Predictors of exercise behaviors in nursing students

Eileen K Gemmell

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PREDICTORS OF EXERCISE BEHAVIORS
IN NURSING STUDENTS

by

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Bachelor of Science
Loma Linda University
1977

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science
in
Nursing

Department of Nursing
University of Nevada, Las Vegas
December 1998
The Thesis prepared by

Eileen K. Gemmell

Entitled

-Predictors of Exercise Behaviors in Nursing Students-

is approved in partial fulfillment of the requirements for the degree of

Master of Science in Nursing

Examination Committee Chair

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ABSTRACT

Predictors of Exercise Behaviors in Nursing Students

by

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Physical activity has been identified as a major deterrent of many diseases, and is one of our nation's top priorities for health promotion. The purpose of this research study was to determine whether personal factors and perceptions of the benefits of and barriers to exercise, as selected factors of Nola Pender's Revised Health Promotion Model (1996), predict exercise patterns in a convenient sample of A.D.N. and B.S.N. nursing students (N = 311). A predictive design was used.

The students' mean score for exercise behaviors was 2.14 (on a scale of 1-4), which indicates inconsistent exercise. The most frequently cited benefit of exercise was "exercising increases my level of physical fitness" (99.02% agreed). The most frequently cited barrier to exercise was "exercise takes too much of my time" (45.48% agreed). The personal factors of age and marital status were not predictive of nursing students' perceptions of the benefits ($R^2 = -.003$) or barriers to exercise ($R^2 = -.005$), nor their exercise behavior ($R^2 = .006$). Nursing students' perceptions of exercise benefits were
predictive of exercise behaviors ($R^2 = .203, p = .000$), and their perceived barriers to exercise were predictive of their exercise behaviors ($R^2 = .184, p = .000$).
ACKNOWLEDGEMENTS

Many people have pulled me through this experience. Librarians, who so patiently answered questions have become valuable resources to me. Paul Nakayu, who exhibited patience and professionalism saved me from insanity. My chairperson, Dr. Susan Kowalski, who has encouraged excellence has given me inspiration. Neighbors who have acted interested in this thesis have kept me motivated. Friends who have reminded me of their prayers have kept me humble. My children, Nathan, Erika, and Jacob, who have learned to become independent have given me courage. Parents and siblings, who had undying confidence that there would be an end to this project have kept me focused. My husband, David who consistently confirmed his love and support has made my dreams realities. Last, but not least, my God, who has demonstrated His interest and leading in each aspect of this endeavor has brought me to the realization that with Him all things are possible. To these I will always be grateful.
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CHAPTER 1

INTRODUCTION

Background

With escalating health care costs, national attention is currently focusing upon strategies for disease prevention and health promotion. The American Heart Association (1997) has identified physical inactivity as a major risk factor influencing mortality rates. Blair, et al. (1995) discovered in their study of 9,777 men, that those who maintained or improved adequate physical fitness were less likely to die from cardiovascular disease than men who were physically unfit.

As many as 250,000 deaths per year in the United States (about 12% of total deaths) are attributed to a lack of regular physical activity (American Heart Association, 1997). The benefits of a physically active lifestyle have been well documented. However, only about 15% of American adults engage in regular vigorous physical activity three times a week for at least 20 minutes according to American Heart Association.

Physical activity has been identified as a major deterrent of cardiovascular disease, as well as other illness such as diabetes, hypertension, osteoporosis, depression, and obesity. Physical activity and fitness have been identified by the U.S. Department of Health and Human Services (1992) in Healthy People 2000: National Health Promotion and Disease Prevention Objectives, as being a top priority for health promotion. Regular
physical exercise can increase life expectancy (Paffenbarger, et al. 1993), and can enhance the quality of life at each developmental stage (Katz, et al. 1983).

The goal for the nation, as expressed in Healthy People 2000 (U.S. Department of Health and Human Services, 1992), is to increase light to moderate regular, preferably daily, physical activity for at least 30% of the population, (which is a 8% increase from 1985). A second goal is to reduce sedentary lifestyles to no more than 15% of our nations’ population (a 9% decrease from 1985).

Recent recommendations regarding exercise, from the Center for Disease Control (CDC) and the American College of Sports Medicine, encourage 30 minutes of moderately intense physical activity on most days of the week (Manson, 1996). This recommendation was designed to present less of an obstacle to exercise for the population than previous recommendations (Pate, Pratt, Blair, Haskell, Macera, Bouchard, et al., 1995). The current recommendations would facilitate reaching the nations' goal of increasing physical activity.

Nurses are the largest occupational group of health professionals in western society. There is evidence that few comply with health behaviors when compared to the general public (Soeken, Bausell, Winklestein, Carson, 1989). There is very little current literature that directly addresses the exercise patterns of nursing students and factors that predict those health-promoting behaviors.

In today's health care system there is a growing focus on health promotion, which is a major responsibility of nurses. It has been well established that exercise is important for one's health. Exercise is a health-promoting behavior that is important for youth in school. Health promotion behaviors begun in youth set patterns for lifelong practices.
Nursing students are better able to support their clients if they are practicing the health behaviors that they are promoting. Little is known about student nurses' exercise behaviors, and factors that predict their exercise behaviors.

Purpose

The purpose of this study was to describe the exercise patterns of nursing students, and to determine the extent that selected variables, suggested by Pender's 1996 revised HPM, are able to predict exercise practices. These variables include personal factors, as well as student nurses' perceptions of the benefits of and barriers to exercise. Pender's revised Health Promotion Model (1996) was utilized for the theoretical framework of this study.

Significance

An increased knowledge of lifestyle patterns among student nurses may give direction to future curriculum and facility design. As student nurses are more equipped to practice health-promoting behaviors such as regular exercise, they will be more effective in their role as health promoters. There have been no identified studies to date testing Pender's variables in nursing students. The use of a student nurse population group may expand the usefulness of the revised Health Promotion Model.
CHAPTER 2

REVIEW OF LITERATURE

Introduction

Health promotion and disease prevention have captured the nation's focus for the past two decades. Exercise has been widely documented to have a positive effect on one's health. The purpose of this research study is to determine the extent to which selected demographic and behavior-specific cognition variables, suggested by Pender's revised 1996 Health Promotion Model (HPM), can predict exercise behaviors practiced by nursing students. The personal factors selected for this study are based on Pender's suggestions (1996, 1998) and the researcher's experience. The personal factors include "age" and "marital status". Other independent variables derived from Pender's revised HPM (1996) include perceptions of the benefits and barriers to exercise, with the dependent variable being exercise behaviors.

The concepts addressed in the literature review are health promotion, relevant studies using Pender's HPM or revised HPM, nursing students' health-promoting behaviors, and demographic research. A review of the literature will address health professionals' perceptions of the benefits of exercise and the barriers of exercise, as well as current recommendations regarding exercise.
Health Promotion Definitions

A common definition of health is "a state of well-being, of optimum functioning, of the absence of disease, and the control of both external and internal risk factors." (Jonas, 1995, p.7). Watson (1988) defined health as harmony with self and environment, while Pender (1982) described health as the actualization of inherent and acquired human potential.

Pender (1996) makes a distinction between health promotion and health protection as outlined in Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Health promotion is driven by the desire to increase well-being and actualize human health potential. It is focused on moving toward a positive state of high-level health and well-being. Pender identifies health promotion as being "approach" motivated as opposed to "avoidance" motivated, with the goal being to expand positive potential for health. Health protection, on the other hand, is driven by a desire to actively avoid illness, with early detection or a maintenance of functionality within the restrictions of an illness. Health protection focuses on moving away from a negative state of illness and injury. Health promotion seeks to expand positive potential for health, while health protection seeks to thwart the conception of insults to health and well-being.

King (1994) views health promotion and disease prevention as being complementary, although she insists that the goal of health promotion has a broader focus than disease prevention. Health-promoting activities may increase one's state of health and involve people in a participatory capacity, whereas disease prevention activities may strive to maintain the status quo.
The World Health Organization (WHO) (Turner, 1986) describes health promotion as encouraging healthy lifestyles, creating supportive environments for health, strengthening community action, refocusing health services, and building healthy public policy. Health promotion should be targeted to communities as well as individuals and families.

Pender (1982) maintains that health-promoting behaviors are intended to "sustain or increase the level of well-being, self-actualization, and fulfillment of a given individual or group." She suggests that it is the nurses' role to lead in the education and promotion of healthy lifestyle changes.

One important health-promoting behavior is exercise. Exercise has been defined (Blair, Kohl, Gordon, Paffenbarger, 1992, p. 101) as "planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness".

Pender (1996) subscribes to Caspersen, Powell, and Christenson's (1986) definition of physical activity as "any bodily movement produced by skeletal muscles that results in caloric expenditure" and suggests exercise is leisure-time or part of an active lifestyle. Leisure-time or endurance exercise would include physical activity such as jogging, bicycling, or swimming. Active lifestyle activities include climbing the stairs rather than taking an elevator, gardening, or parking a distance away from a destination.

History and Trends of Health Promotion

Historians view Florence Nightingale as a pioneer in the area of health promotion. She created conditions in which the restoration and preservation of health and the prevention of disease and injury were possible (Novak, 1988) and identified simple
practices for nurses to deliver which assisted in the promotion of health (Spellbring, 1991).

For the past two decades the nation's focus has been captured by health promotion and disease prevention. As the costs for health care escalated from $42 billion a year, or 5.9% of the gross national product (GNP), in 1965, to 900 billion or 14% of the nation's GNP in 1993, attention has been redirected to how diseases can be prevented and health promoted (Hickey, 1996).

One of the nation's priorities has become the control of health care costs. A set of broad national goals for improving American's health was introduced in 1979 in the report Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention. Since the Surgeon General released his first report on health promotion some gains have been made in the areas of blood pressure control, injury prevention, smoking reduction, immunization, and dental health. Less progress has been made in the areas of exercise (Pender, 1996).

In 1980, 226 specific health goals in the areas of health promotion, health protection, and preventive health services were released in the document, Health Promotion—Disease Prevention: Objectives for the Nation (U.S. DHHS, 1980). These goals were effective in drawing the nation's attention to the importance of disease prevention and health promotion to increase longevity as well as improve the quality of life. Again, in 1987, objectives were developed for the year 2000, and in 1990, Healthy People 2000: National Health Promotion and Disease Prevention Objectives was published.
From research examining healthy lifestyles, there has been an emergence of models focusing on illness avoidance, disease prevention, health protection, and a model which utilizes a health promotion framework (Nemeck, 1986, Pender, 1987). Research has provided refinement of various models such as the Health Belief Model, the Protection Motivation Theory, the Social Cognitive Theory, and Pender's (1986) Health Promotion model. Prediction of health-promoting behaviors and strength of the variables have been the focus of the models. A refined model can serve as a basis for effective health promotion interventions.

Background of Pender's Health Promotion Model

The Health Promotion Model (HPM) was developed by Pender to serve as a guide for exploration of the biopsychosocial processes that motivate individuals to participate in health-promoting activities (Pender, 1987). It was subsequently modified after being tested for strength of explanation of variables (Pender, 1996). It has developed as a framework for integrating nursing and behavioral science perspectives on factors which influence health behaviors (Pender, 1996).

The development of the Health Promotion Model (HPM) was influenced by Becker's Health Belief Model (1974) and the Social Cognitive Theory (Bandura, 1977). Becker's Health Belief Model (1974) served as a paradigm for health-protecting or preventive behavior, while Pender's Revised Health Promotion Model (1996) was developed for examining health-promoting behavior. The social cognitive theory places major emphasis on self-direction, self-regulation, and perceptions of self-efficacy. According to this theory, self-beliefs are powerful influencers of human behavior. Pender incorporates self-efficacy as a central construct in the HPM.
The HPM differs from the Health Belief Model and Protection Motivation Theory in that the HPM does not include "fear" or "threat" as sources of motivation for health behavior. Pender acknowledges that immediate threats to health may have been shown to motivate action, but she suggests that threats in the distant future lack the same motivational strength. Therefore, the HPM is applicable to any health behavior in which "threat" is not a major source of motivation for the behavior.

Pender (1996, p. 22) views health as "the actualization of inherent and acquired human potential through goal-directed behavior, competent self-care, and satisfying relationships with others while adjustments are made as needed to maintain structural integrity and harmony with relevant environments." This concept incorporates both actualizing and stabilizing tendencies.

Pender, et al. (1992) describes several major developmental influences that emerge from the person-environment interactions and may provide points of high receptivity on the part of groups to health promotion and disease prevention nursing interventions. She suggests that normative age-specific influences such as menopause, parenthood, and entrance into school may be critical points at which health-promoting changes can take place. Student nurses would certainly fit into this developmental stage. Thus, they are of interest to the researcher for health promotion in their own context.

Pender, et al. (1992) identifies strategies such as exercise promotion, nutrition education, or smoking cessation counseling to be well within the role of the primary care nurse. She views the undergraduate nursing program as a context in which the nursing students could examine their own life-styles, to make desired behavioral changes, and to
gain an appreciation of their professional responsibility for "role modeling" healthy behaviors.

**Exercise Related Research Using HPM**

Research using Pender's (1986) Health Promotion Model (HPM) as it relates to exercise include a study by Pender, et al. of 539 working adults participating in corporate fitness programs in Midwest corporations. All of her model variables except "cues to action" were used in the study. Pender found 59% of the variance in exercise was explained directly with "perceived control of physical fitness", "exercise efficacy", "barriers", "control of health", and "prior exercise behavior".

Exercise patterns of 361 community-dwelling older adults (Walker et al., 1990), aged 55 and older were studied. Analysis using LISREL showed significant direct paths between benefits and barriers to exercise. Garcia, et al. (1995) found demographic characteristics, situational factors, and perceived benefits and barriers to account for 19% (N = 286) of the variance in exercise frequency and intensity in their study of preadolescents and adolescents.

Sechrist (1990) found behavioral factors, perceived self-efficacy, and perceived barriers account for the major portion of variance in the study of exercise frequency among cardiac rehabilitation patients (N = 511). Frank-Stromborg (1990) studied ambulatory cancer patients' exercise frequency and discovered that their perceived health status, perceived benefits, and perceived barriers to account for 42% (N = 385) of the variance in exercise.
Research Involving Nursing Students

There are no recent studies regarding health-promoting behaviors of nursing students. Several studies have been done in the past, with the most recent being in 1989. There are no studies which have focused exclusively on nursing students' exercise behaviors.

In Richter's (1987) study of health behaviors of 86 nursing students, wellness behaviors tended to decrease over the course of six months. The Lifestyle Assessment Questionnaire (Hettler, 1982) as well as blood pressure measurement, apical pulse, and height-weight ratio were recorded. Students expressed a conflict between knowing what they should do to be healthy, and being unable to achieve health goals because of school schedules and expectations. Richter, et al. (1987) believed that stress which was secondary to expectations in nursing school and curricular change was possibly responsible for impacting the students' wellness behaviors.

In 1984 the faculty of Northern Arizona University (Benson, 1988) were alarmed when many of their nursing students reported stress-related problems. A series of wellness seminars was offered to a group of 29 community health nursing students. They completed an instrument created by the Center for Disease Control (CDC) which measures overall health risks. Their smoking rate was lower than the national average: 82% nonsmokers as compared with 68% of the population nationwide. Eight percent had 20 or more drinks per week, as compared with 4.7% of people nationally. About 37.5% of this class of 29 was found to be exercising intensely enough to maintain an aerobic training response.
Dittmar, Haughey, O'Shea, and Brasure (1989) studied 1,081 female nursing students and found varied results. Sixty-eight percent reported physical activity of 2-4 times per week, and the majority obtained six to eight hours of sleep per night. Sixty-nine percent reported non-smoking or former smoking status. Their research demonstrated a statistically significant relationship between preventive-health orientation scores and age and type of basic nursing education. The ages of students ranged from 17-25, with the mean being 24 and a standard deviation of 2.2. The ages were grouped into 3 groups, and the mean scores of health promoting behaviors increased with age from 6.89 to 7.38 out of a total score of 13. Diploma, associate degree, and baccalaureate nursing students were studied, with associate degree students scoring the highest (7.33), but very close to the baccalaureate degree students (7.30). The diploma students demonstrated the lowest score of 6.69 out of 13 for health-promoting behaviors.

Soeken, et al. (1989) compared a study of 139 final year nursing students with 228 females from a national sample previously studied by Bausell (1985). The nursing students were significantly less compliant with health promoting behaviors than the general population in 12 of the 19 health promoting behaviors studied. In regards to exercise, 13% reported exercising regularly as opposed to 52% of the national sample.

Parkes (1982) found that social support was an important factor, and was responsible for less anxiety and depression among nursing students doing medical-surgical rotations. Haack's (1988) study of 707 nursing students showed that nursing students experience symptoms of burnout that are comparable to working nurses and that these symptoms increase with years in school. Student nurses increase their use of
alcohol from a level of 3.1 to 5.5 and 5.2 as they progressed to their junior and senior
years.

Wentzel (1989) studied the health behaviors of 100 nursing students and found
that 86% of the students admitted to insufficient cardiovascular exercise. Twenty nine
percent of the group smoked, 72% reported being overweight, and 18% acknowledged
inconsistent seatbelt use.

There is evidence of a positive relationship between a physically active lifestyle
with other positive health behaviors (Haskell, Montoye, Orenstein, 1985). People who
exercise regularly are less likely to be smokers (Wechsler & Gottliev 1979).

The most recent research regarding the exercise behaviors of nursing students in
America was in 1989. There is a paucity of current research regarding nursing students,
particularly from the Southwest region of America.

Demographics and Health-Promoting Behaviors

Several demographic variables have been found to be correlated with health-
promoting behaviors. They are age, gender, race or ethnicity, marital status, and income.

Age

Elkind (1980) found age to be less significantly correlated with health-promoting
behaviors than the level of education. However, other researchers (Dittmar, et al., 1989;
Murray, et al., 1981; Rausch, et al., 1987; Feldman & Richard, 1986) found that age had
a significant bearing on health-promoting behaviors. King, et al. (1992) found physical
activity to decrease with age.
Gender

Gender appears to have some bearing on health-promoting behaviors. Feldman, et al. (1986) found male student nurses smoke more than females. Women are more likely than men to engage in general preventive health promoting behaviors and to utilize preventive medical services (Kirscht, 1983). Callaghan's (1995) study of 113 nurses living in southeast England showed female nurses to be more compliant than male nurses with most wellness behaviors.

A U.S. study (Rausch, Zimmerman, Hopp, Lee, 1987) examining health-promoting behaviors in nursing students as they relate to gender found the prevalence of smoking in males is significantly more than females \( (n = 539, \chi^2 = 16.669, P<0.0005) \). Forty-five percent of the males in this sample were smokers, as compared to 25% of the females.

In studying the determinates of physical activity in past research of adults, King et al (1992) purports vigorous physical activity levels to be lower among women than men, yet when light and moderate daily living activities are included, the gender differences disappear. In a national random sample of 181,447 people, 44% of males reported regular moderate physical exercise vs. 37% of females (U.S. National Center for Health Statistics, 1990).

Race/Ethnicity

There were some differences noted by the U.S. National Center for Health Statistics survey (1990), with 41.5% of whites, 34.3% of Blacks, and 34.9% of Hispanics reporting regular exercise. Callaghan's (1995) study of English nurses showed a higher
reporting of smoking and alcohol use than American nurses, but reported more vigilance in health promoting diet than American nurses.

**Marital Status**

Marital status appeared to have some differences in several health-promoting behaviors according to the U.S. National Center for Health Statistics (1990). Thirty nine percent of the randomly selected 117,413 individuals who were currently married reported regular exercise, whereas 51.3% of the 33,413 individuals never married reported regular exercise. The smoking rates were very similar in married and single people. Twenty nine percent of individuals who were currently married reported being 20% or more above desired weight, vs. 19% of single people.

**Income**

Income correlated significantly with the health behaviors of regular exercise, smoking, and weight (U.S. National Center for Health Statistics, 1990), with higher income individuals practicing more health-promoting behaviors. However, drinking alcohol was reported more frequently among those with higher income levels.

**Benefits of Exercise**

There is wide scientific consensus that exercise is beneficial to health. Paffenbarger, et al. (1993) studied 14,786 Harvard alumni and concluded that regular physical activity is one major factor delaying all-cause mortality and extending longevity. Blair, et al. (1989) reported an inverse association between physical fitness and death from any cause after following 3000 women for eight years.
Regular physical activity improves health by reducing the risks of developing heart disease, diabetes, high blood pressure, colon cancer, depression and anxiety, and obesity. It helps maintain healthy bones, muscles, and joints, as well as promoting a sense of well-being (CDC, 1998).

Exercise has been shown to be beneficial even for those who have been ill. O'Connor, et al., (1995) studied 340 myocardial infarction survivors, and found that physical activity was inversely related to their myocardial infarction risk, independent of other risk factors for coronary heart disease.

Because other health behaviors may be triggered by the practice of engaging in exercise, it may be difficult to sort out the exclusive health benefits of exercise (Pender, 1996). Pender (1996) summarizes the ample evidence that supports physical exercise has positive effects on the cardiopulmonary system, immunologic system, endocrine, musculoskeletal systems as well as having a positive psychosocial effect.

Several researchers have studied people's perceptions of the benefits of exercise. Jones and Nies (1996) found older African American women \( (N = 30) \) view the benefits of exercise to be life enhancing, and contributing to their sense of well-being. However, this group of women attended a senior citizen center and exercise was part of their daily routine.

Sabina-McVety, Booth, Orban, and Richards (1988) studied 211 female, undergraduate Canadian nursing students. "Wanting to feel better" and "weight control" were the top two cited reasons for exercise in this population group.

All 77 subjects in Viar and Urey's (1988) study of senior baccalaureate nursing students believed themselves knowledgeable about the benefits of regular strenuous
exercise. Forty-four percent of these students were engaged in a form of a physical activity program, with 50% of these reporting activity at an aerobic level. Callahan's (1995) study of 113 English nurses found 67% desired to increase their exercise behavior, implying they were aware of the benefits of regular exercise.

Barriers to exercise

Pender (1996) suggests that one's perception of anticipated barriers negatively affect intentions to engage in a particular behavior and the actual practice of the behavior. These perceptions of barriers may be imagined or real. Structural barriers may relate to the unavailability, inconvenience, expense, time-consumption, or difficulty of a particular action. Personal barriers relate to an individual and include lack of energy, motivation, need, or health reasons. Dishman, et al. (1985) believe that personal barriers are the barriers most associated with a lack of exercise.

A lack of perceived barriers is an important determinate of an exercise behavior. When barriers are high and readiness to act is low, an action is unlikely to occur, according to Pender (1996). When barriers are low, and readiness to act is high, there is a higher probability that the behavior will occur.

Barriers cited most often in Jones' and Niles' (1996) study of 30 African American women were related to the accessibility and availability of exercise. Other significant barriers included fatigue, fear of looking funny in exercise clothes, and fear of walking in their neighborhood.

Lack of time due to university and work duties was reported by 41% ($N = 211$) of the nursing population studied by Sabina-McVety, Booth, Orban, and Richards (1988),
with the second most frequently cited barrier (30%) being inaccessible or inadequate facilities.

Shaw, Bonen, and McCabe's (1991) study of perceived exercise constraints of 18,293 Canadian adults found "lack of time because of work" was the most significant barrier (indicated by 54% of the sample). Other significant barriers included "no facilities nearby" (19%), "lack of time because of leisure activities" (17%), "low energy" (14.4%), "requires too much self discipline" (14.4%), and "costs too much" (12.9%).

Exercise Recommendations

Recent recommendations from the CDC regarding exercise encourage 30 minutes of moderately intense physical activity on most, if not all days of the week (Pate, et al. 1995). The American College of Sports Medicine (ACSM) has changed their recommendations from 70% of maximal oxygen uptake to a more moderate recommendation of 40-50% of maximal capacity (Blair, Kohl, Gordon, Paffenbarger, 1992). This recommendation should decrease some of the earlier perceived barriers and make complying with the current recommendation more attainable.

Summary

The nation has a growing interest in health promotion. Research has provided us with empirical evidence that there are multiple benefits to exercise. Nurses are natural role models for the general population, and it is likely that habits formed in nursing school will continue on and have an impact on how nurses live and how effective they are as role models.
Research using Pender's (1986) HPM as it relates to exercise have focused on working adults, older adults, and preadolescents and adolescents. Cardiac rehabilitation patients as well as ambulatory cancer patients have been studied in relation to exercise. No known studies involving nursing students have utilized Pender’s HPM framework.

Little is known currently about the specific exercise patterns of nursing students, or whether or not they actually follow the recommendations they’ve heard. Few published current studies have examined the predictors of their behaviors.

The reports of the research involving nursing students are mixed, with one study showing nursing students to have more health-promoting behaviors than the national average. Several studies found student nurses to have a lower level of health-promoting behaviors, and yet another which found nursing students were comparable to the general population in their health-promoting behaviors.

Most researchers found age and gender to have a significant bearing on health-promoting behaviors. Individuals of different races and marital status appeared to have differences in their health-promoting behaviors. Income was positively correlated with some health behaviors.

There is wide consensus among researchers as to the benefits of exercise. There was some diversity found in people’s perceptions of the benefits of exercise and the barriers to exercise, depending on who the population was that was studied. “Lack of time” was one perceived barrier that several researchers agreed on.

There is a paucity of research using Pender's (1996) revised Health Promotion Model relating to nursing students and their health-promoting behavior of exercise. There is very little literature that addresses the exercise practices of nursing students and their
perceived benefits and barriers. It is important to understand whether their perceived
benefits of and barriers to exercise are significantly associated with their exercise
patterns, since exercise has proven to be such a significant determinate of health. The
existing literature supported further investigation of the determinates of exercise
behaviors of nursing students as they relate to Pender’s HPM.
CHAPTER 3

FRAME OF REFERENCE

Introduction

Health promotion has become an important focus of the care delivered by nurses in today's health care climate. A model has emerged which has addressed health promotion and factors that predict health-promoting behaviors. Pender's Revised Health Promotion Model (HPM) (1996) encourages scholars to examine variables that have been shown to impact health behavior.

The model describes cognitive/perceptual factors such as perceived benefits and barriers to health-promoting behaviors. These factors are influenced by modifying factors such as personal factors. Pender (1998) purports that these variables are predictive of given health behaviors.

This chapter describes Pender's Revised Health Promotion Model (HPM) and the structure of the revised HPM in relation to the study's variables. This chapter also presents research questions, definitions, and assumptions of the study.

Conceptual Framework

Pender's revised Health Promotion Model contains two broad components of variables that predict the behavioral outcome or health promoting behavior. Appendix K, Figure 1 illustrates Pender's revised HPM (1996).
Individual Characteristics and Experience

One layer of variables that affects one's behavioral outcome is "individual characteristics and experiences". "Individual characteristics and experiences" are one's unique past and personal attributes that affect their subsequent action. Pender refers to these as "prior related behavior" and "personal factors". She believes the strength of the predictability of "prior related behavior" may be due to the habit formation and habit strength. Pender (1996) suggests prior behavior may also have a direct bearing on one's perceptions of self-efficacy, benefits, barriers, and activity-related affect.

Pender (1996) categorizes personal factors as biologic, psychological, and sociocultural. She suggests personal biologic factors include such physical characteristics as age, gender, body mass index, pubertal status, menopausal status, aerobic capacity, strength, agility, or balance. She describes personal psychological factors as self-esteem, self-motivation, personal competence, perceived health status, and definition of health. Personal sociocultural factors suggested by Pender include variables such as race, ethnicity, acculturation, education, and socioeconomic status. She suggests that only relevant factors be included in any given study.

The proposed study will examine the personal factors of age and marital status. Pender (1996) suggests age is an important determinate of barriers to exercise due to the dynamic changes of the demands of family life as one ages. Dishman, Sallis, and Orenstein (1985) suggest spousal support is an important determinate in one maintaining an exercise program. Preliminary demographics of both nursing schools' populations proposed for this study showed variations in age and marital status.
Behavior-Specific Cognitions and Affect

"Behavior-specific cognitions and affect" encompass variables which Pender believes are most significant as they are subject to modification through nursing interventions (Pender, 1996). These include perceived benefits of action, perceived barriers to action, perceived self-efficacy, and activity-related affect.

Perceived benefits may be intrinsic or extrinsic. Intrinsic benefits might include feelings of heightened energy or increased mental clarity. Examples of extrinsic benefits are monetary rewards or increased social interactions (Pender, 1996.)

Pender (1996) describes perceived barriers as blocks, hurdles, or personal costs of participating in a behavior. If the perception of benefits is high and the perception of barriers is low, the health-promoting activity is likely to take place. If the perceived barriers are higher than the benefits, the activity may not take place. These variables have a direct effect on one's commitment to a plan of action and to a health-promoting behavior. The relationship between nursing students' perceptions of benefits and barriers of exercise and their exercise behaviors will be examined in the proposed study.

Other modifying factors of the revised HPM include interpersonal influences such as family, peers, and providers, as well as norms, support, and models. Finally, situational influences such as the perceptions of options available or aesthetic features of the environment in which a health-promoting behavior is to take place influences one's commitment to a plan of action, and ultimately, their health-promoting behavior. If immediate competing demands and preferences interfere with the variables, the health-promoting behavior may not be performed.
Pender describes health-promoting behavior as the end point or outcome in the HPM. It is directed toward attaining positive health outcomes for the client. Relevant personal factors, the perceptions of benefits of exercise, perceptions of barriers of exercise, and the pattern of their health-promoting exercise behavior will be examined in the proposed study.

Research Questions

The research questions that are addressed are:

1. What is the exercise pattern of nursing students?
2. What perceived benefits of exercise are cited most often by nursing students?
3. What perceived barriers of exercise are cited most often by nursing students?
4. Do the personal factors of age and marital status predict nursing students' perceptions of the benefits of exercise and the barriers to exercise?
5. Do the personal factors of age and marital status predict nursing students' exercise behaviors?
6. Do nursing students' perceptions of benefits of exercise predict their exercise behaviors?
7. Do nursing students' perceptions of barriers to exercise predict their exercise behaviors?

Definition of Terms

The terms used in this study are defined conceptually first, then operationally. The terms are: nursing students, personal factors, perceived benefits of exercise, perceived barriers of exercise, and exercise.
Nursing students - Nursing students are conceptually defined as college students enrolled in nursing courses as their major program of study. Operationally, nursing students are defined as first through fifth semester students who are enrolled in a community college's A.D. program or a university's B.S.N. program.

Personal factors - Conceptually, personal factors are categorized as biologic, psychological, and sociocultural (Pender, 1996). They may directly influence behavior-specific cognitions and affect as well as health-promoting behaviors. Operationally, the personal factors are defined as age and marital status. Psychological personal factors are not within the scope of this study.

Perceived benefits of exercise - Conceptually, perceived benefits of exercise are defined as mental representations of reinforcing positive consequences of exercise. This is based on personal or vicarious experiences from prior experiences according to Pender (1996). The operational definition will be based on the results of Sechrist et al's (1987) Exercise Benefits and Barriers Scale (EBBS), a 43-item, 4-point forced choice Likert scale. Items relating to Exercise Benefits will be used as a sub-scale to define this concept operationally.

Perceived barriers of exercise - The conceptual definition of perceived barriers of exercise is an imagined or real perception concerning the inconvenience, unavailability, expense, time-consuming nature, or difficulty of the action of exercising which serves as a block to action (Pender, 1996). The operational definition will be based on the results of the EBBS, specifically the subscale of Barriers to Exercise.

Exercise - The conceptual definition of exercise is a "subset of physical activity that is planned, structured, repetitive, and has the improvement or maintenance of
physical fitness as an objective." (Caspersen, et al, 1985, p. 126). The operational definition of exercise will be based on the results of the physical activity component, questions 4, 10, 16, 22, 28, 34, 40, and 46 of the HPLPII. These questions address the behavior of following a planned exercise program, duration of at least 20 minutes, frequency of at least 3 times a week, and intensity of light to vigorous. Stretching exercises at least 3 times a week, exercising during usual daily activities, checking pulse rate when exercising, and reaching target heart rate during exercise will also be measured. The HPLPII was developed as a tool for measuring the overall health-promoting lifestyle, however, means can be derived for each subscale separately (Walker, Sechrist, Pender, 1987).

Assumptions

Assumptions of the proposed study include:

1. All persons strive to attain health and well-being.
2. Individuals seek to actively regulate their own behavior (Pender, 1996, p.55).
3. Individuals are the most reliable source of their health-related behavior.
4. All participants who choose to participate in the study will answer the surveys honestly, completely, and accurately.
5. The selected instruments will measure what they are intended to measure.

Summary

Pender's revised HPM (1996) is described in this chapter as the conceptual framework of the proposed research study. It is a model that addresses health promotion and factors that predict health-promoting behaviors.
Pender's revised HPM identifies behavior-specific cognitions and affect such as perceived benefits of action, perceived barriers to action, perceived self-efficacy, and activity-related affect. These factors are influenced by individual characteristics and experiences such as prior related behavior and by personal factors; biological, psychological, or sociocultural. Interpersonal influences and situational influences may affect one's commitment to a plan of action, which would ultimately predict the health-promoting behavior.

The purpose of this study was to examine the influence of the personal factors of age and marital status on nursing students’ perceptions of benefits of and barriers to exercise. The predictability of perceived benefits and barriers of exercise on their exercise behaviors was also examined.

The dynamics of the HPM variables help to explain how a person might choose to engage in a health-promoting behavior, such as exercise. The revised HPM provided direction for the researcher's research questions.
CHAPTER 4

METHODS AND PROCEDURES

Introduction

The purpose of this research study was to describe the exercise patterns of nursing students, and to determine the extent which selected variables, as suggested by Pender's 1996 revised HPM, predict their exercise practices. These variables included personal factors (age and marital status) as well as the nursing students' perceptions of benefits of exercise and perceptions of barriers to exercise.

This chapter describes the research design, sample, setting, population, measurement methods, procedure, ethical considerations for human subject protection, data analysis, and communication of findings.

Research Design

A descriptive, predictive design was utilized for this study. "Descriptive studies are designed to gain more information about characteristics within a particular field of study" (Burns & Grove, 1993, p. 293). The descriptive component focused on what the nursing students' personal factors are, what their perceptions of the benefits of exercise and the barriers to exercise are, and what their exercise pattern is.

"Predictive designs are developed to predict the value of one variable based on values obtained from another variable" (Burns & Grove, 1993, p. 302). A predictive
component is most congruent with the theoretical model chosen for this study. The variables “age” and “marital status” were chosen because it was felt that there would be a cross-section and prior studies had shown some significant differences in different ages and marital status. The predictive component determined the extent the personal factors of age and marital status predict the perceptions of benefits and barriers of exercise. It also determined the extent that nursing students' perceptions of benefits and barriers of exercise predict their exercise practices. Finally, the predictive component predicted exercise practices based on the values obtained regarding personal factors and perceptions of benefits of exercise and of barriers to exercise.

Sample

The target population consisted of first through fifth semester nursing students, who were currently enrolled in a nursing program. Although these students may have a variety of backgrounds, they were enrolled either part time or full time in a nursing program. The nursing programs were a community college's A.D. program, and a large university's B.S.N. program in the state of Nevada. The students were not known to the researcher, and participation was entirely voluntary.

Prior to the commencement of the study, demographic profiles were ascertained from the nursing faculty. The estimated preliminary demographic profile of the A.D. students (Kless-Kern, 1998) was as follows: males comprised 10% of the nursing students, with females representing 90%. There was a considerable age span with 15% age 20-25, 30% age 25-30, 30% age 30-35, 15% age 36-40, and 10% age 40 and older. Approximately 60% of the students were single, divorced, or separated, and 40% are married. There were an estimated 60% Caucasians, 15% African American, 10%
Hispanic, 10% Asian, and 5% other. Other personal factors such as number of children at home, hours worked per week, number of hours in school per week, or number of hours spent exercising were unknown.

The B.S.N. program preliminary demographic profile was estimated as follows (Witt, 1998): males comprised approximately 12% of the nursing students, with females representing 88%. The mean age of nursing students in this population was 27, with the range being 21-50 years of age. Single students represent approximately 58%, with 37.5% married, and 7.3% divorced or separated. Seventy percent of the students were Caucasians, 4% were African American, 4% Hispanic, 19% Asian or Pacific Islander, 1% Indian, and 2% unknown. The majority of students had no children at home.

Using a statistical power table with moderate effect size, a .80 power level, with an alpha level of .05, it was found that a sample of 192 was needed. The sampling for this study was conducted over one semester.

The sampling plan included convenience sampling of 311 students out of a total population of 330. This design was utilized because certain days were set aside for sampling, according to the faculty member's preference. "Convenience samples are inexpensive, accessible, and usually require less time to acquire than other types of samples" (Burns & Grove, 1993, p. 245.)

Setting

The setting for the data collection was in the classrooms of the community college and university at the end or beginning (depending on the preference of the instructor) of one of the students' regularly scheduled class. Both educational institutions are large,
with thousands of students in attendance in multiple disciplines. The facilities for both settings were modern, well lit, and had comfortable desks.

Measurement Methods

Three self-administered instruments were utilized for data collection: (1) a biographical questionnaire was used to obtain personal factor data; (2) the physical activity segment of the HPLP II was utilized to measure exercise-related behaviors of nursing students; (3) the EBBS was utilized to identify perceived benefits of and barriers to exercise.

Personal Factors

Demographic frequencies which were analyzed include: type of nursing program enrolled in (nominal data); semester enrolled in (ordinal data); age (interval data); gender (nominal data); race (nominal data); marital status (nominal data); number of children at home (ordinal data); ages of children at home (interval data); hours worked per week (interval data); and income (interval data). The researcher intended to analyze “number of credits presently carrying in school” but there was such a large range, that there was obvious confusion regarding this demographic question. From the researcher's past experience of being enrolled in school and trying to maintain an exercise pattern, it was felt that these factors are important in describing the sample and would identify personal factors related to exercise behavior (See Appendix G).
Health-Promoting Lifestyle Profile II

A segment of the Health-Promoting Lifestyle Profile II (HPLP II) (Walker, Sechrist, Pender, 1987) was a part of the survey packet. This instrument is a revision of the original which consisted of six subscales. The subscales are intended to measure: health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth, and stress management. The instrument was designed to measure the overall health-promoting lifestyle by the use of all subscales, or means can be derived for each subscale separately. According to Walker (98), "it is appropriate for use in research within the framework of the Health Promotion Model, as well as for a variety of other purposes."

The physical activity component of the revised Health-Promoting Lifestyle Profile II (HPLP-II) (Walker, et al., 1987) was designed to analyze the exercise frequency of stretching, vigorous exercise, moderate exercise, leisure-time exercise, implementing a planned exercise program, daily physical activity, checking the pulse during exercise, and reaching a pulse rate during exercise. It was utilized for this investigation to measure exercise related behaviors of nursing students. This component is an eight-item, 4 point summated rating scale. A range of scores with 1 = never, 2 = sometimes, 3 = often, and 4 = routinely reflected an ordinal level of measurement. The range of possible scores was 8-32, with the higher overall scores indicating a more health-promoting lifestyle including regular exercise patterns. Reliability for the HPLP is indicated by the alpha coefficient of .922 obtained by Walker, et al. in 1987. Reliability for this instrument obtained by the researcher for the present study was indicated by the alpha coefficient of .832 (N = 309).
Validity for the HPLPII was conducted by item analysis on a pool of 107 items to identify those which contributed most to the internal consistency of the measure. This was followed by factor analysis of the refined item pool, and by reliability measures to estimate the internal consistency of the instrument in its final form (Walker, Sechrist, Pender, 1987). Permission to utilize this instrument was obtained from Dr. Susan Walker (Appendix D).

**Exercise Benefits/Barriers Scale**

The Exercise Benefits/Barriers Scale (EBBS) is a 43-item instrument which was designed to identify perceived benefits of and perceived barriers to exercise (Sechrist, et al., 1987). A 4-point forced-choice Likert format is used in this tool to obtain an ordinal measure of the strength of agreement with the item statements. Benefits are scored as strongly agree to strongly disagree, with barriers being reverse scored, thus utilizing ordinal measures. The possible range of scores is 43 to 172 for the total instrument, with the possible range of scores on the benefits scale 29-116, and on the barriers scale the possible range is 14-56 (Sechrist, et al., 1987). Cronbach's alpha was used by Sechrist, et al. (1987) to check for internal consistency of the EBBS. A standardized alpha of .952 was obtained. The 29-item benefits scale had a standardized alpha of .953 and the barriers scale had an alpha of .866. Correlation coefficients were .889 for the entire instrument, with .893 for the benefits scale and .772 for the barriers scale. The researcher’s check for internal consistency was very close to Sechrist’s. The Cronbach's alpha coefficients were .957 (N = 286) for the benefits scale, and .857 (N = 280) for the barriers scale.

Content validity was established by four nurse researchers familiar with exercise and health promotion literature (Sechrist, et al., 1987). Construct validity was established
by factor analysis, which yielded nine factors, five benefits and four barriers, which explained 64% of the variance in the instrument. Permission was obtained from Dr. Karen Sechrist to use this instrument for the proposed research study (See Appendix E).

Pilot Study

In April of 1998, four survey packets were distributed to nursing students, two from each program, to assess for relevancy and clarity. It was also administered to determine the feasibility of the study, and to determine the time-frame needed for the sampling. There were no problems identified at that time, hence, no adjustments were made.

Procedure

The administrators of both nursing programs were contacted. They gave their verbal and written permission (Appendix H) for the research to take place, pending the approval of the instructors of the various nursing classes involved.

The instructors of the nursing classes were contacted by phone, email, or in person by the researcher. They were given the option to allow their class to participate in the study, and if they were in agreement a date was set up for the announcement of the study to the class, and a date for the sampling itself. The instructors who were agreeable to the study were given a letter outlining the details of the sampling, confirming the dates of the sampling, and they responded with a signature of approval (Appendix H).

Approximately one week prior to the sampling date, fliers were placed in the school elevators announcing the study. The instructors of the various classes also verbally announced the study.
On the day of the sampling, the researcher entered the classroom at the time requested by the instructor and announced the planned research study. There was a verbal and written description (Appendix I) of the study. The identity of the researcher, purpose of the study, length of time it would take, confidentiality, and nonobligation to participate were discussed in all classes and in the cover letter. The cover letter included the researcher's name, address, and phone number.

All subjects who agreed to participate in the research study filled out a demographic questionnaire, the physical activity component of the HPLPII, and the entire EBBS (see Appendixes C, E, G). Surveys were placed by the students in an unmarked envelope which they sealed. The researcher collected the survey packets at the conclusion of the class period. Completion of the survey indicated consent to participate in the study.

Completed surveys were reviewed by the researcher only. The surveys were numerically coded to facilitate information retrieval and record keeping. Data from survey forms were entered onto computer disc utilizing the SPSS Graduate Pack 8.0 program. Surveys and back-up discs are maintained at the researcher's residence. They do not identify the participant's names. Access to survey information is available to the researcher only.

Twelve surveys were randomly picked, two from each group of 50 surveys to determine the accuracy of data entry into the computer. All 12 surveys audited were correct.

**Ethical Considerations**

Ethical considerations were examined by the following entities in the following order: Thesis Committee, The Department of Nursing UNLV Human Rights Review.
Committee, UNLV Human Subject Rights Review Committee, and the nursing department administrations of the university and community college (see Appendixes A, H). Approval from all was obtained before any participants were approached.

The risk-benefit ratio was considered. The risk identified was the time involved with completing the surveys. This was time taken away from their regular classwork. The benefits included the knowledge generated regarding student nurses’ health behaviors. If this experience was an impetus to the students modifying their exercise patterns, there may be a lower risk factor for cardiovascular disease, diabetes, arthritis, osteoporosis, obesity, cancer, COPD, and depression (Elrick, 1996). The participants had an opportunity to gain knowledge of the research process firsthand. The benefits were believed to be greater than the expected risks. This was confirmed by UNLV’s Human Subjects Rights Committee as well as UNLV Nursing Department.

Data Analysis

Three hundred thirty surveys were distributed to nursing students in May of 1998. Seventeen surveys were returned uncompleted. Two of the remaining 313 surveys were omitted from analysis due to 50% of the data were missing. Hence, 311 surveys were available for statistical analysis, signifying a return rate of 94%. Sample size was adequate for desired effect size and power.

Demographic characteristics, physical activity behaviors, and perceptions of the benefits and of barriers of exercise were analyzed descriptively to provide information on the characteristics of the sample. Scores from the HPLPII and Exercise Benefits and Barriers Scale were calculated individually and grouped according to benefits and barriers.
The research questions were addressed in the following manner:

1. Frequency analysis was used to determine the exercise patterns in nursing students. The first research question was addressed by utilizing data from the HPLPII questionnaire.

2. Frequency analysis was used to address the second research question which addresses the nursing students’ perceptions of the benefits of exercise. The scores from the Exercise Benefits/Barriers Scale (EBBS) were analyzed. Questions 1, 2, 3, 5, 7, 8, 10, 11, 13, 15, 17, 18, 20, 23, 25, 26, 27, 29, 30, 31, 32, 34, 35, 36, 38, 39, 41, 43 which reflected perceived benefits of exercise were aggregated and listed by ascending means. The range of scores for each question was from 1-4 with 1 representing “strongly agree” (which indicates a high level of perceived benefit) and 4 representing “strongly disagree” (which indicates a low level of perceived benefit).

3. Frequency analysis was used to address the third research question which measures perceived barriers of exercise cited by nursing students. The scores from questions 4, 6, 9, 12, 14, 16, 19, 21, 28, 33, 37, 40, and 42 of the EBBS were analyzed. The range of scores for each question was from 1-4 with 1 representing “strongly agree”, which would be a highly perceived barrier to 4 representing “strongly disagree” which would be a low barrier. These scores were aggregated and listed by descending means.

4. The fourth research question was studied by analyzing the frequencies of age and marital status. A scatter-plot demonstrated the relationship of age and marital status on nursing students’ perceptions of the benefits of exercise and the barriers to exercise. A significant correlation of age and perceptions of benefits (grouped) and of barriers (grouped), as well as marital status and perceptions of benefits and barriers did not exist.
Multiple regression was utilized to determine the predictive relationship between the personal factors of age and marital status and the dependent variables of perceptions of benefits and of barriers.

5. The fifth research question was analyzed by utilizing multiple regression to determine the predictive relationship between the personal factors of age and marital status on nursing students' exercise behaviors. Additionally, it was determined if there was any correlation of age with behaviors as well as marital status with behaviors.

6. The sixth research question was analyzed by utilizing linear regression on benefits of exercise and behaviors. Correlations of the variables were also analyzed.

7. Linear regression was utilized to determine the predictive value of nursing students' perceptions of barriers on their exercise behaviors. The purpose of multiple regression analysis is to predict or explain as much of the variance in the values of the dependent variables as possible (Burns & Grove, 1993).

Assumptions of multiple regression analysis are:

1. The variables (dependent and independent) were measured without error.
2. Variables can be treated as interval level measures.
3. The residuals are not correlated.
4. Dependent variable scores come from a normal distribution.
5. Scores are homoscedastic (equally dispersed about the line of best fit); thus, there is a normal distribution of Y scores at each value of X.
6. Y scores have equal variances at each value of X; thus, difference scores (residuals or error scores) are random and have homogeneous variance (Burns & Grove, 1993, p.528)
Methodological Limitations

A limitation of the study is the lack of randomness in the sample. This study was based on a convenience sample. The subjects may have overestimated or underestimated their health promotion behaviors.

The pilot study would have been more effective if it had more participants in it. The problem of many students not understanding how many credits they were carrying as stated on the biographical information sheet would have been pointed out.

The timing of the study was at the very end of the semester. This may have influenced some of the responses. Half of the instructors requested that the surveying be done during the class period that they were administering the final exam. The increased stress and lack of time could have influenced the students perceptions of barriers of exercise.

There was some overlap of the last two questions on the HPLPII questionnaire. It would be impossible for one to know if they reached their target heart rate if they didn’t check their pulse rate when exercising.

Communication of Findings

The findings of this study will be communicated to the administration of both nursing programs which have been involved with the study. It may assist with their curriculum development and provide them with insights regarding this important health-promoting activity.

The researcher will also consider submission of the findings to appropriate journals such as the Journal of Nursing Education.
Summary

A descriptive, predictive design was utilized for this study to address the research questions. The convenience sample consisted of first through fifth semester undergraduate nursing students in a B.S.N. program and A.D. program. The survey packet contained a demographic questionnaire, the eight-question physical activity segment of the HPLPII, and the Exercise Benefits/Barriers Scale. Frequency distributions, correlations, and multiple regression were utilized to analyze the data.
CHAPTER 5

DATA ANALYSIS

Introduction

This chapter reports the results of the study relating to the health-promoting behavior of exercise in nursing students. Descriptive statistics and regression analysis were utilized to analyze the data.

The findings are reported according to the frequencies of the data reported on the Biographical Data sheet, as well as the HPLPII and the EBBS and are organized in response to the seven research questions. The computer program, SPSS-PC 8.0 was used to statistically analyze the results. Paul Nakayu, Information Technology Consultant of UNLV System Computing Services was consulted regarding the data organization.

Study surveys were distributed to 330 nursing students in two different nursing programs in the southwestern region of the United States. Three hundred and eleven were returned and available for data analysis giving a return rate of 94.2%.

Frequency Results

Biographical Information

The socio-demographic constitution of the sample was realized by referencing the Biographical Information Questionnaire. Descriptive statistics identified the
characteristics of the sample. Tables 1-6 describe the socio-demographic attributes of the sample.

As depicted in Table 1, 46.3% (n = 144) of the students were enrolled in an ADN nursing program, while 53.7% (n = 167) were enrolled in a BSN nursing program.

Twenty five percent (n = 79) of the total sample (N = 313) were enrolled in the first semester of their nursing program, while 20.4% (n = 64) were enrolled in the second; 24.6% (n = 77) were enrolled in their third semester, 20.4% (n = 64) were enrolled in the fourth, and 8.6% (n = 27) were enrolled in the fifth semester.

"Number of credits presently carrying in school" was not used for descriptive analysis as there was an unrealistically large range reported. The range of reported credits presently carrying in school was 5-244 credits, which demonstrates unreliable reporting.

Table 2 describes the age and gender breakdown of the sample. The participants ranged in age from 19 to 57 years. The most predominant age span was from 21 to 34 years. The female population consisted of 85.6% (n = 268) of the sample while there were 43 males (13.7%) who participated.

Table 3 describes the ethnicity and marital status of the participants. There were a high percentage of Caucasian participants (n = 224, 71.6%), with some African-American, Asia, Filipino, and Hispanic. There were few Native Americans, and 6 students reported "other" with another 6 reporting "multiple".

One hundred fifty two (48.6%) of the nursing students reported being "married" while 37.1% (n = 116) reported themselves as "single". A few identified themselves as "separated", "divorced", "widowed" or "other".
As depicted in Table 4, the majority of the 311 nursing students reported having no children living with them \((n = 181, \ 57.8\%)\), whereas 33.2\% \((n = 104)\) reported having 1-2 children living with them. A small percentage of the participants reported having 3 or more children.

The ages of children living with the nursing students was also studied. Out of the total population of participants \( (N = 311)\), the largest group of nursing students with children reported having children less than 2 years of age \((n = 48, \ 15.3\%)\).

The number of hours per week nursing students were employed is described in Table 5. There was a large group of nursing students who reported working 0-10 hours per week \((n = 112, \ 36.1\%)\), however there was also a large number working 31-40 hours per week \((n = 59, \ 19\%)\), with a few working over 41 hours per week \((n = 9, \ 2.2\%)\).

Table 6 describes the nursing student’s family income per year. There was a broad range of reported annual family income. One student \((.3\%)\) reported a total family income of zero per year, while 39 students \((12.5\%)\) reported incomes of $65,001 and over. The largest groups of nursing students reported having incomes of $1-15,000 per year \((n = 53, \ 16.9\%)\), $15,001-25,000 per year \((n = 48, \ 15.3\%)\), and $25,001-35,000 per year \((n = 53, \ 16.9\%)\).

Composition of Sample

A.D.N. and B.S.N. students’ data were examined separately. T tests revealed that there were essentially no differences in the two groups’ behavior, benefits, or barriers scores. Thus, the two groups were merged and analyzed as one group as previously defined in Chapter 3, “Definition of Terms”. 
Reliability Analysis

Alpha coefficients were computed for the HPLPII scale and the EBBS. They were based on the average correlation among items and the number of items on the instrument. Table 7 reflects the alpha coefficients for the present study as compared with other studies’ reliability coefficients utilizing the same instruments.

The reliability alpha coefficient obtained for the present study from the HPLPII physical activity segment, which represented exercise behaviors, was .83. This represented support for internal consistency of the tool.

The reliability alpha coefficient obtained from the 14 questions which related to exercise barriers on the EBBS was .86. The Cronbach alpha coefficient for the 29 questions in the EBBS relating to perceived benefits to exercise was .96. These represented support for reliability and internal consistency of the tool.

Results of Research Questions

Research question number 1: What are the exercise patterns of nursing students?

The physical activity component of the HPLPII was utilized to address the first research question. Study participants selected from a four-point Likert scale: never (1), sometimes (2), often (3), and routinely (4). The possible range of scores was 8-32 overall, with the lower score representing weak physical activity behavior, and higher scores representing high physical activity behavior.

The means for each exercise behavior of the nursing students are depicted in Table 8. The overall mean score for all physical activity behaviors, each with a range of
1-4 was 2.19 with a standard deviation of .6517. Scores of 1 represented no physical activity and 4 represented consistent physical activity.

Results were presented according to how participants responded, “never”, “sometimes”, “often”, and “routinely”. These are depicted in Table 9. The smallest-sized group \( n = 38, 12.1\% \) routinely follow a planned program. A large segment of the sample \( n = 215, 68.9\% \) “never” or “sometimes” exercise vigorously for 20 minutes or more 3 times a week. Ninety seven (31\%) “routinely” or “often” follow this practice.

Ninety-two (29.5\%) admitted to never taking part in light to moderate physical activity 30-40 minutes 5 or more times a week, whereas 39 (12.5\%) “routinely” do. The majority \( 68.9\%, n = 215 \) of nursing students “never” or “sometimes” take part in leisure-time physical activities. Of the 311 respondents of this segment of the survey, 107 (34.4\%) admitted to never doing stretching exercises at least 3 times per week.

One hundred twelve nursing students (36\%) reported often getting exercise during usual daily activities, while and 83 (26.7\%) responded that they “routinely” do. One hundred forty-four (46.3\%) never check their pulse rate when exercising and 117 (37.6\%) responded that they never reach their target heart rate when they’re exercising.

The frequencies that address the first research question indicated that most students do not often or routinely follow a planned exercise program. Most nursing students do not exercise vigorously for 20 minutes or more 3 times a week. Most of the participants sometimes or rarely take part in leisure-time physical activities, while about 12\% do stretching exercises at least 3 times per week. Most nursing students surveyed often or routinely exercise during their usual daily activities, and less than 10\% ever check their pulse rate or routinely reach their target heart rate when exercising.
Research question number 2: What perceived benefits of exercise are cited most often by nursing students?

The perceived benefits of exercise among nursing students were measured using the EBBS. Some perceived benefits of exercise relate to physical well-being. Others relate to psychological well-being, while still others relate to social, leisure, and appearance issues.

Tables 9 through 11 indicate the nursing students' perceptions of the benefits of exercise in descending order from most agreed on to least agreed on. Table 9 describes benefits that relate to physical well-being and Table 10 depicts benefits that are associated with psychological well-being. Table 11 represents nursing students' perceived benefits which relate to appearance, social, and leisure issues. Student responses regarding their perception of the benefits of exercise were classified as agreement if they selected either "agreed" or "strongly agreed" on the EBBS.

The percentage of agreement regarding perceived physical benefits of exercise ranged from 99.02% to 88.96%. The perceived physical benefit agreed upon most often was "exercise increases my level of physical fitness (99.02%); followed by "exercise improves my flexibility" (98.71%). The physical benefit cited least frequently was "exercise helps me decrease fatigue" (88.96).

The percentage of agreement regarding perceived psychological benefits of exercise ranged from 96.75% to 87.99%. The perceived psychological benefits cited most frequently was "I have improved feelings of well-being from exercise (96.75%) followed by "exercise improves my mental health" (96.45%). The physical benefit cited least frequently was "exercise improves the quality of my work" (87.99%).

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The percentage of agreement regarding perceived social benefits of exercise ranged from 97.73% to 45.87%. The perceived social and leisure benefit of exercise cited most frequently was “exercise improves the way my body looks” (97.73%) followed by “I enjoy exercise” (86.49%). The social and leisure benefit cited least frequently was “exercising increases my acceptance by others” (45.87%).

Research question number 3: What perceived barriers of exercise are cited most often by nursing students?

As in research question number two, the scores for each barrier were combined; agreement representing “agree” and “strongly agree” responses. Table 12 depicts the results of this question in descending order of frequency. The most frequently cited barrier to exercising was “exercise takes too much of my time” with 45.48% of the participants agreeing with this statement. This was followed by “Exercise is hard work for me” (43.65%) and “exercise tires me” (38.83%). The least cited barrier to exercise was “I am too embarrassed to exercise” (9.70%).

Research question number 4: Do the personal factors of age and marital status predict nursing students’ perceptions of the benefits of exercise and the barriers to exercise?

A correlation matrix was accomplished to examine multicollinearity of the independent variables prior to multiple regression analysis. Among the 311 nursing students who participated in this study, the correlation between their age and their perceived benefit of “exercise improves the way my body looks” was positive but modest ($r = .117, p = .042$) This showed a weak linear relationship. This was the only significant correlation between age and the dependent variables of perceived benefits and barriers.
There was only one correlation with marital status and the dependent variables of perceived benefits and barriers of exercise. There was a weak negative correlation between marital status and the perceived barrier of “exercise facilities do not have convenient schedules for me” ($r = -.116, p = .041, N = 311$).

There were no strong intercorrelations between each of the responses relating to benefits and barriers. Polit (1996) suggests avoiding the use of a set of independent variables when there are intercorrelations that are .85 or higher. All correlations were below this level.

On scatterplots, (Figures 2 and 3) there was only one weak linear relationship of age and marital status with perceived benefits and barriers. It appeared that the older the student, with the marital status of “other”, the higher their perceived benefit of exercise was.

Not all assumptions for multiple regression were maintained. The variables were measured without known error. Dependent variables were interval level measurements and came from a normal distribution. The independent variables “age” was coded as ordinal, while “marital status” was dummy coded and treated as nominal data. The variables were not significantly correlated, however, the scores were not equally dispersed about the line of best fit. Simultaneous multiple regression was utilized as there was no theoretical basis that any one of the predictors was causally prior to any other. As Tables 13 and 14 depict, there was no predictive value of age and marital status on benefits (adjusted $R^2 = -.003, p = .556$) or barriers (adjusted $R^2 = -.005, p = .847$).
Research question number 5: Do the personal factors of age and marital status predict nursing students' exercise behavior?

Multiple regression was used to determine the predictive value of age and marital status on behavior. The adjusted $R^2$ was low (.006, $p = .159$) and non-predictive. One assumption was violated as there was not linearity in all pairs of variables. Homoscedasticity was maintained, as none of the exercise behaviors were significantly intercorrelated. Sample size was adequate.

Correlations between age and the eight different exercise behaviors were determined, as well as age and marital status and the exercise behaviors. Weak correlation coefficients were found between age, marital status, and almost all exercise behaviors. Only one behavior was weakly yet significantly correlated with age, and it was also significantly correlated with marital status. The exercise behavior of "Gets exercise during usual activities" was correlated with age ($r = .115, p = .044$), and with marital status ($r = .226, p = .000$) (see Table 15).

As Table 16 describes, simultaneous multiple regression showed no predictive value of age and marital status on exercise behaviors (adjusted $R^2 = .006, p = .159$).

On a scatter-plot, the only linear relationship with age, marital status, and behaviors was with the status "other". It appeared that the older the student with a marital status of "other", the lower the level of exercise behaviors (Figure 4).
Research question number 6: Do nursing students’ perceptions of benefits of exercise predict their exercise behavior?

On a scatter-plot, there appeared to be some correlation between benefits and behavior (Figure 5). The students who have high exercise behaviors also had a high level of perception of the benefits of exercise.

Table 17 depicts the regression analysis of nursing students’ perceptions of the benefits of exercise on their exercise behavior. Regression analysis produced an adjusted $R^2$ of .203, $p = .000$ representing a moderate predictive value of the perception of benefits of exercise on exercise behavior. This was congruent with the scatterplot (Appendix L). Again, the assumption of linearity was not maintained. The assumptions of normal distribution and homoscedacity were maintained. Approximately 20% of the variance of nursing students’ exercise behavior is accounted for by their perceptions of benefits of exercise.

Research question number 7: Do nursing students’ perceptions of barriers to exercise predict their exercise behaviors?

The scatter-plot depicting barriers and behaviors showed no correlation or linear pattern (Appendix L). Table 18 represents the regression analysis of the nursing students’ perceived barriers to exercise on their exercise behavior. The adjusted $R^2$ for barriers on behavior was .184, indicating that the predictive value was moderate ($p = .000$). This demonstrates approximately 18% of the nursing students’ exercise behaviors is accounted for by their perceptions of barriers to exercise.
Other Findings

Regression analysis was utilized to determine the predictive value of other personal factors on exercise behaviors, perceptions of benefits of exercise, and perceptions of barriers to exercise. Multiple regression for family income per year and average hours worked per week with exercise behavior as the dependent variable revealed an adjusted $R^2$ of .007. Regression analysis of the same two independent variables and exercise benefits as a dependent variable revealed an adjusted $R^2$ of -.005. Average hours worked per week and family income were entered simultaneously with barriers as the dependent variable and the adjusted $R^2$ was -.004. These analyses revealed that there is no predictive value in the independent variables number of hours worked per week and family income per year on nursing students’ exercise behaviors, perceptions of benefits of exercise, and perceptions of barriers of exercise.

Regression analyses were run utilizing the independent variables “number of children living with you”, and “ages of children living with you”. There was no significant predictive value on the dependent variables of exercise, benefits, and barriers.

This demonstrates that for southern Nevada’s nursing students, personal factors are not significant predictors of their exercise behaviors, nor their perceptions of the benefits or barriers to exercise. Other variables may be more important.

Summary of Results

The findings of this study were as follows. The average participant was a 30 year-old Caucasian female, working 17.88 hours per week, with no children at home. There were slightly more BSN students participating in the study than ADN, and they were evenly dispersed between the first, second, third, and fourth semesters, with few in the
fifth semester of school. Almost half of the sample was married, and a high percentage reported that they were single. The average family income was $25,000-45,000 per year.

Exercise Behaviors

Most of the subjects do not routinely or often do any of the exercise behaviors except getting “exercise during usual daily activities”. They generally do not follow a planned exercise program, exercise vigorously for 20 or more minutes 3 times a week, take part in light to moderate physical activity 30-40 minutes 5 or more times a week, or take part in leisure-time physical activities. Most of the sample do not do routine stretching exercises, check their pulse rate when exercising, or reach target heart rate when exercising.

Benefits of exercise

The most frequently cited benefit of exercise was “exercising increases my level of physical fitness”. The least frequently cited benefit was “exercising increases my acceptance by others” but there was a small difference between these two benefits.

Barrier to exercise

The most frequently cited barrier to exercise was “exercising takes too much of my time”. The least frequently cited barrier to exercise was “I am too embarrassed to exercise”.

Exercise predictors

The personal factors of age and marital status do not predict nursing students’ perceptions of the benefits of exercise and the barriers to exercise. The only significant
correlation was between age and a benefit or a barrier was “exercise improves the way my body looks” \( (r = .117, p = .042, N = 311) \). The only significant correlation between marital status and items in the EBBS was the item “exercise facilities do not have convenient schedules for me” \( (r = -.116, p = .041, N = 311) \).

The personal factors of age and marital status were not predictive of nursing students’ exercise behavior as a whole. There were weak correlations between age and “gets exercise during usual activities” \( (r = -.115, \text{sig .044, 2-tailed, } N = 311) \). Marital status and the behavior of “gets exercise during usual activities” were correlated \( (r = .226, \text{sig .000, } N = 311) \).

There was moderate predictive value of nursing students’ perceptions of benefits of exercise on their exercise behavior. There was also moderate predictive value of nursing students’ perceptions of barriers to exercise on their exercise behavior.

**Summary**

This chapter described the analysis of the data that examined demographic characteristics, exercise behaviors as measured by the HPLPII, and perceptions of benefits of and barriers to exercise as measured by the EBBS. The sample consisted of 311 nursing students in a southern Nevada B.S.N. and A.D.N. program. The sample was statistically described and then data was organized and presented according to the seven research questions.

The demographics, exercise behaviors, and perceptions of benefits and barriers to exercise of the survey participants were presented using descriptive statistics. Multiple regression was used to determine predictive value of the variables mentioned in questions four through seven. Results are communicated in narrative format and in tables.
CHAPTER 6

SUMMARY OF THE STUDY

Introduction

This chapter presents a summary of the findings of the study regarding the purpose, the variables investigated, and the literature reviewed. The conceptual framework is also reviewed as well as the instruments utilized. There is a discussion of the research findings, implications for nursing, and limitations of the study. Recommendations for further research conclude the chapter.

Summary of the Study

In today’s health care environment, there is a growing focus on health promotion. Exercise has been widely documented to be a major determinate of health. Nursing students are better able to support their clients in health promotion themes such as exercise if they are practicing the health promoting behaviors themselves. The purpose of this study was to describe the exercise patterns of nursing students, and to determine the extent that selected variables are able to predict their exercise practices.

The variables under study included the personal factors of age and marital status. They also included perceptions of the benefits of exercise and the barriers to exercise. The dependent variable was exercise behaviors. Concepts investigated in the literature included health promotion, exercise related research utilizing Pender’s Health Promotion...
Model (HPM), and research relating to nursing students health-promoting behaviors. Research regarding demographics and exercise, benefits of exercise, and barriers to exercise was also investigated.

The conceptual framework utilized to guide this study was Pender’s revised HPM (1996). Her model was designed as a framework which integrates behavioral science perspectives and nursing, with a focus on factors that influence health behaviors. It was offered as a guide to discover biopsychosocial dynamics that motivate individuals to participate in health-promoting activities. The dynamics of personal factors (demographic characteristics), cognitive factors (the perceptions of benefits of and barriers to exercise) as well as the dependent variable of exercise behaviors were examined in this study.

Several self-administered instruments were utilized for this study. A biographical data sheet was used to obtain personal factor data. The physical activity segment of Walker, Sechrist, and Pender’s (1995) Health Promoting Lifestyle Profile II (HPLP II) and Sechrist’s (1987) Exercise Benefits/Barriers Scale (EBBS) were utilized to collect data regarding nursing students’ exercise behaviors and their perceptions of benefits of and barriers to exercise. A convenience sample of 311 nursing students was obtained from a southern Nevada A.D.N. program and a B.S.N. program.

Most of the participants of the study were Caucasian females with no children. The average number of hours worked per week was 17.88 hours. There were slightly more B.S.N. students participating in the study than A.D.N. Approximately half of the sample was married, and a large number were single. The average family income was $25,000-45,000 per year.
Discussion of Findings

Exercise Behaviors

Most of the nursing students reported no routine form of exercise. The overall mean score for nursing students' exercise behaviors was 2.19. Duffy, Rosso, Hernandez (1996) compared ten different populations' exercise behaviors using HPLP. The nursing students in the present study scored lower than seven of the ten samples. The groups of subjects that scored lower than the present population were: African American women smokers (2.0), Hispanics (2.1), and Mexican American employed women (1.9). Groups that scored higher than the present study's nursing students were: older adults (2.2), middle-aged adults (2.2), young adults (2.2), African American blue-collar workers (2.2), older adults (2.3), midlife women (2.4), and work site health-promotion participants (3.2). This indicated that the nursing students compared poorly with most other population groups.

This finding is congruent with Wentzel's (1989) study which found 86% of the 100 nursing students studied admitted to insufficient cardiovascular exercise. Soeken, Bausell, Winklestein, and Carson (1989) compared 139 nursing students' health practices with a national sample of 228 females, and discovered only 13% of the nursing students exercised regularly as opposed to 52% of females in the national sample. Boyd's (1988) study of 60 nursing students revealed that they scored slightly better than the national norm in the area of exercise.

There are many possible explanations for the lack of regular exercise behaviors in the nursing students in this study. The area of southern Nevada is not known for being particularly health conscious. Nevada leads the country in smoking related deaths (New
York Times, 1994). Most restaurants allow smoking in their establishment. It is not part of the culture of the area to practice health-promoting behaviors.

Another reason for poor exercise behaviors could be the pace of life in southern Nevada. There is a lot of traffic, low rate of unemployment, and very busy lifestyles which are very full and may not allow for exercise behaviors to be a top priority.

Although there are recreational opportunities such as mountains and lakes within several hours away, they may not be utilized by this population due to the time involved with driving there. Another reason for a lack of recreation and leisure exercise may be the climate. For at least three months of the year the climate prohibits vigorous outdoor exercise due to the intense heat. This may make it difficult to keep up a lifestyle of regular outdoor exercise or recreation.

**Benefits of exercise**

Students reported the most frequent perceived benefit of exercise was an improved level of fitness. This was similar to the benefit cited most frequently by 211 Canadian nursing students (Sabina-McVety, Booth, Orban, and Richards (1988). “Wanting to feel better” and weight control were the top reasons for exercise for this population group.

Approximately 20% of the variance in exercise behaviors was accounted for by the nursing students’ perceptions of benefits of exercise. The most frequently perceived benefits of exercise related to physical well-being. This indicates that the cognitive recognition of the physical benefits of exercise are important to nursing students. Being involved in a health profession where physical aspects of health are emphasized may heighten their perceptions of these physical benefits.
The eighth highest rated benefit was “exercise improves the way my body looks”.

It was surprising that this was not higher, as the culture of the area being entertainment focused, is very appearance-oriented. A possible explanation for this is the timing of the survey. The surveying took place at the end of the semester, near or at final exam time. At this time of the semester, students may not put much emphasis on their personal appearance. It is possible, though that the scores on this question truly reflect their beliefs about the relationship between exercise and appearance.

**Barriers to exercise**

The most frequently cited barrier to exercise was “exercising takes too much of my time”. There is wide agreement in the literature for this to be the most frequently perceived barrier by other nursing student populations. Sabina-McVety, Booth, Orban, and Richards’ (1988) research ($N = 211$) of nurses revealed “lack of time” to be the most frequently cited barrier. Shaw, Bonen, and McCabe’s (1991) study of 18,292 Canadian adults found “lack of time because of work” to be the most significant perceived barrier.

It is not surprising that “lack of time” would be the top barrier perceived by the nursing students participating in this study. With the pace of life as discussed above, and the high percentage of students working (mean = 17 hours per week), there may indeed be a shortage of time for many of the students. The rigors of maintaining acceptable grades in a nursing program may also be a contributing component. The barrier, “lack of time”, was addressed by one subject who wrote a personal note on her survey stating that she had exercised regularly in the past, but since beginning nursing school she hasn’t had time.
Another factor could be the fact that many of the nursing students with children (n = 48) had small children ages 0-2. This is a time intensive age, which may account for their perceived “lack of time”. There was a large percent without children (n = 181, 57.8%) however, and one could legitimately question if some students have simply not made exercise a priority, and “lack of time” is the most logical explanation they can offer.

Predictors of exercise

The personal factors of age and marital status did not predict nursing students’ perceptions of the benefits of exercise and the barriers to exercise. Furthermore, age and marital status were not predictive of nursing students’ exercise behavior in this study. This finding was not in agreement with others in the literature which found age to have a significant bearing on health-promoting behaviors (Murray, et al., 1981; Rausch, et al., 1987; Feldman & Richard, 1986; King, et al. 1992).

Nursing students’ perceptions of the benefits of exercise explained 20% of the variance in exercise behaviors in this study. Their perceptions of the barriers to exercise account for 18% of the variance in their exercise behaviors.

Marital status and age are apparently insignificant factors in predicting exercise patterns of nursing students in this population. Perceptions of benefits of exercise had a slightly stronger predictive effect than perceptions of barriers on nursing students’ exercise behaviors. This might indicate that positive motivation is effective for nursing students.
Use of Pender's (1996) Revised HPM

Pender (1996) suggests personal factors such as age and marital status may be modifying variables which have an indirect effect on health promoting behavior by directly affecting cognitive-perceptual factors. Cognitive-perceptual factors such as perceptions of benefits and barriers have direct effects on health promoting behaviors.

For this study the modifying factors of age and personal status were proposed as factors that influence cognitive-perceptual factors. The modifying factors of age and marital status were nonpredictive of the cognitive-perceptual factors of perceived benefits or barriers, nor were they predictive of the health-promoting behavior of exercise. There was, however, a moderate predictive value of perceived benefits of action and perceived barriers to action on the health-promoting behavior of exercise. Therefore only two of the study variables were significant as predictors of exercise behaviors in nursing students (See Figure 2).

A major strength of the revised HPM is its “attempt to depict the multidimensional nature of persons interacting with their environment as they pursue health.” (Pender, 1996, p.53). For this model to be truly effective, researchers who use Pender's revised HPM (1996) should consider just how multidimensional their focus is and try to design their study to be inclusive of more than a few variables. The findings of this study do not support picking out few variables to test in their predictive value, but may support testing the predictors of a health-promoting behavior in a more comprehensive manner.

This model may be useful in guiding nurses in their assessment of client's likelihood to participate in health-promoting activities. Almost 40% of the variance of
exercise behaviors was explained by just two of Pender's suggested variables, benefits and barriers. It is reasonable to expect many of her other variables might be important predictors of health-promoting behaviors (Appendix J, Figure 6).

Conclusions

The purpose of this study was to describe the exercise patterns of nursing students of southern Nevada, and to determine the extent that selected variables are able to predict exercise practices. The current study suggests several conclusions.

1. Most nursing students in southern Nevada do not routinely practice exercise behaviors.
2. Nursing students' age and marital status are not determinates of their perceived benefits of and barriers to exercise.
3. Nursing students' age and marital status do not determine whether or not they exercise.
4. Nursing students' perceptions of the benefits of exercise and the barriers to exercise are significant predictors of their exercise behaviors.

Implications for Nursing

There is wide agreement in the literature that exercise is important for one's health. Nursing students who have acquired habits of regular exercise may graduate and continue these behaviors as they practice nursing. Pender (1996) suggests counseling about exercise as well as modeling an active lifestyle are essential for health professionals to be effective health-promoters. If nurses are effective health-promoters, their clients' level of health may improve. The economic advantages of having a large
population of health care providers such as nurses routinely exercising are beyond the scope of this study, but one could imagine that they would be considerable. Financially rewarding nurses who practice health-promoting behaviors such as exercise could even result in a more efficient health care system.

The U.S. Public Health Service (1991) recommends in Healthy People 2000, that by the year 2000, at least 50% of all primary care providers should routinely counsel all patients regarding their physical activity. Appropriate exercise counseling should be a routine part of nursing care and nurses should be held accountable for this by their documentation.

Nursing school administrators might evaluate prospective nursing students to determine the likelihood that they will able to participate in health-promoting activities. Nursing schools' curriculums in regards to health promotion merit evaluation. There should be consideration of making Physical Education a requirement of the nursing curriculum throughout the program. Creative methods to effectively support students in internalizing exercise benefits such as participation in fitness fairs and fun runs should be implemented. Setting requirements for exercise behavior levels, possibly giving extra credit for exercise behaviors or making them part of the curriculum, might motivate nursing students to maintain a physically fit lifestyle.

Perceptions of barriers are also important determinates for nursing students. The barrier of "too little time" merits addressing by nursing program administrators. Attempts to remove this and other barriers are in order. Specific interventions might include nursing school facility designs with child care available, and a health club on the
premises. College and University settings frequently have fitness centers or exercise gyms which students should be encouraged to use.

The conclusions of this study suggest nursing students are not at the forefront of society in their practice of exercise behaviors. More effort is in order to increase awareness of the benefits of exercise among nursing students and to lower the perceived barriers.

Limitations

Every subject in the population had equal opportunity to participate. Due to the population being solely based in southern Nevada, the study can only be generalized to the southern Nevada area.

The instruments utilized were self-rated. Therefore, inaccurate and subjective reporting could have occurred. This could have resulted in inaccurate data.

The surveying process occurred at the end of the semester. This may have affected the results as nursing students generally have a heightened anxiety level at this time of the semester. Several instructors requested the surveying to take place during their last class, in which the nursing students’ final exam took place. The lack of standardization of the timing—with some surveying taking place during classes with final exams, and other classes surveyed prior to the last class—may have affected the results. Some nursing students may have been more stressed than others due to the timing of the surveying.

The investigator of this study introduced and explained the study to the participants. This may have biased some students as the investigator of the study exercises routinely, and is a vocal advocate of health promotion.
Pender's model was only partially tested. There may be other variables which are more predictive than the variables studied such as situational influences or self-efficacy. These factors which were not measured in this study may have explained more of the variance in self-reporting exercise patterns of this sample.

The HPLP II overall score for the physical activity segment may not be a true measure of one's exercise patterns or fitness level. It is possible that one may never check their pulse, but may exercise routinely and be at an excellent fitness level.

Recommendations

This study provides information on southern Nevada's nursing students' exercise patterns. Pender has added three new variables to her revised model. Activity-related affect, commitment to a plan of action, and immediate competing demands and preferences are recent additions and have not been widely studied. Further research regarding these variables is merited.

Additional research is needed in the area of curriculum design as it relates to health promoting activities of nursing students and other health professionals such as physicians, dentists, and nurse practitioners. Ongoing studies which compare the outcomes of different health promoting educational strategies would be helpful. Longitudinal studies would be of benefit to determine the physical, psychological, and economic outcomes of health promotion activities in various populations. Specific recommendations for further study include the following:

1. Compare nurses, nurse practitioners, physicians, dentists, other allied health professionals and their health promotion behaviors and their effectiveness as health-promoters.
2. Determine the effect which social support has on health-promoting behaviors in nursing students.

3. Determine the effect which spirituality has on nursing students’ perceptions of stress.

4. Determine the role-modeling effect which nursing instructors who exercise routinely have on their students.

5. Compare nursing schools’ curriculums as they relate to health promotion and identify outcomes of health-promoting behaviors in graduates.

Summary

This chapter presented a summary of the study, identifying the variables studied, conceptual framework utilized, and instruments used for the convenience sample of 311 nursing students. There was a discussion of findings concerning nursing students’ exercise behaviors, their perceived benefits of exercise, and their perceived barriers to exercise. Conclusions of the study were presented along with implications for nursing.

Limitations of the study were discussed as well as recommendations for further research.

The findings of this investigation suggest that most of southern Nevada’s nursing students are not practicing the health-promoting behavior of exercise on a regular basis. These findings suggest that faculty in both A.D.N. and B.S.N. programs should take a more active role in promoting health practices in nursing students.

Continued efforts to increase nursing students’ awareness of the benefits of exercise could promote their exercise behavior. Ultimately this could increase their job effectiveness as nurses and as role models for health-promoting behaviors.
REFERENCES


Witt, R. (personal communication, April 1, 1998).
APPENDIX A

UNLV Human Subject Rights Committee Approval
DATE: April 22, 1998

TO: Eileen K. Gemmell
M/S 3018 (NUR)

FROM: Dr. William E. Schulze, Director
Office of Sponsored Programs (X1357)

RE: Status of Human Subject Protocol Entitled:
"Predictors of Exercise Behaviors in Nursing Students"

OSP #501s0498-018e

The protocol for the project referenced above has been reviewed by the Office of Sponsored Programs and it has been determined that it meets the criteria for exemption from full review by the UNLV human subjects Institutional Review Board. This protocol is approved for a period of one year from the date of this notification and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

If you have any questions regarding this information, please contact Marsha Green in the Office of Sponsored Programs at 895-1357.

cc: S. Kowalski (NUR-3018)
OSP File
APPENDIX B

Permission Letter for Revised Health Promotion Model
March 31, 1998

Nola J. Pender, RN, Ph.D., FAAN
Professor and Associate Dean of Academic Affairs and Research
School of Nursing
University of Michigan
400 North Ingalls Bldg.
Ann Arbor, MI 48109-0482

Dear Dr. Pender,

I am a masters student at the University of Nevada, Las Vegas’ Nursing Department. I have a special interest in health promotion and will be conducting my thesis on “Predictors of Exercise Behaviors in Nursing Students”. I have reviewed your revised (1996) Health Promotion Model, and plan to study the predictability of personal factors as well as nursing students’ perceptions of benefits of exercise and barriers to exercise.

I would like to incorporate your 1996 Health Promotion Model into my study and would appreciate your permission.

Thank you.

Sincerely,

Eileen K. Gemmell

I, ____________________________, grant Eileen K. Gemmell permission to utilize the Health Promotion Model (1996).

Nola Pender

Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807
APPENDIX C

Health Promoting Lifestyle Profile II

(physical activity)
HEALTH PROMOTING LIFESTYLE PROFILE II

Physical Activity

DIRECTIONS: This questionnaire contains statements about 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 frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

1. Follow a planned exercise program N S O R

2. Exercise vigorously for 20 or more minutes three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).

3. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).

4. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).

5. Do stretching exercises at least 3 times per week.

6. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).

7. Check my pulse rate when exercising.

8. Reach my target heart rate when exercising.
APPENDIX D

Permission Letter for use of HPLP II
Dear Colleague:

Thank you for your request and payment to use the Health-Promoting Lifestyle Profile II. As indicated in the enclosed form, you have permission to copy and use the enclosed Health-Promoting Lifestyle Profile II for non-commercial data collection purposes such as research or evaluation projects provided that content is not altered in any way and the copyright/permission statement at the end is retained. The instrument may be reproduced in the appendix of a thesis, dissertation or research grant proposal without further permission. Reproduction for any other purpose, including the publication of study results, is prohibited without specific permission.

We thank you for your interest in the Health-Promoting Lifestyle Profile II and wish you much success with your efforts.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor and Chair,
Department of Gerontological, Psychosocial and Community Health Nursing

Encl.: Health-Promoting Lifestyle Profile II
Scoring instructions
List of publications reporting use of the original Lifestyle Profile

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APPENDIX E

Exercise Benefits/Barriers Scale
## EXERCISE BENEFITS/BARRIERS SCALE

**DIRECTIONS:** Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statements by circling **SA** for strongly agree, **A** for agree, **D** for disagree, or **SD** for strongly disagree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I enjoy exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>2. Exercise decreases feelings of stress and tension for me.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>3. Exercise improves my mental health.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>4. Exercising takes too much of my time.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>5. I will prevent heart attacks by exercising.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>6. Exercise tires me.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>7. Exercise increases my muscle strength.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>8. Exercise gives me a sense of personal accomplishment.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>9. Places for me to exercise are too far away.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>10. Exercising makes me feel relaxed.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>11. Exercising lets me have contact with friends and persons I enjoy.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>12. I am too embarrassed to exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>13. Exercising will keep me from having high blood pressure.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>14. It costs too much money to exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>15. Exercising increases my level of physical fitness.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>16. Exercise facilities do not have convenient schedules for me.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>17. My muscle tone is improved with exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>18. Exercising improves functioning of my cardiovascular system.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>19. I am fatigued by exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>20. I have improved feelings of well being from exercise.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>21. My spouse (or significant other) does not encourage exercising.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>22. Exercise increases my stamina.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>23. Exercise improves my flexibility.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>Exercise takes too much time from family relationships.</td>
<td></td>
<td></td>
<td>SA</td>
<td>D</td>
</tr>
<tr>
<td>25</td>
<td>My disposition is improved by exercise.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>26</td>
<td>Exercising helps me sleep better at night.</td>
<td></td>
<td></td>
<td>SA</td>
<td>D</td>
</tr>
<tr>
<td>27</td>
<td>I will live longer if I exercise.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>28</td>
<td>I think people in exercise clothes look funny.</td>
<td></td>
<td></td>
<td>SA</td>
<td>D</td>
</tr>
<tr>
<td>29</td>
<td>Exercise helps me decrease fatigue.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>30</td>
<td>Exercising is a good way for me to meet new people.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>31</td>
<td>My physical endurance is improved by exercising.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>32</td>
<td>Exercising improves my self-concept.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>33</td>
<td>My family members do not encourage me to exercise.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>34</td>
<td>Exercising increases my mental alertness.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>35</td>
<td>Exercise allows me to carry out normal activities without becoming tired.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>36</td>
<td>Exercise improves the quality of my work.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>37</td>
<td>Exercise takes too much time from my family responsibilites.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>38</td>
<td>Exercise is good entertainment for me.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>39</td>
<td>Exercising increases my acceptance by others.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>40</td>
<td>Exercise is hard work for me.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>41</td>
<td>Exercise improves overall body functioning for me.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>42</td>
<td>There are too few places for me to exercise.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>43</td>
<td>Exercise improves the way my body looks.</td>
<td>SA</td>
<td></td>
<td>A</td>
<td>D</td>
</tr>
</tbody>
</table>
APPENDIX F

Permission letter for use of Exercise Benefits and Barriers Scale
April 10, 1998

Eileen K. Gemmell
10021 Skipper Court
Las Vegas, NV 98117

Dear Ms. Gemmell:

Thank you for your interest in the Exercise Benefits/Barriers Scale. We received the copy of your abstract and letter of agreement regarding use of the instrument. You have our permission to use the instrument in your research. A photoready copy of the instrument and a copy of the scoring instructions are included.

We appreciate your willingness to share the results of the performance of the instrument in your study of “Predictors of Exercise behaviors in Nursing Students.” Best wishes with your research. We look forward to the results of your work.

Sincerely,

Karen R. Sechrist, PhD, RN
for Sechrist/Walker/Pender
BIографИЧИЧеСКОЕ информАЦИИ

ПлЕСе филл ин бЛанк или окружите число перед Вашим правильным ответом:

тиП оТ нУРСИнг ПРОГРАММ вам ЕНРолИн в:

ADN____ BSN____

чего семЕстр оТ вашЕгО нУРсИнг ПРОГРАММ вам ЕНРолИн?

1. Первый 2. Второй 3. Третий 4. Четвертый 5. Пятый

сТатУС оТ сОУЛ оЕНрлИн ит:

1. Полный 2. Часть

вОйте:

гегендер:

1. Женщина 2. Мужчина

рацЕ:

1. Африкано-американец 2. Азиат 3. Европеец 4. Филиппинец 5. Латиноамериканец 6. Иной

семейнО статУС:

1. Свободен 2. Замужем 3. Разведен 4. Разведен 5. Вдовец 6. Иной

кОличЕство детей жИвах с вами:

1. 0 2. 1-2 3. 3-4 4. 5+

вОчЕм детей жИвах с вами: (Если у вас нет детей, пропустите вопрос. Пожалуйста, окружите все, что подходит.)

1. 0-2 2. 3-5 3. 6-13 4. 14-18 5. 19+

вЕсегодний вЕР пер екЕ:

1. $0-10,000 2. $11-20,000 3. $21-30,000 4. $31-40,000 5. $41-50,000 6. $50,000+
APPENDIX H

Letter to Nursing Program Administrators and Instructors
March 31, 1998

Fran Brown, M.S.N.
Community College of Southern Nevada
Las Vegas, NV

Dear Ms. Brown,

I am a graduate nursing student at the University of Nevada, Las Vegas. As a partial fulfillment of my degree, I will be conducting my thesis on "Predictors of Exercise Behaviors in Nursing Students". This research should give insight into what factors predict this important health-promoting behavior in nursing students. I will be studying the students' personal factors, their exercise behaviors, and their perceived benefits of and perceived barriers to exercise.

I would like your permission to ask your undergraduate nursing students to participate in this study. The survey packet will consist of a short demographics questionnaire as well as an eight-question component of the Health Promoting Lifestyle Profile II, and the Exercise Benefits/Barriers Scale. The maximum amount of time it should take a student to complete the questionnaire is projected to be 15 minutes. I would like to hand out the packets and take 2-3 minutes to explain the instructions at the end of one of their nursing classes. Those who wish to participate, could then return the surveys to me following the completion of them. Of course this sampling would only take place with the instructor's permission.

If you have any questions or would like to dialogue further, please feel free to contact me. Thank you for your consideration.

Sincerely,

Eileen K. Gemmell

Investigator

I, Frances Brown, grant Eileen K. Gemmell permission to survey the undergraduate nursing students who consent to participate, for the study "Predictors of Exercise Behaviors in Nursing Students". This will be pending the individual instructor's permission.

Frances Brown 4/17/98

Fran Brown
Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807

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Eileen Gemmell  
10021 Skipper Court  
Las Vegas, NV 89117  
email: gemmell@nevada.edu

March 31, 1998

Rosemary Witt, Ph.D.  
University of Nevada, Las Vegas  
Las Vegas, NV

Dear Dr. Witt,

I am a graduate nursing student at the University of Nevada, Las Vegas. As a partial fulfillment of my degree, I will be conducting my thesis on “Predictors of Exercise Behaviors in Nursing Students”. This research should give insight into what factors predict this important health-promoting behavior in nursing students. I will be studying the students personal factors, their exercise behaviors, and their perceived benefits of and perceived barriers to exercise.

I would like your permission to ask your undergraduate nursing students to participate in this study. The survey packet will consist of a short demographics questionnaire as well as an eight-question component of the Health Promoting Lifestyle Profile II, and the Exercise Benefits/Barriers Scale. The maximum amount of time it should take a student to complete the questionnaire is projected to be 15 minutes. I would like to hand the packets out and take 2-3 minutes to explain the instructions at the end of one of their nursing classes. Those who wish to participate, could then return the surveys to me following the completion of them. Of course this sampling would only take place with the instructor’s permission.

If you have any questions or would like to dialogue further, please feel free to contact me. Thank you for your consideration.

Sincerely,

Eileen Gemmell, R.N., B.S.N.
Investigator

Rosemary Witt, grant Eileen K. Gemmell permission to survey the undergraduate nursing students who consent to participate, for the study “Predictors of Exercise Behaviors in Nursing Students”. This will be pending the individual instructor’s permission.

Rosemary Witt  
April 16, 1998
I, __________________________, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled “Predictors of Exercise Behaviors in Nursing Students”, and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

3/5/98

Date
I, _______________________, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

Date
I, Lisa E. Kless-Kern, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Lisa E. Kless-Kern

Date

April 27, 1998
I, Susan Kasujibi, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Susan Kasujibi
Name

4/27/98
Date
I, ___________________________ grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

May 9, 1998

Date
I, Denise Ogletree McQuinn, granted Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

_Signed_ [Signature]

Name

_April 29, 1998_

Date
I, Krista Ponce, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

Date 5, 1998
I, Ann Thomas, grant Eileen K. Gemmel permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

5/2/98

Date
I, Linda Turner, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

5/16/98

Date

Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807

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I, Robert Wilson, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

Name

Date

Department of Nursing
4505 Maryland Parkway • Box 453018 • Las Vegas, Nevada 89154-3018
(702) 895-3360 • FAX (702) 895-4807

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I, _____________________, grant Eileen K. Gemmell permission to come into my classroom, explain her research study entitled "Predictors of Exercise Behaviors in Nursing Students", and offer the students the opportunity to participate in the study. I understand that the completion of the surveys will take approximately 10 minutes to complete. As the instructor of the class, I will determine the most convenient time for the surveying to take place.

_____________________
Name

4/27/98
Date
Eileen Gemmell  
10021 Skipper Court  
Las Vegas, NV 89117  

March 31, 1998

Dear Nursing Student,

I am a registered nurse, currently completing my masters degree at University of Nevada, Las Vegas. I have a special interest in health promotion behavior, specifically exercise, and what determines a person's exercise patterns. The research I am conducting should give insight into what factors predict nursing student's exercise behaviors.

You and your classmates have been selected to participate in this study. It should take approximately 10 minutes to complete the enclosed questionnaires. Your answers on the questionnaire will go into a large pool of data and will remain confidential. Please do not place your name on the questionnaire. Participation in this study is completely voluntary. Your completion of the surveys will indicate your permission to participate.

After reading the directions, please complete the questionnaires. The accuracy of your responses will greatly enhance the results. Upon completion of the questionnaires, please return the surveys to the envelope provided, and hand them to me at the conclusion of your class.

If you have any questions regarding the study, please feel free to contact me at the Department of Nursing, 895-3360. Questions about the rights of research subjects can be directed to UNLV's Office of Research Administration, 702-895-1357.

Thank you for your consideration. A summary of the results of this study will be made available to you on request.

Sincerely,

Eileen Gemmell, R.N., B.S.N.  
Investigator
APPENDIX J

Data Tables
Table 1

**Sample Demographics Regarding Type of Nursing Program Enrolled In and Semester Enrolled in (N = 311)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Nursing Program Enrolled in</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.D.N.</td>
<td>144</td>
<td>46.3%</td>
</tr>
<tr>
<td>B.S.N.</td>
<td>167</td>
<td>53.7%</td>
</tr>
<tr>
<td><strong>Semester Enrolled in</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>79</td>
<td>25.0%</td>
</tr>
<tr>
<td>Second</td>
<td>64</td>
<td>20.4%</td>
</tr>
<tr>
<td>Third</td>
<td>77</td>
<td>24.6%</td>
</tr>
<tr>
<td>Fourth</td>
<td>64</td>
<td>20.4%</td>
</tr>
<tr>
<td>Fifth</td>
<td>27</td>
<td>8.6%</td>
</tr>
</tbody>
</table>

*Note.* From the Biographical Information Sheet.
Table 2

Sample Demographics Regarding Age (N = 307) and Gender (N = 311)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
<th>Central Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (N = 307)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years or less</td>
<td>8</td>
<td>2.6%</td>
<td>Range: 19-57</td>
</tr>
<tr>
<td>21-25</td>
<td>98</td>
<td>31.9%</td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td>81</td>
<td>26.4%</td>
<td>Mean: 29.93</td>
</tr>
<tr>
<td>31-35</td>
<td>51</td>
<td>16.6%</td>
<td>Median: 28.0</td>
</tr>
<tr>
<td>36-40</td>
<td>35</td>
<td>11.5%</td>
<td></td>
</tr>
<tr>
<td>41-45</td>
<td>20</td>
<td>6.6%</td>
<td>Mode: 27.0</td>
</tr>
<tr>
<td>46-50</td>
<td>9</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>51 and older</td>
<td>5</td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td><strong>Gender (N = 311)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>268</td>
<td>85.6%</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>13.7%</td>
<td></td>
</tr>
</tbody>
</table>

*Note. From the Biographical Information Sheet. Age: SD=7.62*
Table 3

Sample Demographics Regarding Ethnicity and Marital Status (N = 311)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity (N = 313)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>16</td>
<td>5.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>19</td>
<td>6.1%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>224</td>
<td>71.6%</td>
</tr>
<tr>
<td>Filipino</td>
<td>21</td>
<td>6.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15</td>
<td>4.8%</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>0.6%</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>1.9%</td>
</tr>
<tr>
<td>Multiple</td>
<td>6</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Marital Status (N = 311)</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>116</td>
<td>37.1%</td>
</tr>
<tr>
<td>Married</td>
<td>152</td>
<td>48.6%</td>
</tr>
<tr>
<td>Separated</td>
<td>5</td>
<td>1.6%</td>
</tr>
<tr>
<td>Divorced</td>
<td>27</td>
<td>8.6%</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>1.0%</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Note. From Biographical Information Sheet.
Table 4

Sample Demographics Regarding Number and Ages of Children Living with Participant (N=311)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Children Living With Participant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 children</td>
<td>181</td>
<td>57.8%</td>
</tr>
<tr>
<td>1-2 children</td>
<td>104</td>
<td>33.2%</td>
</tr>
<tr>
<td>3-4 children</td>
<td>25</td>
<td>8.0%</td>
</tr>
<tr>
<td>5 or more</td>
<td>1</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

| **Ages of Children Living With Participant** |         |         |
| 0-2 year olds                               | 48       | 15.3%   |
| 3-5 year olds                               | 12       | 3.8%    |
| 6-13 year olds                              | 37       | 11.0%   |
| 14-18 year olds                             | 9        | 6.0%    |
| 19 year olds and older                      | 2        | 0.6%    |

**Note.** From the Biographical Information Sheet.
Table 5

Sample Demographics Regarding Hours Worked Per Week ($N = 310$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours Worked per Week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10 hours</td>
<td>112</td>
<td>36.1%</td>
</tr>
<tr>
<td>11-20</td>
<td>72</td>
<td>23.1%</td>
</tr>
<tr>
<td>21-30</td>
<td>58</td>
<td>18.7%</td>
</tr>
<tr>
<td>31-40</td>
<td>59</td>
<td>19.0%</td>
</tr>
<tr>
<td>41-50</td>
<td>7</td>
<td>2.2%</td>
</tr>
<tr>
<td>51+</td>
<td>2</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

Note. $SD = 14.81$, range 0-59 hours per week, mean = 17.88, $SD = 14.81$. 

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Table 6

Sample Demographics Regarding Annual Family Income ($N = 303$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0$ per year</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>$1-$15,000</td>
<td>53</td>
<td>16.9%</td>
</tr>
<tr>
<td>$15,001-$25,000</td>
<td>48</td>
<td>15.3%</td>
</tr>
<tr>
<td>$25,001-$35,000</td>
<td>53</td>
<td>16.9%</td>
</tr>
<tr>
<td>$35,001-$45,000</td>
<td>37</td>
<td>11.8%</td>
</tr>
<tr>
<td>$45,001-$55,000</td>
<td>40</td>
<td>12.8%</td>
</tr>
<tr>
<td>$55,001-$65,000</td>
<td>32</td>
<td>10.2%</td>
</tr>
<tr>
<td>$65,001+</td>
<td>39</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Note. From the Biographical Information Sheet.
### Table 7

**Reliability Analysis of HPLPII and EBBS**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Alpha</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HPLPII</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Study</td>
<td>.83</td>
<td>311</td>
</tr>
<tr>
<td>Grabowski (1997)</td>
<td>.94</td>
<td>217</td>
</tr>
<tr>
<td>Duffy (1996)</td>
<td>.86</td>
<td>397</td>
</tr>
<tr>
<td><strong>Exercise Benefits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Study</td>
<td>.96</td>
<td>311</td>
</tr>
<tr>
<td>Sechrist (1987)</td>
<td>.95</td>
<td>650</td>
</tr>
<tr>
<td>Jones (1996)</td>
<td>.84</td>
<td>30</td>
</tr>
<tr>
<td><strong>Exercise Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present Study</td>
<td>.86</td>
<td>311</td>
</tr>
<tr>
<td>Sechrist (1987)</td>
<td>.86</td>
<td>650</td>
</tr>
<tr>
<td>Jones (1996)</td>
<td>.84</td>
<td>30</td>
</tr>
<tr>
<td>Exercise Behavior</td>
<td>% Never/Sometimes</td>
<td>% Often/Routinely</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Follow planned exercise program</td>
<td>72.2</td>
<td>27.6</td>
</tr>
<tr>
<td>Exercise vigorously 20 min, 3x/wk</td>
<td>68.9</td>
<td>31.0</td>
</tr>
<tr>
<td>Light to mod. Activity 30-40 min, 5+ x/wk</td>
<td>72.1</td>
<td>27.9</td>
</tr>
<tr>
<td>Leisure time activity</td>
<td>68.9</td>
<td>31.1</td>
</tr>
<tr>
<td>Stretching at least 3x/wk</td>
<td>76.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Exercise during daily activities</td>
<td>37.3</td>
<td>62.7</td>
</tr>
<tr>
<td>Checks pulse when exercises</td>
<td>79.5</td>
<td>20.5</td>
</tr>
<tr>
<td>Reaches target heart rate when exercising</td>
<td>64.5</td>
<td>35.5</td>
</tr>
</tbody>
</table>

Note. Based on Likert Scale of HPLPII (1 = Never, 2 = Sometimes, 3 = often, 4 = routinely).
Table 9

Nursing Students' Perceived Physical Benefits of Exercise ($N = 309$)

<table>
<thead>
<tr>
<th>Perceived Benefits</th>
<th>Percentage of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise increases my level of physical fitness</td>
<td>99.02</td>
</tr>
<tr>
<td>Exercise improves my flexibility</td>
<td>98.71</td>
</tr>
<tr>
<td>Exercise improves functioning of my cardiovascular system</td>
<td>98.71</td>
</tr>
<tr>
<td>Exercise increases my muscle strength</td>
<td>98.70</td>
</tr>
<tr>
<td>My muscle tone is improved with exercise</td>
<td>98.38</td>
</tr>
<tr>
<td>Exercise improves my stamina</td>
<td>98.37</td>
</tr>
<tr>
<td>My physical endurance is improved by exercising</td>
<td>98.37</td>
</tr>
<tr>
<td>Exercise improves overall functioning for me</td>
<td>97.72</td>
</tr>
<tr>
<td>I will prevent heart attacks by exercising</td>
<td>95.49</td>
</tr>
<tr>
<td>Exercise decreases feelings of stress and tension for me</td>
<td>94.85</td>
</tr>
<tr>
<td>I will live longer if I exercise</td>
<td>93.46</td>
</tr>
<tr>
<td>Exercising helps me sleep better at night</td>
<td>92.20</td>
</tr>
<tr>
<td>Exercising will keep me from having high blood pressure</td>
<td>92.56</td>
</tr>
<tr>
<td>Exercising allows me to carry on normal activities without feeling tired</td>
<td>91.56</td>
</tr>
<tr>
<td>Exercise helps me decrease fatigue</td>
<td>88.96</td>
</tr>
</tbody>
</table>

Note. From EBBS instrument, percentage of agreement represents students who chose “agree” or “strongly agreed”.

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Table 10

Nursing Students' Perceived Psychological Benefits of Exercise (*N* = 309)

<table>
<thead>
<tr>
<th>Perceived Benefits</th>
<th>Percentage of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have improved feelings of well being from exercise</td>
<td>96.75</td>
</tr>
<tr>
<td>Exercise improves my mental health</td>
<td>96.45</td>
</tr>
<tr>
<td>Exercise improves my self-concept</td>
<td>95.78</td>
</tr>
<tr>
<td>Exercise increases my mental alertness</td>
<td>95.45</td>
</tr>
<tr>
<td>Exercise decreases feelings of stress and tension for me</td>
<td>94.80</td>
</tr>
<tr>
<td>My disposition is improved by exercise</td>
<td>93.51</td>
</tr>
<tr>
<td>Exercise gives me a sense of personal accomplishment</td>
<td></td>
</tr>
<tr>
<td>Exercising makes me feel relaxed</td>
<td>92.18</td>
</tr>
<tr>
<td>Exercise improves the quality of my work</td>
<td>87.39</td>
</tr>
</tbody>
</table>

*Note.* From EBBS instrument. Agreement indicates responses of “agree” or “strongly agree”.
### Table 11

**Nursing Students' Perceived Social and Leisure Benefits of Exercise ($N = 309$)**

<table>
<thead>
<tr>
<th>Perceived Social/Leisure Benefits</th>
<th>Percentage of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise improves the way my body looks</td>
<td>97.73</td>
</tr>
<tr>
<td>I enjoy exercise</td>
<td>86.49</td>
</tr>
<tr>
<td>Exercise is good entertainment for me</td>
<td>66.77</td>
</tr>
<tr>
<td>Exercise is a good way for me to meet new people</td>
<td>56.35</td>
</tr>
<tr>
<td>Exercising lets me have contact with friends and persons I enjoy</td>
<td>52.90</td>
</tr>
<tr>
<td>Exercising increases my acceptance by others</td>
<td>45.87</td>
</tr>
</tbody>
</table>

**Note.** From EBBS instrument. Agreement indicates responses of “agree” and “strongly agree”.

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<table>
<thead>
<tr>
<th>Barrier</th>
<th>Percent of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise takes too much of my time</td>
<td>45.48</td>
</tr>
<tr>
<td>Exercise is hard work for me</td>
<td>43.65</td>
</tr>
<tr>
<td>Exercise tires me</td>
<td>38.83</td>
</tr>
<tr>
<td>Places for me to exercise are too far away</td>
<td>28.30</td>
</tr>
<tr>
<td>I am fatigued by exercise</td>
<td>26.13</td>
</tr>
<tr>
<td>My family members do not encourage me to exercise</td>
<td>23.61</td>
</tr>
<tr>
<td>Exercise takes too much time from my family responsibilities</td>
<td>23.03</td>
</tr>
<tr>
<td>My spouse (or significant other) does not encourage exercising</td>
<td>21.03</td>
</tr>
<tr>
<td>Exercise takes too much time from my family responsibilities</td>
<td>18.63</td>
</tr>
<tr>
<td>Exercise facilities do not have convenient schedules for me</td>
<td>14.19</td>
</tr>
<tr>
<td>There are too few places for me to exercise</td>
<td>13.96</td>
</tr>
<tr>
<td>I think people in exercise clothes look funny</td>
<td>13.59</td>
</tr>
<tr>
<td>It costs too much money to exercise</td>
<td>10.97</td>
</tr>
<tr>
<td>I am too embarrassed to exercise</td>
<td>9.71</td>
</tr>
</tbody>
</table>

Note. From EBBS.
Table 13

**Simultaneous Multiple Regression Analysis of Age and Marital Status on Perceived Benefits of Exercise (N = 307)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>3.526</td>
<td>.065</td>
<td>.282</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-9.642</td>
<td>-.026</td>
<td>.668</td>
</tr>
</tbody>
</table>

*Note.* Adjusted $R^2 = -.003$, $F = .587$, $p = .556$. From the Biographical Information Sheet and the EBBS instrument.

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Table 14

Simultaneous Multiple Regression Analysis of Age and Marital Status on Nursing Students' Perceived Barriers to Exercise ($N = 307$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-1.940</td>
<td>-.035</td>
<td>.565</td>
</tr>
<tr>
<td>Marital Status</td>
<td>3.996</td>
<td>.010</td>
<td>.863</td>
</tr>
</tbody>
</table>

Note. Adjusted $R^2 = -.005$, $F = .166$, $p = .847$. From the Biographical Information Sheet and the EBBS instrument.
<table>
<thead>
<tr>
<th>Variables</th>
<th>&quot;Gets exercise during usual activities&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r$</td>
</tr>
<tr>
<td>Age</td>
<td>.115</td>
</tr>
<tr>
<td>Marital Status</td>
<td>.226</td>
</tr>
</tbody>
</table>
Table 16

Simultaneous Multiple Regression of Age and Marital Status on Nursing Students' Exercise Behaviors ($N = 306$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-8.541</td>
<td>-.100</td>
<td>.097</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-1.470</td>
<td>-.025</td>
<td>.678</td>
</tr>
</tbody>
</table>

Note. Adjusted $R^2 = .006, F = 1.851, p = .159$. From the Biographical Information Sheet and the HPLPII.
Table 17

Regression Analysis of Nursing Students’ Perceptions of Benefits of Exercise on their Exercise Behavior ($N = 310$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>-.710</td>
<td>-.453</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. Adjusted $R^2 = .203$, $F = 79.926$, $p = .000$. From the HPLPII and EBBS instruments.
Table 18

Regression Analysis of Nursing Students’ Perceived Barriers to Exercise on their Exercise Behavior ($N = 310$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>Sig. t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers</td>
<td>.664</td>
<td>.432</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. Adjusted $R^2 = .184$, $F = 70.932$, $p = .000$. From the EBBS and HPLPII instruments.
Figure 1 Pender's Revised Health Promotion Model (1996)
Figure 2  Age and Marital Status vs. Perceived Benefits of Exercise
Figure 3  Age and Marital Status vs. Perceived Barriers of Exercise
Figure 4  Age and Marital Status vs. Exercise Behaviors
Figure 5  Perceptions of Benefits of Exercise and Barriers to Exercise vs. Exercise Behavior
Figure 6 Testing of Pender's (1996) Model using Study Variables

Note. Adjusted $R^2$ from multiple regression used.

* indicates a significant prediction
VITA

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Committee Member, Dr. Susan Michael, D.N.Sc.
Graduate Faculty Representative, Dr. Clifford McClain, Ph.D.