UNDERSTANDING AN OLDER WOMAN'S RESPONSES TO PATIENT EDUCATION AIMED AT REDUCING OSTEOPOROTIC FRACTURES

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ABSTRACT

As women live longer, a concomitant increased risk of fracture due to osteoporosis can be predicted. Through patient education, older women can be taught to increase their calcium thereby reducing their odds of fracture. An interpretivist approach was used to document the experiences of older women having undergone both DEXA and patient education. Random selections of participants were interviewed a week later. The Health Belief Model was used a priori in structuring questions to discover possible health behavioral changes. The results, although richly descriptive, point to a larger study in order to investigate the elements mentioned by the participants.

INTRODUCTION

This study is an interpretivist approach to discovering the issues surrounding older women who are battling the propensity for developing osteoporosis with advancing age. The research question posed deals with whether an older woman provided with specific educational information could undergo a health behavior change that would lower her risk for osteoporotic fractures? In order to better understand the issues and realities for elderly women who are at risk for this medical difficulty, it is appropriate to attempt to understand the realities that impact an older woman who is involved in this situation. To develop this type of rich description, a qualitative prepilot study was devised. The intent of this pilot was to discover whether patient education was useful to older women suffering with the possible diagnosis of osteoporosis.

Osteoporosis is a clinical condition, which is denoted by a decreased bone mass, affecting the bone's architecture and can lead to an increased risk for fracture (Ott, 1999). Primary osteoporosis has been subdivided into idiopathic osteoporosis and involutional osteoporosis and this secondary classification is the one that is more prevalent with aging (Ott, 1999). The involutional form of osteoporosis, even though it is identified with older adults, is especially prevalent in older women. As adults mature, it appears that skeletal growth is completed around the age of 30 years. After stability in bone content, the aging process begins to cause a slow decline in bone content. Women are especially vulnerable to lose up to 35% of their cortical bone and 50% of their trabecular bone in their

lifetime (Edwards and Perry, 1994). The rate of bony mass decline is believed to begin in the perimenopausal period and continue with a curvilinear decrease of 2.4% per year (Edwards and Perry, 1994). In 2002, it is estimated that over 10 million people already have osteoporosis. Approximately eighty percent of these people are women. This figure will rise to almost 12 million individuals by 2010 and to approximately 14 million by 2020 if additional efforts are not made to stem this disease. (NOF, 2002). One of the causes for American women to be so at risk for this loss of bone mass could be some of their early nutritional habits. Calcium is considered an important part of the human diet and proper intake has been studied extensively in the United States. The Hanes I and II studies found that American men consume 1.2 to 2.0 times more calcium than American women and the lowest intakes were seen in the underprivileged (Edwards and Perry, 1994). In order to affect a change in older women's propensity for postmenopausal osteoporosis an educational intervention could be developed that might assisted them in understanding the nutritional value of calcium in their diet. Additional factors that are influential in the quality of bone density are stature and body habitus (Edwards and Perry, 1994). It is for these reasons that bone densitometry examinations have been advocated for at risk older women. Dual energy x-ray absorptiometry (DEXA) is a screening x-ray procedure that assesses the skeleton's ability to absorb low dose radiation. Through this process of x-ray absorption, it is possible to make a comparison between measured bone mass and the optimal peak adult bone mass. This value, which is called a T score, helps to identify women at risk for osteoporotic fractures and can be very important in

helping to reduce their chances of fracture and associated medical problems (Cadarette, Jaglal, and Murray, 2001). Osteoporosis has been linked to more than 1.5 million fractures a year in the United States yielding an estimated $13.8 billion in direct care cost to hospitals and nursing homes due mainly from women suffering from this disease (Raush, 2000). It would appear that with the seriousness of these statistics and the chance to diagnosis osteoporosis with DEXA, this might be a benefit to the health of older women. Promoting health education might be an approach that could provide future benefits by increasing older women's calcium intake and thereby stabilizing the demineralization process. In a recent publication, it has been advocated that patient education materials should be available to patients in the waiting rooms of centers that provide x-ray absorptiometry. They also advocate using patient questionnaires to obtain better patient information (Lenchik, Rochmis, and Sartoris, 1998). This presents a chance to not only provide health education materials but also obtain follow up information on the utility of the information for older women.

MATERIALS AND METHODS

A qualitative inquiry into health education benefits for older women facing osteoporosis was attempted by designing a packet of reading materials for each older woman who attended a DEXA appointment. The educational materials that were provided were a two page informational sheet on the facts about osteoporosis, a handout about calcium supplements, a handout rating the number of calories in popular brands of yogurt, and a test on facts about nutritional sources of calcium. For those women who were on the patient schedule for

DEXA, that were at least 60 years of age, the receptionist flipped a coin to randomly assign older women to the post health education interviews. On two different DEXA examination days, this process yielded 8 women who were given educational packets and who granted permission for a follow up phone call in one week. Of those randomly chosen, interviews were successfully conducted on 6 women who ranged in age from 60-70. The interviews were done using the Health-Belief Model (HBM) as a guide for composing questions and the kind of information might be asked in the interviews. The HBM is based on three variables which are: belief in a vulnerability to illness and estimations of the degree of the threat; motives to reduce the threat with related goals of good health; and the belief that compliance with recommended behaviors will reduce the threat and lead to good health (Ross and Mico, 1980). The DEXA study provided an estimation of the degree of threat, the educational packet was given to all patients in order to provide motives to reduce the threat through nutritional advise, and the random selection of patients for follow up interviews was done to gauge compliance with recommended behaviors. The HBM model serves as an a priori theory of guidance for the construction of this research.

Validity of research

The validity of this project was enhanced by a number of qualitative techniques advocated by Guba and Lincoln (1985) and referred to as techniques for establishing trustworthiness.

In the area of credibility, the first technique to establish research validity was prolonged engagement. The researcher is a Radiologic Technologist who has

been conducting DEXA studies on older women for more than two years. The researcher also is a PhD student studying in the area of research and gerontology. The second technique utilized for this study was triangulation of data. Triangulation for this study was a technique accomplished through comparing the data collected during the interview phase to the patient's medical chart. As part of the DEXA intake appointment, the nurse practitioner asked each patient to fill out a pre DEXA questionnaire. The questionnaire contains several important questions that were later used to check the interview data for accuracy. The intake questionnaire asked for information in the following categories: Personal health habits/dietary habits, medical history, and a female section reserved for gynecological information. An additional credibility technique was that a negative case was encountered during the interview process is included as a source of disconfirming evidence. Referential adequacy lends credibility by having all the interview data and transcripts available upon request. Lastly, a member check was done in order to lend credibility by recalling one of the participants to insure that the researcher's interpretation of the data was reasonable by providing this participant with her own transcript.

The next area used as criteria for validity was transferability and that was accomplished by providing thick description of participant responses and that is coupled with excerpts from a reflexive journal that was kept during the data collection phase. Some evidence of catalytic validity is demonstrated as respondents examine their own thinking through the interview process thereby entertaining a change in their lifestyles (Lather, 1986). The data is provided and

is situated through the lens of the HBM but as the data was analyzed, it became apparent, as the transcripts were coded, that an additional theory emerged. Lawton's theory of press-competence for aging and the environment was noted an additional theory that could be used to assist in better understanding the older women's responses. The press-competence theory posits that behavior of older adults can be explained as a function of the competence of the individual and the environmental press of the situation (Lawton, 1982). Using Lawton's theory as a perspective for this data, these older women seem to validate that as the environmental press of their health and living conditions increases, they are forced to think competently about changes in diet, exercise, and household accommodations. This theory triangulation helped to add extra layers of interest to this research project as the researcher was involved in the collection of the data, coding, analysis, and journaling.

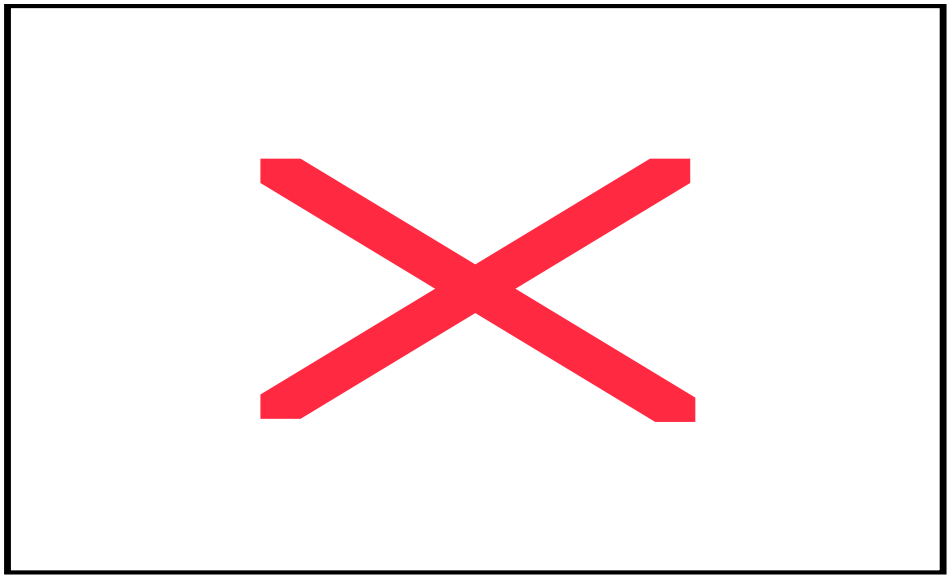
RESULTS

Considering the results for this research study, the Health Belief Model's first parameter was to identify the degree of threat to the patient's potential for good health. From these interviews, six participants were included in this study. The results of their DEXA examination and age are listed in Table A.

TABLE A.

PARTICIPANTS	Ms. M	Ms. H	Ms. C	Ms. L	Ms. J	Ms. W.
AGE	70 years	66 years	64 years	65 years	60 years	77 years
LUMBAR DEXA	T=-0.1	T=-0.13	T=-1.3	T=-1.8	T=-0.8	T=-2.2
HIP DEXA	T=-1.2	T=-0.9	T=+1.0	T=-1.8	T=-1.1	T=-2.0

When reviewing the DEXA results, the patient's diagnosis for bone density is based on osteopenia being defined as a T score between –1 and –2.5 below the mean. This definition is significant because it buts the patient in a risk category that demonstrates a trend toward osteoporosis. In 3 of the 6 lumbar spine cases, osteopenia was the diagnosis. Additional, in 4 of the 6 hip cases, osteopenia was also the diagnosis due to DEXA scores below –1.0 (See scatter plot below).



It is important to make an intervention with these women before a fracture occurs (WHO, 1994). The threat to all but one older woman in this group was the onset of an early stage of osteoporosis without the associated fracture. It also would appear that these women are under environmental press with the threat of a progressive skeletal disease process.

Again using the Health Belief Model, the next category of interest was motives to reduce the threat through good health practices. Open interview questions were used to stimulate dialogue and generate rich responses. The first

inquiry made to each participant was to gauge the type of items and concepts that were interesting in the educational materials given to the participants.

Ms. H gave this insight, " I plan to live to be 90 or 100 years old. So in order for me to do that, I try to have an appetite for learning and these handouts helped to know what adjustments I need to make. I try to read a lot and some of this stuff was things that I already knew in my head." Ms. J also contributed to this line of questioning with these comments, " I read up on yogurt in them handouts. I was surprised in the differences in the types of yogurts and the fat. I am wondering about other stuff I eat like whip cream and cottage cheese."

The second question attempted to probe the motives for reducing their threats to good health. The interest was to ask participants about any changes they had contemplated after reading the educational materials.

Ms. C was quick to tell about her exercise regiment, "I live in the village and you know how close I am….so I try to walk to get most my exercise. I walk up to Vernon Street to the Post Office for my exercise. I sometimes have to have people carry me up there in cold weather 'cause I don't want to fall on the ice." This was noted to be true as Ms. C did mark her intake form that she uses walking as her main exercise.

Ms. H offered this insight, " I will be practicing most of this stuff that I read 'cause I want to be independent. I want to go when I want to go. I don't want to wait for anybody else to do for me." This was indicative of Ms. H's intake questionnaire when she wrote that she exercised 30 minutes, 3 times weekly by walking.

Ms. L is trying to become more competent with her diet after reading the educational literature as is evidenced by these comments, “I didn’t like to drink milk when I was younger but now I do. I was drinking the whole milk but after reading the handouts, I think I need to change to 2%. I guess I need to think about ice cream too.”

These comments seemed to indicate some catalyst for future change and are backed up by her intake form that indicated that she has not been taking in 3 servings of milk/day during her life.

Ms. W has decided to begin a new exercise class, “I have just begun taking classes in Ti Chi and that is really going to give me some extra chances for exercise. I also walk the dog for exercise but lately, I haven’t been able to do that much.”

Ms. W.’s intake questionnaire also provide evidence that she was reporting accurate information as she gave anecdotal information about contemplating an exercise class.

The final category of the HBM theory is the idea of compliance with change results in good health. This was also evidenced in the interviews of the older women when they were asked what changes in their lifestyle might assist them in promote healthier bones.

Ms. L reported about her ongoing troubles with bathing, “ I get down in the tub to bath but my daughter has to help me get out. I told my daughter that I really need one of them grab bars to make it safer for me. I have a walker and a

cane in my house but the grab bar in the tub would be better. I haven't slipped yet and I don't want to either!"

It appears that Ms. L is trying to reduce her environmental press by thinking of competent ways to protect her from the risk of fractures. Ms. W. also has given her bathing situation consideration and is evidenced by her report on housing modifications.

Ms. W. expressed her concerns about bathing in reference to the lifestyle question by saying," I also guess that I am going to have put those handles in my bathtub. This spring, I am going to have a contractor take the tile off the walls of my bathroom and then I will have a place to put up those handles."
(Personal journal entry)

"I want to project my personality in order for the interviewee to make the connection as to my identity. Since I had been the one that has given the participants the educational material about calcium and methods to strengthen their chances of resisting osteoporosis, in many cases, I felt the need to make conversations to allow them to feel comfortable with answering my questions.

Ms. C also has concerns about reducing her environmental press with some household changes, "A friend gave me a stool that I could use to help me take a shower. I hope that will keep me from haven' so much trouble in the shower. I also think that I need to be doin' somethin' about those throw rugs 'cause they aren't tacked down in my living room."
(Personal journal entry)

"Ms. C. is one of my respondents and when we talked about the questions of changes in lifestyle, she offered several insights…This was a great outgrowth of the call that she would reflect on the questions and come up with some additional strategies to make her home safer. This is one example of catalytic validity that I am pleased to report as part of my mini study."

Again the hope is that both through the interview and the educational materials, that Ms. C. is competently working to make her environment safer and ultimately reduce her risk of fracture due to weakness in her bony architecture.
(Personal journal entry)

"One of my calls was to Ms. C., who went into great detail about her trials in getting an apartment for her and her husband. They had been on a waiting list for a handicap accommodated apartment and now the possibility for Ms. C., to be diagnosed with osteoporosis gave her a real sense of urgency."

Ms. J has decided due to the readings and the DEXA appointment to make some additional changes in her lifestyle, "I have decided to use an exercise bike for a month. I think that I will try to set it up so that I can watch TV while I ride it. My doctor had asked me to get a bike and so now I've decided it is time to give it a try. I think doing it in front of TV will make the time go faster. Hey, you look up and you forget that you have been riddin'." This is definitely a change in behavior because the intake form indicated limited exercise other than walking 1 hr/day 7 days a week.

The last question that was included as part of the interview process developed during the interview session with the first participant. The question is related to

women's self image and whether it might have be a contributory risk factor for osteoporosis due to low intake of calcium products. The interview question was whether the participants felt that on being thin and small as a young woman could have been a reason not to drink milk and eat products rich in calcium? Ms. C. summed up this line of questioning by saying, " I have never been fashion concioius so I'd have to say no. I was very small when I was young, in fact I only weighted 90 lbs." Ms. L concurred with this by saying that, " I knew that I wasn't goin' to be fashionable so I didn't worry about it. These young girls today are just stupid!" However Ms. H. had a different story to tell about her earlier years, " My sisters were very shapely and I did want to look like them. People always told me that I was thin…I didn't want to be thin and after my divorce, I felt that I was even more thin. I guess I always wanted to look like my sisters."

Ms. W. took this line of questioning a different direction by relating an incident that occurred with her granddaughter. Ms. W began to explain about a recent holiday trip to visit her granddaughter, "I have been thinking about my granddaughter who lives in another city. She has had some weight gain and I feel bad for her. After moving she was new to her community and it caused her to have a summer that did not provide much exercise so she did a lot of watching TV. She plays soccer and basketball so those sports will help her. I really think that she will be able to get moving and get her weight off. It is funny because at Christmas, we were visiting her and the family decided to go shopping. While in a health food store, I noticed a brochure about lowering your fat intake to reduce cholesterol. My granddaughter noticed me reading the brochure and she

remarked that she hoped that I wasn't going to give her that brochure. I said, 'No dear, but we need to work on the fact that you would feel you thought that I would do that.'"

Ms. M served as our negative case study by answering all the questions about learning nothing from the educational materials. She also felt that she didn't need to make any changes in her life style. She is not interested in making any changes in her diet or consumption of calcium products. Interestingly, on her intake form prior to her DEXA, she indicated that she has never taken in 3 servings or more of dairy products during her life. Currently she is exercising _ hour per day by walking.

DISCUSSION

The information that is provided by these older women through their interviews is only descriptive of their experiences. However the fact that health information was given to these DEXA patients and that five participants responded positively to the material makes a case for further investigation. This prepilot qualitative study was based on a concern for providing a health education intervention that gave older women both nutritional and exercise methods to prevent osteoporosis. Some recent recommendations that can be used as part of an educational effort to this end are that osteoporosis can result from a multifactor cause. A concerted effort should be made to inform older women that they could reduce their risk of bone disease by maintaining a supply of vitamin D and calcium, participating in regular physical activity, having adequate energy intake to provide sufficient nutrients, maintaining healthy body weight to avoid frailty

and thinness, and being subject to medication review to identify and monitor adverse drugs on calcium and vitamin D (Mughal, 2000). Using the HBM as a lens to view these participants' responses, it is possible to see the interrelation of the readiness to comply, motivation, and compliance behaviors for these older women. (See Figure 1.)

With additional mining of the data, an emergent pattern was noted that seemed to point to a behavioral explanation related to home modifications by the participants. This middle-range theory is called "Grappling with Grab Bars". This concept emerged when looking back at the connection between the many mentions of intended modifications to the bathroom and bathing area. A connection was noted between Ms. L., Ms. W., and Ms. J., because they all mentioned specific needs to modify their bathtub for security and safety. Ms. L mentioned specifically that she wants her daughter to arrange for grab bars to be installed in order for her to more successfully get up and down after bathing. Ms. W. states, " I really have trouble lowering my fat self down into the tub for a bath. Now a days, I just take a shower. It really is easier and makes it less trouble getting up and down out of the bathtub." As she earlier stated, "…take the tiles off the walls of my bathroom and then I will have a place to put up those handles." These kinds of statements made by the research participants are linked to all three having osteopenia of the hip. This connection fits with the congruence model of person-environment interaction. Kahana proposed this model to explain the lack of congruence between aging people and the environments with which they find themselves living (Kahana, 1982). As the need increases for assistance

with daily needs so does the gap between the person and their environment. This connection became apparent and makes the "Grappling with Grab Bars" a grounded explanation for increasing osteopenia and difficulties with the daily needs of bathing so the grab bars seem to be a way for the participants to make their environment more congruent with this adaptation. This has not been a topic of current research and perhaps deserves some added attention for those patients who are trying to live with the disease. Adapting to life with osteoporosis means trying to live a quality life but that may mean a modification of the patient's living circumstances. Looking back over the transcript, an additional conversation was recorded that at the time seemed unrelated and that was Ms. C's discussion about waiting for new housing due to her husband's health condition. She mentioned that they had applied for housing that accommodated handicapped residents. "We was so glad to get that call that one was available!" said Ms. C. She also told me that with this move all the throw rugs in her house were going to throw away. "I blame them rugs for the fall that I had that broke my arm and started all this testing." Ms. C and her husband actually fall into the grounded theory that emerged from this study with their active moves to modify their living arrangements. The Kahana theory informs this study that these participants are striving to reduce the gap between their aging disabilities and their environment. Ms. C and these participants are successfully "grappling" with a high quality of life by making modifications in their environment.

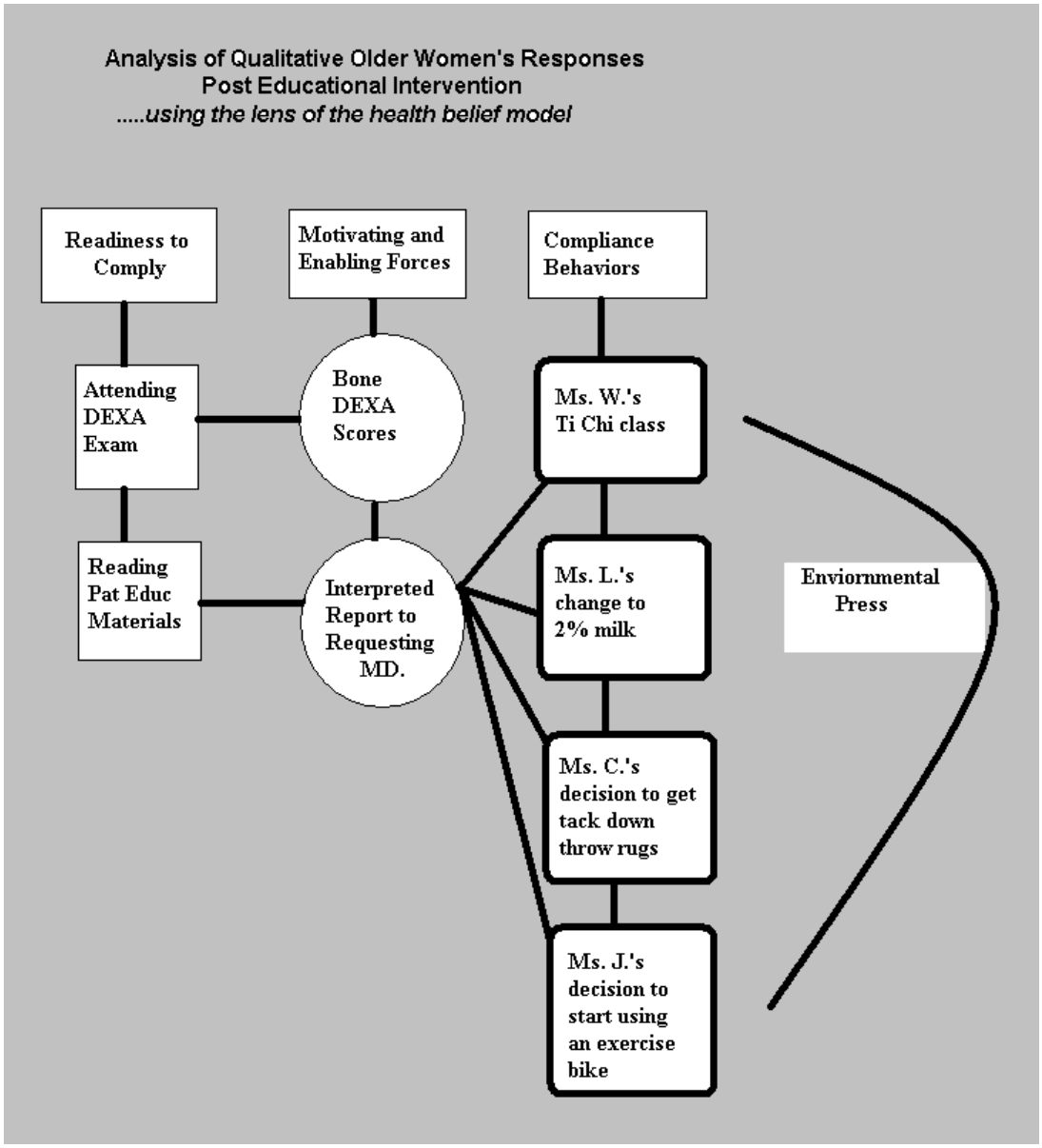
Using this type of qualitative research may help to provide a better understanding of some of the issues that older women face when dealing with the

diagnosis of bone fragility. The concern for minimizing the mortality of older women from fractured bones has financial ramifications. Using preventative health measures to lower the risk of osteoporosis with educational efforts could produce a cost savings in health care dollars.

RECOMMENDATIONS

Perhaps this small prepilot study will promote a more rigorous study of older women using an intentional educational effort to reduce osteoporotic fractures. Interestingly, 12 to 20% of hip fracture patients die within the first year after their fracture (dexabonedensity.com). Hopefully this type of negative outcome might be prevented if it could be demonstrated that investing in a health education and promotion program yielded better patient outcomes. Certainly, all people, no matter their age, including those with disabilities have the right to healthy aging (Janicki and Ansello, 2000). This study gives voice to a group of older women facing the diagnosis of osteopenia and their efforts to live in a way that modifies their physical risk and enhances their self-image.

Figure 1. Analysis of Results



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Analytic Reflections on the Realist Tale:

This is the continued work on my research study of osteoporotic women from our Osteoporosis and Treatment Center. Much of my data has been flowing through the Qualitative course work and as each course has built on the next, so has my analysis of this data set. I am very pleased with the final iteration of this data. This is better than my original submission to one of my professional journals. I am so pleased with the analysis and grounded theory section that I am going to offer this revised version for consideration. I have received a letter of acceptance of the original manuscript and that it is being reviewed for possible publication however, I feel that this version is much stronger. I will either wait for their comments and then resubmit or notify them of the additional work and ask for reconsideration.

This is an article that has taken all year to collect, code, analyze and write and the amount of work shows in the quality of the text. I am very proud of this work, as it is so strikingly different than my other publications. I come from a very quantitative background and this has been a fun departure in research.

An additional benefit of this exercise is that I am now looking at my pilot work toward my dissertation and thinking about seeking approval to proceed with a mixed model of inquiry. My dissertation topic is Breast Self-Examination for older women in assisted living facilities exploring its effect on health perceptions. I think that many of the participants of that study could be researched in parallel ways to this study.