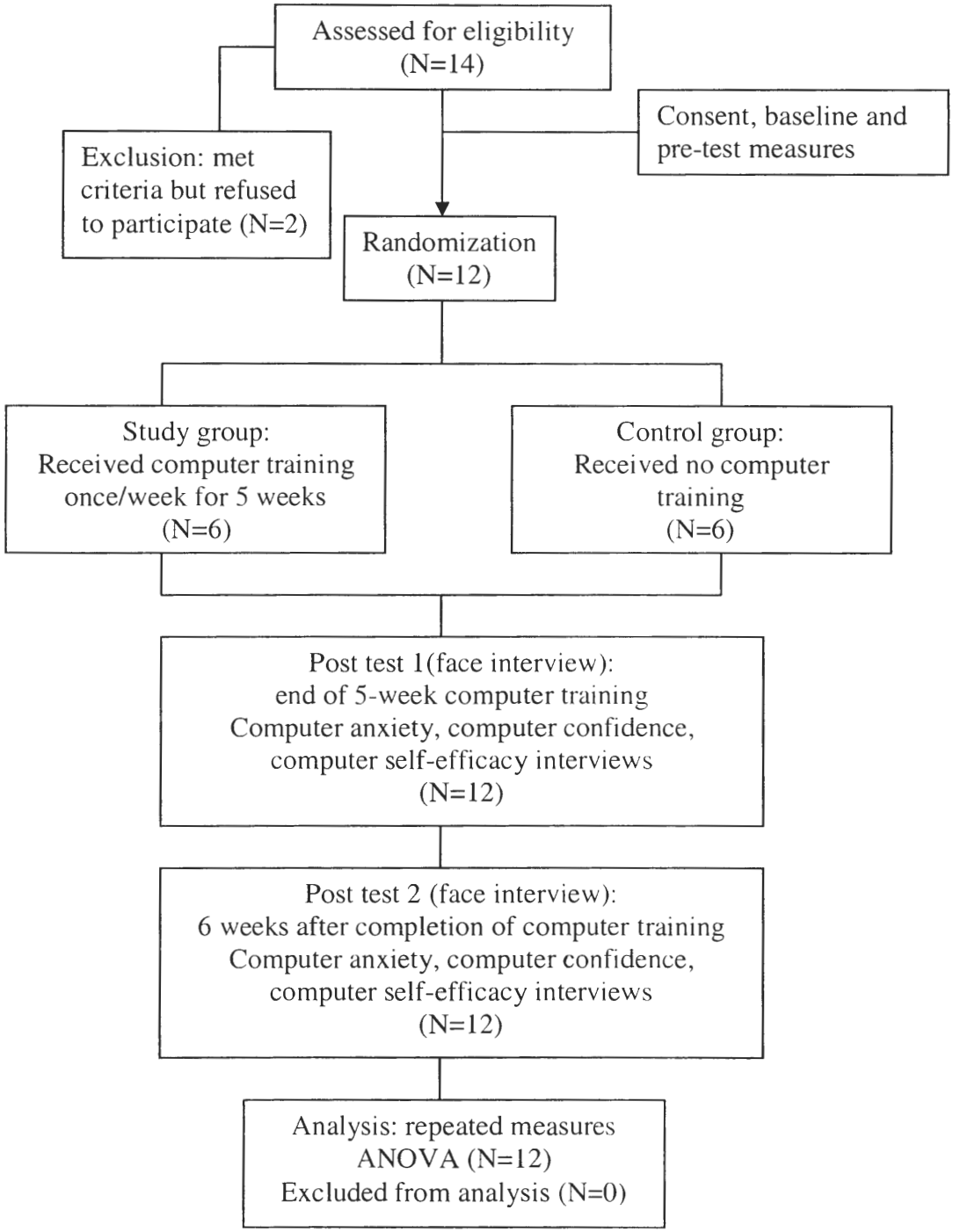

Figure 3. Data collection and analysis procedure.

Analysis Plan

The data were computed and analyzed in SPSS version 13. Baseline variables were evaluated across groups and summarized using frequency distribution. Repeated measures analysis of variance (ANOVA) was employed to examine each variable: computer anxiety, computer confidence and computer self-efficacy within the groups over time.

Findings

Computer Anxiety

The results of the one-way ANOVA contrasting groups at baseline, at the completion of the 5-week training program, and 6 weeks after the completion of the program were analyzed. The results indicated the means for computer anxiety at baseline ($M = 31.0$; $SD = 5.80$), at the completion of the 5-week training ($M = 36.5$; $SD = 5.40$), and 6 weeks after the training ($M = 38.0$; $SD = 2.69$) groups were significantly different $F(2, 9) = 4.83$, $p < .05$). It must be noted that the larger the mean, the lower the anxiety towards computer use and information retrieval online.

Computer Confidence

Similarly, the means for computer confidence at baseline ($M = 29.67$; $SD = 4.97$), at the completion of the 5 week training ($M = 35.0$, $SD = 5.37$), and 6 weeks after the completion of training ($M = 38.17$; $SD = 2.86$) indicated significant change over time $F(2,9) = 5.84$, $p < .05$).

Computer Self-Efficacy

Likewise, computer self-efficacy scores at baseline ($M = 16.83$; $SD = 2.23$), at the completion of the 5-week training ($M = 22.83$; $SD = 3.06$) and 6 weeks after the completion of the 5-week training ($M = 23.17$; $SD = 2.48$) showed significant difference $F(2, 9) = 6.68$, $p < .05$).

Discussion

With the adoption of new technologies among the seniors, there has been an explosion of health information resources that specifically target this age group. The information found on some of these websites are reputably well researched and well developed to meet to the needs of the seniors. For instance, MedlinePlus and NIH SeniorHealth are useful health resources that cover a wide variety of topics from the aging process to fall precaution and common diseases and conditions specifically related to aging. Following the leads of these agencies, other healthcare associations, professional organizations, societies, and commercial websites began to develop and market their own senior health information web pages to meet the demand of the society's health and lifestyle information. These have lead to numerous resource directories made available for the seniors on health and senior-related issues alone.

However, not all the information in the World Wide Web considers the readability and literacy level of their consumers. Most, if not all of this information can be problematic because the quality of online information and the readability level have always been a concern to many healthcare providers and e-consumers alike.

Evidence on the efficacy of Internet health information from clinical trials is few and mixed. Most of the clinical trials looking at Internet seeking behaviors among the elderly were conducted in Europe. Unlike in the United States, descriptive reports and surveys are still being conducted on the same issue. Given the large influx of health related materials on the Internet, there are insufficient studies to examine if these materials are useful when it is so strongly advocated for its many benefits to the targeted population.

Moreover, although efficacy of Internet use among older adults have been discussed in a small number of research papers, the science and the understanding behind the concept is not well studied and established. There is a lack of empirical research to conclude what constitute the cognitions and affect of Internet efficacy in the seniors, and how this behavior in turns influence health promoting behavior.

Health promotion and disease prevention has been identified as one of the priority areas of nursing research in the twenty-first century. Henceforth, determining the factors that contribute to promoting a certain health behavior, in this case, the area of computer confidence, computer anxiety and computer self-efficacy, are pertinent in establishing evidence-based practice in nursing science, which, at this stage is still in its infancy. Exploring the relationship between Internet efficacy and health literacy among the seniors will open up an array of possible solutions for nurses to develop and design health promotion and health information content that will adequately cater to the needs of the population, hence contribute to the state of nursing science.

Results from the pilot study provided satisfactory, preliminary evidence on positive psychosocial outcomes and benefits of a structured computer training program in health information searches for older adults. The findings reported significant evidence of decreased anxiety, increased computer confidence, and increased self-efficacy among older adults who participated in the 5-week training program on health information retrieval on the Internet over time, as compared to older adults who were not in the program.

Positive psychosocial associations from the pilot study also supports literature that claims the existence of a positive relationship between computer anxiety, computer confidence and computer self-efficacy with computer training. A high level of computer anxiety has been negatively related to learning computer skills (Harrington, McElroy, & Morrow, 1990), resistance to the use of computers (Torkzadeh & Angula, 1992), and poorer task performance (Heinssen, Glass, & Knoght, 1987). The pilot study observes that a reduction in computer anxiety can be brought about with small, in-class training at a pace that can accommodate individual participants. Working with a group of adults with similar age-group, educational backgrounds and similar computer exposure help bring together lively discussion, and problem-solving when met with roadblocks during the learning process. These interactions have a significant effect on computer confidence and self-efficacy, as demonstrated in other computer training protocols (Levine & Donitsa-Schmidt, 1998; Hong, Othman, & Nordin, 2005)

Several limitations are noted in the pilot study. The participants were relatively well-educated, predominantly White and Hispanic retirees living in a socioeconomically well-established part of town. Therefore, the results may not be generalizable to other older adults living in the city of Houston. The participants in the study are mostly female volunteers; hence, it is not possible to examine if gender differences affect training. Replication of this study with an even distribution of participants by gender, socio-economic background and ethnicity, and in a larger suburban environment may be more valuable.

An important methodological conclusion of this study is the positive results obtained by testing the causal model based on Bandura's framework in predicting computer anxiety, computer confidence and computer self-efficacy through a structured computer training program for older adults.

CHAPTER IV

CAN I REALLY GOOGLE? INTRODUCING COMPUTERS AND THE INTERNET TO OLDER AMERICANS IN URBAN, LOW-SOCIOECONOMIC COMMUNITIES

Abstract

Purpose: This is an interdisciplinary health communication project that demonstrates the psychosocial influences of computer anxiety, computer confidence and computer self-efficacy among older adults at 6 congregate meal sites who complete a 5-week education intervention, based on Bandura's Self-Efficacy Model, designed to assist older adults in Internet health information retrieval and evaluation.

Methods: 137 participants, ages 65 and older, were randomized to a controlled, 2-group, pre-post, repeated measure design. Participants in the intervention group were given a 2-hour session, once a week for 5 weeks. The computer confidence and computer anxiety subscale of the Computer Attitude Scale (CAS), and the Computer Self-Efficacy Measure (SEM) were administered to both groups at three time intervals: baseline, at the completion of the 5 week intervention, and 6 weeks after completion of the intervention. Data were analyzed using repeated measures ANOVA.

Results: Findings showed a reduction in computer anxiety, increase computer confidence, and increase computer self-efficacy in older adults after completion of intervention as compared to older adults not in the program ($p<.001$).

Discussion: The study opens up an array of possibilities to engage older adults with the use of internet health information resources to better contribute to their health, independence, safety and wellness.

Background

The trends on information access through the Internet are an integral part of our society regardless of age, race or ethnicities. The Internet has been widely advertised for its efficacy in delivering healthcare information all over the United States. Surveys conducted by Health on the Net Foundation in 2002 and the Pew Internet & American Life Project concluded that the masses of e-consumers on health-related matters has became one of the most popular online activities (Pew Internet and American Life Project, 2004). In the year 2003, the American Association of Retired Persons (AARP) reviewed major demographic studies of seniors and Internet use in the nation. The report showed 36 million (48%) elderly aged 50 years and older were online. For those aged 50 to 64 years, 25 million (61%) were involved with online activities, and 11 million (32%) of the seniors aged 65 and older were online (American Association of Retired Persons [AARP], 2003). A study conducted in 2004 by the Pew Internet and American Life Project on older Americans and the Internet reported a rise of 47% of seniors who went online between 2000 and 2004 (Pew Internet and American Life Project, 2004). These survey findings are evident that older Americans are taking on the trends of narrowing the age gap on Internet use in the United States.

Health information is one of the most popular subjects searched online these days. The Pew Internet and American Life reported a 66% increase of Older Americans who searched for health and medical information online, which is a 13-point jump from 2000 (Pew Internet and American Life Project, 2004). Similarly, Kaiser Family Foundation survey conducted in 2005 on e-health among older Americans reported one in 5 older Americans (21%) aged 65 years and above went online to search for health information. Those between 50-64 years of age reported a 24% increase for choosing online health information to the traditional information found in books, television, radio and newspapers (Kaiser Family Foundation, 2005).

There is an ever growing need for more information in decision-making for health-related matters as older Americans are especially proactive health care consumers. Many older Americans are learning to use the computers and the Internet for the single reason of seeking answers to their medical questions. This group of computer-literate older adults reportedly seemed to better manage their illnesses and treatments, make informed decision about their health care, and take active roles in managing them (Cotten & Gupta, 2004; Detlefsen, 2004; Dickerson et al, 2004; Hoglund, Maceviciute, & Wilson, 2004; Nahm, Preece, Resnick, & Mills, 2004; Vanbiervliet, & Edwards-Schafer, 2004; Wagner, Baker, Bundorf, & Singer, 2004). While there are advances in technologies and the availability of consumer health information on the World Wide Web, there are potential downfalls as well. Not every older Americans who uses Internet consumer health information are competent to evaluate the information retrieved. Most, if not all may be influenced by the subtle advertising and marketing tricks that comes with it,

unknowingly endangering their own health. It is essential, therefore, to design intervention programs for older Americans to gain the skills and competence to retrieve credible information so that they can better contribute to their health, independence, safety and well-being (Leaffer & Gonda, 2000; Hill & Weinert, 2004).

With the vulnerability of the digital divide, not every older Americans with lower income, lower education, and from rural parts of the country owns a computer or have Internet access. There are about two million people aged 65 years and above residing in the state of Texas (AARP, 2000). Texas is among the top ten states with the highest poverty rates for older adults at 14.4% as compared to the national rate of 10.2% (AARP, 2000). The Internet has the ability to sell itself as a powerful tool by promising to extend its capability to bring information to underserved populations such as people with disabilities, those living in remote areas and with socially stigmatized health condition (Wagner &Wagner, 2003). However, to what extent technology and the Internet has penetrated low socioeconomic communities is still questionable. The Kaiser report noted that older Americans with an annual family income of less than $20,000 are less unlikely to be able to be go online (Kaiser Family Foundation, 2005) because personal computers were deemed too high a price to pay for low-income population (Birru et al., 2004; Lai, Arthur, & Chau, 2004).These groups were largely excluded from the enjoyment of Internet health resources, causing a gap between older Americans who have the privilege of Internet access and those who do not.

Objective 11-1 of health communication for Healthy People 2010 recognizes that lower income and lower socioeconomic older Americans have the least access to

information, communication technologies, health care, and supporting social services in their communities, hence one of the objectives of Healthy People 2010 is to improve internet access in the home, which encompasses all the factors that make an Internet connection valuable, such as basic computer literacy, effectively narrowing the gap of digital divide and unequal distribution of technology and technical skills in the society (Healthy People 2010, Department of Health and Human Services, 2006)

Health promotion and disease prevention has been identified as one of the priority areas of nursing research in the twenty-first century. Determining the factors that contribute to promoting a certain health behavior, in this case, the area of computer confidence, computer anxiety and computer self-efficacy towards health information retrieval and web content evaluation are pertinent in establishing evidence-based practice in nursing and library information science, which, at this stage is still in its infancy. This objective of the study is to narrow the gap of digital divide and unequal distribution of technology among older adults in low socioeconomic communities by designing an intervention, based on Bandura's Self-Efficacy Model, to assist older adults to engage the skills and competence in consumer health information retrieval and evaluation online.

The purpose of the study is to determine the psychosocial influences of computer anxiety, computer confidence and computer self-efficacy among older adults, 65 and above, who participate and complete a 5-week education intervention in health information retrieval and evaluation on the Internet. The following hypothesis was tested: Older adults, ages 65 and above, who complete a 5-week education intervention in online health information retrieval at congregate meal sites will report lower computer anxiety,

higher computer confidence and computer self-efficacy towards computer use at the end of the intervention and 6 weeks after the completion of the intervention as compared to older adults not in the program.

Review of the Literature

There were insufficient intervention studies to date that examined the psychosocial outcomes on how older Americans residing in lower socioeconomic communities take to computer and Internet searches for health related information. One reason might be the stereotyped expectation that older adults are generally less responsive to innovations and technology, resulting in fewer interventions designed for this population (Wagner & Wagner, 2003). A community-based telephone survey conducted among 60 residents ages ranging between 18-65 and older of an urban, low-income community in Chicago showed that 25 participants in the intervention group who received training and access to WebTV, a printer and researcher support resulted in positive health-related empowerment with in-home technology use as compared to the 35 participants who did not receive the intervention (Masi, Suarez-Balcazar, Cassey, Kinney, & Piotrowski, 2003). The outcome of a cross sectional survey that measured computer and Internet access, and the use of Internet health information with low income, urban African American caregivers of pediatric outpatients reported that only 52% of the 206 participants have use the Internet for health information, and agreed that it would be ideal if they have the opportunity to connect to the Internet and have access to health on the Internet (Kind, Huang, Farr, & Pomerantz, 2005). A before-after study of 60 older adults who received a 5-week Internet training program at public libraries and community

centers in greater Pittsburgh and Allegheny County region showed statistically significant findings on locus of control and health information seeking 5-weeks after the completion of the intervention (Campbell& Nolfi, 2005). The study also showed that a year after receiving Internet training, 21 of the 27 respondents reported using the Internet weekly or as needed to locate health information.

Computer Anxiety

Computer anxiety is a well-studied concept within the field of information technology with conflicting theories. Computer anxiety is defined as the fear or apprehension felt by individuals when they use computers or when they consider the possibility of computer utilization (Chua, Chen, & Wong, 1999; Maurer, 1983; Simonson, Maurer, Montag-Torardi, & Whitaker, 1987). Computer anxiety is characterized as an affective response, an emotional fear of potential negative outcomes, such as damaging the equipment or looking foolish (Hong, Othman, & Nordin, 2005). Findings showed a high level of computer anxiety has been negatively related to learning computer skills (Harrington, McElroy,& Morrow,1990), resistance to the use of computers (Torkzadeh & Angula, 1992), and poorer task performance (Heinssen, Glass, & Knoght, 1987).

Computer Confidence

Computer confidence is defined as the ability to use or learn the computer (Gressard, & Loyd, 1986). A statement such as "I have a lot of confidence when it comes to working with computers" and "I am sure I could do work with computers" were used to measure computer confidence. Computer confidence has also been shown to be

inversely related to computer anxiety (Loyd & Loyd, 1985), and significantly related to computer utilization (Al-Khaldi & Al-Jabri, 1985).

Computer Self-Efficacy

Computer self-efficacy has been identified as a key determinant to computer related-ability and use of computers (Doll & Torkzadeh, 1989). The term is derived from the general concept of self-efficacy (Bandura, 1986), and refers to an individual's perceptions about his ability to successfully perform a computing task, and the intentions for future use of computers (Compeau & Higgins, 1995). Zhang & Espinoza also reported that computer self-efficacy was positively related to enrolling in computer courses (Zhang & Espinoza, 1998).

Theoretical Framework

The study is guided by the Bandura's self-efficacy theory, a major component of Bandura's social learning theory (Bandura, 1977). Self-efficacy is a context-specific assessment of competence to perform a task in a given domain. Self-efficacy is the belief in one's capability to organize and execute the courses of action required to manage prospective situations (Bandura, 1995). Self-efficacy influences the choices an individual makes. The stronger the efficacy, the more effort and persistence a person will put forth in the face of obstacles and aversive experiences (Bandura, 1977).

The concept of self-efficacy is derived from four major sources of efficacy expectations: mastery experiences, vicarious experience, verbal persuasion and emotional arousal. The most influential source of these beliefs is the interpreted result of one's performance, or mastery experience (Pajares, 1995). In the current study, performing a

computer task successfully raises mastery experience, repeated failures lower subsequent performances. For example, to evaluate the quality of a health website using standardized evaluation criteria, the instructor, in this case, the researcher, first performed the exercise in easily mastered steps, strictly following the criteria in the course content. Older adults executed the modeled activity with appropriate guidance (participant modeling), with early mistakes and failures identified and corrected at this stage until they were able to perform the task confidently (performance exposure and desensitization). Joint performance with an instructor allowed participants to engage in computer use with less anxiety and higher confidence. Reinforcement of course content using case studies and handout exercises as supplementary practices at learners' own time also allowed active participation in learning (self-instructed performance), hence the reinforcement of self-directed mastery experience.

The second source of efficacy information is the vicarious experience of the effects produced by the actions of others. This source of information is weaker than the interpreted results of mastery experiences, but, when individuals are uncertain about their own abilities or have limited prior experience, they become more sensitive to the task at hand (Bandura, 1977; Pjares, 1995). Therefore, to achieve successful vicarious experience is to have a significant model to instill self-beliefs that will influence the course and direction an individual will take (Bandura, 1977; Pjares, 1995). In the program, every participant had access to a computer in the classroom for adequate hands-on training. Live modeling with an instructor and observing other participants perform a computer activity with no adverse consequences created expectations among the learners

that they could persuade themselves to achieve the activity performance when they intensified and persisted in their efforts in learning a new skill.

Individuals can be led into believing that they can cope successfully through persuasive suggestions (Bandura, 1977; Pjares, 1995). Although verbal persuasion is a weaker source of efficacy information than mastery and vicarious experiences, verbal persuasions played a vital role in an individual's self-belief (Bandura, 1977; Pjares, 1995). Verbal persuasions include suggestion, exhortation, self-instruction and interpretive treatment. Conveying positive appraisals and social encouragement prompted participants to intensify their efforts in the pursuit of accomplishing a specific computer task and reaching higher self-efficacy belief (Bandura, 1977; Pjares, 1995). Teaching strategies such as the use of questioning and return demonstration created opportunities to encourage suggestions and exhortations on a specific task performed by the learners.

Emotional arousal, the fourth source of efficacy expectations, includes responses such as anxiety, stress, fatigue, and mood change. Individuals have the ability to alter their own thoughts and actions (Bandura, 1977; Pjares, 1995). Bandura put forward that "people rely upon their state of physiological arousal in judging their anxiety and vulnerability to stress" (Bandura, 1977,p 82). Perceived self-efficacy to exercise control over stressors plays a central role in anxiety arousal (Woodrow, 1994). When an individual believes he can exercise control over learning Internet searches on the computer, he will not conjure up disturbing thought patterns about computer use. On the contrary, when an individual believes he cannot manage the threat of computer and Internet use, he will experience high anxiety arousal, dwelling on his own coping

deficiencies. Attribution, relaxation, biofeedback and symbolic desensitization and exposure can influence emotional arousal (Bandura, 1977), thus enhancing optimism among older adults in computer training. The intervention program created a positive learning environment closely related to the practice of the real world, which will result in self-belief expectation when beset by aversive arousal leading to high anxiety and agitation (Bandura, 1986).

Model Specification

Figure 4 presents a theoretical model based on Bandura's self-efficacy theory in computer training. The model hypothesizes that a computer training that incorporates all four major components of efficacy expectations will positively influence computer confidence and lower anxiety towards computer, leading to computer self-efficacy. Higher confidence and lower anxiety will positively and simultaneously affect one another. Higher confidence will positively lower anxiety towards computer, and lower anxiety will positively increase confidence with computer use as shown. The model anticipates that both these variables will enhance the outcome expectation of computer self-efficacy since studies have suggested that anxiety and confidence essentially measure the same construct (Gressard & Loyd, 1986; Woodrow, 1994).

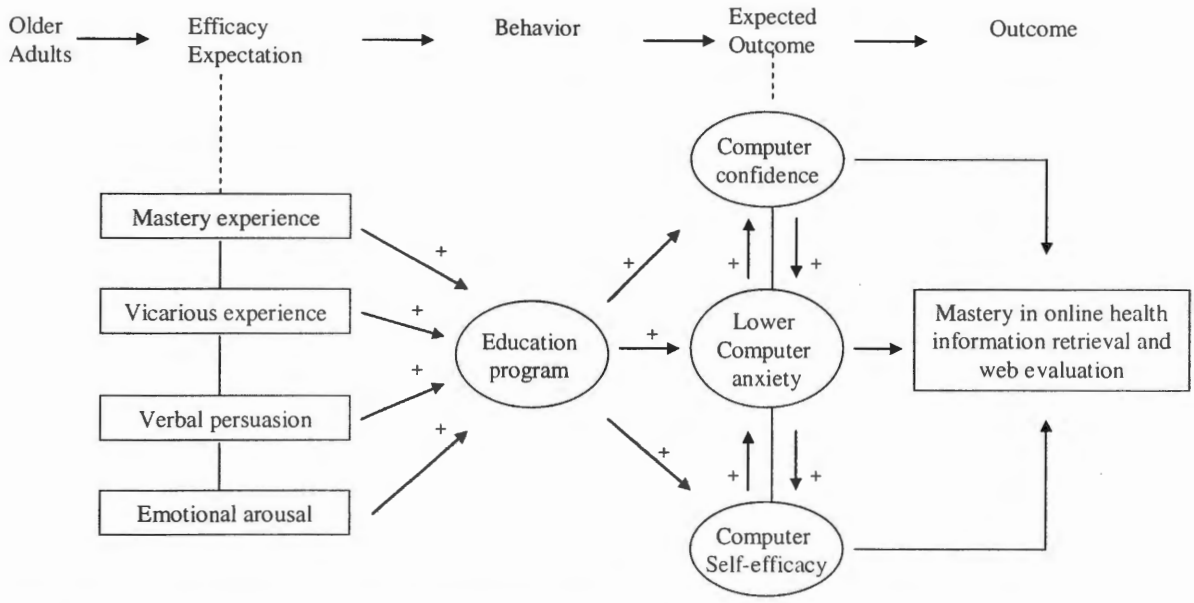

Figure 4. Hypothesized model of computer confidence, computer anxiety in the prediction of computer self-efficacy in a computer education program.

+ indicates positive influence.

Methodology

The research study utilized a randomized, controlled, two groups, repeated measure design to determine older adults' psychosocial outcomes of computer anxiety, computer confidence and computer self-efficacy following a 5-week structured program introducing computer literacy and health information retrieval on the Internet compared to older adults who were not enrolled in the 5-week program. The results were measured at three time intervals: before the program, at the completion of the program and 6 weeks following the completion of the program. The study eligibility criteria requires that all participants (a) read and understand English, (b) identify the on switch button on the computer and be able to hold a mouse to navigate the arrow on the screen, and (c) self-

identified ability to do simple typing on a keyboard. Those with no prior computer training or some prior introductory computer class will be included in the study.

Setting

The class was conducted at a facility of the YWCA Greater Houston. A computer lab was specially set up at the facility for this project. Transportation was provided by the YWCA staff to bring participants to the facility for classes. Financial remuneration in the form of a gift card was given to participants who completed the study.

Instruments

The Computer Anxiety Subscale of the Computer Attitude Scale (Gressard & Loyd, 1986) is a 10-item Likert-type instrument measuring computer anxiety with responses ranging from "strongly agree" to "strongly disagree". Higher scores on the scale reflect lower degree of anxiety. The Computer Confidence Subscale of the Computer Attitude Scale (Gressard & Lyod, 1986) is also a 10- item Likert-type instrument measuring computer confidence with responses ranging from "strongly agree" to "strongly disagree". Higher scores represent more confidence with computer use.

The Computer Self-Efficacy Measure (Campbell, 2004) a 5-item Likert scale measuring participants' levels of self-efficacy using the Internet to locate health information and was modified with permission from the author to change all the items which were written in question format to statements for ease of use. For example, "How confident are you that you can learn to use 'search tools' to find information on the Internet?" was changed to "I am confident I can learn to use 'search tools' to find information on the Internet," with responses ranging from "strongly agree" to "strongly

disagree." Higher scores represent higher self-efficacy toward using the Internet to search for information.

Content validity tests of the three instruments were conducted to ensure measurements are appropriate for use with older adults. Nine of the 10 content and lay experts responded to the survey. The content validity indexes for the three measurement scales fall between 0.93-1.0 for representativeness and 0.87-0.92 for clarity. The inter-rater agreement was acceptable at .8-1.0 for representativeness and 0.60-.080 for clarity. Alpha coefficient reliabilities were 0.82, 0.72 and 0.83 for the computer anxiety subscale, the computer confidence subscale and the computer self-efficacy measure.

Program Curriculum

The curriculum was modified with permission from Campbell's article in Older Women and the Internet (2004). Several of the materials such as website addresses and website examples were altered with permission to suit the culture in the Houston population. The curriculum consisted of two components: computer literacy section which included basic Google search, correct mouse handling, and web evaluation. The second component included consumer health information searches on Medline Plus, NIH SeniorHealth, and Go Local. The program was taught by two instructors. The computer literacy instruction was taught by the principal investigator, and the Internet health information searches were conducted by a consumer health librarian. The class was conducted once a week for 5 weeks and each lesson lasted 2 hours with a 15-minute snack break in between. Training manuals were given to participants at each instructional session. Instructions and demonstration were given in the first session, followed by

hands-on class activities and case studies in the second session. Freebies were also given to participants at every session as incentives and as encouragement for their persistence in trying.

Data Collection Procedure

Permission to conduct the study was obtained from the Institutional Review Board at the Texas Woman's University and YWCA Greater Houston. Participants, ages 65 and above, were enrolled in the study through distribution of flyers and sign up sheets placed at six congregate meal sites. The investigator met with eligible participants to obtain signed informed consent, followed by administration of baseline measures, computer anxiety subscale, computer confidence subscales, and computer self-efficacy measure. Eligible participants were assigned to either intervention or wait-list control group corresponding with their ID numbers and randomized numbers generated on the computer. Participants in the intervention group attended a 5-week education intervention conducted once a week for 2 hours at the congregate meal sites. The principal investigator met participants in person to administer post-tests measurement of computer anxiety, computer confidence and computer self-efficacy at the end of the 5-week program and 6 weeks after the completion of the 5-week program for both intervention and wait-list control groups. Evaluation of the program was obtained from participants in the intervention group at the completion of the last class session. Participants in the wait-list control group were offered the program after the termination of the research study.

Results

There were a total of 137 participants recruited for the study from July 2007 to February 2008. Twenty-five participants dropped out of the study for various reasons. Participants were either relocated to other parts of the town due to a fire at one of the congregate meal sites, and others decided to opt out because they felt they have waited too long to take a class. In addition, a few moved away from the congregate meal sites for personal reasons. The attrition rate was 18%.

Of the 112 participants eligible for analysis, 72% were female. The mean age was at 74 years. Sixty-four percent of these participants' annual family incomes were below the $10,000 margin. While everyone has at least some form of education ranging from less than high school to post graduate degrees, only 21.4% of the participants had attended less than high school. Fifty percent of the participants had high school or some college or technical degree. About 80% of the participants had never used a computer before, and almost 81.2% never used or never had access to the Internet even though 46% mentioned that they or a member of the family owed a computer. When participants were asked the reasons for not using the computer, 42.9% mentioned they did not have the opportunity to learn while 25% of the older adults mentioned they did not have access to a computer. Similar questions were asked about Internet use. The findings showed that 71.4% of the older adults either did not have access to the Internet or they had no opportunity to learn how to get online. Of the 112 participants enrolled in the study, 70 participants believed that the Internet could be used to find medical information that

would be useful to manage their healthcare; three participants responded negatively, and 39 participants were uncertain.

Interestingly, almost 92% of the participants were not aware that computers and Internet access were available and accessible to the public at community centers and public libraries. Table 3 gave a breakdown of the participants' baseline and demographic characteristics in the study.

Table 3

Baseline Demographics and Characteristics of Study Participants

Baseline Characteristics of study participants	Intervention (N= 62)	Wait-list (N= 50)
Gender		
Male	17	13
Female	45	37
Age (means ± SD)	74± 6	74 ± 7
Ethnicity - no. (%)		
White	4 (6.5)	2 (4.0)
African American	32 (51.6)	31 (62.0)
Hispanic	8 (12.9)	2 (4.0)
Asian (Chinese, Vietnamese, Indians)	17 (27.4)	13 (26.0)
Others	1 (1.6)	2 (4.0)

Table 3 (Continued)

Baseline Demographics and Characteristics of Study Participants

Education level		
Less than high school	12 (19.4)	12 (24.0)
High school	21 (33.9)	14 (28.0)
Some college or technical degree	8 (12.9)	13 (26.0)
College degree	10 (16.1)	7 (14.0)
Post grad degree	11 (17.7)	4 (8.0)
Annual family income		
under $10,000	41 (66.1)	34 (68.0)
$10,000- $15,000	15 (24.2)	12 (24.0)
$15,000-$19,999	6 (9.7)	4 (8.0)
Believe Internet health information can managed health		
Yes	40 (64.5)	30 (60.0)
No	1 (1.6)	2 (4.0)
Don't know	21 (33.9)	18 (36.0)
Current health problems		
Yes	55 (90.3)	40 (80.0)
No	5 (8.1)	6 (12.0)
Not sure	1 (1.6)	4 (8.0)
Ever use a computer before		
Yes	21 (33.9)	12 (24.0)
No	41 (66.1)	38 (76.0)
You or family own a computer		
Yes	28 (45.2)	18 (36.0)
No	33 (53.2)	32 (64.0)
Ever use a public computer		
Yes	7 (11.3)	2 (4.0)
No	55 (58.7)	48 (96.0)
Ever use the Internet		
Yes	4 (6.5)	4 (8.0)
No	58 (93.5)	46 (92.0)

Computer Anxiety

The results of the repeated measures ANOVA at baseline, at the completion of the 5-week training program, and 6 weeks after the completion of the program were analyzed with SPSS Version 16. The results showed the means for computer anxiety at baseline ($M = 26.13$; $SD = 5.77$), at the completion of the 5-week training ($M = 34.87$; $SD = 5.37$), and 6 weeks after the training ($M = 35.05$; $SD = 5.39$) were significantly different $F(2, 109) = 68.14$, $p < .001$). It must be noted that the larger the mean, the lower the anxiety towards computer use and information retrieval online.

Computer Confidence

Likewise, the means for computer confidence at baseline ($M = 28.26$; $SD = 5.40$), at the completion of the 5 week training ($M = 35.95$, $SD = 5.25$), and 6 weeks after the completion of training ($M = 36.10$; $SD = 5.18$) indicated significant change over time $F(2, 109) = 56.21$, $p < .001$).

Computer Self-Efficacy

Computer self-efficacy scores at baseline ($M = 13.90$; $SD = 2.74$), at the completion of the 5-week training ($M = 17.76$; $SD = 2.58$) and 6 weeks after the completion of the 5-week training ($M = 17.87$; $SD = 2.63$) showed significant difference $F(2, 109) = 51.61$, $p < .001$).

Discussion

The findings showed that participants in the intervention group had lower anxiety, higher confidence and higher self-efficacy towards use of computers and towards health information searches on the Internet over time (Table 4). No activity or booster was given prior to the third interview 6 weeks after the completion of the intervention, yet the increase in scores was statistically significant and maintained 6 weeks after the completion of the 5 week intervention.

Table 4

ANOVA Summary Table for Computer Anxiety, Computer Confidence and Computer Self-Efficacy

Variable	Source	df	SS	MS	F	P
Computer Anxiety						
Baseline	Between groups	0.34	1	0.34	0.1	0.93
	Within groups	3874.1	110	35.22		
Program completion	Between groups	2461.82	1	2461.82	69.84	0.00
	Within groups	3877.29	110	35.25		
6 weeks after program completion	Between groups	2728.36	1	2728.36	76.71	0.00
	Within groups	3912.14	110	35.56		

Table 4 (Continued)

ANOVA Summary Table for Computer Anxiety, Computer Confidence and Computer Self-Efficacy

Computer Confidence						
Baseline	Between groups	0.39	1	0.39	0.01	0.91
	Within groups	2985.89	110	27.14		
Program completion	Between groups	1902.93	1	1902.03	67.09	0.00
	Within groups	3120.08	110	28.36		
6 weeks after program completion	Between groups	2007.68	1	2007.78	72.51	0.00
	Within groups	3045.6	110	27.69		
Computer Self-Efficacy						
Baseline	Between groups	0.12	1	0.11	0.01	0.90
	Within groups	812.14	110	7.38		
Program completion	Between groups	451.33	1	451.33	65.20	0.00
	Within groups	761.45	110	6.92		
6 weeks after program completion	Between groups	423.36	1	423.36	60.25	0.00
	Within groups	772.89	110	7.03		

Participants who completed the intervention also evaluated the overall program, and how they would use the information learnt to manage their own health matters. More than half of the participants who completed the program agreed that the experience was an eye-opener, like "opening a Pandora's box," as one participant put it. Older adults were grateful for the opportunity to learn computer and the Internet. As mentioned earlier, most of these adults did not have computers or Internet access in their homes. As such, the only contact time with a computer was during the 5-week program. Because of their enthusiasm and quest for knowledge, a handful of these participants actually received free or hand me down computers from their family to be installed at their homes. Older adults were also able to obtain refurbished computers at a very low price from a local non-profit organization who provides basic computer services to seniors and people with disabilities in greater Houston.

At the end of the program, participants reported they felt more confident exploring and evaluating health information online, and planned on using the health information received on the Internet to manage their chronic illnesses, learn more about the prescription drugs, Medicare benefits, and share this information with their friends and family members. Most of the participants also reported more confidence in taking a collaborative role in their own health management, such as discussing and making important decisions about their healthcare needs with their physicians. Three participants mentioned that their physicians would not be interested to discuss Internet health information with them at a typical doctor's visit but would try nonetheless.

The survey also asked participants to share with the researcher what they liked best and least about MedlinePlus and NIH SeniorHealth websites. Sixty-five percent of the participants who completed the program reported that they liked MedlinePlus for its comprehensiveness in content. However, they would prefer MedlinePlus to have similar features found in NIH SeniorHealth such as the ability to increase font size and background contrast that were available in the latter. The prescription and supplement drug page of MedlinePlus had the most hit during the course of the program.

Participants also enjoyed Go Local Gulf Coast to locate local health information resources. Participants also agreed that they would prefer to have MedlinePlus and NIH SeniorHealth websites be translated to various languages besides Espanola, which was only available in MedlinePlus. Although MedlinePlus has included a health information section that linked to multiple language sites, older adults found consumer health information on the parent sites more useful and hoped to be able to share them with families who could not read or understand English and Espanola.

Challenges and Recommendations

There were challenges faced in the study. Since this was an intervention study with participants randomized to the study and wait-list control group, the researcher found it difficult to convince participants in the wait-list control group that they would be given the opportunity to take the program after the termination of the study. Participants in the wait-list control group were unhappy and frustrated for waiting too long in the process. Frequent on-sites visitations and phone calls were made to participants in the wait-list control group to make them aware of the progress of the study.

Participants in the study group mentioned that the program did not have enough time for practice and exploring. The present study allowed a 45 minutes practice time at the end of each lesson. The computer training program was conducted at one of the YWCA facilities. Transportations had to be arranged to bring the participants to the facility from the congregate meal sites. Classes were often not started on schedule because participants who required private transportation to the congregate meal sites often arrived late for the YWCA transportation to bring them to the computer lab. Numerous negotiations and phone calls were made to these private transportation providers to bring participants to the congregate meal sites on time. Moreover, there was a stipulated time for participants to return to the congregate meal sites for lunch and for their private transportation providers to bring them home. Hence, practice times at the end of the lessons were often shortened to 30 minutes or less than planned to accommodate to the participants' stipulated lunch hours at the congregate meal sites.

Several limitations were noted. The study was conducted in English. As a result, older adults who could not speak or understand English residing in the lower-socioeconomic community were disqualified from the study. One of the attributes to effective health communication is to get health information content out to the largest possible number of people in a target population (Healthy People 2010, Department of Health and Human Services, 2006). One recommendation is to develop programs in other languages, and to have instructors who could speak more than one language to reach older adults of different race and ethnicities so that they, too, could enjoy the opportunity of health information and digital technology.

The current study examined the positive differences in computer anxiety, computer confidence and computer self-efficacy scores after a 5-week intervention. The study, however, did not explore if such behavioral changes led to more usage of Internet health information resources and how this information impacts the lives of older adults in lower-socioeconomic communities in the long run. Further study is recommended to explore how older adults, after attending a health communication activity such as this use the Internet for health information matters, and how this information is perceived in their lives and those around them.

Conclusion

The study concluded that interdisciplinary collaboration is effective in providing the ideas and tools to carry out a health communication program among urban, lower socioeconomic community of older adults. Older adults who participated in the 5 week program on retrieving and evaluating health information online increased their confidence and self-efficacy towards computer and Internet use, and lower their anxiety towards such an endeavor. The study affirmed that self-efficacy does not decline in old age. The model also affirmed that a well-designed program, guided by Bandura's four major sources of efficacy expectations: mastery experiences, vicarious experience, verbal persuasion and emotional arousal resulted in positive behavioral outcomes from the participants in the study. Participants modeled and challenged one another to excel throughout the intervention study, provided encouragement and rendered support to those who faced technical challenges. Overall, the camaraderie experienced by the older adults was commendable.

CHAPTER V

SUMMARY OF THE STUDY

This section highlights the purpose of conducting the research study, and the result of the intervention program aimed at bringing technology to older adults in a low-socioeconomic community. The following paragraphs included further recommendations to increase the number of health communication activities for this population.

Summary

Medical technologies and the advances in consumer health information are constantly changing the delivery of health information to meet the needs of the consumers in the market. With the influx of technology, and the various mass media communication pounding consumers every day, the widespread availability and use of the Internet to retrieve consumer health information has created a digital divide among older Americans residing in lower-socioeconomic communities. Older Americans residing in these areas are often deprived of healthcare information and access, and lack health communication programs targeted to reach this population. A well-designed health communication intervention is the key to older Americans becoming more knowledgeable about health information, services and resources available to them. The purpose of the study was to develop a systematic computer education program, based on the theoretical framework of Bandura's self-efficacy model, to assist older adults, ages 65 and older to achieve the mastery and control of health information resources on the

Internet and the ability to retrieve and evaluate the quality of this information to achieve personal health development.

Discussion of the Findings

The result of the research showed radical improvement among older adults who participated in a 5-week education program compared to those who did not undergo the program. Participants who completed the program showed less computer anxiety, higher computer confidence and computer self-efficacy in using the computers and the Internet to search for health information, and the capability to evaluate the quality of the information on the World Wide Web.

Older adults are enthusiastic learners. The study observed that older adults needed very little encouragement to take on the task of learning new technology. They might take slightly longer time to move and click the mouse, locate a letter on the keyboard and read a paragraph on the web page, but they were persistent in their venture and refused to quit until they have mastered the task at hand. A combination of patience and perseverance, peer-to-peer or instructor encouragement, whether verbally or a pat on the shoulder, successfully reduced their stress and anxiety in learning, and raised their self-efficacy and confidence towards completion of the program.

Conclusion and Implications

Almost 66% of the older adults in the study group had not used a computer before, and about 94% of the older adults did not have access to the Internet. As a result, most of

the participants did not have a computer or Internet capability to practice the skills taught in class. Participants also had issues with transportation, which made it more difficult to access a public computer at the library or a community center. Some older adults had family members that passed down old computers or had new computers installed at their homes. Others were able to contact a local non-profit organization to obtain refurbished computers at a fraction of the cost. In summary, this outreach program impacted the lives of older adults living in low-socioeconomic environment. Regardless of poverty, lower education, or limited literacy in this subset population, the study concluded that older adults are proactive healthcare consumers. More interventions and support services are necessary in reaching out to the underserved community and eliminating health disparities. Collaborative relationships between nursing and library science disciplines can contribute to better health promotion and disease prevention resulting in enhanced health communication efforts in the community.

Recommendations for Further Study

The study concluded that a structured computer program could reduce computer anxiety, increase computer confidence and increase computer self-efficacy among older adults learning to use the computer and the Internet for health information. The current study, however, failed to examine if positive behavioral changes as described above could led to more usage of Internet health information resources, and how this information impacts the lives of older adults in the long term. Further study is recommended to explore how older adults, after attending an activity such as this use the Internet for health information matters, and how this information is perceived in their

lives and those around them. The program was specifically designed for older adults residing in an urban, low-socioeconomic community in greater Houston. Further testing is necessary to explore if a similar intervention could be generalized to various communities in Texas.

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APPENDIX A

AGENCY APPROVAL LETTER FOR PILOT STUDY

St. Vincent de Paul Church

Diocese of Galveston-Houston

May 12, 2006

To whom it may concern:

This is to confirm that Adeline Chu visited the Leisure Learning Center for Senior Adults at St. Vincent De Paul Catholic Church on May 1, 2006 to determine if there would be an interest in some of our elderly population to participate in her proposed research project aimed at helping older adults learn how to use the internet to search for health information.

I am certain there will be a very good response and willingness from many of our older adults to participate. I will be happy to assist in any way I can including scheduling the use of our library computers for this project.

Sincerely,

Chris Villacorta

Chris Villacorta
Director Senior Adult Leisure Learning Center

5800 BuffaloSpeedway • Houston, Texas 77025-1499 • 713/667-9111 • FAX 713/667-3453

APPENDIX B

AGENCY APPROVAL LETTER FOR FINAL STUDY

Eliminating racism
empowering women
ywca

February 2, 2007

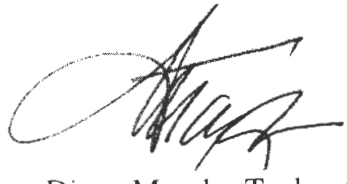
To whom it may concern:

This is to confirm that Adeline Chu has visited with the YWCA Houston and discussed the possibility of launching a program where we would engage the YWCA and its community partners in a computer literacy initiative for the express purpose of acquiring health education through the internet for the seniors that we currently serve in our Senior Service Department.

We see great a need for this type of training because many of our clients are of low socioeconomic status and have limited access to healthcare services. Additionally, we work with many of the cultural groups that have recognized risk for specific illnesses.

We look forward to proceeding with this project and providing support in a variety of ways including equipment, staff and volunteers.

Sincerely,



Diana Morales Taylor, CPA MBA

Chief Executive Officer

3220 Broadway St. Houston, TX 77017 •(713)868-9922 •Fax (713)868-1315

APPENDIX C

CONSENT FORM

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

College of Nursing
Houston Center
6700 Fannin
Houston, TX 77030-2343
713-794-2100 Fax 713-794-2103

Pioneering Nursing's Future:
An Adventure in Excellence

TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

Study Title: Psychosocial influences of computer anxiety, computer confidence and computer self-efficacy with online health information in older adults.

Investigator: Adeline Chu, RN, MEd
Advisor: Sandra Cesario, RNC, PhD

Explanation and Purpose of the Study:
You are being asked to participate in a research study for Ms. Chu's thesis at Texas Woman's University. The purpose of the study is to measure your experience of using a computer to search for health information on the Internet.

Research Procedure:
The investigator will conduct a face-to-face interview with you. The types of questions that you will be asked include how comfortable you are with using a computer and the Internet to search for health information. Your participation is voluntary. You may withdraw from the study without penalty at any time. Once you have answered the questions, you will have a 50-50 chance of being placed on a computer class conducted at the nutrition site. The investigator will notify you in person whether or not you are selected to attend the computer class.

If you are selected for the computer class, you will be asked to attend classes once a week for 5 weeks. At the end of the 5 week, the investigator will make an appointment to interview you two other times about using the computer and the Internet. The second interview and a class evaluation will be conducted after the completion of the program. The third interview will be conducted 6 weeks after the end of the 5-week program. The total expected time commitment for this study is approximately 11 hours 5 minutes, broken down as follows: 20 minutes for consent and initial interview, 10 hours total class time, 15 minutes each time for the second and third interviews, and 15 minutes for evaluation of computer class.

Participant Initials

Study Title: Psychosocial influences of computer anxiety, computer confidence and computer self-efficacy with online health information in older adults.

If you are not selected to participate in the computer class, you will not need to come to class. Likewise, the investigator will make an appointment to interview you two other times about using the computer and the Internet. The second interview will be conducted 5 weeks after the initial interview. The third interview will be conducted at 6 weeks after the second interview.
The total expected time commitment for this study is approximately 50 minutes, broken down as follows: 20 minutes for the consent and initial interview, and 15 minutes each time for the second and third interviews. You will be given an opportunity to take a similar class at the end of the research study.

Participation Risks and Benefits:
There are no direct benefits for participating in this study. Risks of participating in this study are: (1) potential loss of confidentiality, and (2) loss of time during participation. All of the information that the investigator obtains from you during the study will be kept confidential. You will be assigned an identification number that will serve to represent you in the study. The investigator will not use your name or other identifying information in any reports of the project. Project records will be filed and kept in a locked cabinet. The information collected from you will be destroyed at the end of the five years after the completion of the study. The same confidentiality guarantees given here will apply to future use of the materials. It is anticipated that the results of this study will be published in the investigator's thesis as well as in other research publications. However, no names or other identifying information will be included in any publication. A summary of the results will be mailed to the Chief Executive Officer and the Director of Senior Services of YWCA Houston.

Confidentiality will be protected to the extent that is allowed by law. The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participant Initials

Study Title: Psychosocial influences of computer anxiety, computer confidence and computer self-efficacy with online health information in older adults.

For Further Information about this Study:
You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research at 713-794-2480.

_____ _____

Signature of participant Date

_____

Contact information: Phone

The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.

_____ _____

Signature of Investigator Date

APPENDIX D

DEMOGRAPHIC AND BASELINE MEASURE

Partnering with Seniors for Better Health

Baseline Measure

The purpose of this survey is to gather information concerning how older adults use the computer and the Internet. It should take about 15 minutes to complete these questionnaires. All responses will be kept confidential.

1. Gender: ☐ Male ☐ Female

2. Ethnic/race:
   - ☐ White
   - ☐ African American
   - ☐ Hispanic
   - ☐ Pacific Islander
   - ☐ Asian _____
   - ☐ Others _____

3. What is your age_____?

4. Annual family income:
   - ☐ under $10,000
   - ☐ $10,000 - $15,000
   - ☐ $15,000 - $19,999
   - ☐ $20,000 - $29,999
   - ☐ $30,000 - $39,999
   - ☐ $40,000 - $49,999
   - ☐ $50,000 - $59,999
   - ☐ $60,000 - $74,999
   - ☐ $75,000 - $99,999
   - ☐ $100,000 - $124,999
   - ☐ $125,000- $149,999
   - ☐ $150,000 and over

5. What is your highest level of education?
   - ☐ Less than high school
   - ☐ High School degree
   - ☐ Some college or Technical Degree
   - ☐ College Degree
   - ☐ Post-Graduate Degree
   - ☐ Other

6. Have you ever used a computer? (If no, go to question 9)
   ☐ Yes ☐ No

   6a. If you answered yes, how many times have you used a computer in the past 3 months?
   ☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

7. Do you or your family have a home computer? (If no, go to question 8).
   ☐ Yes ☐ No

   7a. If you answered yes, how many times a week do you use your computer?
   ☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

   7b. Have you ever used your computer to search for information on the Internet?
   ☐ Yes ☐ No

8. Have you ever used a computer made available by a public library or community center? (If no, go to question 9).
   ☐ Yes ☐ No

   8a. If you answered yes, how many times have you used a public accessible computer in the past 3 months?
   ☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

   8b. Have you ever used a public accessible computer to search for information on the Internet?
   ☐ Yes ☐ No

9. Have you ever used the Internet to search for health information?
   ☐ Yes ☐ No

   9a. If you answered yes, how many times have you used the Internet to search for health information in the past 3 months?
   ☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

10. If you have never used a computer, what was the reason?
   ☐ Do not have access.
   ☐ No desire to use one.
   ☐ Too time consuming to learn how to operate.
   ☐ Had no need to use one.
   ☐ Had no opportunity to learn how to use.
   ☐ Other_____
   ☐ Does not apply.

11. If you have never used the Internet, what was the reason?
    - ☐ Do not have access.
    - ☐ No desire to learn how to use.
    - ☐ Too time consuming to learn how to operate.
    - ☐ Had no need to use it.
    - ☐ Had no opportunity to learn how to use.
    - ☐ Other_____
    - ☐ Does not apply.

12. Have you ever used electronic mail (e-mail)?
    ☐ Yes ☐ No

13. Have you ever joined an online support group, chat room or news group?
    ☐ Yes ☐ No

14. Do you currently have a health problem?
    ☐ Yes ☐ No ☐ Not sure

    14a. If you answered yes, is your problem newly diagnosed, acute, or chronic?
    - ☐ Newly Diagnosed
    - ☐ Acute
    - ☐ Chronic

15. Regardless of your health condition, do you believe that the Internet can be used to help you better manage your health care?
    - ☐ Yes
    - ☐ No
    - ☐ Do not know

Answer the following questions to the best of your ability regardless of whether you have used a computer or the Internet or not. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Circle the answer that corresponds to your feeling toward the following statements:

1. I'm no good with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

2. I could get good grades in computer classes.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

3. I do not think I could handle a computer course.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

4. I get a sinking feeling when I think of trying to use a computer.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

5. Working with a computer would make me very nervous.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

6. I think using a computer would be very hard for me.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

7. I am confident I can manage your personal health care using the Internet

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

8. I am confident I can use "search tools" to find medical information as it pertains to my own health on the Internet.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

9. I have a lot of self-confidence when it comes to working with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

10. Computers make me feel uneasy and confused.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

11. It wouldn't bother me at all to take computer courses.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

12. I would feel at ease in a computer class.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

13. I am confident I can use "search tools" to find information on the Internet.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

14. I would feel comfortable working with a computer.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

15. I am confident I can use a computer

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

16. Computers make me feel uncomfortable.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

17. I am not sure I could do work with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

18. I am confident I can use the Internet

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

19. I'm not the type to do well with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

20. I feel aggressive and hostile toward computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

21. I do not feel threatened when others talk about computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

22. Computers do not scare me at all.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

23. I am sure I could learn a computer language.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

24. I don't think I would do advance computer work.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

25. Generally, I would feel OK about trying a new problem on the computer.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

Note: From Gressard, C.P., & Loyd, B.H. (1986). Validation studies of a new computer attitude scale. *Association for Educational Data System Journal, 18*(4), 295-301 From Campbell, R. (2004). Older woman and the internet. *Journal of Women and Aging*, 16, 161-174.

APPENDIX E

EVALUATION FORM

Computer and Internet Use in Older Adults
Evaluation From

Thank you for participating in the computer and Internet learning program. We hope the past 5 weeks of learning together have been helpful to you. To further improve ourselves and the course program, please answer each question based on your experience in the computer class you have completed.

1. Gender: Male □ Female □

2. Age: _____

3. Ethnic/race:
   - ☐ White
   - ☐ African American
   - ☐ Hispanic
   - ☐ Pacific Islander
   - ☐ Asian _____
   - ☐ Others _____

4. Before you attended the program, did you believe the Internet could be used to find medical information that will be useful to manage your health care?

   a. Yes
   b. No
   c. I do not know

5. After you attended the program, did you believe the Internet could be used to find medical information that will be useful to manage your health care?

   a. Yes
   b. No
   c. I do not know

6. If you answered YES to question 5, how many times have you used the Internet to search for medical information since the beginning of the program to the completion of the program?

   a. 1 □
   b. 2-3 □
   c. 4-6 □
   d. 7-10 □
   e. >10 □

7. Briefly describe your feelings towards computers and the Internet. Have they changed or not changed since you began taking this class?

8. How do you plan on using the medical information your retrieved on the Internet to manage your health? *For example, manage newly diagnosed illness, manage an acute or chronic illness, learn more about a drug prescribed by a physician, health and wellness promotion, sharing with friends and family members.*

9. Using the medical knowledge available on the Internet, do you feel more comfortable taking a more collaborative role in your health care? *For example, you and your doctor work together to make important decisions in managing your health.*

10. What aspect of the program did you find most useful?

11. What aspect of the program did you find least useful?

12. How do you think we should improve the program to better serve the older adults in the Houston area?

Thank You for your time

APPENDIX F

POST TEST 1 AND 2

Partnering with Seniors for Better Health

Post-test 1

Answer the following questions to the best of your ability regardless of whether you have used a computer or the Internet or not. It should take you no more than 15 minutes to complete the questionnaire.

1. Have you used a computer in the last 5 weeks?

☐ Yes ☐ No

1a. If you answered yes, how many times have you used a computer?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

2. Have you used a computer to look up information on the Internet in the last 5 weeks?
☐ Yes ☐ No

2a. If you answered yes, how many times have you used a computer to look up information on the Internet?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

3. Have you used a computer made available by a public library or community center in the last 5 weeks?
☐ Yes ☐ No

3a. If you answered yes, how many times have you used a public accessible computer?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

4. Have you used a public accessible computer to search for information on the Internet in the last 5 weeks?
☐ Yes ☐ No

5. Have you used the Internet to search for health information in the last 5 weeks?
☐ Yes ☐ No

5a. If you answered yes, how many times have you used the Internet to search for health information?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

6. Have you used electronic mail (e-mail) in the last 5 weeks?
☐ Yes ☐ No

6a. If you answered yes, how many times have you used the email in the last 5 weeks?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

7. Have you joined an online support group, chat room or news group in the last 5 weeks?
☐ Yes ☐ No

There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Circle the answer that corresponds to your feeling toward the following statements:

1. I'm no good with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

2. I could get good grades in computer classes.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

3. I do not think I could handle a computer course.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

4. I get a sinking feeling when I think of trying to use a computer.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

5. Working with a computer would make me very nervous.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

6. I think using a computer would be very hard for me.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

7. I am confident I can manage your personal health care using the Internet

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

8. I am confident I can use "search tools" to find medical information as it pertains to my own health on the Internet.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

9. I have a lot of self-confidence when it comes to working with computers.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

10. Computers make me feel uneasy and confused.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

11. It wouldn't bother me at all to take computer courses.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

12. I would feel at ease in a computer class.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

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21. I do not feel threatened when others talk about computers.

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22. Computers do not scare me at all.

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Note: From Gressard, C.P., & Loyd, B.H. (1986). Validation studies of a new computer attitude scale. *Association for Educational Data System Journal, 18*(4), 295-301 From Campbell, R. (2004). Older woman and the internet. *Journal of Women and Aging*, 16, 161-174.

Partnering with Seniors for Better Health

Post-test 2

Answer the following questions to the best of your ability regardless of whether you have used a computer or the Internet or not.

1. Have you used a computer in the past 6 weeks?

☐ Yes ☐ No

1a. If you answered yes, how many times have you used a computer?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

2. Have you used a computer to look up information on the Internet in the past 6 weeks?
☐ Yes ☐ No

2a. If you answered yes, how many times have you used a computer to look up information on the Internet?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

3. Have you used a computer made available by a public library or community center in the past 6 weeks?
☐ Yes ☐ No

3a. If you answered yes, how many times have you used a public accessible computer?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

4. Have you used a public accessible computer to search for information on the Internet in the past 6 weeks?
☐ Yes ☐ No

5. Have you used the Internet to search for health information in the past 6 weeks?
☐ Yes ☐ No

5a. If you answered yes, how many times have you used the Internet to search for health information?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

6. Have you used electronic mail (e-mail) in the past 6 weeks?
☐ Yes ☐ No

6a. If you answered yes, how many times have you used the email in the past 6 weeks?
☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7-10 ☐ >10

7. Have you joined an online support group, chat room or news group in the past 6 weeks?
☐ Yes ☐ No

There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Circle the answer that corresponds to your feeling toward the following statements:

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12. I would feel at ease in a computer class.

Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

13. I am confident I can use "search tools" to find information on the Internet.

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Strongly Agree Slightly Agree Slightly Disagree Strongly Disagree

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From Campbell, R. (2004). Older woman and the internet. *Journal of Women and Aging*, 16, 161-174.

APPENDIX G

ACKNOWLEDGMENT LETTER MANUSCRIPT 1

Feb 25, 2008

RE: CIN-D-07-00084, entitled "The outcomes of anxiety, confidence and self-efficacy with Internet health information retrieval in older adults: a pilot study"

Dear Ms Chu,

The reviews of your manuscript are complete. The reviewers thought that the article would be of interest to CIN readers but revisions and a re-review are necessary.

Please revise the manuscript, taking into consideration the reviewer's suggestions, attached below. When you resubmit, I will send the revised paper to the original reviewers for their appraisal. Please include with your revised submission an itemized, point-by-point response to the comments of the reviewers; remember that this is a blinded review, so do not sign or identify yourself in the response.

To keep the process moving, please submit the revised article by Apr 25, 2008. If you cannot meet the requested date, please e-mail Leslie (leslie@medesk.com) or Susan (susan@medesk.com) at the editorial office.

To submit a revision, go to http://cin.edmgr.com/ and log in as an Author. You will see a menu item called "Submission Needing Revision." Please click on this item to obtain your submission record and begin the revision process.

Your username is:
Your password is:

With Kind Regards,

Dr. Leslie H. Nicoll
Editor in Chief
Computers, Informatics, Nursing

APPENDIX G

ACKNOWLEDGMENT LETTER MANUSCRIPT 2

May 23, 2008

Thank you for submitting your manuscript for possible publication in the Journal of the Medical Library Association. We will forward your submission for peer review and contact you with more information as soon as possible.

Please send any questions or comments about your submission to jmlaeditor@vanderbilt.edu. Please be aware that the editor of the JMLA will be Susan Starr as of June 1st, 2008. We will distribute your manuscript for peer review, but you will likely hear from Susan rather than us regarding a decision.

Regards,
Rachel Walden, MLIS
JMLA Editorial Assistant
Librarian
Eskind Biomedical Library
Vanderbilt University Medical Center
Phone: 615-936-1418
Fax: 615-936-1384

For:
Nunzia B. Giuse, MD, MLS, AHIP
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Director of the Eskind Biomedical Library
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