Outcomes of On-line Financial Education for Chronically Ill Rural Women

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This research was part of a larger longitudinal study of chronically ill rural women to determine if computer technology could be effective in allowing the women to take control of their own well-being, including finances. The current study examined whether chronically ill rural women can effectively use on-line personal finance educational programming, as measured by a financial literacy assessment pretest compared to a post-test assessment consisting of the same questions in the pretest. The women were randomly divided into three groups: (a) an intensive intervention group where participants had an on-line series of lessons on finances, access to experts, and a social support discussion board; (b) an intermediate intervention group where participants had only the on-line lessons; and (c) a control group. Results indicate the intensive and the intermediate intervention strategies are effective compared to the control group in producing a significant increase between pre-test and post-test scores.

Key Words: chronic illness, financial education, on-line education, rural women

Introduction

Living with chronic illness influences all aspects of people's well-being: physical, intellectual, social, emotional/spiritual, occupational, and economic/financial. When the financial resources of ill individuals are strained by the costs of managing a chronic condition, they can be left with a sense of impaired well-being that is systematically disrupted without any apparent paths for regaining control. Personal and family finances are at the foundation of chronic illness, as money can be a fundamental resource to increasing well-being in every sphere.

A woman who is chronically ill is at particular risk for the financial impacts of chronic illness because women overall are often less knowledgeable about financial matters and are often not in charge of the finances for the household (Lusardi, 2008). It is also possible that rural women are at more risk than urban women because family finances are frequently entangled with small, family-owned business ventures such as farms, ranches, and other rural-based businesses, making financial management more risky and complex. Rural women are less likely than their urban counterparts to be covered by health insurance, so the financial impacts of chronic illness can be particularly severe for these women and their families (Ormond, Zuckerman, & Lhila, 2000).

The current study was part of a larger research project called the Women to Women (WTW) Project, which was designed to deliver on-line support and health education to chronically ill rural women so that these women will have greater self-efficacy in managing their own illnesses. The demands of chronic illness can be overwhelming and resource intensive. The WTW Project's thesis was that if on-line tools (education, social support from fellow subjects, and chats with subject matter experts) could be delivered to chronically ill rural women, the women could learn to manage their own illnesses better. If the women could learn to gain resources from the on-line environment about managing their illnesses they would have higher well-being. The ability to gain on-line resources is a skill that can benefit the women far into the future, since chronic illness

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is and will likely be a part of their lives for the foreseeable future. This project focused on financial well-being as one aspect of overall well-being. The underlying assumption was that increasing financial knowledge could increase overall well-being. The first step to this outcome, however, was to determine if financial knowledge could be impacted in an on-line learning environment delivered to chronically ill rural women.

Review of Literature

A short review of the frequency of chronic illness in the United States, the cost of chronic illness, and the problem of being underinsured or uninsured will begin the literature review. As far as financial management and chronic illness are concerned, no past research has attempted to assess the impact of an on-line method of teaching chronically ill rural women about personal finances. However, literature was available in vast quantities on financial literacy or financial education in general. Some literature examines financial literacy/education for women, financial literacy/education and chronic illness, and financial literacy/education and distance or e-learning. Each of these areas will be reviewed in turn.

Chronic Illness in the United States

Nearly 125 million people in the U.S. suffer from chronic illness, and deaths from chronic illness account for 70% of all deaths. The annual direct cost of care for chronic illness is estimated at $510 billion (Bureau of Primary Health Care National Health Care Collaborative, 2005). The number of people in the population with chronic illness grew by 25% from 1999 to 2009 (Pendo, 2009). During this time of growth in chronic illness, the rate of the uninsured population also increased. A study of chronic disease and insurance coverage in the U.S. found that in 1987, the number of uninsured in the U.S. was 31 million, and in 2006, the number was 47 million (Wilper et al., 2008). This study used data from the National Health and Nutrition Examination Survey from 1999-2004 to identify the number of Americans with chronic illness who were uninsured. The findings indicated that an estimated 11.4 million Americans with chronic illness do not have insurance. These uninsured individuals with chronic illness were less likely than insured individuals to visit a health professional or have a standard site for care. They were more likely to go to the emergency room as a standard care site. Chronic illness impacts finances, but finances also impact the care individuals with chronic illness receive.

Financial Literacy and Financial Education Research

Financial literacy and financial education has been a burgeoning area of interest in the past 20 years because of a number of factors, including the housing bubble and mortgage crisis, the downturn in the economy, the increasing use and concern about the use of credit by consumers, and other financial hot topics in the news. Millions of dollars have been spent on financial literacy and education curricula development in this time period.

In a 2006 review of financial literacy and education programs in the U.S., Hogarth defined financial education and financial literacy. She examined financial education initiatives currently underway and attempted to determine how the initiatives are working. Financial literacy has been tested through a bi-annual survey of high school students over a number of years through the Jump$tart Coalition for Personal Financial Literacy. The survey has consistently found that high school students fail in financial literacy, with score averages falling from 1997, when the score average for survey participants was 56.9%, to 52.4% in 2006, to 47.5% in 2008, despite huge increases in the number and types of financial literacy and education programs (Jump$tart, 2006; Jump$tart, 2008). Other studies reported poor average scores on financial literacy knowledge surveys as well, although one study showed that consumers who graduated from states with mandated financial education were more likely to have higher savings rates and higher net worth (Bernheim, Garrett, & Maki, 2001). Hogarth (2006) suggested that financial education program planners must take into account at least four distinct elements: choosing topics that address subjects' financial knowledge deficits, a clear target audience, appropriate learning style for the audience, and an understanding of the learner's current stage of behavioral change. In a review of financial education impact evaluations of 23 programs, Hogarth reported that some type of financial education gain was achieved through financial education in each program. However, linking the knowledge gain to financial behavior is a much more difficult challenge. Hogarth concluded that many programs exist but more work needs to be done to show behavioral outcomes from the knowledge imparted in the programs.

Also in 2006, Marcolin and Abraham reviewed the financial literacy research in the United States, United Kingdom, and Australia. They reported that financial literacy studies focusing on the general population showed

that people with higher educational levels generally have higher levels of financial literacy. Since financial education has not been a consistent public school offering in any of the three countries, the studies revealed that personal finance education is usually done through the trial and error of daily financial management. The authors also pointed out that links between financial knowledge and financial behavior are less clear. Another point made in the article was that financial literacy and financial education do not have a standardized definition in research studies; therefore, comparing results is problematic.

Lusardi (2006) reviewed financial literacy and financial education programs and found evidence that financial illiteracy is particularly acute among some demographic groups, including women. She noted that European surveys reported consumers were overconfident in their own financial knowledge, which made consumers less likely to seek professional advice on financial decisions. Those consumers who were financially literate were more likely to plan and to invest in complex, tax-favored assets such as stocks and individual retirement accounts (IRAs).

To summarize, financial literacy in the general population at all ages is low. Education has been shown to improve financial literacy, although so many different programs have been initiated and implemented, no general result was available. Women are particularly financially illiterate (Lusardi, 2006).

Financial Literacy/Education and Women

Lusardi and Mitchell (2008) examined women's retirement planning knowledge. They devised a module on planning and financial literacy to add into the 2004 Health and Retirement Study. Two relatively simple questions on the time value of money and a question on the safety of company stock versus a stock mutual fund were asked. In addition, three questions on saving for retirement, including questions on whether or not the respondent tried to determine how much saving would be needed in retirement, whether or not the respondent had developed a retirement savings plan, and whether or not the respondent was able to stick to the plan. The study sampled 785 women age 50 and older to determine whether or not literacy about the time value of money and investing influenced devising and carrying out plans for retirement. Results indicated that 61.9% of the women correctly answered an interest rate calculation question, 70.6% correctly answered a question on inflation, and 47.6% correctly identified a mutual fund as being safer than an individual company stock. A disturbingly low 29% of all respondents got a perfect score on all three questions. Less than one third of the women had ever attempted to calculate retirement savings needs, 58.5% indicated they actually developed a plan, and 53.9% said they stuck to the plan, either always or most of the time. A final analysis showed that the women's financial literacy was strongly and positively related to planning behaviors. The researchers emphasized the need for basic financial literacy programming for women, as planning behaviors for retirement will not be likely if women do not understand the fundamentals of the time value of money or investing principles. A similar finding was presented in a study of older women and financial management, where the researchers determined that women needed education in budgeting and planning, how to find resource people to answer questions about financial paperwork, and the value of networking with peers (Into, 2003).

Some literature specifically looks at the financial literacy level and financial education programs targeting women. Hira and Mugenda (2000) posited that gender is a social phenomenon producing differences in the way men and women perceive financial issues. Their survey of 2000 Iowans in 1995 indicated that women were more likely to perceive their financial situation as worse than or the same as others; whereas, men were more likely to see their financial situation as better than others. Women reported more money worries that interfered with work performance than men, but were less likely than men to let money worries interfere with personal relationships. Women were more likely to buy things without a need and to buy unplanned items than men and were more likely to report they could not resist a sale. Women were more likely to agree that spending habits created chaos in their lives than men. Women were more likely to be dissatisfied with their current financial situation than men. The authors suggested the need for financial education that can focus on the problems presented by each gender in gender-specific workshops. Women should be targeted with topics such as spending behaviors, assessing current financial situations, and how to determine one's future financial status. A think tank (Anthes & Most, 2000) on the dynamics of women and money was convened by the National Endowment for Financial Education and the American Association of Retired Persons to examine gender-related issues. They found similar trends with regard to women: women ranked financial issues as the most pressing issues, women were more intimidated about financial issues than men, women earned less over a lifetime than men, women were less prepared for retirement than men, women were poorer in

retirement than men, and women are more conservative investors than men. The think tank concluded that women need financial education targeted to them specifically, as women did not have the financial literacy levels they needed to be financially able.

A summary of the literature on financial literacy/education and women indicates that women should be a targeted audience for financial literacy programming. Women are less confident, more worried, less knowledgeable, and more prone to spending without controls than men. These are needs to be addressed in financial education.

Financial Literacy/Education and Chronic Illness or Health Status

A study of families of people with multiple sclerosis (MS) showed many impacts on subjective well-being due to financial strain associated with the management of the illness (DeJudicibus & McCabe, 2005). Financial strain arose due to reduced or complete abandonment of paid work by the family member with MS, costs due to home adaptations for the limited mobility of the ill family member, mobility equipment for the ill family member, and special transportation needs for the member with MS. The additional costs placed extra stress on the family, which in turn reduced subjective well-being of the family members. This study did not examine financial education but documented financial stress in these families.

A second study of persons with MS (Iezzoni & Ngo, 2006) also documented financial insecurities. Often these individuals become unemployed and lack the health, disability and life insurance policies they would have if they could still be employed. The population studied was 78.9% female. Of study subjects, 27.4% reported that health insurance concerns had significantly affected their employment decisions. Additionally, 16.4% reported difficulty in paying for health care, 27.4% had put off health care because of costs, and 22.3% had delayed filling prescriptions, skipped doses, or split pills because of the costs. Over one quarter of the sample (26.6%) reported being worried about affording basic necessities such as food, utilities, and housing.

These two studies illustrate that chronic illness, such as MS, adds stress to families due not only to the medical condition but also to the financial impacts that the illness has on the family finances. Next, studies on general health status and its relationship to finances are examined.

Many studies exist showing a relationship between health and the level of distress and worry about finances (Bagwell & Kim, 2003; Drentea & Lavrakas, 2000; Kim & Garman, 2003; Kim, Garman, & Sorhaindo, 2003; O'Neill, Sorhaindo, Xiao, & Garman, 2005a, 2005b, 2005c). Often financial distress is part of a larger series of stressor events, with one stressor requiring management before another event lands on top of the last one. Stressors can add up to cause a negative effect on health. Health effects reported in one study of 3,121 credit counseling client subjects included anxiety, insomnia, headaches, and depression (O'Neill et al., 2005c). Financial distress can also limit the ability of an individual to afford or access health services, creating another series of stresses. Poor health status and high financial distress often go hand-in-hand (O'Neill et al., 2005b).

Financial Literacy and Education Delivered through Distance or e-learning

Pickard and Reichelt (2008) reported that family and consumer sciences teachers can facilitate the development of financial literacy; however, because of the severe shortage of conventionally prepared family and consumer sciences teachers, there is a need for more training routes to become a family and consumer sciences teacher, including distance delivery through on-line courses. Research indicated that these courses, delivered via the Internet, have resulted in comparable student achievement.

Rhine and Toussaint-Comeau (2002) conducted a study to determine adult preferences for the delivery of personal finance information. A sample of 2,553 households was surveyed in the Chicago metropolitan area to determine what method of educational delivery they would prefer to learn about personal finance topics. Consumers most likely to prefer courses delivered via the Internet were younger adults, adults with bank accounts, higher income adults, adults with higher levels of education, and employed adults. Males were more likely than females to prefer the Internet. Blacks and a category of adults called "other race" were also more likely to choose the Internet than Whites. Females tended to prefer information delivery if it was coupled with a social network, such as an informal community seminar.

Summary

Financial literacy is important to today's adult as it allows the knowledge base for making important financial decisions such as credit use, savings and investing, retire-

ment planning, insurance purchasing and use, and estate planning. The financial literacy rates of women are low and therefore place women at a disadvantage for adequate financial management and planning. Chronic illness can cause financial distress and the converse may be true that chronic financial distress can cause or at least contribute to chronic illness and lower health status. On-line financial education has been successful in many cases, although women tend to prefer educational settings that involve a social component. However, in the case of chronically ill rural women, on-line courses may be a lifeline to the educational opportunities these women need to take charge of their own health and finances.

Theoretical Model

Economic theory posits that humans who have many resources at their disposal will have higher utility or well-being than humans who have access to few resources. One of the resources important to human well-being is information. In economics, possessing high levels of information or the skill to acquire and use information is a part of human capital. Information can be used to increase productivity because increased levels of information will allow that person to have more options for problem solving. This larger information resource can therefore increase well-being.

To elaborate on this theory, Bryant and Zick (2006) proposed that a human can use time in three ways: work, leisure, or household production. The higher the human capital in work, the less time will be spent in leisure and household production. Likewise, the higher the human capital in household production, the less time will be spent in leisure and work. The more productive a person is in work and household production overall, the more time will be spent in leisure. The reason for this decision-making is that paid work and household production activities can increase the quantity of goods and services available and allow more leisure time as well. Theoretical economics assumes that humans always desire higher levels of goods and services because being able to consume at higher levels will increase utility (well-being or happiness). To summarize, having more human capital (intellect, skills, abilities, and information) to produce in the household and in paid work will produce higher utility because of the increased capacity to transform the human capital into productivity to gain more goods and services.

To apply the theory to the current research, many chronically ill women have had to either reduce their paid work or quit entirely due to the difficulties their illnesses have caused in allowing them to maintain reliable work productivity. Household production is also reduced because of low personal energy, painful movement, increased need for sleep, reduced mental alertness, depression, and other problems due to chronic illness. However, all of the chronically ill women studied did have the ability to log on to and use a computer, and they all were provided with and learned to access the Internet through the WTW Project. One household production activity that could be accomplished by nearly all the women was financial management, whereas paid work and tasks, such as cooking, cleaning, and other household production activities, were hampered to some degree by the chronic illness. The general theory of the research was that, by improving the financial education levels of the women, they could increase their household production by becoming more involved in financial management for the household. This higher household production could allow the women to create and consume more goods and services, and, thereby, increase utility for the women.

Three specific hypotheses were tested:

H1: Women who receive the on-line module with the intensive intervention, which includes the financial management lesson plan, a discussion board lead by experts, and a social support discussion group (hereafter called the intensive intervention group), will have significantly higher gains between the pretest and the posttest than the women who receive the on-line module with only the financial management lessons along with the social support discussion group (hereafter called the less intensive intervention group).

H2: Women who are in the intensive intervention group will have significantly higher gains between the pretest and the posttest than the women who are in the control group.

H3: Women who are in the less intensive intervention group will have significantly higher gains between the pretest and the posttest than the women who are in the control group.

Methodology

The WTW Project is located at a state land grant university in a western state of the U.S. and is a 12-year project to study and provide support and health information to chronically ill rural women via computer-based distance delivery technologies.

Overall Study Design

For the current study, women were self-nominated. Recruitment for subjects was accomplished through the media, informational flyers, contacts, and nominations through Extension agents located in rural counties, word of mouth, and special mailings conducted by non-profit health information organizations. Since chronically ill rural women are a small group, self-nomination was a process that worked well, reducing costs for sample recruitment. Women were recruited from Montana, Idaho, North Dakota, South Dakota, and Wyoming. An a priori power analysis indicated that at least 60 participants were needed in each of three experimental groups, so an effort was made to recruit 180 or more participants.

Due to the recruitment efforts, women were made aware of the project and all advertising included a toll-free number to contact the WTW office. An interested woman could call the office for information about the project. If the woman wanted to be included, she was asked a series of questions to determine eligibility for the study. The first requirement was that the women had to have at least one chronic condition such as diabetes, MS, or fibromyalgia. The women were required to be between 35 and 65 years old and be classified as a rural resident, meaning that the woman's residence was at least 25 miles away from a town of 12,500 or more people. If these criteria were met, the woman was informed about the participant's responsibilities. Women were not required to have a computer or be computer literate, as the project provided computers and Internet connections for all women who needed equipment and connections. Consent for participation for each woman was obtained via signed consent forms and the study was approved by the Montana State University Institutional Review Board for the Protection of Human Subjects. The final number of women recruited was 240.

After recruitment, screening, and information provision, the accepted participants were randomly assigned by an SPSS randomization program into three experimental groups of 80 women each. The three experimental groups involved an intensive treatment, a less intensive treatment and a control group. Then the SPSS randomization program was used to place each experimental group of 80 women into four cohorts with 20 women per cohort. The cohorts were kept small to encourage interaction in a chat room, described later. Each of the four cohorts completed a 22-week intervention between February 2002 and February 2005.

The experimental group with intense intervention consisted of on-line health and finance teaching units with Internet access embedded in the teaching units. Experts in each of the instruction topic areas facilitated discussion about the topics in an interactive discussion group called the Health Roundtable. A third element of the intensive intervention group was a social support group called Koffee Klatch. Both the Health Roundtable and the Koffee Klatch were asynchronous discussion forums, allowing the women to enter the discussions any time of the day or night. The platform used to provide the intensive intervention was WebCT. This intensive intervention group was on a published schedule, which strongly encouraged regular active participation in the instruction modules, the Health Roundtable, and the Koffee Klatch discussion groups. In summary, the intensive intervention group received the instruction on-line lessons, an interactive discussion group led by experts in the Health Roundtable, and a social support discussion group called Koffee Klatch.

The second experimental group in each of the four cohorts received a less intensive intervention. This group was provided the on-line teaching units but was not provided access to expert input (Health Roundtable) or to social support discussion forums (Koffee Klatch).

The third experimental group in each of the four cohorts, the control group, received no interventions and was only asked to complete the questionnaires. The control group completed the assessment instrument prior to the administration of the intensive and less intensive interventions. After the interventions were completed, the control group again completed the assessment instrument, despite having received no intervention.

As stated before, a total of 240 women were recruited for four different cohorts, with three experimental groups in each cohort. Group 1, the intensive group, started with 80 and ended with 57 usable observations. Group 2, the less intensive group, started with 80 and ended with 60 usable observations. Group 3, the control group started with 80, but we received 68 usable pre-assessment questionnaires. At the end of the study, 66 women returned the final questionnaire for Group 3. A total of 183 women completed a pre-test questionnaire and a post-test questionnaire with usable data.

The Financial Education Module

The objectives of the financial education model were to have participants (a) learn to record income and expenses, (b) determine the household's net worth with an emphasis on assets and saving vocabulary, and (c) determine eligibility for governmental assistance programs. Each of the objectives was presented in a 1-week learning time frame in the on-line lessons. The intensive intervention group had access to three, 1-week modules consisting of a one to two page instructional guide followed by an activity and a Health Roundtable discussion topic for the week.

To assess the module's effectiveness, five questions were written for the pretest and post-test assessment instrument. The assessment instrument operationalized the concept of financial literacy. The assessment instrument, consisting of the five questions, was given to the three groups. The intensive intervention group and the less intensive intervention group received the pretest, participated in the financial lessons, and then completed the post-test assessment. The control group did not receive the lessons but completed the pretest and the posttest. The questions used in the pretest and post-test assessment can be found in the Appendix. These questions were patterned after exam questions in a popular personal finance textbook (Garman & Forgue, 2008) and were reviewed by the research team, as well as personal finance professors at Montana State University, to provide an assessment of face validity.

Control Variables

No literature existed that examined financial literacy in chronically ill women. Therefore, selecting control variables to specify in the model was done in an exploratory attempt to define potential variables that could explain the outcome measures: the differences in test scores between time one and time two. The first control variable selected was age; it was anticipated that older women might have less financial knowledge than younger women. Involvement in finances has often been a male duty in households with more traditional roles, which would be the households of older women. The year of the onset of illness was also considered to be important, as a new illness might be more consuming of a person's time, meaning the person would be less involved in household affairs. The difficulty in daily living tasks faced by the chronically ill person was also included, as more difficulty could indicate less involvement in household affairs, including managing finances. Race was included to proxy for cultural differences in handling finances. Marital status could impact results because a single woman would possibly be more involved in managing finances than a married woman. Educational level was included as more highly educated women would be more likely to be involved in household financial management and would be able to understand more easily the complexities of finances. Higher income women were thought to be more attentive to financial information and management than lower income women because of the increased level of complexity of household finances and the increased number of choices present in managing finances. The number of children in the household was included, as more children often indicate a more traditional role division of parents, with women engaging more in child care, food preparation, and other chores rather than finances. Employment status was a final control variable, with the expectation that employed women would be more aware of and engaged in managing money that they earned than non-employed women.

Results

This study examined a very unique sample of chronically ill rural women who have participated in a series of on-line learning modules on health and well-being (experimental group). The study included two experimental groups, differentiated by the level of intensity of training, and one control group. This results section describes the sample and discusses statistically significant differences in the pre-test and post-test results.

Demographic analysis of the study participants showed 60% of the study participants were older than 50 years of age, nearly 56% of the women were diagnosed with their illness 10 years ago or less, and over 60% had a difficulty score of 10 or more (meaning they had moderate to severe chronic illness). The majority (92%) of the sample was white, 79% were married, and nearly 75% had some college or more. Almost 50% had incomes of less than $35,000. Almost three fourths (70%) had no children in the household, and less than 38% worked outside the home.

The demographic characteristics of each of the three experimental groups were tested to determine if significant differences between the three groups were found. The only statistical differences were found with the less intensive group. The less intensive group was not as likely to complete "some college" than the intensive group or the control group. However, the less intensive group was more likely to have completed a college degree or more. These statistical differences were found at the .05 level (see Table 1).

Table 1. Characteristics of the Sample (*N* = 183)

		All		Intense		Less intense		Control	
Variable	**Group**	***N***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Age	50 or younger	92	40.4	26	32.5	36	45.0	30	44.1
	more than 50	136	59.7	54	67.5	44	55.0	38	55.9
Years since illness	10 years or less	127	55.7	37	46.3	53	66.3	37	54.4
diagnosed	11 to 20	63	27.6	26	32.5	19	23.8	18	26.5
	More than 20	38	16.7	17	21.3	8	10.0	13	19.1
Difficulty score	10 or less	90	39.5	29	36.3	34	42.5	27	39.7
	10 to 20	118	51.8	40	50.0	41	51.3	37	54.4
	More than 20	20	8.8	11	13.8	5	6.3	4	5.9
Ethnicity	Other	18	7.9	6	7.5	4	5.0	8	11.8
	White	210	92.1	74	92.5	76	95.0	60	88.2
Marital status	Not married	48	21.1	14	17.5	17	21.3	17	25.0
	Married	180	79.0	66	82.5	63	78.8	51	75.0
Years of education	High school or less	55	24.1	18	22.5	20	25.0	17	25.0
	Some college	94	41.2	33	41.3	27	33.8*	34	50.0
	College degree or	79	34.7	29	36.3	33	41.3*	17	25.0
Income	Less than $15,000	42	18.4	16	20.0	11	13.8	14	20.6
	$15,000 - $24,999	36	15.8	11	13.8	12	15.0	13	19.1
	$25,000 - $34,999	37	16.2	11	13.8	16	20.0	10	14.7
	$35,000 - $44,999	31	13.6	14	17.5	11	13.8	7	10.3
	$45,000 - $54,999	32	14.0	9	11.3	11	13.8	12	17.6
	$55,000 - $64,999	24	10.5	9	11.3	8	10.0	7	10.3
	$65,000 and greater	26	11.4	10	12.5	11	13.8	5	7.4
Children in household	None	160	70.2	57	71.3	52	65.0	51	75.0
	1 or more	68	29.8	23	28.8	28	35.0	17	25.0
Work outside the home	No	143	62.7	56	70.0	46	57.5	41	60.3
	Yes	85	37.3	24	30.0	34	42.5	27	39.7
Number of observations		228		80		80		68	

*$p < .05$.

Results showed that 228 women took the pretest and 183 took both the pretest and posttest, which is an attrition of 45 women. A comparison of means using a *t*-test was conducted to see if the demographic characteristics of women who took the pretest were significantly different than the 183 who completed both the pretest and the posttest. No significant differences were found between the two groups, indicating that the attrition rate was not systematic or due to a particular characteristic (see Table 2). In a separate study, Weinert, Cudney, and Hill (2006) examined the attrition of participants in the WTW projects and found three primary reasons that women dropped out of the study:

Table 2. Characteristics of Participants Completing Only the Pretest and Completing Both the Pretest and Posttest

		Participants who completed only the pretest		Participants who completed both the pretest and posttest	
Variable	**Group**	***n***	**%**	***n***	**%**
Age	50 or younger	92	40.4	75	41.0
	More than 50	136	59.7	108	59.0
Years since illness	10 years or less	127	55.7	102	55.7
diagnosed	11 to 20	63	27.6	50	27.3
	More than 20	38	16.7	31	16.9
Difficulty score	10 or less	90	39.5	75	41.0
	10 to 20	118	51.8	95	51.9
	More than 20	20	8.8	13	7.1
Ethnicity	Other	18	7.9	11	6.0
	White	210	92.1	172	94.0
Marital status	Not married	48	21.1	31	16.9
	Married	180	79.0	152	83.1
Years of education	High school or less	55	24.1	45	24.6
	Some college	94	41.2	75	41.0
	College degree or more	79	34.7	63	34.4
Income	Less than $15,000	42	18.4	28	15.3
	$15,000 - $24,999	36	15.8	30	16.4
	$25,000 - $34,999	37	16.2	32	17.5
	$35,000 - $44,999	31	13.6	26	14.2
	$45,000 - $54,999	32	14.0	29	15.8
	$55,000 - $64,999	24	10.5	17	9.3
	$65,000 and greater	26	11.4	21	11.5
Children in household	None	160	70.2	132	17.5
	1 or more	68	29.8	51	27.9
Work outside the home	No	143	62.7	114	62.3
	Yes	85	37.3	69	37.7
Number of observations		228		183	

*$p < .05$.

(a) lack of time, (b) health status declined to the point that they could no longer use the computer or keep up with the demands of the project, and (c) decided they did not want to participate in the study activities.

The intensive and less intensive experimental groups made progress in the wealth, savings, and management questions. The average score across all questions increased from 68% on the pretest to 86% on the posttest for the most intensive group and 73% to 86% for the less intensive group (see Table 3). In the wealth question, scores increased from 69% to 90% for the intensive group and from 85% to 95% for the less intensive group. In the savings question, scores increased from 28% to 63% for the intensive group and 29% to 60% for the less intensive group. In the management question, scores increased from 63% to 84% for the intensive group and from 65% to 78% for the less intensive group. The most significant changes occurred in the savings question, where the average pre-test score was very low (only 28%) and the percentage change was over two-fold. When matching all pre-test and post-test scores, over 35% of the intense and less intense experimental group participants showed significant progress from the pretest to posttest. The control group showed no progress.

Results of Hypothesis Testing

As stated earlier in the paper, the results of the hypothesis testing are shown in Table 4. To explain further, Table 4 examines the means of the differences between the pretest and the posttest for each group. A Tukey test was performed to determine if the mean differences were significantly different. The mean differences are shown for each question individually, and then for the summation of the scores on the questions. H1 stated that the intensive intervention group will be significantly different than the less intensive group. The hypothesis testing showed that there were no significant differences between the intensive and the less intensive groups; therefore, the hypothesis was not supported. H2 stated that the intensive intervention group will have a significantly higher gain between the pretest and the posttest than the control group. Table 4 shows that this hypothesis was supported. H3 posited that the less intensive group will have a significantly higher gain between the pretest and the posttest than the control group. Table 4 shows that this hypothesis was supported.

When examining the questions individually, the dissaving question was the only significant individual question between the intensive group and the control group, and the less intensive group and the control group. In both cases, when examining the mean differences, the number of correct answers increased by over 34% for both groups compared to the control group.

Multivariate Results

A second analysis was performed using linear regression to determine if these results were robust or if other variables might be more important in explaining differences than the intervention of the educational programming. The other variables considered were age, degree of illness, the difficulty the participant had in performing tasks of daily living, race, marital status, educational achievement, income, number of children in the household, and employ-

Table 3. Percentage of Correct Answers by Group Using All Observations

	All		Intense		Less intense		Control	
Variable	**Time 1**	**Time 2**	**Time 1**	**Time 2**	**Time 1**	**Time 2**	**Time 1**	**Time 2**
Income	93.0	95.1	93.8	96.5	95.0	100.0	89.7	89.4
Wealth	78.5	89.6	68.8	89.5	85.0	95.0	82.4	84.8
Savings	28.1	48.6	27.5	63.2	28.8	60.0	27.9	25.8
Management	60.1	70.5	62.5	84.2	65.0	78.3	51.5	51.5
Asset	89.9	94.5	87.5	96.5	91.3	96.7	91.2	90.9
Average score	69.9	79.6	68.0	86.0	73.0	86.0	68.5	68.5
Number of observations	228	183	80	57	80	60	68	66

Table 4. Mean Difference Between the Pre-test and Post-test Scores for Each Group

Group comparison	Income	Wealth	Savings	Manage	Asset	Total
Intensive and control	0.018	0.18	0.364*	0.195	0.105	0.862*
Less intensive and control	0.05	0.05	0.347*	0.102	0.033	0.585*
Intensive and less intensive	-0.032	0.127	0.017	0.094	0.072	0.277

*$p < .05$.

Table 5. Regression Summary of Differences Among Intensive, Less Intensive, and Control Groups

Group comparison	*n*	Income	Wealth	Savings	Manage	Asset	Total
Intensive and control	123	0.172	0.191*	0.358**	0.159	0.077	0.325**
Less intensive and control	126	0.093	0.064	0.333**	0.085	0.014	0.270**
Intensive and less intensive	117	-0.025	0.154	0.017	0.076	0.076	0.049

Note. The linear regressions control for age, illness, difficulty, race, marital status, education, income, children in household and employment status.
p *< .05. *p* ** < .01.

ment status. These variables were added to the regression analysis as control variables. Results indicated that these variables did not explain the differences in mean scores; therefore, the educational programming intervention was the critical variable in explaining the resulting differences in mean scores. The results proved to be robust when using other model specifications.

Discussion

The purpose of the current research was to determine if distance education in personal and family finance could be effective with three groups of rural women who were randomly assigned to an intensive intervention, a less intensive intervention, or a control group. The three groups began with statistically similar pre-test scores. The two intervention groups had significantly higher post-test scores than the control group; however, the two intervention groups were not significantly different in the post-test scores.

The difference in the interventions between the intensive and less intensive group was the presence of a discussion board of experts, who were available to answer questions and to participate in general discussions. The less intensive intervention group did not have the experts available to participate in a discussion board. The expert discussion board did not appear to matter, which is good news for any eventual use of this educational delivery system. The expert discussion board is a more expensive, time consuming element to include in the programming, and it turns out that it does not have a relationship to learning outcomes.

The two intervention groups did score significantly higher than the control group in the post-test score. This finding indicates that on-line delivery of personal and family finance educational programming is effective and can result in gains in learning.

Distance education for these women was a practical method of educational delivery. They are rural women and the distances to services, such as community colleges or universities, were great, sometimes 400 miles or more. The women initially needed intensive training and help in setting up their systems, but they quickly became very skilled at using the computer to access the project modules. The modules contained fairly simple information about finances because no background information about

the women was available to guide the construction of a more sophisticated set of lessons. Judging from the pre-test scores, a slightly more advanced set of materials could have been covered in the lessons. Even so, progress with basic financial literacy information was made.

While this research report does not cover the entire WTW Project, a final comment for discussion, which is pertinent to this project, is that the embedded social network part of the project was a great help to the educational aspect. The women discussed the material within the discussion room during the financial module. They also could discuss finances in general or any other topic of interest in the general chat room associated with the project. Financial topics came up frequently, mostly as a source of worry, since many of the medical interventions these women need are expensive and not covered 100% by insurance. While it may have seemed a stretch to include finances in a well-being module used in the WTW Project overall, it was clear that the women thought finances were important to every aspect of their well-being and they participated fully in the module.

Uses for the Findings of the Research

Finances change throughout the lifecycle even for individuals and families who are not faced with health or financial challenges. In early adulthood, establishing a household, becoming married, establishing a career, and paying for any debt incurred for education are major financial challenges. In later adulthood, attention must be paid to accruing resources in tax-deferred and tax-preferred accounts for education for children and for retirement, along with further saving and investing for retirement. In retirement, making the nest egg last through the remainder of life is a big challenge. From the teen years through the end of life, the need for financial education to meet the challenges of the lifecycle, to say nothing of the challenges presented by the economy or careers, is very real. If more challenges than the typical lifecycle challenges are present, such as chronic illness, the need for education is even greater. Educators often talk about "just-in-time education" or the "moment of readiness." What this means is that individuals may not pay attention to information until it is needed.

The research presented in this article shows that distance education may be a way to deliver that "just-in-time" education to willing adult learners, especially those challenged by health concerns. Adding a social component to the educational process, such as this study modeled through the Koffee Klatch social networking function, certainly was a positive contribution to the entire educational experience for the participants, as indicated by their dedicated and extensive involvement with each other. What may have made this group of participants somewhat different than a group of average adult learners was their strong desire to interact with someone else who had problems with chronic illness. These study subjects expressed their feelings of being alone, of being in a social environment in their homes and communities where no one understood what they were going through, and their feelings of guilt concerning how much time and money they consumed due to their illnesses, which were then unavailable to other family members. Many women also expressed a knowledge void about finances, particularly, because few of them were the family money managers. Therefore, they did not really know the full impact of their illnesses on the family coffers. They seemed to have an idea that their illnesses were expensive without being able to see the full financial picture. The women were at a "moment of readiness" to learn how to make their lives better and how to take control of their health, including financial health.

Many groups, such as the American Heart Association and the American Diabetes Association, could use an educational outreach approach such as the one reported here to extend a helping hand to populations with chronic health conditions. The combination of educational materials along with the social support could be delivered in a cost-effective way to geographically dispersed clients. Every illness has an associated financial impact, so financial information and financial management strategies should be included as part of the educational information delivered.

Finally, this project has shown that finances are a foundation for overall well-being, and certainly in the context of dealing with chronic illness. The women studied had a modest level of financial literacy, at least as measured by the simple set of questions used here. However, the worry they expressed over finances was a concern to the researchers, as money was clearly a stressor. The need for higher levels of knowledge about money and money management in the population has been well-established; however, no systematic program exists for incorporating knowledge about insurance needs or use, submitting medical claims, tracking medical claims, accessing public resources that can be helpful for dealing with the financial consequences of chronic illness, budgeting, using a net worth statement to track financial well-being, and so forth for people who deal with chronic illness. The degree to which patients can follow through with medical

care, medicines, physical therapy, diet, and other helpful therapies and programs is certainly dictated by financial resources. Patients need information about finances just as they need information about dealing with chronic illness from the medical perspective.

Limitations and the Need for Further Research

This research was conducted with chronically ill rural women, which is a relatively rare group to study. One limitation was that the number of women who could be identified and then recruited for the study is small compared to other populations. This project could be expanded to rural and urban women, as much of the material presented in the educational modules is useful to populations beyond the chronically ill rural women studied. A second limitation was that the basic knowledge of the women with regard to finances was not able to be determined before the study began. With the knowledge gained, a more advanced set of materials would be appropriate with accompanying assessment questions at a higher level. Even so, the level of financial knowledge gained from the programming was substantial. A third limitation was the size of the experimental groups was small. Statistical tests with small numbers in each variable response category may not find significant results that larger numbers may produce. A study with more subjects in each experimental group would be useful to test for significance that the current study may not have detected.

More research is needed to determine how to keep populations engaged in an educational program and what aspects of the programming are important. This research shows that, while the intensive intervention group did have experts contributing to the Health Roundtable discussion board, results did not find the expert input in a discussion board to be valuable in increasing scores on the assessment posttest. However, if the level of difficulty of the financial information was increased, the expert presence on the discussion board may be valuable to the educational process. The on-line lessons appear to be successful in producing learning gains. As distance delivery becomes more widespread and appropriate to many audiences, including adults of every possible background, more research such as this will be helpful in making the programming successful for the various audiences.

References

*References marked with an asterisk indicate studies included in a meta-analysis.

Anthes, W. L., & Most, B. W. (2000). Frozen in the headlights: The dynamics of women and money. *Journal of Financial Planning, 13*(9), 130-142.

Bagwell, D. C., & Kim, J. (2003). Financial stress, health status, and absenteeism in credit counseling clients. *Journal of Consumer Education, 21,* 50-58.

*Bernheim, B. D., Garrett, D. M., & Maki, D. M. (2001). Education and saving: The long-term effects of high school financial curriculum mandates. *Journal of Public Economics, 80*, 435-465.

Bryant, W. K., & Zick, C. D. (2006). *The economic organization of the household*. New York: Cambridge University Press.

Bureau of Primary Health Care National Health Care Collaborative. (2005). Collaborative charter. Retrieved from http://www.healthdisparities.net/hdc/hdcsearch/isysquery/3eeb2bb4-deed-444c-8817-d37eac971d25/5/doc/

DeJudicibus, M. A., & McCabe, M. P. (2005). Economic deprivation and its effects on subjective wellbeing in families of people with multiple sclerosis. *Journal of Mental Health, 14*(1), 49-59.

Drentea, P., & Lavrakas, P. J. (2000). Over the limit: The association among health status, race, and debt. *Social Science & Medicine, 50,* 517-529.

Garman, E. T., & Forgue, R. (2008). Personal finance, 8th edition. Boston: Houghton Mifflin Company.

Hira, T. K., & Mugenda, O. (2000). Gender differences in financial perceptions, behaviors and satisfaction. *Journal of Financial Planning, 13*(2), 86-92.

Hogarth, J. M. (2006). Financial education and economic development. Paper presented at the International Conference hosted by the Russian G8 Presidency in Cooperation with the OECD, November 29, 2006.

Iezzoni, L. I., & Ngo, L. (2006). Health, disability, and life insurance experiences of working-age persons with multiple sclerosis. *Multiple Sclerosis, 13*(4), 534-546.

Into, F. H. (2003). Older women and financial management: Strategies for maintaining independence. *Educational Gerontology, 29,* 825-839.

*Jump$tart Coalition. (2006). Financial literacy: Improving education. Retrieved from http://www.jumpstartcoalition.com/upload/2006%20Executive%20Summary%20Draft%20Final.doc

Jump$tart Coalition. (2008). Jump$tart Coalition survey of personal financial literacy among students. Retrieved from http://www.jumpstart.org/survey.html

Kim, J., & Garman, E. T. (2003). Financial stress and absenteeism: An empirically derived model. *Financial Counseling and Planning, 14*(2), 31-42.

Kim, J., Garman, E. T., & Sorhaindo, B. (2003). Relationships among credit counseling clients' financial well-being, financial behaviors, financial stressor events, and health. *Financial Counseling and Planning, 14*(23), 75-87.

Lusardi, A. (2008). Financial literacy: An essential tool for informed consumer choice? National Bureau of Economic Research, Inc. NBER Working Papers 14084. Retrieved from http://www.nber.org/papers/w14084.pdf

Lusardi, A. (2006). Financial literacy and financial education: Review and policy implications. NFI Policy Brief No. 2006-PB-11. Retrieved from http://ssrn.com/abstract=923437

Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: How do women fare? *American Economic Review: Papers & Proceedings, 98*(2), 413-417.

Marcolin, S., & Abraham, A. (2006). Financial literacy research: Current literature and future opportunities. Paper presented at the Third International Conference on Contemporary Business, September 21-22, 2006 in Leura, NSW, Australia. Retrieved from http://ro.uow.edu.au/commpapers/223

O'Neill, B., Sorhaindo, B., Xiao, J. J., & Garman, E. T. (2005a). Financially distressed consumers: Their financial practices, financial well-being, and health. *Financial Counseling and Planning, 16*(1), 73-87.

O'Neill, B., Sorhaindo, B., Xiao, J. J., & Garman, E. T. (2005b). Health, financial well-being, and financial practices of financially distressed consumers. *Consumer Interests Annual, 51,* 80-82.

O'Neill, B., Sorhaindo, B., Xiao, J. J., & Garman, E. T. (2005c). Negative health effects of financial stress. *Consumer Interests Annual, 51,* 260-262.

Ormond, B. A., Zuckerman, S., & Lhila, A. (2000). Rural/urban differences in health care are not uniform across states. Number B-11 in a series, "New Federalism: National Survey of America's Families." Retrieved from http://www.urban.org/url.cfm?ID=309533

Pendo, E. (2009). Working sick: Lessons of chronic illness for health care reform. *Yale Journal of Health Policy, Law, and Ethics, 9,* 453. Retrieved from http://ssrn.com/abstract=1435545

Pickard, M. J., & Reichelt, S. A. (2008). Consumer economics and family resources: Internet delivery of consumer economics and family resource management courses. *Journal of Family and Consumer Sciences Education, 26* (National Teacher Standards 2), 1-13.

Rhine, S. L. W., & Toussaint-Comeau, M. (2002). Adult preferences for the delivery of personal finance information. *Journal of Financial Counseling and Planning*, *13*(2), 11-25. Retrieved from https://www1067.ssldomain.com/afcpe/doc/Vol1322.pdf

Weinert, C., Cudney, S., & Hill, W. (2008). Retention in a computer-based outreach intervention for chronically ill rural women. *Applied Nursing Journal, 21*(1), 23-29. Retrieved from http://www.sciencedirect.com.proxybz.lib.montana.edu/science?_ob=ArticleURL&_udi=B6WB4-4RP4KPD-5&_user=1497480&_coverDate=02%2F29%2F2008&_rdoc=1&_fmt=high&_orig=search&_origin=search&_sort=d&_docanchor=&view=c&_acct=C000053128&_version=1&_urlVersion=0&_userid=1497480&md5=ef2d389eab9357057d269a8ff17e9b46&searchtype=a

Wilper, A. P., Woolhandler, S., Lasser, K. E., McCormick, D., Bor, D. H., & Himmelstein, D. U. (2008). A national study of chronic disease prevalence and access to care in uninsured U.S. adults. *Annals of Internal Medicine, 149*(3), 170-176. Retrieved from http://web.ebscohost.com/ehost/results?vid=7&hid=109&sid=51b3ecbe-aea5-4b85-bd02-dc388ee6b649%40sessionmgr113&bquery=(%22chronic+illness%22)+and+(insurance)&bdata=JmRiPWM4aCZsb2dpbi5hc3AmdHlwZT0xJnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#11

Appendix. Questions Used in the Pretest and Posttest

1. An income and expense statement (INCOME)
   A. Is a tool for finding out how much wealth you have.
   B. Is a tool for planning how much to spend next year.
   C. Is a tool for discovering how much money has been earned and spent over a time period.
   D. Is a method of discouraging spending on frivolous items.

2. A net worth statement (WEALTH)
   A. Helps a family know how many assets and how much debt they have.
   B. Helps a family budget for the next year.
   C. Is a tool for discovering how much money has been earned and spent over a time period.
   D. Is a form required by the federal government when paying income taxes.

3. Which of the following is NOT true with regard to healthy financial management? (MANAGEMENT)
   A. Families should strive for having their income exceed their expenses.
   B. Families should work toward having more assets than debts.
   C. No government programs are available to help middle income families who are dealing with chronic illness.
   D. Two "thermometers" of financial health are the net worth statement and the income and expense statement.

4. Dissaving is (SAVING)
   A. The tendency of people to save less as they get older.
   B. Putting money into stocks and bonds rather than savings accounts.
   C. Using credit or savings to pay for current expenses.
   D. Any debt that you owe.

5. An asset is (ASSET)
   A. Any bill or debt that a family owes.
   B. Any expense that a family had over the past year.
   C. Anything a family owns that could be sold for money.
   D. Any source of income, such as a salary.