SENIORS' LEARNING PREFERENCES, HEALTHY SELF-CARE PRACTICES AND COMPUTERIZED EDUCATION IMPLICATIONS

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ABSTRACT

Health promotion uses an increasing amount of Internet-based education. Understanding seniors' learning orientation and self-care practices can inform instructional designers how to use the Internet with this population. A correlational, descriptive study of community-based seniors' (n=87) learning orientation and healthy self-care practices was conducted in a western state. Implications for Internet-based health promotion include associations between rural and urban location, age, health condition, self-care practices, informational preferences, and learning orientation factors. Difference between urban and rural populations and illness severity were identified. Respondents used the Internet as much as they did television and friends for health promotion materials. Transforming learners used the Internet while conformers did not and yet conformer learners performed the most self-care practices. Implications for designing differentiated health promotion materials based upon learning orientations are discussed.

INTRODUCTION

Anticipating a budget cut, a regional department of aging in a western U.S. state considered developing a centralized health promotion program. Using the Precede-Proceed Model (Green & Kreuter, 1999), a health promotion assessment was initiated to explore how community-based elders learn about and then practice self-care strategies. Program leaders questioned how seniors examined and experienced health education according to age, residence, and health status.

The Need

Policy makers consider health promotion an important strategy for reducing the expected costs of chronic disease in an elderly baby boomer generation (Department of Health and Human Services, 2003). Educators and health care providers search for methods of teaching people disease prevention while attempting to control costs. One strategy is to adopt "cheaper" computerized health education programs, but understanding who benefits from online curriculum is not well understood (Gore, 2002).

A major reason for developing computerized education programs is to reach more people using fewer dollars (Gore, 2002). Providers feel pressured by economics to shorten the time spent with clients, which limits educational opportunities and leaves patients wanting more information (Frank, 2003). At the same time, the need for health

care is expected to grow. The anticipated cost of chronic disease management for the baby boomer generation constitutes the highest single health care cost in the United States. The cost is expected to exceed 906 billion dollars by 2050.

Prevention of chronic disease through self-care is a major public health strategy (National Center for Chronic Disease Prevention and Health Promotion, 2003). Informal self-care accounts for 75% of all health care in the United States (Levin, 1976). Self-care is based upon health care information. The public longs for inexpensive, reliable information that is not always available. The lack of insurance prevents some people from accessing providers, while others postpone provider visits until a crisis occurs (Staff, 2004). The Internet can meet several health promotion information needs if more is understood about its role in health care (Voelker, 2005).

The prevention of chronic illness entails aggressive self-care, providing information that people will incorporate into their lives, demands attention to complex, interrelated issues. According to the "Precede" portion of the Precede-Proceed Model (Green & Kreuter, 1999, p 11), program planning depends on understanding the predisposing, reinforcing, and enabling conditions impacting lifestyle, health decisions, and quality of life. Chronic disease results from intertwined and synergistic play of many risk factors (Public Health Works, 2003). For instance, the single concept of health literacy includes knowledge, motivation, attitudes, behavioral intentions, personal skills, and self-efficacy (Nutbeam, 1999; Bruhn, 1997). Understanding the computer's role in health literacy requires cross discipline study of health, education, and informatics.

Promoters rank Internet technology with antibiotics, genetics, and computers as among the most important changes in health care delivery history. Researchers find the Internet an effective communication and educational tool (Hern, Weitkamp, Hillard, Trigg, Guard, 1998; Colombet & Chatellier, 2001). Access to the tool increases each year. Forty percent of elders in 1996 reported using computers (Marks, 1996), and researchers expected the use of electronic health strategies "to expand exponentially" (Coile, 2000). Twenty-two percent of people over age 65 were found to use the Internet in 2001 (Fox, 2004). Twenty-one percent of seniors were found to use online health information in 2004 by Voelker. Of these, 53% of elders between 50 and 64 used the Internet for health information, indicating a difference between generations (Voelker, 2005).

Organizations and agencies targeting elders with online education include professional health care associations, the federal government, state governments, universities, insurance companies, drug companies, health care providers, and vendors (Science Daily, 2003). The timely question of the efficacy of computerized health education remains. Who uses the computer? What are their learning characteristics and needs (Dutta-Bergman, 2003)?

Understanding learner motivation, attitudes, and intentions are central to both the Precede-Proceed health promotion model and online instructional design. Individual cognitive learning needs are different (Kesler & Alverson, 2003), and recent research indicates that the role emotions play in learning may be more important than cognitive aspects because information first travels through emotional brain centers before entering cognitive centers (Sapolsky, 1998). Chiesa (2003) states, "If you are motivated enough, you will make it" when discussing the important role of emotions in goal achievement. Motivation increases the individual's ability to respond and act upon stimuli (Sapolsky,

1998). Recent research shows that emotions form before reasoning begins and then remain after memory fades, further impacting educational outcomes. Assessing learner characteristics and preferences is important to health promotion instructional development.

Learning Preferences

"Learning orientation" describes the emotional characteristics a person knowingly utilizes to manage learning situations. Preferences include emotions, values, and intentions. Margaret Martinez developed the learning orientation model and questionnaire (Martinez & Bunderson, 1999) in a whole-person effort to understand learning differences and to improve educational outcomes. The framework provides a foundation for personalizing and customizing instructional events to meet learners' needs and is used to guide concept organization, outcomes prediction, process monitoring, and progress assessment. Learning orientation can even advise teachers when and how to promote social relationships.

The learning orientation model (Martinez & Bunderson, 1999) describes dominant psychological factors influencing knowledge acquisition. The perspective considers the student's 1) emotional investment, 2) committed strategic planning and effort, and 3) independence or learning autonomy. The approach incorporates cognitive, emotional, and intentional characteristics to describe how individuals feel about learning and how they may want or intend to learn differently.

The learning orientation questionnaire (LOQ) describes people as possessing one of four orientations. The Cronbach alpha was listed at .89 by the author but performed at a .78 for this study. The "transformer" is highly motivated, passionate, and persistent. Learning is of great value to transformer learners and acquiring new expertise is enjoyable. These individuals use their personal strengths to achieve goals despite failures. Transformer learners may become frustrated in environments that constrain their aggressive learning styles and will not take information on "trust" (Martinez, 2001).

"Performers" are persistent in learning situations of interest to them; otherwise, they seek extrinsic rewards. Performers are systematic, sophisticated learners that think hierarchically. These people need an important reason or seek perceived benefits to reach for short-term goals. Performers want to explore the details and follow the best steps towards task completion. These individuals try to avoid making mistakes or setting challenging goals. They are said to desire reaching the instructor-defined goals quickly and efficiently. Performers enjoy coaching, social interaction, and collaboration (Martinez, 2001).

The "conformer" learner is described as preferring routine, explicit, supportive environments in which all expectations are made clear. Conformers tend to be passive learners who will accept, store, and reproduce information to please others. They like others to make the decisions, avoid discovery, and complex thinking. Conformers like to begin at the beginning and want to proceed in an orderly fashion. This population wants to be shown how to accomplish each step. These learners will work in teams if with strong leaders (Martinez, 2001).

The "resistant" learner lacks the belief that academic knowledge is useful but may enjoy studying outside academic settings. These people like to gain knowledge using

their hands and experience. Martinez describes the orientations as generalized characteristics that alter with some situations. It is not known if health status alters learning orientation.

People succeeding in online courses are generally more motivated and exert more self-control than their less successful peers. The LOQ demonstrated the ability to predict who will succeed in web-based courses (Jones, 2001; Molinari, 2005; Molinari, Dupler & Lungstrom, 2005). Stress was found to be related to learning orientation and achievement online, which prompts more self care questions (Molinari, Anderberg, Dupler, Lungstrom, 2005). These findings make the model useful in answering questions about seniors' use of the Internet for health promotion programs. If centralized patient education programs require highly motivated learners, then learner motivation needs to be assessed.

METHODOLOGY

The study was conducted after approval from an institutional review board and in collaboration with senior centers in three communities. The study considered what healthy self-care practices seniors used and what demographic conditions related to their learning preferences. Seniors completed two surveys: the learning orientation questionnaire (LOQ) and a personal information survey. The LOQ asks twenty-five questions with a Likert-like scale anchored in "very characteristic and uncharacteristic of me". The questions focus on the conative/emotional aspects of learning. This study represents the first time the measure was used in a health care setting (Martinez, personal interview, 2000).

The primary investigators designed the demographic survey. The questions explored environmental conditions, self-care practices, education materials, and feelings. The survey included barriers to education and healthy practices as well as perceptions of health education and locations. As many questions as possible matched the LOQ for consistency. The tool was piloted with five senior volunteers. Changes including wording and font size were based upon the feedback. Descriptive statistics, correlations and ANOVAs were performed to see if relationships existed among demographic variables and learning orientations.

RESULTS AND DISCUSSION

Participants came from a variety of ages and locations. Ninety-two people completed some portion of the survey tools. Ninety-five percent (n=87) completed all questions. Surveys were gathered from rural (n=50) and urban (n=37) seniors lunching at senior centers. Fifty-seven percent lived in rural communities. Males constituted 37.9% of the sample and females 62.1%. Ages ranged from 49 to 105 with 40.2% under age 60. Twenty percent of the sample was between the ages of 61 and 70, 21% between the ages of 71 and 80, and another 20% were over the age of 80

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Health Promotion Access

The most frequent locations for learning about self-care were the doctor's office (61%), home (46%), and the hospital (40%). Participants used a variety of information

sources (Figure 1.) Health care providers and books were the most popular choices. The Internet was chosen about the same number of times as television and friends. Forty-seven percent of participants denied having an illness, 15% reported being ill for 1 to 5 years, while 21% reported having an illness for over 5 years.

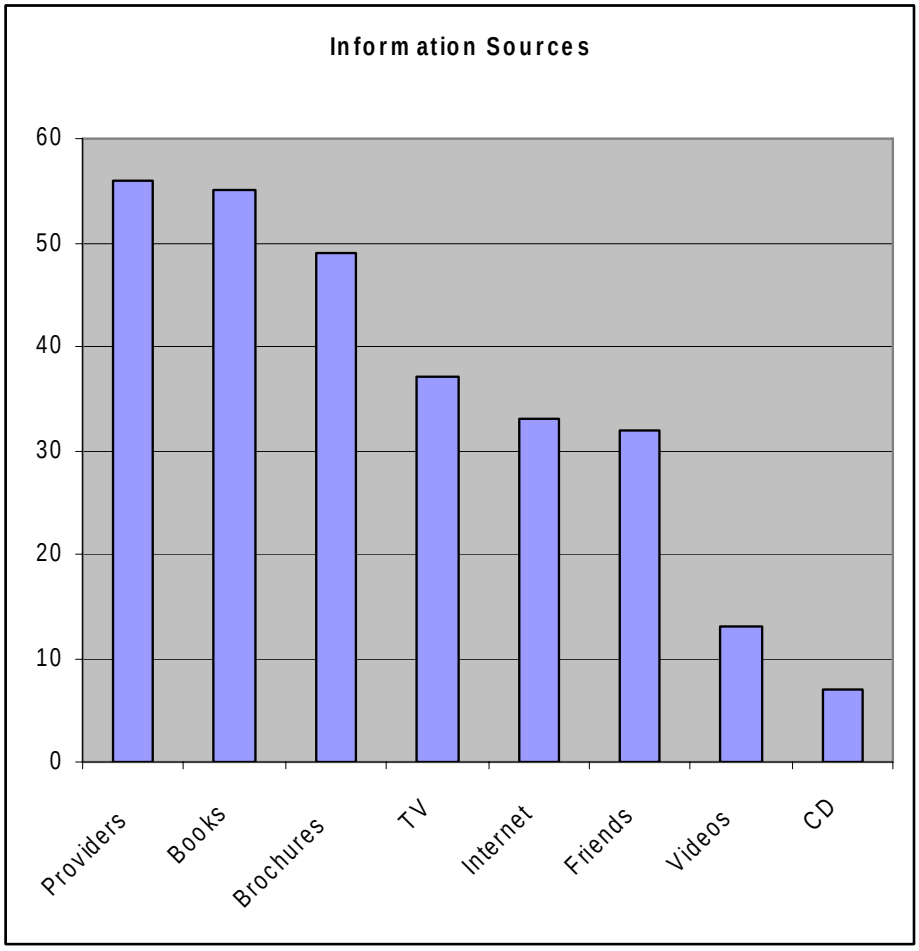

Figure 1. Information Sources

Self-Care Characteristics

The top three reasons preventing completion of healthy self-care practices included: Finances (29%), lack of motivation (21%), and lack of time (20%), with mobility, transportation, vision, low priority, pain, lack of information, memory, and attention problems also mentioned. Sixty-six percent of respondents indicated they believed in and were satisfied with the information received from their health care providers. Personal feelings about caring for oneself included: 47% felt guilty, 61% felt confident, while a third felt angry and helpless.

Learning Orientation

Results from the learning orientation questionnaire (LOQ) indicate the majority of seniors were performer and transforming learners. Only 24.1% indicated conforming or resistant preferences. This is similar to younger samples that typically have 20% conforming and resistant learners according to an interview with Martinez (2000). Age was not related to learning orientation. Differences in location were identified.

Location	Resistant	Conforming	Performing	Transforming
Rural	9%	18%	52%	20%
Urban	0%	25%	56%	6%

A t-test showed significant relationship between the number of healthy self-care practices and the LOQ score ($t = 0.85$, $p < .05$) indicating the more control one likes to exert over learning the fewer the number of self care practices reported. Transformer learners like to exert control over their learning goals, methods, and process. The more control a person wanted to exert over their learning in this sample the less likely they were to do what they were told were healthy practices. Qualitative responses provided further information on this finding when transformer learners reported doubting the advice published by researchers and health care providers, "They change their minds about what you should do" and "I don't really think they know what is true."

People with a conforming orientation reported the highest number of self-care practices. Perhaps conformers prefer to perform activities meant to keep them safe. A t-test of the number of self-care practices by age showed a significant relationship ($p < .01$). ANOVA s of the prediction of self-care by age ($f = 7.748$, $p < .01$) showed people over 70 years less likely to practice self-care.

Bivariate Pearson correlations were identified for a number of variables. Associations between gender and time ill ($p < .05$) and between rural residence and the number of healthy self-care practices ($p < .04$) were found. Learning preferences related to gender and time ill with the longer someone was ill being associated with less autonomy and motivation for learning. The more severe the illness the less autonomy and learning motivation reported. As the severity of illness increased the number of self-care practices decreased ($p < .03$). The time ill was associated with the severity of the illness ($p < .00$), which is indicative of chronic disease. Conformer and resistant learners reported the most self-care practices and also indicated experiencing the most wellness.

Three quarters of those using the Internet were rural residents indicating an "availability" factor. Twenty of the 21 reporting using the Internet for health care information reported high performer and transformer strategies, which agrees with learning orientation literature (Jones, 2001). Seniors reported consulting the Internet as often as they did their friends about health promotion indicating trust in the information.

IMPLICATIONS

Seniors' Internet use has several implications. Why do rurally based people use the Internet more than their urban peers? Do time and distance contribute to this difference? The literature does not differentiate location in studies with findings of little

elder Internet use (Meischke, Eisenberg, Rowe, & Cagle, 2005). Brunk (2003) found that younger elders used the Internet more than older elders.

The increasing amount of Internet use indicates a need to teach elders how to best utilize the Internet. Several types of information need to be taught such as how to construct search strategies and how to evaluate information found (Ullrich & Vaccaro, 2002). Providers could share aids to help the public evaluate health care like the Health on the Net logo or the peer-reviewed journal articles found on PubMed (http://www.pubmed.gov).

Although increasing numbers of physicians are using the Internet in their own practice (Federation of State Medical Boards, 2002), how many providers recommend Internet education sites? Patients may feel informed, which will alter their communications with providers. Provider education programs need to instruct future caregivers how to relate to Internet users.

Further, seniors need to know how to approach their health providers with information. The Internet may alter physician and patient roles in health promotion. No longer are providers the only authoritative resource, but they can serve as counselors in understanding the expanding patient self-care role. Evaluation skills could empower people to make better search and selection decisions.

Not everyone responds the same to health care information from authorities. Although the majority of the sample did not use the Internet, the majority of Internet users indicated a performing or transforming learning preference. Elders reporting a transformer preference indicated skepticism about the quality of the information they receive from physicians. They did not perform as many healthy self-care practices as conformers. The different approaches to self-care and Internet-based information require attention. Instructional designers must meet conformers' and transformers' different needs.

The issue of information evaluation will also impact conforming and resistant learners. Conformer learners desire to please authorities and are stressed by their health and security events (Martinez, 1999). Conformers want clear, step-by-step instructions they can accomplish. They are not interested in underlying causes, extra resources, alternative choices, or theoretical materials. Conformers are less likely to think about costs and benefits, information reliability, or to express skepticism of what an "authority" says. The conformer may believe and follow incorrect information delivered by an authoritative figure.

Each learner orientation poses a different set of self-care challenges. Martinez (2003) and the findings of this study indicate conformer and resistant learners seem most likely to do what they are told is good for them. Transformer learners may question the wisdom of a health care practice and performers may not work during adversity if the "costs" were too high. Motivating transformers to change behaviors may require instructional approaches that encourage the weighing of long- and short-term behavior consequences, experimenting with alternative self care practices, or creating their own plan of action based upon sound principles. Conformers do not tend to seek out information on their own and do not tolerate alternative choices and will benefit from a less complicated teaching approach. Internet sites with many links would be avoided for this population.

Findings suggest educators may want to provide different information presentations for different learning orientations. Health promotion programs can use learning orientation tools to assess student-learning preferences before the teaching moment and then guide clients to the program that best meets their needs. This is called differentiated programs. A health promotion site constructed with learner preference theory discriminates in the amount of information provided, provides concept sequencing, efforts required, and supports provided for each orientation type. Transformer and performer learners are the most likely to use the Internet. Transforming learners want several resources from which they can choose. Links to a variety of research materials offering different viewpoints could be provided. Transformers prefer non-linear learning environments where they can innovate. The ill transformer may tire before finishing an educational task and require direction to meet outcome expectations.

Performer learners may be interested in the topic if it pertains to their health but not tolerate theoretical discourse. Performers are interested in the most efficient method of reaching a learning goal. These learners want hands on learning with tools and demonstrations. They like personal attention with coaching and support groups. Links to extraneous materials would not be appreciated.

Conforming learners enjoy linear, step-by-step, explanatory materials. Time spent on the computer should be short. CDs in a provider's office with directed materials would be their computer preference. Conformers prefer instructors to control the teaching. Their tolerance for technology glitches is low. These learners might enjoy linear programs using touch screens under the direction of a health educator. They would appreciate printouts to take home.

There is not much information about the resistant learners' preferences except in a negative sense. They are not fond of books or academic settings. Not much is understood about the types of learning "resistance." Martinez states resistant learners prefer trial and error to books and authorities (2001). The resistant learner wishes for hands-on learning and immediate results for labor inputs. Findings in this study indicate conformer and resistant learners did not use the Internet and yet performed the most healthy self-care practices. These learners prefer to learn about health care from hospital and clinic personnel, according to these findings. An example of how to apply this knowledge is that conformer and resistant learners would like to try out exercises and taste foods in the clinic setting. A centralized computerized educational system might utilize pictures of doctors and nurses with audio to help this type of learner through a linear instructional program. A text based program with clicking on links would not be as successful with these learners.

The majority of respondents in this study expressed satisfaction with the information received from health care professionals but felt negative about their self-care abilities. Self-care doubts may pertain to different stages of health. Findings suggest chronic illness impacts how people prefer to learn. Providing individualized instructional materials could meet the changing needs of chronic illness. Opportunities to control and question authoritative resources may work best for people feeling confident, energetic, and in control of their learning, while those feeling tired and sick may desire clear, simple directions. Findings indicate a need to review further the link between severe and long term illness and the conforming learning orientation. The most ill patients did not practice self-care.

Limitations of this study include the lack of ethnic and educational diversity. There is a lack of information about the relationship between learning orientation and socioeconomic influences. Larger samples for both rural and urban populations are needed before generalizations can be applied. Seniors tired during the long survey process. Completers expressed difficulty relating some of the learning orientation questions to their stage of life. Another version of the learning orientation questionnaire is needed for non-academic populations. A short chronic ailment assessment would also be useful.

CONCLUSIONS

Technology advances have moved faster than the understanding of individual learning needs. Technology is now available to tie educational programs and patient communications to the electronic health record. A continued multidisciplinary search for best practices is needed so that when all systems are tied together, optimal outcomes will occur.

The development of individualized educational programs for different learning preferences needs further study. Seniors reported similar learning preferences to younger people, but differences in health were associated with different learning orientations. The level of wellness may alter individuals' learning orientation by altering independence, effort, and motivation commitment levels. Those using the Internet were highly motivated and self-controlling learners, indicating less-motivated people may not use Internet-based health promotion materials. Instructional designers may consider designing health promotion materials to meet the needs of various levels of goal setting, information management, change process management, and need for pleasurable outcomes. More information is needed about how learning orientation relates to age level, residency, and wellness.

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