

THE EFFECTIVENESS OF AN OSTEOPOROSIS
HEALTH EDUCATION PROGRAM ON
SUBSEQUENT BEHAVIORS OF
COLLEGE STUDENTS

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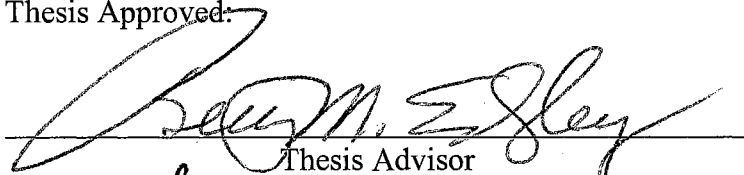
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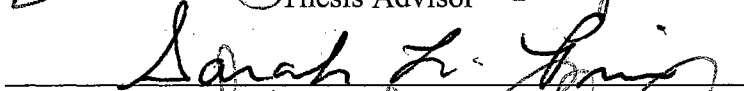
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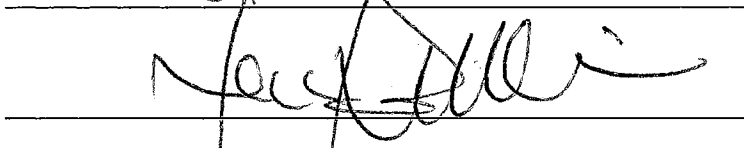
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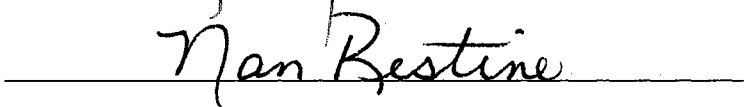
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CHAPTER I

INTRODUCTION

Osteoporosis and Quality of Life

Osteoporosis is a national concern both in terms of quality of life for the client, and in terms of health care costs for the consumer and the health care industry. The federal government is concerned about the rising health care costs of our national population and what these costs mean to the health care industry. Health educators have taken an active role in their efforts to minimize health care costs through the promotion of health educational programs and changes in health care delivery systems. Over the years hospital stays have decreased, however health care costs continue to rise and legislature and institutions continue to explore alternative methods to health care delivery and the rising costs (National Osteoporosis Foundation, 1999). The Healthy People 2010 (US Department of Health and Human Services, 1996) document includes goals aimed at increasing the health care of the nation. Goals at the top of the list include many items that are influenced by behaviors and lifestyle activities of Americans. Many issues are related to nutrition, physical activity, sexual behavior, tobacco, alcohol, other drugs, and safety. Research has shown that the reduction of smoking can greatly reduce the amount

of diseases such as lung cancer, emphysema, and pulmonary disorders (US Department of Health and Human Services, 1996).

Health promoting behaviors have been shown to increase work productivity, mental health, and physical health. Pro-active health promotion can decrease the amount of dollar expenditures and increase the quality of life for the client.

In July of 1999, the National Osteoporosis Foundation reported that 25 million Americans are affected by osteoporosis (National Osteoporosis Foundation, 2000; Brewer, 1998; Doctor's Guide to Medical and Other News, 1999; Lewis, Collier, & Heitkemper, 1996; Merck & Co., Inc., 1995-1999; US Department of Health and Human Services, 1991). The epidemiological characteristics of osteoporosis suggest resounding implications for the health care of people through lifestyle and behavior activities.

Although osteoporosis may strike at any age, one out of every two women and one in five men will have an osteoporosis related fracture. The prevalence of osteoporosis in women older than 80 years of age is 84% (Cummings, S. 1990; Cummings, S., 1993; Melton, L., 1989; Cummings, S., 1989; Ross, P., 1991; Smeltzer & Bare, 2000; Genant, H., 1997). Eighty percent of all persons affected by this disease are women (Cummings, S, 1990; Cummings, S., 1993; Melton, L., 1989; Cummings, S., 1989; Ross, P., 1991; Smeltzer & Bare, 2000; Genant, H., 1997). Osteoporosis is responsible for 1.5 million fractures annually of which more than 300,000 are hip fractures, 500,000 vertebral fractures, 200,000 wrist fractures, and in excess of 300,000 fractures at other sites. It has been estimated that 10 – 20% of elderly will die within one year of experiencing a hip fracture. Approximately 15-25% of one year survivors (of hip fractures) will require long-term institutional care. Associated with this disease and resulting fractures are pain and

disability (Cummings, S., 1989; Ross, P., 1991; Gardsell, P., 1993; Melton, L., 1993; Black, D., 1992; Nguyen, T., 1993; Hui, S., 1989; Cummings, S., 1993; Brewer, S., 1998; Lewis, et al, 1996).

The cost of health care is rising and osteoporosis is dramatically impacting those rising health care costs. In 1987, the estimated national direct expenditures (institutional care) and indirect expenditures (lost earnings) for osteoporosis and associated fractures was \$10 billion. Not only is this a major health problem, but this disease also impacts the socio-economic welfare of the American public and health care delivery costs (National Osteoporosis Foundation, 1999; Berarducci, A. & Lengacher, C., 1998; Edwards, M., & Howley, N., 1999; Heins, K., 2000; Dowd, R. & Cavalieri, J., 1999; Genant, H., 1997).

Significance of the Study

This study may impact the overall health of people, impact health care costs and loss of work expenses, and could promote a general sense of well-being. The research will enhance the body of scientific knowledge related to health promotion activities for a college age population. College students have the potential to change their lifestyle behaviors now so that they may reap the benefits in the future. This research may encourage people to utilize the most effective avenues of interventions when working with at risk populations to promote disease prevention. The possible decrease in health complications, and therefore the decrease in health care costs, the decrease in work loss, and the increase in overall health status of the American people makes this study

beneficial and worthwhile. The study will have practical application for community health nurses, health educators, and those working with behavior change.

Needs Assessment

The literature review in Chapter II documents the need for further study based on the quality of life issues, health care issues, health care costs and health promotion activities. Osteoporosis is a disease characterized by low bone mass which leads to bone fragility and susceptibility to bone fractures. Estimated annual national expenditures for osteoporosis and related fractures exceed 10 billion dollars. A major component in the development of bone mass density is dietary intake of calcium and vitamin D during the main growth period (National Osteoporosis Foundation, 1999). A needs assessment (Okeson, D., 2000) survey of four college age populations in four college dining halls was completed in order to observe the intake of calcium through milk usage. The results of this needs assessment demonstrated the lack of milk (calcium) intake during meals on a college campus.

TABLE I
NEEDS ASSESSMENT RESULTS FOR FREQUENCY AND PERCENT OF
STUDENTS' SELECTION OF MILK

College	N	GENDER	Frequency	Percent
A	75	Female	3	.04
A	90	Male	4	.04
B	20	Female	0	.00
B	28	Male	4	.14
C	20	Female	1	.05
C	22	Male	0	.00
D	20	Female	2	.10
D	19	Male	4	.21

One of each of the meal times was observed at a different institution with the evening meal being the duplicated meal observation. The institutions observed included a rural community college, a large urban state institution, an urban private institution and a medium sized urban state institution.

Based on the ADA recommendation for calcium intake in this population, young adults should have an intake equivalent to 1000 mg per day of calcium. This equals approximately 24 ounces of milk per day or three glasses of eight ounces each. The survey showed an inadequacy of milk intake in this population. Therefore, the assessment of need demonstrated that a college age population does not drink milk to obtain their calcium intake when going through the cafeteria or dining lines. The follow-

up program developed was then piloted for consistency and accuracy of information being provided to the audience.

An educational program (pilot study) was developed to promote health promotion awareness to this population. Objectives were developed in relation to the intervention. They were as follows: (1) State with 100% accuracy the importance of calcium intake for increased bone mass density. (2) All will have an awareness of the impact of bone density on future health and prevention of fractures. (3) Identify four of the six risk factors for osteoporosis. (4) Apply nutritional information about daily calcium intake to daily life 50% of the time.

A pre-test was developed to determine the level of knowledge about osteoporosis and administered prior to the presentation of the educational program. Then the test was repeated in post-test fashion (following the educational program presentation) in order to assess the knowledge gained from the educational presentation. The pre and post-test was piloted in order to evaluate tool effectiveness. The graph (Appendix A) reports the scores of correct and incorrect responses on the pre and post-test as it was piloted at the four different sites.

Analysis of the pilot study demonstrated an inconsistency in information regarding the amount of calcium needed. Actual slides utilized by all four presenters did not give the amount of calcium and therefore one presenter utilized a different reference source for this intake amount. The student responses indicated this difference. The variation of this amount would not occur if this ADA requirement is included on the slide, and the same presenter is utilized. The graph also demonstrates some increase of osteoporosis knowledge based on pre and post-test results.

Statement of the Problem

The problem of the study is to measure the effectiveness of an osteoporosis health education program on subsequent behaviors. Osteoporosis can be eliminated or at the very least minimized through health promoting behaviors or individuals. Educational programs that influence the behavior and lifestyle changes could be effective in minimizing the long-term effects of osteoporosis. Therefore it is important to continue to document the effect of educational programs on health and lifestyle changes.

Hypotheses

Null Hypothesis One

There will be no statistically significant difference between experimental and control groups based on timing of the knowledge test score (pre-test vs. post-test).

Null Hypothesis Two

There will be no statistically significant difference between the experimental and control groups on health risk appraisal scores.

Null Hypothesis Three

There will be no statistically significant difference between the experimental and control groups on the Rosenberg Self-Esteem Scale.

Null Hypothesis Four

There will be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Total Score.

Null Hypothesis Five

There will be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Six Sub-scale Scores.

Null Hypothesis Six

There will be no statistically significant difference between the experimental and control groups on the Activity Log Final Questionnaire.

Null Hypothesis Seven

There will be no statistically significant difference between the experimental and control groups on the Activity Log WALK Measurement.

Null Hypothesis Eight

There will be no statistically significant difference between the experimental and control groups on the Activity Log MILK Measurement.

Limitations

The following limitations may influence the results of this study.

1. Participants are not representative of a specific risk group.
2. The participants' exposure to additional health education could affect their responses to the instruments.
3. There was no attempt to control for exercise and calcium intake.

Delimitations

The study was delimited to the following:

1. The participants will be delimited to male and female community college students.

2. Participants will be delimited to those attending this one rural community college.
3. The study will be delimited to the Spring 2001 academic semester.

Assumptions

This study is based on the following underlying assumptions.

1. The participants will carefully read and properly follow the directions on the instruments.
2. The participants will respond truthfully to the surveys and questionnaires.
3. The participants will record accurately and truthfully in the logs.
4. The classroom environment will be conducive to presenting the information and carrying out the data collection.
5. The participants' knowledge base relating to osteoporosis will be varied.

Definitions

Osteoporosis - Condition characterized by increased bone brittleness (Stanhope and Lancaster, 1996).

Health Promotion – Strategies designed to increase the physical, social, and emotional health and well-being of individuals, families, and communities (Stanhope and Lancaster, 1996).

Risk appraisal – A quantitative approach comparing data from epidemiologic studies and vital statistics with information supplied by individuals about their (1) health-related practices, (2) health habits, (3) demographic characteristics, and (4) personal and family medical history (Stanhope and Lancaster, 1996).

Exercise – Walking briskly for 30 minutes three times a week (National Osteoporosis Foundation, 2000).

Risk Factor – Disease precursor, the presence of which is associated with higher than average mortality. Disease precursors include demographic variables, certain everyday health practices, family history of disease, and some physiological changes (Stanhope and Landcaster, 1996).

CHAPTER II

REVIEW OF LITERATURE

Osteoporosis Characteristics

Osteoporosis, otherwise known as the “silent disease”, occurs without presenting symptoms. Bone loss is not manifested until bones break or collapse. Some people are more likely to develop the disease than others (Genant, H., 1997; Thomas, T., 1997; Hunt, A., 1996). Risk factors – those factors that increase the likelihood of the disease have been identified for osteoporosis. Risk factors include: (a) menopause before age 45, (b) a family history of fractures in elderly women, (c) use of corticosteroid and anti-convulsant medications, (d) chronically low calcium intake, (e) thin and or small bones, (f) Caucasian or Asian, (g) inactive lifestyle, (h) cigarette smoking, (i) excessive use of alcohol, and (j) advanced age. Women have 10-25 % less total bone mass than men, which makes them more susceptible to osteoporosis. Caucasian women 60 years of age and older have twice the incidence of osteoporosis related fractures as African-American women, (Genant, H., 1997; Thomas, T., 1997; Hunt, A., 1996; Berarducci, A. & Langacher, C., 1998; Brewer, S., 1998; Edwards, M. & Howley, N., 1999; Foundation of Osteoporosis Research and Education, 1997-1999). Bone density can be measured with a

bone density scan, whereby physicians can predict the likelihood of fractures based on the scan results.

Prevention is the best defense against osteoporosis. Strong bones must be “built” before the age of 35 for the best preventive effects. It is critically important to develop a healthy lifestyle. Four major components of a healthy lifestyle of osteoporosis are: (a) a balanced diet rich in calcium, (b) exercise regularly including weight bearing activities, (c) no smoking, and (d) limited alcohol intake. Even though there is no cure for osteoporosis, studies have shown that there are two major drug treatments available that help stop further bone loss and fractures. Estrogen has been shown to prevent the loss of bone mass in post-menopausal women. Calcitonin is another drug that has been proven effective in decreasing bone breakdown. Many treatments currently under investigation include bisphosphonates, nasal spray calcitonin, sodium fluoride, vitamin D, and anti-estrogen medications. Medical experts agree and it is well documented in the literature that osteoporosis is highly preventable (Burki, R., 1999; Doctor’s Guide to Medical and other news, 1999; Lewis, et al, 1996; Edwards, M. & Howley, N., 1999; Smeltzer, S. & Bare, B., 2000).

The European Foundation for Osteoporosis and Bone Disease, the US National Institute of Arthritis and Musculoskeletal and Skin Diseases, and the American National Osteoporosis Foundation agree that osteoporosis is a world-wide issue resulting in major expenses and has become a disease of major social implications. Principle epidemiological studies have been undertaken which may provide a solid basis on which to develop standards of disease recognition and strategies for treatment and prevention (Genant, H., 1997; Thomas, T., 1997; Hunt, A., 1996; Berarducci, A. & Lengacher, C.,

1998; Brewer, S., 1998; Edwards, M. & Howley, N., 1999; Foundation of Osteoporosis Research and Education, 1997-1999; The Epidemiology of Vertebral Osteoporosis (EVOS study, a review of vertebral osteoporosis), the Study of Osteoporotic Fractures (SOF), (Cummings, S., 1990; Cummings, S., 1993), the Mediterranean Osteoporosis Study (MEDOS) (Johnell, O., 1992), a study utilizing a random sample population from Rochester, Minnesota (Melton, L., 1989), a study of Japanese-American women in Hawaii at the Hawaii Osteoporosis Center (HOC), (Ross, P., 1991), a study of fracture predictions conducted in Dubbo, Australia (Nguyen, T., 1993), and a study of fractures in Sweden (Gardsell, P., 1989; Gardsell, P., 1993). These studies looked at very definitive measurements, types of fractures, and treatments of this disease and point to the major impact of this disease process on lifestyle, health care of the public, and health care costs. While these researchers have selected diagnostic criteria and treatment as a basis for their research, this study will focus on the prevention of the disease by evaluating the effectiveness of educational health promotion strategies and the correlation to healthy behavior activities. Pender's (1996) research cites the value of health promotion and education on effectiveness of lifestyle changes (Pender, N., 1996; Arnold, J. & Gorin, S., 1998; Glantz, K., Lewis, F., Rimer, B., 1997).

The goals of Healthy People 2010 concentrate on health promotion and risk reduction to reduce the mortality and morbidity (US Department of Health and Human Services, 1991). The literature reports that an estimated 40% of 1990 deaths in the U.S. were attributable to health risk behaviors that could be lifestyle changing (McGinnis, J. & Foege, W., 1993). Sheahan (2000) suggests that all health care providers should share the responsibility for the promotion of healthy lifestyle behaviors that lead to reductions

in morbidity and mortality. Taira, D., Safran, D., Seto, T., Rogers, W., & Tarlov, A. (1997) studied the relationship of patient income to the physician's discussion of health risk behaviors. They suggested that the estimated societal costs for smoking and alcohol alone account for \$179 billion annually. The estimated costs for osteoporosis related care are in excess of \$14 billion annually for the institutional care alone of patients with osteoporosis. With days of lost work and complicating factors the estimate runs well over \$30 billion annually. Therefore it is critical that we begin to learn how to assist people in follow-through of lifestyle behavior choices that increase their quality of health in areas that are preventable. Sheahan (2000) examined the documentation of selected risk factors and health promotion discharge counseling by professionals in the emergency department. In 1996 the U.S. Preventive Services Task Force recommended that health care providers routinely assess health risk factors and encourage modified behaviors related to diet and exercise. The literature does not document that follow-up behavior changes that do or do not occur based on simple health promotion strategies in the institutions. Yet many professional organizations have adopted health promotion as a part of the standards and scope of practice for health care professionals (American Academy of Nurse Practitioners, 1998). Inherent in this study is the grounded framework that health promotion enhances the health of the individual and the community. This is an integral part to the socioeconomic and political spheres in the community and the health care arena (Shields, L. & Lindsey, A., 1998). Healthy people are more likely to be energized, financially sound, progressive and more productive than their counterpart in a community of people afflicted with chronic diseases. Many researchers described the role of professionals in health risk identification, and health promotion counseling and

education (Sheahan, S., 1998; Griffith, H. & Rahman, M., 1994; Merrill, E., 1995), however, few have published studies that include the documentation of health promotion activities and the resultant outcomes of those programs or activities. Taira et al (1997) reported that discussion of these health promotion behaviors occurred with less frequency than recommended by the US Preventive Service Task Force. They also reported that low-income patients were more likely to report attempting to change their behaviors based on physician advice. This study will measure direct reporting of behavior change as a result of the health promotion activity. Sheahan (2000) only reports that the patient received the counseling or education and that this event occurred much less frequently than expected by standards of practice. “The study reported that 59% of the sample of relatively young adults had one or more health risk factors, including elevated blood pressure, increased weight, alcohol and tobacco use.” “Basic health risk identification and follow-up health promotion are activities grounded in a community approach to health care.” Sheahan (2000) and Hays, J.; Dale, L.; Hurt, R.; and Croghan, I. (1998) report that smoking is a modifiable contributing factor for numerous acute and chronic diseases, including respiratory, and cardiac problems, cancer, cataracts and osteoporosis. They report that promotion of smoking cessation by health care professionals is cost-effective and can reduce related morbidity and mortality. Sheahan (2000) states in her research that health promotion has a predictable relationship between health status and the work force and economic productivity. Applications of this perspective of health promotion are important in order to provide the opportunity for lifestyle and behavior changes. Sheahan’s (2000) study reports that the lack of documentation of risk factors and counseling or health promotion education has important implications for practice and

society. She suggests that follow-up studies are needed to address the congruence between patient's perceptions or recall of health promotion events. This researcher suggests that imparting of this information is not enough. One needs to be able to report the outcomes of the health promotion activity in order to assess whether the effectiveness of the promotion activity produced the desired outcome.

Self-Esteem

Self-esteem has been studied throughout history including sub-topics of self-concept and social-self. James (1980) described self-concept as the unique kind of interest which the human mind perceives and which influences a person's decisions and actions (Rosenberg, M., 1979; Tzeng, O., Maxey, W., Fortier, R., & Landis, D., 1985). Hoover (1984) discussed the "social-self" concept in the early twentieth century. He stated that according to Cooley, "the process of developing an image of oneself includes the imagined appearance of oneself to the other, and finally an affect, or self-feeling such as pride and embarrassment. Hoover, M. (1984) states that feelings of self begin at birth and continue throughout life experiences. Sullivan views the self-concept as arising out of social interaction. Lewis et al (1936) states that space is included in the individual's universe of personal experience. Andreoli, K., (1980) stated that researchers, Combs and Snygg, postulated that self-concept is a basic variable affecting and controlling perceptions, which eventually affects the behavior of the individual. Andreoli refers to Carl Rogers works which suggest that the self-concept is a phenomenological concept: the self as seen by the experiencing person. He suggests that the self-concept becomes

the most significant determinant of response to the environment. Rogers discusses the ability of an individual to allow changes to occur in the self-concept, according to the needs perceived by the individual. Taft, (1985) suggests that self-esteem involves an affective quality of the self-concept and the individual is able to place a value on the components of self-concept which therefore determines satisfaction or dissatisfaction with self-concept. He states as the concept of self develops, behaviors are involved. Gergen (1971) states that depending on these values, and depending on motivation, behavioral styles are selected. Rosenberg's works describe feelings of individuals, and the criteria they use for evaluation and more specifically to identify the influence of self-esteem on significant attitudes and behaviors. Rosenberg's results support the idea that self-esteem has an effect on lifestyle behaviors and even the motivation to participate and follow-through on activities. The behavior relies on self-esteem. Antonucci and Jackson (1983) completed research with data from 2,264 adults 21 years of age and older. They looked at predictor's of health and relationships to self-esteem. The existence of a health problem, regardless of type or severity, was associated with significantly lower self-esteem. Significant differences in self-esteem were also found among individuals reporting no health problems. Hallal (1982) conducted a study of women who practiced breast self-examination and found that those who practiced this procedure had higher self-concept levels than those who did not engage in the practice. Muhlenkamp and Sayles (1986) studied relationships among social support and positive health practices and reported that both self-esteem and social support are positive indicators of lifestyle. Rew (1990) reported in his study that significant predictors of health-promoting lifestyle were body image, education, and self-esteem. Rew concluded that positive self-esteem

may contribute to a healthy lifestyle and suggested that further research should be completed to investigate these relationships. Research studies also suggest relationships exist between self-esteem and health habits (Vines, S., & Williams-Burgess, C., 1994); health promotion (Wood, M., 1991), and positive attitudes toward rehabilitation (Conn V., Taylor, S., & Casey, B., 1992) and participation in an exercise program (Bonheur, B. & Young, S., 1991).

The literature addresses relationships between self-esteem, health promotion, and activities but does not conclusively report on follow-up of patients to change their lifestyles and follow-through on health promoting behaviors.

Health Promotion has been a major concern for certain diseases and the implications for health care. Duncan and Gold (1986) reported that the World Health Organization's definition of health was: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, when combined with the word "promotion" means to "advance or move forward". They stated that health promotion includes activities aimed at healthy individuals as well as at populations, that contribute to growth, or excellence of their health, or of achieving high-level wellness, (Duncan, D. & Gold, R., 1986). Hettler, (1984) and Bruhn et al (1977) support the idea that wellness is in part a learned value and students can see themselves as their own health manager. Hettler (1984) suggests that educational opportunities are a successful approach to health promotion. Laffery (1986) defines health promotion behavior as involving a series of choices that people make to achieve higher potentials for health or well-being. This researcher states that health conceptions and health choice behaviors were found to be significantly related. In a later study, Laffery observed that perceived health status was

significantly related to health conception in a normal weight group, but was not related to health behavior choice in either obese subjects or those of normal weight. The author therefore concluded a person's definition of health is more closely related to the reasons for engaging in health behavior than to how healthy or unhealthy a person believes himself/herself to be.

Health Promotion

Green (1985) conducted a study to compare terms and stated that health promotion is a viable concept and method of health care. She further postulated that the key to health promotion is responsibility by the health care consumer.

Brubaker (1983) reports that health maintenance, health protection, wellness promotion, and health education are all associated with health promotion. His study reports the emergence of two themes: the call for goals beyond the status quo that produce a positive state of health, and the need for health and changes in lifestyle. Brubaker raises important issues about health promotion and the process that encourages changes in habits. Walker, S., Volkan, K., Sechrist, K., and Pender, N. (1988), differentiate between health promotion and prevention. They conducted a study where they compared health promoting lifestyles of older adults to those of young and middle aged adults. The authors reported that older adults reported the highest total frequency of health promoting behaviors. Pender (1987) proposed a model of health promotion which provided a complementary counterpart to models of health protection and may explain the occurrence of health-promoting behavior. Pender stated "that health promotion is

directed toward increasing the level of well-being and self actualization; desire for growth, quality of life, and expression of human potential as the motivating factors for health promoting behaviors. The model supports the idea that health promoting behaviors are continuing activities that should be integrated into an individual's lifestyle. Pender suggests that individuals act on the environment to move toward higher levels of health rather than react to an external threat. The Health Promotion Model (Pender, 1987) is categorically structured according to the type of influence on behavior: cognitive-perceptual factors serve as primary motivational mechanisms for initiation and maintenance of health promoting actions and directly affect those behaviors: the importance of health, perceived control of health, perceived self-efficacy, definition of health, perceived health status, perceived benefits and barriers of health promoting behaviors. The modifying factors include the demographic factors, biological characteristics, interpersonal influences, situational factors and behavioral factors to indirectly influence the patterns of health behavior. Pender also includes cues to action in the model.

Health promotion literature review contains numerous definitions and concepts. Some commonalities in these definitional concepts include health promotion as an evolving process and learning and self-motivation as a process that involves conscious decisions and choices. Lifestyle is imparted as a major influencing factor on health promotion and is closely related to self-esteem.

McClaeb (1991) examined the relationships among self-esteem, health behaviors, and other psychosocial variables. He reported that the relationship between self-concept

and self-care practices was found to be significantly positive. The author concluded that the single best predictor of self-care practices is important in explaining health behaviors.

Throughout the review of literature, there is a relationship reported regarding behaviors to smoking, sexual activity, alcohol use and safe driving practices. The literature does not include reported studies on the follow-through of health promoting behaviors in relationship to osteoporosis education. The literature does suggest that there are major implications to both socio-economic and health care related to quality of life issues. The literature indicates the continued need to explore health promotion activities and the effectiveness of these activities on lifestyle behaviors.

Several researchers have reported findings related to the relationship between exercise and health behaviors. Costakis, C., Dunnagan, T., & Haynes, G., (1999) studied the relationship between the stages of exercise adoption and the practice of other health behaviors. These researchers reported that those respondents in “action exercise” were less likely to smoke cigarettes than those in contemplation phases. The study suggested that encouraging individuals to become more involved in exercise could indirectly influence other health behaviors and lifestyle practices. Since Costakis et al (1999) study indicated that an important relationship exists between stage of exercise adoption and the practice of other healthy behaviors, health promotion interventions that encourage individuals to adopt a more active lifestyle could indirectly influence other lifestyle behaviors. If exercise is a gateway to other health enhancing activities, then a variety of programming options would be available for health care providers to utilize. Shephard, R., (1996) completed a study on the health impact of worksite fitness and exercise programs. The concluded that participation in worksite fitness programs can enhance

health related fitness and reduce risk taking behaviors. Shephard concluded that health of workers relates to productivity, absenteeism, and employee turnover; however it is unclear what these outcomes are influenced by since the causal relationship to fitness programs is lacking in evidence. The author reviewed numerous worksite fitness program studies. Consistent explanations for why workers exercise or participate in the worksite programs remain elusive and varied. It is clear that there are direct health benefits for the individual who participates in a fitness program and that those benefits are long reaching to include quality of health, socioeconomic benefits through reduced health care costs and reduced risks for other health care complications. It is unclear what motivates a person to exercise, whether it is the health promotion opportunity, the health promotion education program, or another factor. It is clear that there is a connection between health of the individual and the health care costs and the cost to the work force. Guo, H., Shiro, T., Halperin, W., & Cameron, L., (1999) reported that loss of work related to back pain has a major impact on the work force and the health promotion of the working population. The decline of back problems would make a significant impact on the health care dollar expenditures in the United States. Therefore it is of consequence to continue to incorporate health promotion activities into the workforce as well as with other populations in the effort to reduce business costs, and to improve health of individuals. A study such as this one where there is an estimate of the prevalence of a condition – back pain among workers – allows us to begin to document the costs as well as the economic benefits for health promotion programs. Allison et al (1999) studied the direct health care costs of obesity in the United States. Oster et al, (1999) estimated the lifetime health and socioeconomic benefits of modest weight loss among obese people.

These researchers all related the importance of a changed behavior to the impact on the health of the individual and the socio-economic impact. Ozminkowski, R., Dunn, R., Goetzel, R., Cantor, R., Murname, J., & Harrison, M., (1999) and Wilson, M., DeJoy, D., Jorgensen, C., & Crump, C., (1999) relate health promotion programs to small worksites and the investment return. Wilson et al (1999) discussed the results of a national survey where the outcome measure was to examine the prevalence of health promotion activities at the workplace. This study indicated that smaller employee bases were provided less variety or health promotion activities. This study did not show any conclusive evidence about the level of participation as it relates to the level of availability of offerings. There continues to be need for further research on follow-through of activities as a result of an educational health promotion program.

Ozminowski et al, (1999) evaluated the financial impact of a health promotion program on the medical expenditures and evaluated the belief that better health habits of employees will lead to healthier lifestyles, less use of health care benefits, and increased work productivity. This study supported program costs benefits equal to \$4.56 return for every \$1.00 invested. However, they utilized a low cost intervention program, had high participation rates, provided education and awareness, and informed employees of health care services and opportunities, and there were intensive resources for the highest risk members, and there were self-managements. These researchers suggest that with some follow- tracking, there may be some benefits in that clients are more apt to follow-up on their interventions. Ozminowski et al (1999) support the theory that you can deliver a one-time, low cost program and have the opportunity for clients to derive benefits as well

as have companies benefit by reduced health care costs, less absenteeism, and higher productivity.

Summary

In summary, the literature suggests that multiple factors are all integrated when looking at health promotion and the ability to change a lifestyle behavior. The characteristics of the disease, “silent” bone loss may have an impact on whether the client changes behavior prior to the risk or after an event or injury occurs. The medical studies review the types of fractures most likely to occur. The epidemiological rates reinforce the importance of recognition of the risk factors Pender, N. (1996), Sheahan, S. (2000), and Taira, D., et al (1997) all discuss the importance of health promotion.

Pender (1996) suggests that health education and health promotion will encourage healthy behavior changes. Sheahan (2000) reported that all health care providers share responsibility for health promotion and health education. Taira (1997) reported that physicians do not meet the standards of the U. S. Preventive health Services Task Force when discussing health risks with their patients. This study also reported that low-income patients were more likely to change their health behaviors.

Rosenbergs’ (1965) work on self-esteem reported that people with higher self-esteem are more likely to change their behaviors. Reasoner (1983) reported that women with high self-esteem were more likely to conduct self-breast exams.

Health promotion had been integrated into both the community and the work force. Costakis (1999) reported that the stages of adoption of exercise were a gateway to

the practice of other healthy behaviors. Shepherd (1996) investigated fitness and exercise as it related to employee productivity, absenteeism, and turnover rates in the worksite.

Ozminkowski (1999) reported that for a one-dollar investment you can get a \$4.56 return when working with clients to adopt healthy behaviors.

CHAPTER III

METHODOLOGY

The purpose of this study was to measure the effectiveness of an osteoporosis health educational program on subsequent behaviors. The procedures used in this study are categorized in two sections: (1) preliminary procedures and (2) operational procedures. The preliminary procedures will be described in terms of (a) research sample, (b) subject selection, and (c) instruments. The operational procedures include: (a) collection of data and (b) research design and statistical analysis.

Before this study was conducted, approval was sought and obtained from Oklahoma State University's Institutional Review Board (Appendix J). All procedures for this study were performed in accordance with the I. R. B. guidelines for ethical treatment of human subjects.

Preliminary Procedures

Research Sample

The sample for this study was chosen from a simple random sample of spring, 2001 community college students attending a small rural community college in the

Midwest. Written permission was granted by the institution (Appendix M) to allow the researcher to conduct this study. The participants were recruited through random selection of classes at the participating institution. Students completed a written consent form (Appendix N) in order to participate in the study. Administrative procedures were designed to protect the student's privacy and allow for voluntary participation while identifying all materials by a numerical system so that data could be matched. Class participants, both male and female, were randomly assigned to the control or intervention group. The study was designed to obtain approximately 150 subjects with 50 of those being randomly selected for the control group and 100 randomly selected for the experimental group. The final sample consisted of 38 student participants in the control group and 106 student participants in the experimental group for a total of 144 participants. There were six responses that were not able to be matched and were therefore not included in the study.

Selection of Subjects

The subjects selected for this study, $N = 144$, including males and females, were limited to those students enrolled in a small rural community college in the Midwest during the Spring 2001 semester. Prior to initiating the study, an estimate of the anticipated sample size was calculated based on tables discussing the power and the concept of effect size. From this analysis the size of the sample (n) was determined based on a 95% confidence level. In addition, the researcher selected an alpha of 0.01 to provide further rigor to the analysis of the data based on sample size. Subjects were

proportionally selected based on the total number and a pre-determined ratio of 3:1 with three participants in the experimental group for each participant in the control group. The participants were randomly assigned to one of the two groups.

The subjects ranged in age from 17 to 47 years old. There were 119 students that were full time students (12 credits or more) and 25 part-time students. The sample consisted of 73.7% Caucasians, 18.4% Afro-Americans, 2.6 Asians, 2.6% Hispanic, and 2.6% declaring other as ethnic selection. The mean age for the experimental group was 23.2 while the mean age for the control group was 22.4.

Instruments

There were five instruments utilized in this study. They were as follows: a demographic questionnaire (Appendix B), the Rosenberg Self-Esteem Scale (Appendix C), the Health Promoting Lifestyle Profile (Appendix D), the test of knowledge base (which was utilized in pre- and post-test format) (Appendix E), and the Osteoporosis risk appraisal tool (Appendix F). Activity logs were used to record and report student's health promoting behavior activities (Appendix G, Appendix H).

The Rosenberg Self-Esteem Scale (1965) (Appendix C) is a ten item (Guttman) scale which can also be used as a likert scale with numerical values. Rosenberg recommends that one recode the negatively worded items so that a high score on the scale would indicate high self-esteem and a low score would indicate low self-esteem. Reliability measurements for the original Guttman scale are reported to have a reproducibility index of 93% with scalability of items at 73% (Rosenberg, M., 1965 &

1979). Rosenberg (1979) reported an internal reliability yield of .85-.88. Greene, A. and Reed, A. (1992) reported Cronback's alpha coefficients of .78 and .79. Validity is consistently demonstrated through correlations with other psychological constructs. Clinical correlations by Silber, E., and Tippett, J., (1965) and Wylie, R. (1974) match those clinical correlations of Rosenberg (1965 & 1979). It is important to realize that depressed affect is reported as a low score and no depressive affect correlates with a high score for this tool.

The Osteoporosis risk appraisal is a Yes/No questionnaire with eight items. The more YES responses, the higher the risk for osteoporosis. This questionnaire was developed by the National Osteoporosis Foundation. This simplistic risk appraisal is reliable for obtaining information regarding the amount of risk an individual has for osteoporosis.

The Health Promoting Lifestyle Profile (HPLP) (Appendix D) is a 48 item summated behavior rating scale. The HPLP utilizes a four-point response format that is as follows: never, sometimes, often, or routinely. This tool measures the frequency of self-reported health promoting behaviors. Six dimensions of health promoting lifestyles are identified through factor analysis and are used as subscales: self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management (Walker, S., et al, 1988). Studies report that this tool has a reliability coefficient with an alpha of .92 for internal consistency and a test-re-test stability coefficient of .926 (Walker, S., Sechrist, K., & Pender, N., 1987). Additional testing demonstrated alpha reliability coefficient of .923 for the total scale, and coefficients of .694-.898 for the subscales (1988). The tool validity was established through factor analysis with items loaded on

expected factors at a level of .350 or higher and the six factors have explained 47.1% of the variance in the instrument. James (1988) reported validation of this tool when using it with senior high school adolescents. Internal consistency was high with Cronbach's alpha coefficients for total instrument reported to be .926 (James, L., 1988).

The demographic questionnaire (Appendix B) was developed by the researcher to collect data for descriptive reporting purposes. This data also allows for comparison of the groups in order to evaluate similarities between groups.

The osteoporosis educational presentation (Appendix I) was made up of slides that included educational information about osteoporosis. The presentation was designed to be concise and informational. The material included information on the health characteristics, costs of the disease, risk factors, and ways to prevent the disease through health promotion activities. The presentation took 15 minutes to deliver through power point.

A knowledge base test (Okeson, D., 2000) was developed to determine the level of knowledge about osteoporosis following the specific presentation. This test was designed to be given in pre and post-test fashion. This test was piloted in order to evaluate the effectiveness of the tool prior to use in this study. A comparative graph reported the scores of correct and incorrect responses on the pre and post-test as it was piloted at the four different sites (Appendix A). This graph assisted in analysis of the pre and post-test utilized in the pilot study. It was discovered that during the pilot study an inconsistency in knowledge presentation occurred. Information regarding the amount of calcium needed was presented utilizing differing amounts. All four presenters utilized the same set of slides, however, the slides did not give the actual amount of calcium and

the one presenter reported a different calcium requirement based on a different resource for amount of calcium intake. The student responses indicated this difference in test responses. The variation of this amount would not occur if the ADA requirement is included on the slide and/or the same presenter is utilized. The graph also demonstrates some growth of knowledge based on pre and post-test results. Therefore, it was concluded that the pilot study of the testing tool was effective in drawing out inconsistencies in order to correct those prior to the actual study (Okeson, D., 2000).

Activity logs were utilized as a recording mechanism for the experimental group. Their packets included calendars for the time period of the study. These were included to assist the participants in recording their behaviors so that the reporting would be accurate. The participants were asked to simply record the amount of milk they drank daily and to record the times when they exercised – walked for 30 minutes.

The final questionnaire was developed to provide another comparison method between the experimental and control groups. This questionnaire consisted of four Yes/No questions with opportunity for explanatory comments should the participant wish to comment.

Operational Procedures

Collection of Data

Permission to conduct the study was granted by the Human Subjects Research, Oklahoma State University Institutional Review Board (Appendix J). The author

contacted the selected institution to secure the written permission (Appendix M) for this study to be conducted. The classes were randomly selected and then the faculty in each class were contacted. Explanation of the research project was presented to the faculty and approval to make this presentation during a class period was requested. The researcher informed the potential subjects that their participation was voluntary and in no way required or related to the class in which they were enrolled. All procedures were explained to the participants (Appendix O) and they were given an explanation of the data coding so that data could be matched for the study. Reporting information in aggregate format was described to the participants.

Five instruments (demographic questionnaire, Rosenberg's Self-Esteem Scale, osteoporosis risk appraisal, HPLP, knowledge base test) were administered to the subjects during March, with follow-up data collected 30 days later in April, and the final time period of data collected through May 15th. This timeline was designed to provide opportunity for a follow-up period.

The experimental and control groups were randomly selected. The packets were prepared for each class with a 3:1 ratio. The control packets were interspersed randomly among the experimental packets and all packets were then distributed in the classes.

The participants received the packet with consent form (Appendix N), participant letter (Appendix P), and questionnaires: demographic (Appendix B), self esteem (Appendix C), health risk appraisal (Appendix F), HPLP (Appendix D), knowledge pre-test and knowledge post-test (Appendix E), activity logs (experimental group only) (Appendix G), and the final questionnaire (Appendix H). Participants completed the consent form and those were sealed in separate envelopes. All the participants completed

the questionnaires on demographics, self-esteem, health risk appraisal, HPLP, and the knowledge pre-test prior to hearing the presentation. Completion of these questionnaires took 15-20 minutes. The slide show on osteoporosis (Appendix I) was presented, which took 15 minutes. Following the presentation, all participants completed the post-test on knowledge. Additional questions were answered at this time. The instructions for the activity logs were then given. All participants took the remainder of their packets with them to complete and return. For the experimental group this included the activity logs (Appendix G) and the final questionnaire (Appendix H), and the return date reminder page. For the control group this included the final questionnaire (Appendix H) and the page with the return date reminder.

The faculty reminded students to return the packets at the end of the follow-up time period. The participating classroom instructors were sent thank you notes for their support of the project. All collected data was put in sealed and dated envelopes until time to complete the data entry and analysis.

Research Design and Statistical Analysis

This research design incorporates a pre-post design with both an experimental group and control group. The research design and statistical analysis incorporated a 2 X 2 repeated measures ANOVA for group at two independent levels (experimental vs. control), and the repeated measure or time at two levels (pretest vs. posttest). T-tests for independent samples were used to test for significant differences between means. All analyses were tested at the 0.05 level of statistical significance. The dependent variables

were: self-esteem scores, health risk appraisal scores, knowledge test scores – both pre and post, HPLP total and sub-scale scores, and the activity log measurements.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this chapter is to present the results from the data collected and to provide a discussion of the results. This chapter is divided into three sections as follows: (1) Analysis of demographic data, (2) analysis of hypothesis data and (3) discussion of the results.

Analysis of Demographic Data

Table II provides the frequency and percent for demographic data by group – experimental and control. The demographic questions consisted of the following categories: gender, class, enrollment status, age, and ethnic classification.

TABLE II
DEMOGRAPHIC DATA

Variable	Freq	Percent	Exp	Percent	Control	Percent
Group Total	144	100	106	73.6	38	26.4
Gender						
Male	64	44.4	48	45.3	16	42.1
Female	80	55.6	58	54.7	22	57.9
Class						
Baseball (Men's)	15	10.4	11	10.4	4	10.5
Nursing	34	23.6	25	23.6	9	23.7
Lab Sciences	21	14.6	15	14.2	6	15.8
Nutrition	11	7.6	9	8.5	2	5.3
Psychology	33	22.9	20	18.9	13	34.2
Government	12	8.3	10	9.4	2	5.3
Basketball (Women's)	18	12.5	16	15.1	2	5.3
Enrollment						
Full-time	119	82.6	88	83.0	31	81.6
Part-time	25	17.4	18	17.0	7	18.4
Age						
17-19	5	3.5	4	3.7	8	21.0
20-29	118	81.8	85	80.5	26	68.5
30-39	15	10.5	12	11.3	3	7.9
40-47	6	4.2	5	4.5	1	2.6
Ethnic Background						
Afro-American	21	14.6	14	13.2	7	18.4
Asian	5	3.5	4	3.8	1	2.6
Caucasian	103	71.5	75	70.8	28	73.7
Hispanic	4	2.8	3	2.8	1	2.6
American Indian	3	2.1	3	2.8	0	0.0
Other	8	5.6	7	6.6	1	2.6

Further analysis of the demographic data for age assists one in further detailed analysis of demographic data. The mean age for the experimental group was 23.2 years

while the mean age for the control group was 22.4 years. Therefore, the groups were alike when comparing age.

Analysis of Hypotheses

Eight hypotheses were evaluated in this investigation. Each of the hypotheses was examined to determine if significant differences ($p \leq .05$) occurred between the two groups.

Hypothesis One

It was hypothesized that there would be no statistically significant difference between the experimental and control groups based on the timing (pre-test vs. post-test) of the knowledge test score about osteoporosis. The knowledge test score was calculated with one being true and 2 being false. Therefore the lower score was better. A 2 X 2 repeated measures analysis of variance test was performed to analyze the interactions among groups (experimental and control) and time (pre-test and post-test). The results are indicated in Table III.

There were significant differences in the knowledge test scores based on time (pre-test vs. post-test). There was no group by time interaction. Table III indicates that there was a significant difference in time. These were significant at the .01 level. There was no time by group interaction. The null hypothesis was rejected.

TABLE III
 REPEATED MEASURES ANALYSIS OF VARIANCE OF
 GROUP (Experimental and Control) BY TIME (Pre-test to Post-test) FOR
 KNOWLEDGE TEST SCORES

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significant F
GROUP	.695	1	.695	.348	.556
Error (Between)	283.551	142	1.997		
Time	62.018	1	62.018	97.242	.000*
Time x Group	.351	1	.351	.550	.459
Error(TIME) (Within)	90.562	142	.638		

The post-test means were as follows: experimental – 11.585 and control – 11.553. The pre-test means were as follows: experimental – 12.717 and control – 12.553. Since the scores decreased from pre-test to post-test and a low score was best, that the scores increased or got better from the pre-test to the post-test.

Hypothesis Two

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on health risk appraisal scores. T-Tests for Independent Samples were performed. As indicated in Table IV, there were no statistically significant differences between the two groups on the health risk appraisal scores. Since this variable showed no statistically significant difference, this indicates that the experimental and control groups were similar in health risk appraisal. Therefore, the null hypothesis was accepted.

TABLE IV
T-TEST FOR INDEPENDENT SAMPLES FOR RISK

Variable---RISK						
Group	N	Mean	SD	t-score	Sig. (2-tail)	
Exp.	106	9.4528	1.0248			
Control	38	9.3158	.8732			
				.734		.464

Hypothesis Three

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Rosenberg Self-Esteem Scale. T-Tests for Independent Samples were performed. As indicated in Table V there were statistically significant differences between the two groups on the Rosenberg Self-Esteem

Scale scores. In Table VI the means varied by $\pm 1.2 - 1.35$, which is not clinically important. Therefore, the null hypothesis was rejected.

TABLE V
T-TEST FOR INDEPENDENT SAMPLES FOR SELF-ESTEEM

Variable---SELF ESTEEM					
Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	106	24.7547	2.7109		
Control	38	26.2105	2.4067		
				-2.922	.004*

Hypothesis Four

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Total Score. T-Tests for Independent Samples were performed. As indicated in Table VI there were no statistically significant differences between the two groups on the Health Promoting Lifestyle Profile total score. Since this variable showed no statistically significant difference, this indicates that the experimental and control groups were similar in Health Promoting Lifestyle Profile. Therefore, the null hypothesis was accepted.

TABLE VI
T-TEST FOR INDEPENDENT SAMPLES FOR HPLP TOTAL

Variable---HEALTH PROMOTING LIFESTYLE TOTAL Score					
Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	106	127.2925	21.8976		
Control	38	128.1842	22.0808		
				-.215	.830

Hypothesis Five

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Six Subscale Scores. T-tests for independent samples were performed. As indicated in Table VII there were no statistically significant differences between the experimental and control groups on the six subscale scores of the Health Promoting Lifestyle Profile. Since these subscale scores showed no statistically significant difference, this indicates that the experimental and control groups were similar in Health Promoting Lifestyle Profile Subscale scores. Therefore, the null hypothesis was accepted.

TABLE VII
T-TEST FOR INDEPENDENT SAMPLES FOR HPLP SUBSCALE SCORES

Variable---HEALTH PROMOTING LIFESTYLE SUBSCALE SCORES

Self-Actualization

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	97	57.1649	8.6803		
Control	38	57.7105	9.9889		
				-.315	.754

Health Responsibility

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	31.7100	8.0933		
Control	37	30.7297	6.8136		
				.655	.513

Exercise

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	102	18.2745	5.1802		
Control	35	18.2000	4.2689		
				.077	.939

Nutrition

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	104	15.1635	3.6313		
Control	38	15.2368	3.8304		
				-.105	.916

Interpersonal Support

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	99	42.5455	7.2468		
Control	36	43.4167	7.4541		
				-.613	.541

Stress Management

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	103	22.7282	4.8974		
Control	37	23.5405	4.8568		
				-.867	.387

Hypothesis Six

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Activity Log Final Questionnaire. T-Tests for Independent Samples were performed. As indicated in Table VIII there were no statistically significant differences between the two groups on the Final Questionnaire. Since this variable showed no statistically significant difference, this indicates that the experimental and control groups were similar for these four questions. Therefore, the null hypothesis was accepted.

TABLE VIII

T-TEST FOR INDEPENDENT SAMPLES FOR FINAL QUESTIONNAIRE

Variable---FINAL QUESTIONNAIRE

Question One

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	1.3100	.5449		
Control	38	1.3684	.4889		
				-.578	.564 Question

Question Two

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	1.3300	.5515		
Control	38	1.4211	.5004		
				-.888	.376

Question Three

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	1.7600	.5148		
Control	38	1.7895	.4132		
				-.316	.752

Question Four

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	1.8000	.7654		
Control	38	1.9737	.7161		
				.228	-.1737

Hypothesis Seven

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Activity Log WALK Measurement. The T-test for Independent Samples was performed. As indicated in Table IX there was a statistically significant difference between the experimental and control groups on the Activity Log WALK measurement. This indicated that a significant mean difference existed between the two groups. Therefore, the null hypothesis was rejected.

TABLE IX
T-TEST FOR INDEPENDENT SAMPLES FOR WALK

Variable---Activity Log WALK Measurement

Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	100	54.2700	21.1702		
Control	38	9.1053	20.8350		
				11.243	.000*

Note: * =significant at .05 level ($p \leq .05$).

Hypothesis Eight

It was hypothesized that there would be no statistically significant difference between the experimental and control groups on the Activity Log MILK Measurement.

The T-test for Independent Samples was performed. As indicated in Table X, there was a statistically significant difference between the experimental and control groups on the Activity Log MILK measurement. This indicated that a significant mean difference existed between the two groups. Therefore, the null hypothesis was rejected.

TABLE X
T-TEST FOR INDEPENDENT SAMPLES FOR MILK

Variable---Activity Log MILK Measurement					
Group	N	Mean	SD	t-score	Sig. (2-tail)
Exp.	79	39.8101	29.7951		
Control	35	8.0000	20.0939		
				5.756	.000*

Note:* =significant at .05 level ($p \leq .05$).

Discussion of the Results

The purpose of this study was to measure the effectiveness of an osteoporosis health education program on subsequent behaviors. The final measure was to determine if an identified intervention would result in measurable behavior changes. Based on the literature review, health education programs do not in and of themselves produce a health promoting behavior change. The literature review documented that many components are inter-related when looking at health promoting behavior changes. These components include self-esteem, values of health promotion, health risk appraisal values, and

knowledge. All have been documented to have varying influences on health promoting behavior changes. As the literature review pointed out, with rising health care costs it is imperative that health care providers not only find interventions that promote health behavior changes, but find ones that are feasible and economical. Therefore, this study looked at all of those aforementioned aspects as well as at an economical intervention.

The needs assessment documented that the college age population is not drinking sufficient amounts of milk. A presentation was developed to inform this age group about osteoporosis, the risk factors, and health promoting behaviors. An experimental style of study was designed in order that one could measure any differences that might occur between the two groups. It was hypothesized that there would be no difference between the two groups on the knowledge test. The knowledge test was given in pre-test format, followed by an educational presentation, and then given again in post-test format. The literature shows that knowledge is critical and one must first have basic knowledge and understanding about osteoporosis. Even though the time frame for the pre-test, presentation, and the post-test, was minimal, the analysis of data indicated that there was a significant difference for both groups in knowledge scores over time. This change was in a positive direction when you take into account that the lowest score is the better score. This difference indicates that one can speculate that presenting educational information is valuable. Educators have long been under the assumption one must have time to absorb information. Perhaps it is not so much the time frame as it is the personal impact to the client that allows for intake of information.

It was believed that there would be differences seen in self-esteem, health promoting lifestyle behaviors, health risk appraisal scores, and the final questionnaire, if

there were behavior changes documented. This was not the case. The analysis of the data indicated that there was not a significant difference in self-esteem, health promoting lifestyle behaviors, health risk appraisal scores and the final questionnaire.

The health promoting lifestyle behavior tool has six subscales that were measured. Those subscale measurements included self-actualization, health responsibility, exercise, nutrition, personal support, and stress management. These six subscale means showed no significant difference between the experimental and control groups. This indicated that the groups looked very similar in these categories. It is especially notable to re-emphasize that for two of the subscales, exercise and nutrition, the two groups also looked very similar. It was surprising to not see any differences in these two subscales. The mainstream of popular thought would suggest that the values participants placed on these two topics would have been an indication of their involvement levels with behavior change. This was not so. In speculating why this difference did not occur, one must then ask the question – ‘Why did the behavior change?’ Was the change due to the act of recording the changes? This researcher suggests that recording behavior was an important component to the resultant changes.

The main two statistically significant differences in this study were 1) the difference of Activity Log WALK measurement, and 2) the difference of Activity Log MILK Measurement. The analysis of the data showed that there was a significant difference between the two groups on these two activity log measurements. The students indicated days of exercise or drinking of milk on calendars. The research hypotheses were rejected since there were significant differences between the two groups. The analysis of the data indicated that there were more students who reported higher amounts

of exercise than drinking of milk even though both reported amounts were statistically significant.

Final explanations only intrigue the researcher to begin to explore new and diverse issues and their correlations. For example, is one population more apt to record information than another population? Is recording of the event the critical component in changing a behavior? If so, then for how long must one record a behavior before it begins to be a 'lifestyle change'? This data suggests that further research studies are needed to compare these findings.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Chapter V includes a summary of the findings, conclusions and recommendations. Recommendations include two categories: (1) recommendations for health care professionals and (2) recommendations for further study.

The purpose of this study was to measure the effectiveness of a health education program on subsequent behaviors. This study investigated the differences between two groups, experimental and control, based on self-esteem, health risk appraisal, health promoting lifestyle behaviors and knowledge base about osteoporosis. In addition, the investigator wanted to determine if there were any differences in health promoting behavior changes based on an intervention- the activity log. Significance of this study could impact the overall health of people, impact health care costs, impact loss of work expenses, and promote a general sense of well-being.

Summary of Findings

The data collected in this study was analyzed at the conclusion of the three month time frame. The data was analyzed at the .05 level of significance. Each of the hypotheses was examined to see if differences occurred between the two groups,

experimental and control, in regard to self-esteem, health promoting lifestyle behaviors – total score and subscale scores, health risk appraisal, final questionnaire, and Activity log for milk and walk measurements. In addition, the investigator examined the osteoporosis knowledge base tests to determine if there were any differences based on time – pre and post-test. The data yielded the following findings in relationship to each hypothesis:

- *Hypothesis One - There will be no statistically significant difference between experimental and control groups based on timing of the knowledge test (pre-test vs. post-test). Rejected.*
- *Hypothesis Two - There will be no statistically significant difference between the experimental and control groups on health risk appraisal scores. Accepted.*
- *Hypothesis Three - There will be no statistically significant difference between the experimental and control groups on the Rosenberg Self-Esteem Scale. Rejected.*
- *Hypothesis Four - There will be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Total Score. Accepted.*
- *Hypothesis Five - There will be no statistically significant difference between the experimental and control groups on the Health Promoting Lifestyle Profile Six Sub-scale Scores. Accepted.*
- *Hypothesis Six - There will be no statistically significant difference between the experimental and control groups on the Activity Log Final Questionnaire. Accepted.*

- *Hypothesis Seven - There will be no statistically significant difference between the experimental and control groups on the Activity Log WALK Measurement. Rejected.*
- *Hypothesis Eight - There will be no statistically significant difference between the experimental and control groups on the Activity Log MILK Measurement. Rejected.*

Conclusions

The results of this study indicate that there are significant differences among the experimental and control groups based on time for knowledge scores. This demonstrates that even brief and basic amounts of health education effectively produce change in knowledge base even when delivered over a relatively short time span. Therefore, one cannot discount any amount of health education provided to the person. Sheahan, S. (1998), Griffith, H. & Rahman, M. (1994), Long (1993), Merrill, E. (1995), and Pender, N. (1995) described the role of professionals in health risk identification, health promotion counseling and education. Taira et al (1997) reported that these discussions occur with much less frequency than recommended by the US Preventive Service Task Force. Sheahan, S. (1998), Costakis et al (1999) and Hays et al (1998) report on the cost-effectiveness of health promoting behaviors. According to these studies, it appears beneficial to implement health education and counseling at every possible opportunity in an effort to increase the knowledge base of the person. It seems that health education could have a significant impact on promotion of change for healthy behaviors.

The results of this study indicate that there are significant differences in groups when given an activity log to record health promoting behaviors related to exercise (walking) and nutrition (drinking milk or eating calcium rich foods). The experimental group reported a significantly higher reporting of these behaviors for both exercise and nutrition. The experimental group reported higher changes in exercise than in nutrition. Tiara et al (1997) reported that low-income patients were more likely to report attempting to change their behaviors based on physician advice. This investigation demonstrated the importance of having the client record their activity for future follow-up visits and counseling with the physician. This intervention was feasible and realistic for patients to complete as demonstrated by the responses. A single sheet calendar outline or dated journal format is simple for the professional to provide at the time of the counseling. It appears that this simplistic intervention could be quite beneficial in promoting healthy lifestyle behavior changes. Multiple benefits are well documented in the literature resulting from healthy lifestyle behaviors: reduction of morbidity and mortality, increased work productivity, decreased health care costs and increased quality of life.

It is worthwhile to further explore the relationship between recording behavior changes and the actual changing of health promoting lifestyle behaviors. If this process of reporting and recording assists the person in follow-through for behavior changes, then it is certainly important to incorporate this intervention into the process of health care caregivers. It is justifiable to include reporting components in any behavior change programs.

Recommendations

Recommendations for Health Care Professionals

The literature documents the value of health promoting behaviors, both personally and socially. The findings indicated the value of providing an intervention that promotes the recording of behaviors on an activity log. These findings indicate several implications for health care professionals. The following are recommendations for health care professionals to further encourage health promotion benefits.

1. It is important to provide educational information about the condition or circumstance.
2. It is important to provide information regarding the risks associated with the condition.
3. It is important to take the opportunity to ask the client for feedback regarding their knowledge and understanding of the information presented to them at the visit.
4. It is important to provide an intervention opportunity to the client where in they become an active participant in their changes for health promoting behaviors.
5. It is important for health care professionals to realize that the education and counseling does not have to be a lengthy process in regard to time investment.

6. It is important for the health care professionals to realize that the education and counseling does not have to provide high level educational information that covers every minute detail known.
7. It is important for the health care provider to have the client leave with something in hand on which to record their behaviors.
8. It is important for the health care provider to have the client know that they will be coming back for a follow-up visit and that the client will be asked to show their recording of the health behavior changes.

Recommendations for Further Study

Given the findings of this study and the importance of research in the field of promoting healthy lifestyle behavior changes, the following recommendations are made for future research studies:

1. A qualitative study may provide understanding into what motivates a client to change their behavior when the activity is to be recorded and reported. The interview method could provide further information on the client's thought process and motivation.
2. A continuation of this study over a longer time span would allow one to investigate if the behavior changes continue and for how long. This might give health care professionals information on length of time necessary for follow-up in order to still have an effective behavior change.

3. A comparative study for populations with healthy behaviors and those without healthy behaviors for economical evaluation in the health care system.

Perhaps the cost effectiveness comes in reimbursement for those clients who produce changes and continued reimbursement for follow-up visits rather than for crisis interventions and “ill” care.

According to researchers such as Costakis et al (1999), there is an important relationship between stage of exercise adoption and the practice of other healthy behaviors. Unfortunately, there are few studies that document behavior changes over a long period of time. However, it seems feasible that this type of research would provide valuable information about health care and promotion of lifestyle behavior changes.

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APPENDIX A
PILOT TEST PRE AND POST SCORES

(PILOT STUDY)
Evaluation
Pre-test Post-Test Scores for the Presentations

	Question	A				B				C				D			
		Pre C	Pre Inc	Post C	Post Inc	Pre C	Pre Inc	Post C	Post Inc	Pre C	Pre Inc	Post C	Post Inc	Pre C	Pre Inc	Post C	Post Inc
1	Osteoporosis is a disease that affects bone density.	5	1	6	0	10	0	10	0	14	1	15	0	8	0	8	0
2	A major consequence of osteoporosis is bone fractures.	6	0	6	0	9	1	10	0	15	0	15	0	8	0	8	0
3	Being female puts you at higher risk for osteoporosis.	6	0	6	0	8	2	10	0	14	1	15	0	8	0	8	0
4	Exercising throughout your life helps prevent osteoporosis.	5	1	6	0	10	0	10	0	14	1	15	0	8	0	8	0
5	Calcium intake has significant impact on bone density.	6	0	6	0	10	0	10	0	15	0	15	0	8	0	8	0
6	Young adults need a 1000 milligrams of calcium a day.	4	2	4	2	8	2	10	0	11	4	3	12	8	0	8	0
7	Health care cost related to osteoporosis exceeds 14 Billion dollars annually.	6	0	6	0	10	0	10	0	12	3	15	0	6	2	8	0
8	Smoking cigarettes does not increase chances for osteoporosis.	6	0	6	0	8	2	10	0	11	4	15	0	7	1	8	0
9	Excessive drinking of alcohol does increase the chance for osteoporosis.	6	0	6	0	8	2	10	0	8	7	15	0	3	5	8	0
10	High doses of cortisone-like drugs for asthma, arthritis, or cancer will not increase the possibility of developing osteoporosis.	3	3	6	0	9	1	9	1	11	4	13	2	4	4	7	1
11	Broccoli is a good source of calcium.	3	3	6	0	6	4	10	0	10	5	15	0	7	1	8	0

APPENDIX B
DEMOGRAPHIC QUESTIONNAIRE

Osteoporosis Study Demographic Questionnaire

1. Present college major _____ -
2. Select the appropriate category for your enrollment status this semester.
 - a. Full-time: 12 credit or more
 - b. Part-time: 6-11 credits
 - c. One class only: 1-5 credits
3. Gender:
 - a. male
 - b. female
4. Age
 - a. 16-20
 - b. 21-25
 - c. 26-30
 - d. 31-35
 - e. 36-40
 - f. 41-45
 - g. 46-50
 - h. 51-55
 - i. 56 and older
5. Ethnic background
 - a. Afro-American
 - b. Asian
 - c. Caucasian
 - d. Hispanic
 - e. American Indian
 - f. Other

APPENDIX C

THE ROSENBERG SELF-ESTEEM SCALE

ROSENBERG SELF - ESTEEM SCALE

Please complete the following items by circling the letter of the response which best describes how you feel.

1. I feel that I'm a person of worth, at least on an equal plane with others.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

2. I feel that I have a number of good qualities.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

3. All in all, I am inclined to feel that I am a failure.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

4. I am able to do things as well as most other people.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

5. I feel I do not have much to be proud of.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

6. I take a positive attitude toward myself.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

7. On the whole, I am satisfied with myself.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

8. I wish I could have more respect for myself.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

9. I certainly feel useless at times.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

10. At times I think I am no good at all.
 - a. Strongly Agree
 - b. Agree
 - c. Disagree
 - d. Strongly Disagree

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APPENDIX D

HEALTH PROMOTION LIFESTYLE PROFILE QUESTIONNAIRE

HEALTH PROMOTION LIFESTYLE PROFILE QUESTIONNAIRE

Directions: This questionnaire contains statements regarding your present way of life or personal habits. Please respond to each item as accurately as possible and try not to skip any item. Indicate the regularity with which you engage in each behavior by circling:

N for Never, S for sometimes, O for Often or R for Routinely.

1. Eat breakfast.	N	S	O	R
2. Report any unusual signs or symptoms to a physician.	N	S	O	R
3. Like myself.	N	S	O	R
4. Perform stretching exercises at least three times per week.	N	S	O	R
5. Choose foods without preservatives or other additives.	N	S	O	R
6. Take some time for relaxation each day.	N	S	O	R
7. Have my cholesterol level checked and know the result.	N	S	O	R
8. Am enthusiastic and optimistic about life.	N	S	O	R
9. Feel I am growing and changing personally in positive directions.	N	S	O	R
10. Discuss personal problems and concerns with persons close to me.	N	S	O	R
11. Am aware of the sources of stress in my life.	N	S	O	R
12. Feel happy and content.	N	S	O	R
13. Exercise vigorously for 20-30 minutes at least three times per week.	N	S	O	R
14. Eat 3 regular meals a day.	N	S	O	R
15. Read articles or books about promoting health.	N	S	O	R
16. Am aware of my personal strengths and weaknesses.	N	S	O	R
17. Work toward long-term goals in my life.	N	S	O	R
18. Praise other people easily for their accomplishments.	N	S	O	R
19. Read labels to identify the nutrients in packaged food.	N	S	O	R
20. Question my physician or seek a second opinion when I do Not agree with recommendations.	N	S	O	R
21. Look forward to the future.	N	S	O	R
22. Participate in supervised exercise programs or activities.	N	S	O	R
23. Am aware of what is important to me in life.	N	S	O	R
24. Enjoy touching and being touched by people close to me.	N	S	O	R
25. Maintain meaningful and fulfilling interpersonal relationships.	N	S	O	R
26. Include roughage/fiber (whole grains, raw fruits, raw vegetables) in My diet.	N	S	O	R
27. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O	R
28. Discuss my health care concerns with qualified professionals.	N	S	O	R
29. Respect my own accomplishments.	N	S	O	R
30. Check my pulse rate when exercising.	N	S	O	R
31. Spend time with close friends.	N	S	O	R
32. Have my blood pressure checked and know what it is.	N	S	O	R
33. Attend educational programs on improving the environment in which we live.	N	S	O	R
34. Find each day interesting and challenging.	N	S	O	R
35. Plan or select meals to include the "basic four" food groups each day.	N	S	O	R
36. Consciously relax muscles before sleep.	N	S	O	R
37. Find my living environment pleasant and satisfying.	N	S	O	R
38. Engage in recreational physical activities (such as walking, swimming, soccer, bicycling).	N	S	O	R
39. Find it easy to express concern, love, and warmth.	N	S	O	R
40. Concentrate on pleasant thoughts at bedtime.	N	S	O	R
40. Concentrate on pleasant thoughts at bedtime.	N	S	O	R
41. Find constructive ways to express my feelings.	N	S	O	R
42. Seek information from health professionals about how to take good care of myself.	N	S	O	R

43. Observe my body at least monthly for physical changes/danger signs.	N	S	O	R
44. Am realistic about the goals I set.	N	S	O	R
45. Use specific methods to control my stress.	N	S	O	R
46. Attend educational programs on personal health care.	N	S	O	R
47. Touch and am touched by people I care about.	N	S	O	R
48. Believe that my life has purpose.	N	S	O	R

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health promoting lifestyle profile: development and psychometric characteristics. Nursing Research, 36, 76-81.

APPENDIX E

OSTEOPOROSIS KNOWLEDGE TEST
(PRE- AND POST-TEST)

OSTEOPOROSIS KNOWLEDGE TEST
(PRE- AND POST-TEST)

Circle the correct response.

- | | |
|------------|---|
| TRUE FALSE | 1. Osteoporosis is a disease that affects bone density. |
| TRUE FALSE | 2. A major consequence of osteoporosis is bone fractures. |
| TRUE FALSE | 3. Being female puts you at higher risk for osteoporosis. |
| TRUE FALSE | 4. Exercising throughout your life helps prevent osteoporosis. |
| TRUE FALSE | 5. Calcium intake has significant impact on bone density. |
| TRUE FALSE | 6. Young adults need 1000 milligrams of calcium a day. |
| TRUE FALSE | 7. Health Care cost related to osteoporosis exceeds 14 billion dollars annually. |
| TRUE FALSE | 8. Smoking cigarettes does not increase chances for osteoporosis. |
| TRUE FALSE | 9. Excessive drinking of alcohol does increase the chance for osteoporosis. |
| TRUE FALSE | 10. High doses of cortisone-like drugs for asthma, arthritis, or cancer will not increase the possibility of developing osteoporosis. |
| TRUE FALSE | 11. Broccoli is a good source of calcium. |

APPENDIX F

OSTEOPOROSIS HEALTH RISK APPRAISAL QUESTIONNAIRE

HEALTH RISK APPRAISAL – OSTEOPOROSIS: CAN IT HAPPEN TO YOU?

Learn more about this bone thinning disease that causes debilitating fractures of the hip, spine, and wrist. Complete the following questionnaire to determine your risk for developing osteoporosis.

QUESTION	YES	NO
1. Do you have a small, thin frame, or are you Caucasian or Asian?	_____	_____
2. Do you have a family history of osteoporosis?	_____	_____
3. Are you a post-menopausal woman?	_____	_____
4. Have you had an early or surgically induced menopause?	_____	_____
5. Have you been taking an excessive thyroid medication or high doses of cortisone-like drugs for asthma, arthritis, or cancer?	_____	_____
6. Is your diet low in dairy products and other sources of calcium?	_____	_____
7. Are you physically inactive?	_____	_____
8. Do you smoke cigarettes or drink alcohol in excess?	_____	_____

The more times you answer “yes”, the greater your risk for developing osteoporosis. See your physician, and contact the National Osteoporosis Foundation for more information.

National Osteoporosis Foundation
1150 17th Street, N. W., Suite 500
Washington, D.C. 20036-4603

Reprinted with permission from the National Osteoporosis Foundation, Washington, DC 202-223-2226.

APPENDIX G

ACTIVITY LOGS
(REPORT AND MARCH, APRIL, AND MAY)

OSTEOPOROSIS STUDY ACTIVITY REPORT

Please use the following calendars to record exercise and calcium intake.

For each day that you walk 30 minutes – record on that dated square the words walk-30 minutes and the time of day you walked.

Also record on the dated square the type and amount of food or drink that you are during that date that would have calcium content. Some examples of this would be if you were to drink three glasses of milk you would record three glasses of milk for that date, if you ate a serving of cottage cheese you would include that. If you are taking a calcium supplement, record the date and the amount of that also.

Foods containing calcium are listed below for your reference.

Hard cheese, almonds, sesame seeds, dark green leafy vegetables, milk, sunflower seeds, brazil nuts, broccoli, parsley, watercress, sardines – with the bones, yogurt, spinach, rice, ice cream, cottage cheese, baked beans, halibut, garbanzo beans, chick peas.

March

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

2001

April

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

2001

May

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

2001

APPENDIX H
FINAL ACTIVITY LOG QUESTIONNAIRE

FINAL ACTIVITY LOG QUESTIONNAIRE

Based on the presentation you heard in February did you change any of the following behaviors:

1. Walking: Yes _____ No _____
If Yes, please explain what you changed _____
2. Drinking of milk: Yes _____ No _____
If Yes, please explain what you changed _____
3. Taking a calcium supplement: Yes _____ No _____
If Yes, please explain what you changed _____
4. If you did not change any behaviors as a result of the educational program, do you believe you should change any behaviors? Yes _____ No _____

If Yes, describe those behaviors you believe you should change _____ and
what you believe would motivate you to do so _____

APPENDIX I
OSTEOPOROSIS PRESENTATION SLIDES

OSTEOPOROSIS

NO BONES ABOUT IT

DIANE OKESON, RN, MN, ARNP-CNS
Dean of Nursing and Allied Health
Pratt Community College

Copyright 7/22/99 D. Okeson

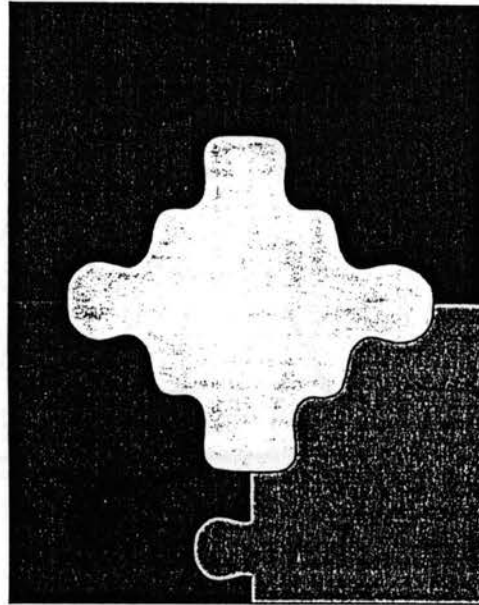


OSTEOPOROSIS: CAN IT HAPPEN TO YOU ?

- 1. Do you have a small, thin frame, or are you Caucasian or Asian ?**
- 2. Do you have a family history of osteoporosis ?**
- 3. Are you a postmenopausal woman ?**
- 4. Have you had an early or surgically induced menopause ?**
- 5. Have you been taking excessive thyroid medication or high doses of cortisone-like drugs for asthma, arthritis, or cancer ?**
- 6. Is your diet low in dairy products and other sources of calcium ?**
- 7. Are you physically inactive ?**
- 8. Do you smoke cigarettes or drink alcohol in excess ?**

• **National Osteoporosis Foundation**

FITTING ALL THE PIECES TOGETHER



WHAT IS OSTEOPOROSIS ?

Bone Disease

- Decreasing total bone mass
- Crippling
- Painful

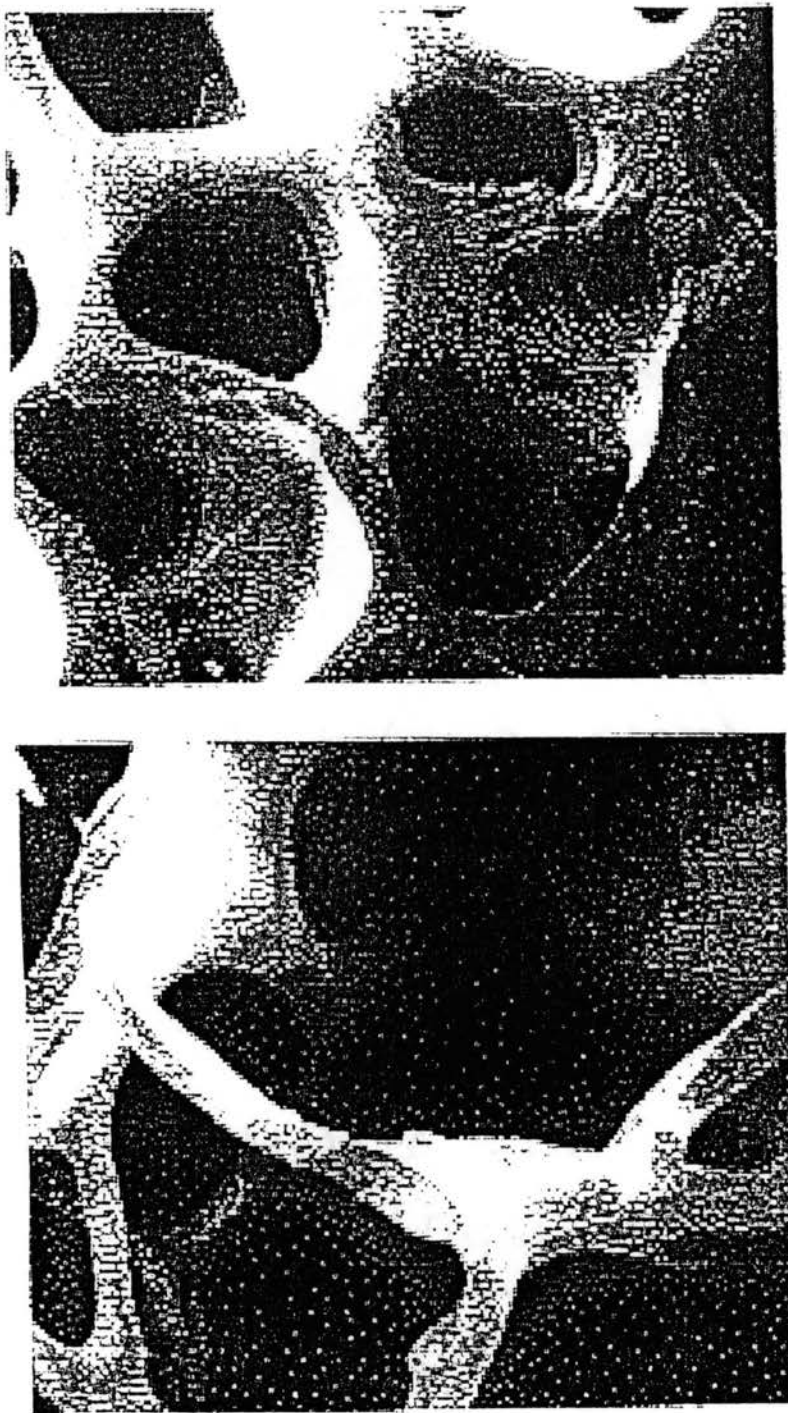


Figure 1. Osteoporotic Bone Compared with Normal Bone

Adapted from Compston, D. W., et al. A simple method for correlation light and scanning electron microscopy of thin sections of great beam thickness. *Calcif. Tiss. Int.* 1985; 37: 1-6. Reprinted with permission from the National Osteoporosis Foundation, Washington, DC. 2003/223/2236

LET'S EXAMINE THE ISSUES





DEMOGRAPHIC RISK FACTORS

- **Female**
- **Increased age**
- **Caucasian**
- **Oophorectomy**
- **Prolonged immobility**
- **Insufficient dietary calcium**
- **Cigarette smoking**
- **Excessive alcohol intake**
- **Decreased ingestion of vitamin D**
- **APOE4 (Gene linked to Alzheimer's - 2 X risk)**



WHY WOMEN ?

- ◉ **Less calcium intake**
- ◉ **Less peak bone mass (Smaller frame)**
- ◉ **Resorption begins earlier**
- ◉ **Resorption accelerates at menopause**
- ◉ **Pregnancy and breastfeeding deplete skeletal reserve**
- ◉ **Women live longer than men**



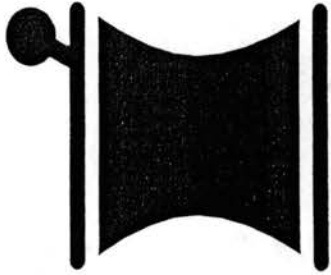
HOW BIG IS THE PROBLEM ?

- **Common cause of fractures (1/2 women, 1/5 men)**
- **1.5 million people suffer from osteoporotic fractures**
- **40% of women over the age of 50 will have a hip fracture**
- **10-20% of elderly will die within one year of hip fracture**
- **15-25% of one year survivors require long-term institutional care**
- **41 million Americans at risk**
- **80% of patients treated for fractures were not diagnosed and treated for osteoporosis**



HEALTH PROMOTION -- YOU CAN:

- **Exercise**
- **Increase calcium in diet**
- **Stop smoking**
- **Stop excessive alcohol intake**
- **Decrease your stress**
- **Increase public awareness**
- **Take estrogen replacement therapy**



IF EXERCISE WERE A PILL

• Patients

- 25 million people with osteoporosis

• Dosage

- 2-3 weekly weight lifting workouts for arms and legs

• Result

- Halt bone loss or rebuild bone



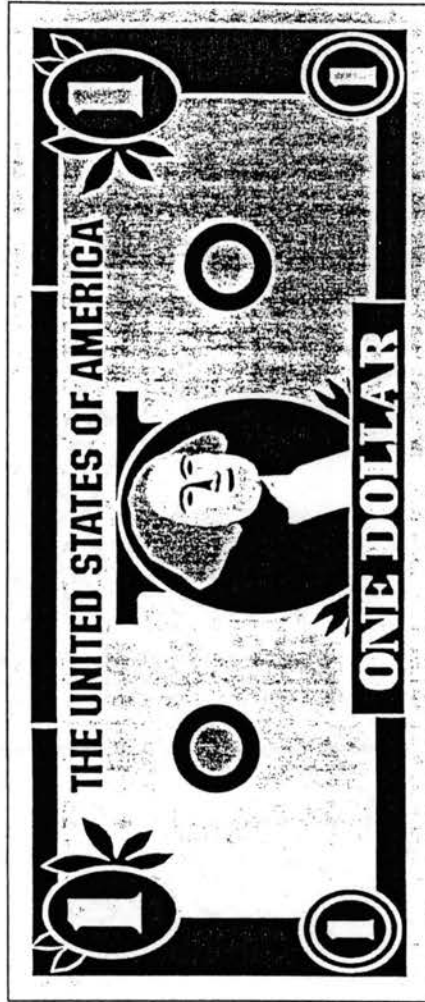
CALCIUM - RICH FOODS



- ◉ **Milk**
- ◉ **Ice Cream**
- ◉ **Cottage, Cheddar, Swiss Cheese**
- ◉ **Broccoli, Turnip Greens, Collard Greens**
- ◉ **Orange Juice (Fortified)**
- ◉ **Canned Salmon With Bones**



\$\$ COSTS \$\$



**U.S. Spends \$14 Billion Annually for
Institutional Care of Osteoporotic Patients**

TREATMENT COSTS

- Bone Density Scan -- \$75.00 - \$150.00
- Fosamax - 5-10 mg/day - one year -- \$544.00
- Broken Hip - 11 days in hospital --
\$16,871.00

Federal Funding



- Medicare Bone Mass Measurement Coverage Standardization Act
- Education
- Research
- Testing





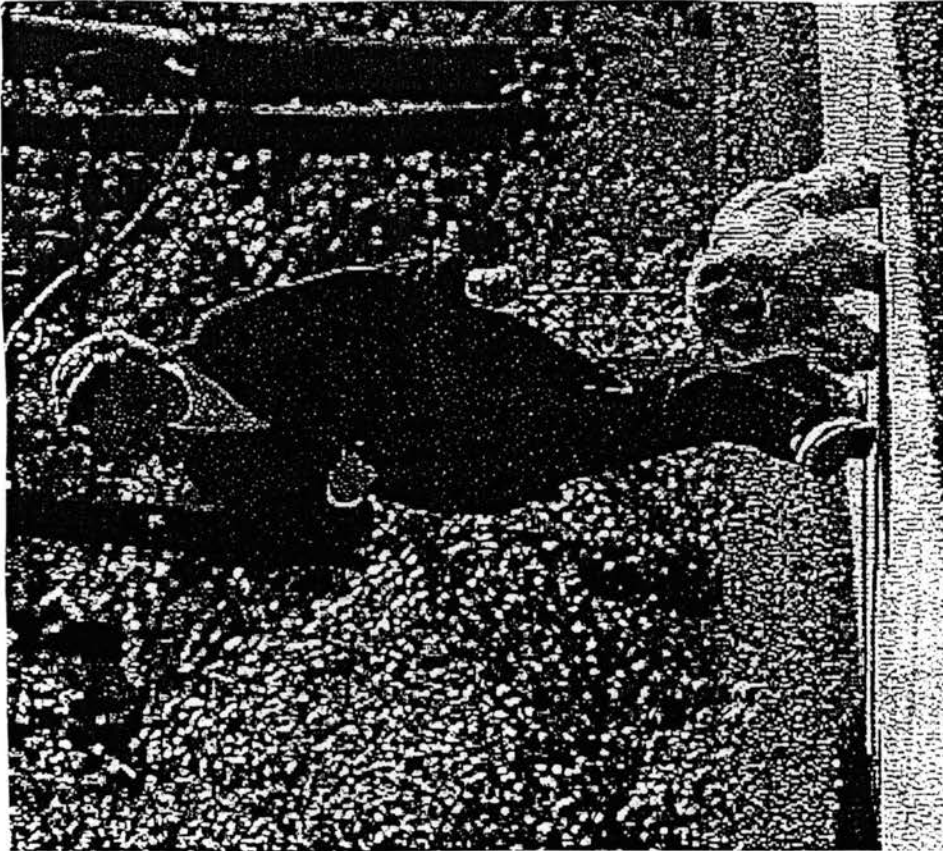
HEALTH PROMOTION

• **CONTRACT**

- **Knowledge**
- **Attitude**
- **Plan for behavior change**

• **30 X 3 Rule**

- **30 days - 90% won't**
- **next 30 days - 90% will**
- **last 30 days - behavior change**



QUESTIONS



APPENDIX J

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

Oklahoma State University
Institutional Review Board

Protocol Expires: 2/27/02

Date : Wednesday, February 28, 2001

IRB Application No ED0184

Proposal Title: THE EFFECTIVENESS OF AN OSTEOPOROSIS HEALTH EDUCATION PROGRAM ON
SUBSEQUENT HEALTH BEHAVIORS

Principal
Investigator(s) :

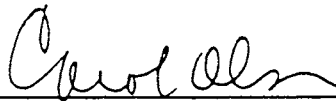
Diane Okeson
348 NE SR 61
Pratt, KS 67124

Betty Edgley
110 Colvin Center
Stillwater, OK 74078

Reviewed and
Processed as: Expedited

Approval Status Recommended by Reviewer(s) : Approved

Signature :



Carol Olson, Director of University Research Compliance

Wednesday, February 28, 2001

Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX K

HPLP PERMISSION CONSENT LETTER



348 NE S.R. 61, Pratt, KS 67124-8317
316-672-5641 or 1-800-794-3091


February 23, 2001

Dr. Nola Pender
Associate Dean
School of Nursing
University of Michigan
Ann Arbor, MI

Dear Dr. Pender:

I am a doctoral student at Oklahoma State University. I am requesting permission to use your Health Promotion Lifestyle Profile in my dissertation entitled "The Effectiveness of an Osteoporosis Health Education Program on Subsequent Behaviors."

Sincerely,


Diane Okeson, MN, RN, ARNP-CNS
Dean of Nursing Education and Allied Health

DO/sj

Permission
granted
Nola Pender
2/27/01

APPENDIX L

ROSENBERG CONSENT LETTER

MARYLAND

Department of Sociology
University of Maryland
College Park, Maryland 20742-1315

The Rosenberg Self-Esteem Scale

Thank you for your interest in the Self-Esteem Scale of Dr. Morris Rosenberg, regrettably, Dr. Rosenberg passed away several years ago. However, Dr. Florence Rosenberg, Manny's widow, has given permission to use the Self-Esteem Scale for educational and professional research. Please be sure to give the credit due to Dr. Morris Rosenberg when you use it. We would also appreciate receiving copies of any published works resulting from this research.

Below you will find a copy of the scale, along with brief instructions on norming and scoring it. A fuller description of the scale may be found in the Appendix of Society and the Adolescent Self-Image. You may wish to contact Dr. Rosenberg's co-authors for more information relating to his work.

There is no charge associated with the use of this scale in your professional research.

Frequently Asked Questions

- The ten items constitute the scale
- Originally, they were treated as a Guttman scale, but later were scored as a Likert scale with responses of yes and no.
- To score these items, assign a value to each item, e.g. zero for each low self-esteem answer and one for each high self-esteem answer. The items are reversed in some cases. Then each individual has a score, e.g. ten indicates high self-esteem responses on all items and zero indicates low self-esteem on all items. Then individuals can be compared in terms of numerical scores.

Rosenberg Self-Esteem Scale

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The scoring for some items needs to be reversed so that in each case the scores go from less to more self-esteem. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Scale Items and Scoring Procedure

The ten scale items were presented, as below, with these instructions: **BELOW IS A LIST OF STATEMENTS DEALING WITH YOUR GENERAL FEELINGS ABOUT YOURSELF. IF YOU STRONGLY AGREE, CIRCLE SA. IF YOU AGREE WITH THE STATEMENT, CIRCLE A. IF YOU DISAGREE, CIRCLE D. IF YOU STRONGLY**

DISAGREE, CIRCLE SD.

		1. STRONGLY AGREE	2 AGREE	3. DISAGREE	4. STRONG DISAGREE
1.	On the whole, I am satisfied with myself.	SA	A	D*	SD*
2.	At times I think I am no good at all.	SA*	A*	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D*	SD*
4.	I am able to do things as well as most other people.	SA	A	D*	SD*
5.	I feel I do not have much to be proud of.	SA*	A*	D	SD
6.	I certainly feel useless at times.	SA*	A*	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D*	SD*
8.	I wish I could have more respect for myself.	SA*	A*	D	SD
9.	All in all, I am inclined to feel that I am a failure.	SA*	A*	D	SD
10.	I take a positive attitude toward myself.	SA	A	D*	SD*

References with further characteristics of the scale:

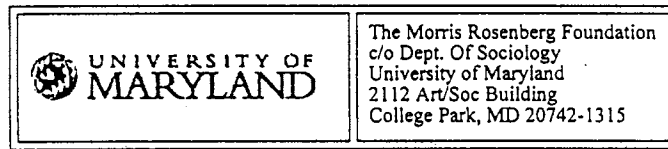
Crandal, Rich
1973. The Measurement of Self-Esteem and Related Constructs, Pp. 80-82 in J.P. Robinson and P.R. Shaver (eds.), Measures of Social Psychological Attitudes. Revised Edition. Ann Arbor: ISR.

Rosenberg, M.
1965. Society and the Adolescent Self-Image. Princeton, New Jersey: Princeton University Press. (Chapter 2 discusses construct validity.)

Silber, E. and Tippett, Jean
1965. Self-esteem: Clinical assessment and measurement validation. Psychological Reports, 16, 1017-1071. (Discusses multitrait-multimethod investigation using RSE.)

Wylie, Ruth C.
1974. The Self-Concept. Revised Edition. Lincoln, Nebraska: University of Nebraska Press. (Especially pp. 180-189.)

The RSE scale may be used without explicit permission. The author's family, however, would like to be kept informed of its use:



APPENDIX M
INSTITUTIONAL CONSENT LETTER



348 NE S.R. 61, Pratt, KS 67124-8317
316-672-5641 or 1-800-794-3091

February 13, 2001

Dr. Betty Edgley
Oklahoma State University
School of Applied Health and Educational Psychology
110 Colvin Center
Stillwater, OK 74078-2021

Dear Dr. Edgley:

I am writing in support of Diane Okeson's research study entitled "The Effectiveness of an Osteoporosis Health Education Program on Subsequent Behaviors". I have been informed by Ms. Okeson about her study and have reviewed the protocol. I am granting permission for her to conduct her study on our campus.

Sincerely,

A handwritten signature in black ink that reads "James S. Stratford".

Jim Stratford
Vice-President of Instruction
Pratt Community College

JS/jj

APPENDIX N
INFORMED CONSENT FORM

INFORMED CONSENT

I, _____, hereby authorize or direct Ms. Diane Okeson, OSU doctoral student, or associates or assistants of her choosing, to perform the following treatment or procedure:

I have been asked to participate voluntarily in a Oklahoma State University research study entitled, "The effectiveness of an Osteoporosis Health Education Program on Subsequent Behaviors." The purpose of the study is to investigate the effects of an osteoporosis education program on college students. I may be asked to fill out questionnaires, walk for 30 minutes 3 times per week, keep a log of my activities, record my intake of calcium or listen to a presentation on osteoporosis depending upon my exact participation status. There are no known risks or discomforts associated with participation in these activities. It is hoped that this research may discover important information regarding the problems associated with osteoporosis. All information gathered in this study is kept in the strictest confidence and no individual scores will ever be reported. I understand that my participation is voluntary and that I will not be penalized if I choose not to participate. I also understand that I am free to withdraw my consent and end my participation in this project at any time without penalty after I notify the project director, Ms. Diane Okeson.

If I have any questions I may contact the researcher, Ms. Diane Okeson at 348 NE S.R. 61, Pratt, KS 67124. Phone: 1-316-672-5641 (ext. 232) or Ms. Sharon Bacher, IRB Executive Secretary, Oklahoma State University, 203 Whitehurst, Stillwater, OK 74078. Phone: 1-405-744-5700. I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me at my request.

Date: _____ Time: _____ (a.m./p.m.)

Name (printed)

Signature

APPENDIX O
INSTRUCTION SCRIPT

The recruitment script will go like the following:

Introduction:

My name is Diane Okeson and I am a doctoral student at Oklahoma State University. My doctoral research is entitled: "The Effectiveness of an Osteoporosis Health Education Program on Subsequent Behaviors".

Purpose:

The purpose of this study is to investigate the effects of an osteoporosis education program on college students. Osteoporosis is a very serious problem in our nation. In July of 1999, the National Osteoporosis Foundation reported that 25 million Americans were affected by osteoporosis. One out of every two women and one in five men will have an osteoporosis related fracture. With 1.5 million fractures annually that are related to osteoporosis, the health care costs are rising dramatically. In 1987, the estimated national direct expenditures (institutional care) and indirect expenditures (lost earnings) were in excess of 10 billion dollars annually. Health educators are trying to find the best ways to teach people about osteoporosis and preventive measures which include health promotion activities. The research data will be used to determine both the need for public health action and to re-evaluate the health educational programs available to the public.

Participation:

I request your participation in this research. Your participation is strictly voluntary and you will not be penalized in any way should you choose not to participate. You are also free to withdraw your consent and end your participation in this project at any time without penalty after you notify the project director – myself. You may be asked to fill out questionnaires, walk for minutes three times per week, keep a log of your activities, record your intake of calcium or listen to a presentation on osteoporosis, depending on your exact participation status. There are no known risks or discomforts associated with participation in these activities. As participants, you will be requested to follow all directions to the best of your ability.

Confidentiality:

All information gathered in this study is kept in the strictest of confidence and not individual scores will ever be reported. The administration procedures are designed to protect your privacy and allow for confidentiality. Published reports will not include names of participating schools or students and will only report aggregate – group – data.

Questions:

Are there any questions? (Respond to the questions.)

Thank you for your participation in this study.

APPENDIX P
PARTICIPANT LETTER

February 27, 2001

Dear Participant,

Osteoporosis is a very serious problem in our nation. In July of 1999, the National Osteoporosis Foundation reported that 25 million American were affected by osteoporosis. One out of every two women and one in five men will have an osteoporosis related fracture. With 1.5 million fractures annually that are related to osteoporosis, the health care costs are rising dramatically. In 1987, the estimated national direct expenditures (institutional care) and indirect expenditures (lost earnings) were in excess of 10 billion dollars annually. Health educators are trying to find the best ways to teach people about osteoporosis and preventive measures which include health promotion activities.

A doctoral dissertation entitled, "The Effectiveness of an Osteoporosis Health Education Program on Subsequent Behaviors" is being conducted under the School of Applied Health and Educational Psychology at Oklahoma State University.

Education should guarantee that people acquire the knowledge and skills they need to adopt a lifestyle that virtually eliminates their risk for osteoporosis and fractures related to osteoporosis. The research data can be used to determine both the need for public health action and re-evaluate the health educational programs available to the public.

I request your participation in this research study. Participation is voluntary. The administration procedures are designed to protect your privacy and allow for confidentiality. Published reports will not include names of participating schools or students and will only report aggregate types of data.

Your cooperation and assistance in participating in this survey is appreciated. Thank you for your assistance.

Sincerely,

Diane Okeson
Researcher

VITA

Diane LaVon (Minks) Okeson

Candidate for the Degree of

Doctor of Education

Thesis: THE EFFECTIVENESS OF AN OSTEOPOROSIS HEALTH EDUCATION PROGRAM ON SUBSEQUENT BEHAVIORS OF COLLEGE STUDENTS

Major Field: Applied Educational Studies

Biographical:

Education: Graduated from Ulysses High School, Ulysses, Kansas in May of 1971; received Bachelor of Science degree in Nursing from Fort Hays State University, Hays, Kansas in May 1975; received a Master of Science degree in Nursing from the University of Kansas, Lawrence, Kansas in October of 1988. Completed the requirements for the Doctor of Education degree with a major in Applied Educational Studies at Oklahoma State University in August 2001.

Experience: Dean of Nursing and Allied Health, Pratt Community College, 1998 – present. Governor's Appointment as a Full Board Member to the Kansas State Board of Nursing, Topeka, 1999 – 2003. Associate Professor, Southwestern College, Winfield, 1994 - 1998. Assistant Professor, Wichita State University, Wichita, 1988-1994. Faculty, Garden City Community College, 1985-1987. Administrator of Scott County Home Health Agency and Scott County Health Department, Scott City, 1980-1985. Various nursing positions.

Professional Memberships: National League for Nursing, Sigma Theta Tau, National Council of State Boards, Kansas Organization of Nurse Leaders, Kansas Council of Associate Degree Nurse Educators, Kansas Council of Practical Nurse Educators, National League for Nursing Accrediting Commission.

Awards & Honors

Governor's Appointment to KSBN (1999–2003); President's Honor Roll; Dean's Scholarship; Nomination for Outstanding Young Teacher (WSU 1992); Outstanding Young Women in America (1982); Who's Who Among Students in American Colleges and Universities (1975); Nominated for the Froehlke Award at K.U. (1987)