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Physical Activities

Among Korean Midlife Immigrant Women in the U.S.

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Physical Activities

Among Korean Midlife Immigrant Women in the U.S.

by

Kyeongra Yang, B.S.N.; M.P.H.

Dissertation

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Dedication

To My Mother

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When I look back over all my years at Austin, I can see that I made many choices that changed my life forever. Of those memories, my most cherished is the time I met Inkyu, who would later become my husband. It was because of his

love, support, and patient listening that I was able to finish the dissertation, but more than that, I now know I will always have a warm companion in the years ahead. To my family in Korea, I cannot express in words the depth of my love and gratitude. I do know this: without their continuous prayer and encouragement, I would have faltered somewhere along the way.

I thank God, who gave me the opportunity to study in the university and who gave me the strength to carry on through the years. It is He who has prepared good things for me, and with His strength behind me, I can meet the challenges of the years ahead.

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Physical Activities

Among Korean Midlife Immigrant Women in the U.S.

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The purpose of the study was to examine the relationships among individual characteristics (age, acculturation, income, education, and marital status), cognition and affect (exercise self-efficacy, perceived barriers/benefits, and social support for exercise), and physical activity (total activity, household/caring activity, occupational activity, daily active living habits, and sports/exercise activity) among Korean midlife immigrant women. A health-promotion model of physical activity was adapted from Pender's Health Promotion Model to guide this study.

A non-probability sample of 121 Korean midlife immigrants was recruited by flyers in Korean communities in Central Texas. Bivariate correlations and a series of regression analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 12.0.

According to the findings, acculturation was not significantly related to physical activity. Level of education was significantly and negatively related to occupational activity and positively related to sports/exercise activity. Married women reported more activity in sports/exercise than those who were not currently married. As observed in previous research, cognition and affect (higher self-efficacy, lower perceived barriers, higher perceived benefits, and higher social support) were significantly related to higher levels of physical activity.

There are three mediation effects of cognition/affect in the relationship between marital status (whether married or not) and sports/exercise activity. Marital status was significantly related to sports/exercise activity, but when perceived benefits and total social support were controlled in separate analyses, the variance in sports/exercise activity explained by marital status decreased each time. When spouse support was controlled in regressing sports/exercise activity on marital status, marital status did not explain any variation of the dependent variable, which is a condition for a mediation effect.

This study adds to our knowledge about physical activity among Korean immigrant midlife women. Acculturation did not play an important role in the women's involvement in physical activity. Nevertheless, the study provides meaningful information in a research area that few other studies have addressed. Among individual characteristics, income and marital status were significantly related to cognition and affect and sports/exercise activity. In addition, the

relationships between cognition and affect and sports/exercise activity supported the health-promotion model of physical activity.

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CHAPTER 1

INTRODUCTION

Physical activity is regarded as vital to the promotion of one's general health and the prevention of illness (U.S. Department of Health and Human Services, 1996, 2001). An active lifestyle is especially vital to young and middle-aged women, for it helps them improve and maintain their general functioning in later life. Unfortunately, recent studies show that, among women from diverse populations aged 18 to 75 years, only 12 percent engage in leisure time physical activity at the recommended levels (Scharff, Homan, Kreuter, & Brennan, 1999). Among Korean women aged 15 years and older, more than half (57.8 percent) are regarded as sedentary (Lee, 1997). For comparison with women in the U.S., data from the Behavioral Risk Factor Surveillance System (BRFSS) for Texas (Centers for Disease Control and Prevention, 2000) showed that 30.5 percent of women aged 18 and older had not engaged in any leisure-time physical activity in the previous month. Although these Korean and American samples differ, it is clear that activity must be increased in both groups.

An important personal factor in health-promotion studies of immigrant populations is acculturation. Health promotion is defined as any process that helps people change their lifestyle to optimize their health status (O'Donnell, 1989). Acculturation, on the other hand, is a prolonged and intense process of adapting to one's new environment, a process that often shakes one's deeply held convictions

and values and causes newcomers to re-examine their heretofore lightly regarded behaviors and manners (Liem, Lim, & Liem, 2000). Most studies addressing the acculturation process come to us from the social sciences; however, health-promotion studies of immigrant groups are beginning to acknowledge that acculturation may have a major effect on how newcomers in a society respond to their health-related needs, an effect that may be either negative or positive. For that reason, studies into smoking, physical activity, and dietary habits among immigrants are beginning to take acculturation into account (Lee, Sobal, & Frongillo, 2000). To date, however, of the existing studies on the relationship between acculturation and the health-promotion behaviors of immigrants, few are comprehensive.

Purpose of this Study

The purpose of this study was threefold: (1) to investigate the level of physical activity among Korean midlife immigrant women in the U.S., (2) to identify for this population any relationships between individual characteristics and experiences and behavior-specific cognition and affect, on one hand, and the level of physical activity, on the other, and (3) to examine any mediation effects of behavior-specific cognition on the relationships between individual characteristics and the level of physical activity.

Background and Significance of this Study

According to the U.S. Census Bureau (U.S. Census Bureau, 2001), 38 percent of the net change of the U.S. population from April 2000 to July 2001 was due to international migration. A large portion of the U.S. population consists of immigrants and their direct descendents. The proportion of Asian and Pacific Islanders in the U.S. is growing especially fast. While about 9.7 percent of the U.S. population is foreign born, 27 percent of those immigrants are from Asia (Schmidley & Gibson, 1999). According to projected data from a 1992-94 National Health Interview Survey (NHIS) (Kuo & Porter, 1998), 3.7 percent of the 1997 U.S. population was composed of Asian Americans, a large increase since 1970 after the Immigration Law of 1965. It is expected that by 2020 Asian Americans will number 20 million, about 6 percent of the total U.S. population (Kuo & Porter, 1998).

This Asian American influx encompasses a diversity of cultures. For example, there are more than 50 countries of origin listed under the categories Asian and Pacific Islanders (Association of Asian Pacific Community Health Organizations, 1996). This wide range of origins suggests an equally wide range of social, cultural, and economic influences acting on the individuals in each group. At first the Asian American immigrant populations may share many experiences in common. For example, most come to the U.S. for economic improvement or for religious and political freedom. Sooner or later, however, they

begin to experience their own difficulties in adjusting to the American culture, which is frequently radically different from that of their old country. For them, the food, language, climate, and entertainment appear strange and sometimes forbidding, and eventually members of each ethnic group must come to terms with their unique health issues and values as they become acculturated to their new home.

The acculturation of immigrants is a complex phenomenon that profoundly affects the health of both the individual and group. Many of the personal choices and activity patterns of immigrants in the United States have been conditioned by habits formed in the countries of origin. Consequently, the demands of the new environment require shifts in household, occupational, and leisure activity patterns, which in turn may affect the person's health. In addition, the well-being of the community membership may be closely tied to ethnic and social standing within the larger society.

There is a belief that the more acculturated an individual becomes the better should be his or her access to education, income, and preventive health services (Sundquist & Winkleby, 1999). The long-term health consequences of acculturation are actually highly variable. For example, Frisbie, Cho, and Hummer (2001) report that foreign-born immigrants have generally better health than their U.S.-born ethnic counterparts. The authors also note that health status decreases with increased length of stay in the United States. This decline in health

with length of stay in the new country seems true for Korean Americans. According to Kuo and Porter (1998), about 13 percent of Korean Americans reported they were in fair or poor health, compared to 9.2 percent for all Asian Americans and 8.9 percent for non-Hispanic Whites. Of those Korean immigrants, 80 percent had been in the United States for 5 years or more.

The clear indication is that, in any immigrant community, health is not solely a medical matter. The process of learning to live and work in another country can itself have a major impact on a person's health and self-identity. It is important, therefore, that studies of health and health promotion among immigrants take into account the effects of acculturation processes.

Acculturation may have different effects on women than on men. For one thing, women are generally more sedentary than men (Crespo, Smit, Andersen, Carter-Pokras, & Ainsworth, 2000; Crespo, Smit, Carter-Pokras, & Andersen, 2001; Lindstrom & Sundquist, 2001; Treiber et al., 1991). Moreover, immigrant women, while physically active, differ from men in types and amount of exercise and sports activity (Wood, 2000). Most studies attempting to measure physical activity have focused on men. By ignoring women's physical activity, those studies also ignore activities typically performed by women, such as those related to caring for the household, transporting children, and organizing family activity (Ainsworth, 2000; Jacobs, 2000). Because of those gender differences, it can be

supposed that acculturation processes would act differently on women than on men in terms of the types and amount of physical activity they perform.

In addition, acculturation may place conflicting demands on women. For example, according to a study of Korean immigrants, women (aged 40.8 ± 13.8 years) were less involved in physical activity than Korean immigrant men the same age (Lee et al., 2000). A possible reason for those differences may lie in the traditions of the old country, where girls are taught to be good wives and wise mothers, as encapsulated in the four-word expression *Hyun* (wise)-*Mo* (mother)-*Yang* (good)-*Chu* (wife). While the modern Korean immigrant woman attempts to fulfill her traditional role as wife and mother, she also tries to assume a third role as a wage-earner in a new labor market (Im, 2003). Stated simply, for the Korean immigrant woman, her new roles may conflict with the old, with the result that she is more likely to feel over-burdened than her male counterpart (Kim & Hurh, 1988). For her, acculturation is a different, more complex undertaking.

In summary, although the recent increase in studies focusing on Asian Americans implies a growing research interest in acculturation and ethnic/racial variations, Korean Americans are one of the least studied groups. This lack of research interest is true even though Korean Americans are estimated to represent around 11 percent of all Asian Americans (Kuo & Porter, 1998). Moreover, studies addressing the specific health issues of Korean American women are

indeed few. This study, therefore, attempts in part to address this imbalance by focusing on physical activity in the lives of midlife Korean immigrant women.

Regardless of their ethnic group, women in their middle years experience physical and psychological changes. Midlife can be generally defined as the span from 40 to 55 years of age, a time when around 68 percent of women experience at least some degree of menopause. In addition, it must be remembered that midlife is often considered more a state of mind than a range of chronological years (Morgan, 1998). For the purposes of this study, however, midlife is defined as the years in a woman's life from 40 to 65. For these midlife women, physical activity provides health benefits for symptoms related to menopause and other conditions (Gold et al., 2001). In addition, physical activity may reduce the stress of immigration and help in the acclimation to a new environment.

The study is intended to help build a better research understanding of the pattern of physical activity among adult Korean immigrant women. In addition, the study provides practical information that health professionals and community healthcare centers can use to help women enhance their awareness of their own health status, develop positive changes in behaviors, and seek supportive environments for good health.

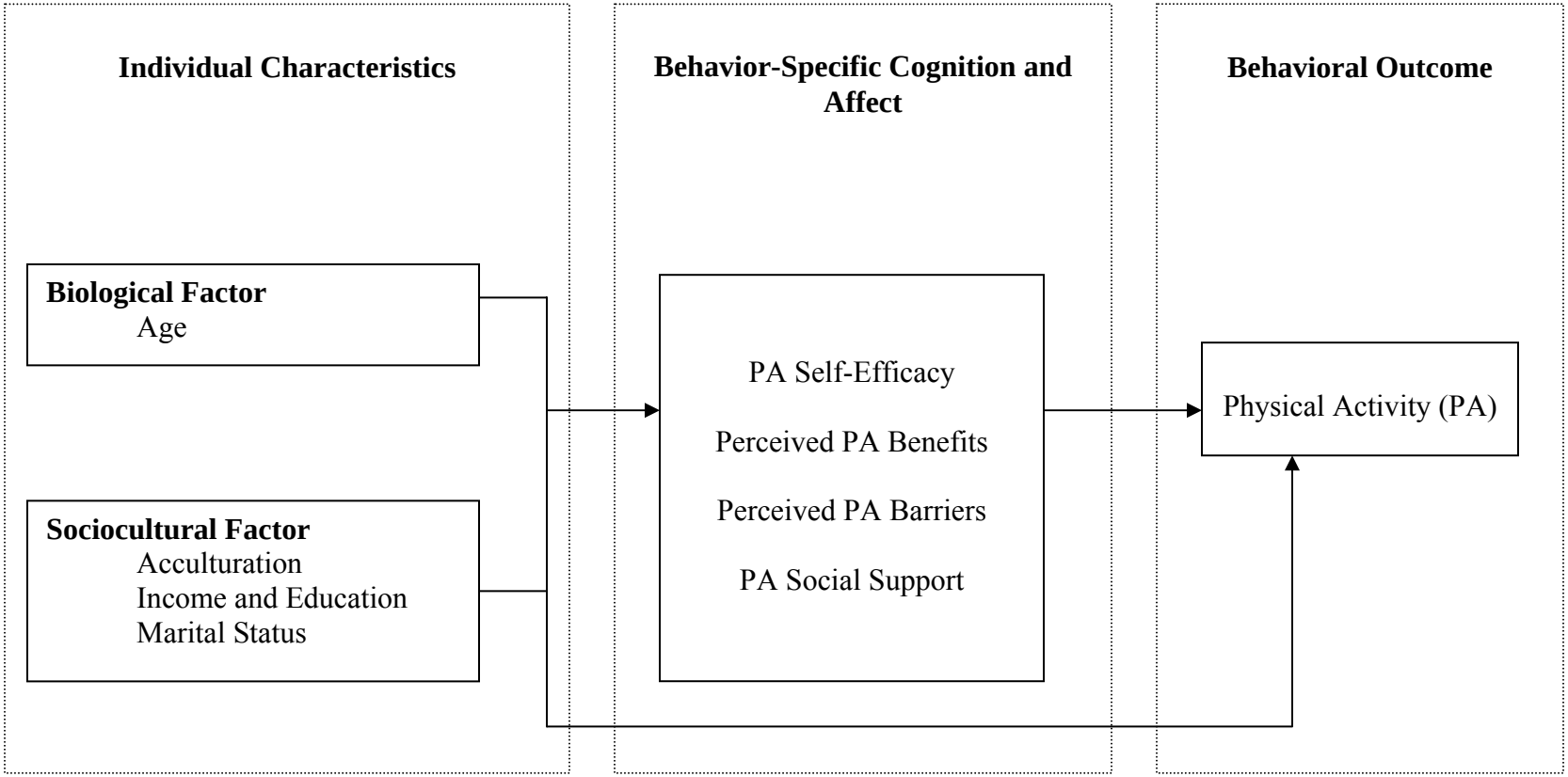
Conceptual/Theoretical Framework

An adaptation of Pender's modified Health Promotion Model (HPM) guided this study. The HPM emphasizes the active role of people in decision making and is based on expectancy-value theory and social cognitive theory (Pender, Murdaugh, & Parsons, 2002) The HPM is useful for testing predictors of specific behaviors and health-promoting lifestyles (Pender et al., 2002). Constructs in the HPM include individual characteristics and experiences (related prior behavioral, biological, psychological, and sociocultural personal factors), behavior-specific cognitions and affects (perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affects, interpersonal influence, and situational influence), commitment to a plan of action, immediate competing demands and preferences, and behavioral outcomes.

According to the underlying assumptions of the HPM, people have free will in choosing their behaviors, and they are more likely to choose well if they perceive that conditions around them encourage them to do so. From the perspective of the HPM, a health-improving behavior has rewards or benefits for the individual, and the greater the perceived self-efficacy, the more the person will engage in the behavior even in the face of competing demands. People practice health-promoting behavior as a result of interactions among cognition, action, and environment (Wu & Pender, 2002).

The HPM factors were adapted for this study as shown in Figure 1. The major constructs are individual characteristics, behavior-specific cognition and affect, and physical activity. Individual characteristics include several variables: age, acculturation, income, education, and marital status. Behavior-specific cognition and affect include four variables: physical activity self-efficacy, perceived physical activity barriers, perceived physical activity benefits, and physical activity social support. The dependent variable, or behavioral outcome, is physical activity.

Figure 1. Conceptual Framework for the Study



Individual Characteristics

Individual characteristics are defined in this model as age, income, education, marital status, and level of acculturation. Individuals tend to adopt lifelong habits early in life, but, as they get older, their adherence to a healthful lifestyle tends to decrease. A study from the National Survey of Midlife Development in the United States shows that persons with more income and education are more inclined to engage in leisure-time physical activity, but even they reduce the amount of such activity as they age (Grzywacz & Marks, 2001). Menopausal symptoms have been shown to be significantly related to the degree that the woman is physically active; that is, increased physical activity has been associated with a lower incidence of menopausal symptoms (Gold et al., 2001; Li, Holm, Gulanick, Lanuza, & Penckofer, 1999).

Income has been shown to be significantly related to one's level of physical activity. According to Crespo, Smit, Anderson, Carter-Pokras, & Ainsworth, (2000), persons living below the poverty level are less likely to be physically active than persons living at or above the poverty level, and this difference holds across race and gender. The Crespo et al. study, which included Caucasians, African Americans, and Mexican Americans, was a part of the Third National Health and Nutrition Examination (2000).

The marital status of a woman can be associated either negatively or positively with her physical activity (Ransdell & Wells, 1998; Schmitz, French, & Jeffery, 1997). Married women reported significantly less leisure time activity

than divorced women or widows among African Americans and Mexican Americans (Crespo et al., 2000).

In health-promotion studies acculturation is considered a personal factor because individuals vary in their health-related responses to new situations. It can be assumed that acculturation may lead to the adoption of new habits that can affect one's health either negatively or positively. Thus, studies of health-promoting behaviors among immigrants should take acculturation processes into account when assessing behaviors such as smoking, physical activity, and dietary habits (Lee et al., 2000). In one study, less acculturated Mexican Americans were more likely to be inactive than their more acculturated counterparts (Crespo et al., 2001).

According to Scharff, Homan, Kreuter, and Brennan (1999), younger women reported a greater number of barriers to physical activity than older women. Younger women, however, reported higher self-efficacy for physical exercise than middle-age and older women.

This health-promotion model proposes that age, income and education, marital status, and acculturation influence physical activity directly and also indirectly through physical activity self-efficacy, perceived physical activity barriers and benefits, and physical activity social support.

Behavior-Specific Cognition and Affect

Behavior-specific cognition and affect in this model are defined as physical activity self-efficacy, perceived physical activity barriers and benefits, and physical activity social support, all of which are important determinants of health-promoting behaviors (Pender et al., 2002).

Physical Activity Self-Efficacy

Perceived self-efficacy is a person's judgment of her ability to perform a health-related behavior; thus, exercise self-efficacy is a strong predictor of exercise behavior (Clark, 1999; Sallis, Hovell, & Hofstetter, 1992; Sherwood & Jeffery, 2000; Stutts, 1997). For example, one study showed that there was a difference in self-efficacy between active and inactive homemakers who had at least one child under six years (Horne, 1994). Self-efficacy has also been positively associated with exercise behavior among adults aged 65 years or older (Conn, 1997; Resnick, 2001).

Perceived Physical Activity Barriers and Benefits

Perceived barriers to and benefits from physical activity have been shown to be important determinants of health-promoting behavior such as physical activity (Pender et al., 2002). In a study with Latina women, Juarbe, Turok, & Perez-Stable (2002) identified several perceived barriers and benefits in regard to physical activity. Among the important barriers were time constraints and notions

of a woman's proper role, and a significant benefit was the improvement in overall health. In another study of Mexican women, motivational barriers were negatively correlated to the level of physical activity (Clark, 1999).

Physical Activity Social Support

Social support can enhance a person's willingness to adopt and maintain physical activity (Sallis, Hovell, & Hofstetter, 1992). Women reporting mid or high levels of social support were less likely to be inactive than those with no or low social support (Eyler et al., 1999). This need for social support may be especially pronounced for women because they place high priorities on family responsibilities, which in turn may represent a barrier to physical activity. If they receive support from others, however, they are better able to overcome that emotional barrier to increase their activity and thereby improve their general health (Yang, 2004).

The model presented in this study proposes that exercise self-efficacy, perceived exercise barriers and benefits, and social support for exercise have direct effects on physical activity and are themselves influenced by individual characteristics.

Physical Activity

Physical activity is essential for the promotion of health and the prevention of illness throughout life. According to the U.S. Government Report

Healthy People 2010 (U.S. Department of Health and Human Services, 2001), in 1997 the leading causes of death in the United States among those 45 years or older were heart disease and cancer. According to the 1996 Surgeon General's Report, regular physical activity reduces the incidence of those and many other diseases, including cardiovascular disease, colorectal cancer, breast cancer, non-insulin-dependent diabetes mellitus, osteoarthritis, osteoporosis, and obesity. Also, physical activity reduces a person's feelings of depression and anxiety and promotes a positive outlook on life. In summary, regular physical activity can improve one's perception of his or her psychological/emotional, physical, and cognitive functionality.

These conclusions have been borne out by numerous empirical studies. For example, in an 8-week study of elderly Korean women (N=27; 14 experimental and 13 control), Shin (1999) showed that women who participated in a walking program improved their cardiovascular functioning, flexibility, and positive emotional state. The volunteers participating in that study were healthy elderly women aged 60 to 75, and the control group was matched by age with the experimental group. Although the conclusion was based on data drawn from a relatively small convenience sample, it confirmed results from a number of other studies on physical activity (U.S. Department of Health and Human Services, 1996, 2001).

In the model described for this study, physical activity was identified as a behavioral outcome. According to the model, physical activity is directly

influenced by individual characteristics and by behavior-specific cognition-affect characteristics. In addition, physical activity is indirectly influenced by behavior-specific cognition-affect characteristics and individual characteristics.

Research Questions

Although it is generally recognized that physical activity has numerous health benefits, only a few studies have addressed physical activity among Korean immigrant women. In particular, little is understood about the relationship between physical activity and acculturation processes within the population of Korean immigrant women. For those reasons, this study attempts to answer research questions that will lead to a greater understanding of physical activity and acculturation in the lives of these women.

Research Question 1

What are the relationships among individual characteristics (age, acculturation, income, education, and marital status) and physical activity (total physical activity, household/caring activity, occupational activity, active living habits, sports/exercise activity) for Korean midlife immigrant women?

Research Question 2

What are the relationships among cognition and affect (physical activity self-efficacy, perceived physical activity barriers/benefits, and physical

activity social support) and physical activity (total physical activity, household/caring activity, occupational activity, active living habits, sports/exercise activity) for Korean midlife immigrant women?

Research Question 3

Do cognition and affect (physical activity self-efficacy, perceived physical activity barriers/benefits, and physical activity social support) mediate the effects of individual characteristics (age, acculturation, income, education and marital status) on physical activity (total physical activity, household/caring activity, occupational activity, active living habits, sports/exercise activity) among Korean midlife immigrant women?

Definition of Terms

Individual characteristics in this study include age, income, education, marital status, and level of acculturation. In the study, age, income, education, level of education and marital status were measured with a demographic questionnaire.

Acculturation, according to Burnam, Hough, Tellers, Karno, and Eschbar (1987), is a process involving "a fundamental change which includes relearning the meaning of symbols, readjusting to a new system of values, and relinquishing some old customs, beliefs, and behaviors" (p. 107). Level of acculturation was measured by the adapted Suinn-Lew Asian Self-Identity Acculturation Scale (SL-

ASIA) (Suinn, Ahuna, & Khoo, 1992; Suinn, Rickard-Figueroa, Lew, & Vigil, 1987).

Behavior-specific cognition-affect characteristics comprise physical activity self-efficacy, perceived physical activity barriers and benefits, and physical activity social support.

Physical activity self-efficacy is the degree of confidence one has in the ability to engage in physical activity in the face of distracting day-to-day conditions (Bandura, 1997). In this study, the degree of self-efficacy for physical activity was measured with the Self-Efficacy Exercise Scale (Bandura, 1997, 2001; Shin, Jang, & Pender, 2001)

Perceived barriers and benefits of physical activity are obstacles and rewards that an individual sees as hindering or enhancing the engagement in physical activity. These barriers and benefits were measured with the Perceived Barriers and Benefits Scale (Jang & Shin, 1999; Sechrist, Walker, & Pender, 1987).

Physical activity social support is defined as instrumental, informational, emotional, or appraisal support from family and friends (Resnick, Orwig, Magaziner, & Wynne, 2002). Physical activity social support was measured with the Exercise Social Support Scale (Pender, 1998; Shin & Jang, 2002). There are four subscales, one for each source of support, in this scale: spouse, children, other family members, and friends/coworkers.

Physical activity is "bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above the basal [metabolic] level" (U.S. Department of Health and Human Services, 1996, p. 20). Physical activity is generally categorized as occupational, household, and leisure time (Bouchard & Shephard, 1994). People are active in different ways at different times for different reasons (Sallis et al., 1985). In fact, everyone's physical activity patterns vary from day to day and season to season (Ainsworth, Sternfeld, Slattery, Daguise, & Zahm, 1998). Moreover, physical activity patterns vary by racial/ethnic or socioeconomic group. To explore these differences, many studies have made use of various direct and indirect techniques to measure physical activity and discern patterns and relationships between activity and health benefits. Among those techniques, self-report protocols are regarded as an efficient and practical way for working with large populations (Ainsworth et al., 1998). Thus, the Kaiser Physical Activity Survey (KPAS) (Ainsworth, Sternfeld, Richardson, & Jackson, 2000) was used to measure physical activity. The instrument provided both a total score for physical activity and scores for each subscale: household/caring activity, occupational activity, active living habits, and sports/exercise activity.

Assumptions

The overall assumption in the study was that the research model could explain the involvement of Koreans in physical activity. In addition, the following assumptions were made:

1. The amount of physical activity can be captured by a questionnaire.
2. Some personal factors cannot be changed; however, it is possible to enhance physical activity by altering the relationships between personal factors and cognition-affect characteristics.

Limitations of the Study

The limitations of the study were as follows:

1. The generalizability of the study findings was limited because the study employed a nonprobability sample.
2. The findings may reflect a response bias in that persons who were interested in health issues may have been more likely to participate.
3. The cognition-affect characteristics related to physical activity were measured by exercise-specific measurements because of the unavailability of instruments in those areas.
4. The amount of physical activity measured by the self-administered questionnaire may have been over- or under-reported.

CHAPTER 2

REVIEW OF LITERATURE

This chapter reviews the research literature germane to an understanding of the relationship between level of acculturation and the involvement of Korean midlife immigrant women in physical activity. The review focuses on research in the following areas: (1) the definition of physical activity, (2) middle-aged women and physical activity, (3) physical activity and Korean immigrant women, (4) acculturation, (5) acculturation and health related-behaviors, (6) individual characteristics, and (7) behavior-specific cognition and affect.

The Definition of Physical Activity

As defined in Chapter 1, *physical activity* is "bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above the basal level" (U.S. Department of Health and Human Services, 1996, p. 20). Exercise, for example, is a specific type of physical activity that is characterized by planned and structured rhythmic body movement that is performed for physical fitness. In addition, Korean women living both in the U.S. and in Korea tend to think that exercise is a matter of choice, while physical activity is an inevitable part of daily life (Im & Choe, 2004; Yang, 2004).

Common physical activities for women include walking, gardening, doing yard work, and engaging in stretching exercises. Walsh, Pressman, Cauley, and Browner (2001), in their cross-sectional study of 9,442 elderly White women,

found that the most common forms of leisure physical activity were walking, gardening, swimming, and bicycling. Walking (51 %) was the most frequently reported physical activity during the previous 12 months. This finding was similar to that of Laffrey's study, in which walking was the most frequent activity for elderly Mexican American women (2000).

According to *Healthy People 2010,* in 1997 the proportion of the adult population aged 18 years or older that engaged in 30 minutes of moderate physical activity five or more days per week was 15 percent. One of the objectives of *Healthy People 2010* is to increase to 30 percent the proportion of people who engage in moderate physical activity five or more days per week.

Data from the Behavioral Risk Factor Surveillance System (BRFSS) for Texas (Centers for Disease Control and Prevention, 2000) showed that 30.5 percent of the women who participated in the survey reported that they had not engaged in any leisure-time physical activity in the previous month. When this percentage is compared with that of men (26.5 %), women are seen to be less active. In fact, 79.6 percent of the women answered that they had engaged in no regular, sustained physical activity during the previous month, a frequency low enough to indicate a population with a sedentary lifestyle.

Middle-Aged Women and Physical Activity

Physical activity has beneficial effects on the general functioning of middle-aged women. For these women, a healthy lifestyle in midlife improves the likelihood that they will be able to maintain good health and functional ability in later life.

Functional limitation begins to appear between the ages of 40 and 55 (Pope, Sowers, Welch, & Albrecht, 2001) and gradually becomes more marked as age increases. Diseases commonly associated with functional limitation are osteoarthritis and cardiovascular disease. Nineteen percent of 16,065 women aged 40 to 55 years reported that they had moderate or substantial limitations, 25 percent had hypertension, and 23 percent had osteoarthritis (Pope et al., 2001). Osteoarthritis is most common in women over 45 years, and cardiovascular disease is the second leading cause of death for both men and women in the 45- to 64-year age group (U.S. Department of Health and Human Services, 2001).

On the other hand, people—especially women—increase their levels of occupational and household activities as they age. In a cross-cultural activity-participation study (N = 114), Ainsworth, Irwin, Addy, Wnitt, and Stolarczyk (1999) used 24-hour physical activity records for analyzing the physical activity patterns of African Americans and Native Americans (age range: 40 to 83 years). Most of the women reported they spent at least 30 minutes a day in household chores (95%) and walking (87%). Only 10 percent of the women answered that they were performing moderate activities unrelated to household work. According

to the 1981 Canada Fitness Survey, 85 percent of the daily energy expenditure of women was from non-leisure-time activities (Weller & Corey, 1998). Among Mexican Americans aged 40 to 59 years, 42 out of 100 women reported that they were physically inactive, compared to 32 out of 100 men at the same age level (Crespo et al., 2001).

According to a study of the menopausal experience (Park, Kim, Ku, Kang, & Chun, 2001), the most frequent symptoms reported by Korean women between the ages 41 and 65 years and living in Korea were hot flashes, back pain, fatigue, and failing memory. Those symptoms were not significantly different when related to the women's involvement in physical activity. This finding is similar to that of a case-control study by Sternfeld, Quesenberry, & Husson (1999), in which habitual physical activity before menopause showed no association with reduced vasomotor menopausal symptoms.

There is evidence, however, that physical activity reduces the number of symptoms related to menopause. For example, in a study of 214 perimenopausal women between the ages of 40 and 55, the level of physical activity (inactive, relatively active, and active) had a significant association with the frequency and severity of perimenopausal symptoms, such as irritability, forgetfulness, headache, and vaginal dryness (Li et al., 1999). The study also showed that active and relatively active women had fewer and less severe psychosomatic and sexual symptoms than inactive women. In summary, physical activity was negatively related to menopausal difficulties. In a study of 16,065 women aged 40 to 55

years (Gold et al., 2001), women whose activity levels were more than moderate showed fewer problems and less severe distress from menopause. The study concluded that vasomotor symptoms decreased with increasing physical activity. That result seems generalizable, because it is based on data from a large sample size that included several ethnic groups (Caucasian, African American, Japanese American, Chinese American, and Mexican American). On the other hand, the study measured physical activity with only one question, which asked how the woman's degree of physical activity compared to that of other women in the same age group. Thus, the woman's response amounted to a subjective guess, and her self-comparison with other women might have included some bias.

Physical Activity and Korean Immigrant Women

One of the greatest psychological and emotional events in a person's life is immigration to another country. Immigration is known to impose a more drastic role change on women than on men, and this difference may be relevant to a study of Korean immigrant women. Because of the large number of Koreans coming to the U.S. for permanent residency, the health care professions, which have a special interest in questions of cultural differences and diversity in America, have contributed many studies on the life experiences of Korean immigrant women. One of these (Shin & Shin, 1999), a qualitative study of the acculturation experience of six Korean immigrant women in the New York area, focused on how the women adjusted to their new environment. Shin and Shin divided the

acculturation process into four stages: dreams, conflicts, renunciation, and remorse. These stages cover the span of time from the point when the immigrant comes to the U.S. with hope for a better life, through difficult times in the U.S., and to the point when the immigrant longs for a return to life in the homeland.

Immigration is a stressful event for anybody, but for Korean women immigration seems even more difficult. For one thing, the typical middle-aged Korean immigrant woman, who has been raised to accept the traditional household responsibilities of daughter, wife, and mother, suddenly finds herself having to work outside the home (Im, 2003). This entry into the workforce comes at a time when the demands of her family and household are at their greatest (Shin & Shin, 1999). Thus, in occupational terms, Korean women consider their everyday lives as physically active. On the other hand, leisure time—when they could engage in a physical fitness program, for example—is minimal (Shin & Shin, 1999). Consequently, though Korean immigrant women are quite active overall, when they consider their activity only during leisure time, they report that they are sedentary compared to women of other cultures. Thus, like middle-aged women in general, they fail to engage in health-promoting behaviors during the busy years of parenthood, careers, adjustments to middle age, and, finally, retirement.

Elderly Korean immigrants in the U.S. (60 to 89 years old) reported less engagement in exercise among their health-promoting practices, which also included nutrition, self-actualization, health responsibility, stress management,

and interpersonal support, even though education and economic status were positively associated with their involvement in exercise (Sohng, Sohng, & Yeom, 2002). Another study (Gu & Eun, 2002), using the same measures of health-promoting behaviors to compare older adults in Korea (60 to 79 years old) with elderly Korean immigrants in the U.S., found that the immigrants were less engaged in exercise.

It is clear from the literature that immigrant women need to be more involved in physical activity. In a behavioral risk-factor survey (Kang et al., 1997), 36 percent of Korean women in California reported they had not exercised at all in the preceding month, compared with 26 percent of Korean men in the same area and 20 percent of the total California population. The sedentary behavior of Korean women during leisure time leads to a higher risk of chronic disease, such as heart and arterial disease. Like other elderly Asians and Pacific Islanders (Lum, 1995), these women tend to focus on their symptoms rather than take preventive health measures.

There are few studies addressing the physical activity of Korean immigrant women. A qualitative study (Im & Choe, 2001) investigated Korean immigrant women's needs for and attitudes toward daily levels of physical activity. Fifty-four women aged 20 to 60 (mean age = 39 years) reported that they related physical activity to improved health and body self-image. They differentiated between exercise and physical activity: they could appreciate the cosmetic effects of exercise, and they generally anticipated more opportunities for

socialization and amusement from exercise. These women also identified barriers to their engaging in physical activities, such as a lack of financial security, insufficient social support, and scarcity of time. They also believed that their occupational and household tasks provided sufficient amounts of activity. These negative attitudes inhibited the Korean women from including physical activities in their everyday health-promoting behaviors.

According to a study on acculturation and physical activity in Korean Americans (Lee et al., 2000), of the Korean immigrant women studied, 23 percent were participating in light physical activity more than three times per week, and only 12 percent were involved in vigorous activity more than three times per week. Those percentages are lower than those for men (32% and 20%, respectively).

Acculturation

An influx of immigrants usually makes a society more open to other cultures and ethnic groups (Berry, 1997). As the society becomes culturally diverse, the many cultural groups learn to live together, and they each experience the acculturation process in their own way. Some immigrant groups join the new society voluntarily, while other groups, for example, refugees, come to the new society involuntarily. Moreover, some groups remain in the new society permanently, while others, such as international students, remain in the society

only a short time. Regardless of their specific aims and characteristics, all of these groups inevitably undergo some form of the acculturation process.

According to Burnam, Hough, Tellers, Karno, and Eschbar (1987), acculturation is a transformation during the adjustment process by which the person learns new values and abandons old values. As such, the acculturation process has been used to help explain contact phenomena between two different cultures. Most studies of acculturation, however, are from the perspective of the dominant culture (Thompson, Anderson, & Bakeman, 2000).

The study of acculturation, which has its roots in anthropology, was initially more focused on particular cultural groups (Berry, 1980). Acculturation, however, refers to transformation processes at both the group and individual level. For that reason, acculturation affects group and individual ethnic identity, behavior, beliefs, and values (Cuellar, Arnold, & Maldonado, 1995; Williams & Berry, 1991). Some studies have identified the phases of acculturation. For example, as described previously, one study that focused on Korean immigrant women identified four developmental stages of acculturation: dreams, conflicts, renunciation, and remorse (Shin & Shin, 1999). Berry and Kim (1988) refer to five phases of acculturation, any of which can have an effect on mental health: pre-contact, contact, conflict, crisis, and adaptation.

According to Spector (1996), it takes three generations for members of a family to become acculturated. If that is the case, only the descendents of an immigrant couple beginning with the grandchildren could be said to be

acculturated. In fact, such third-generation individuals would more likely be assimilated, which is generally different from being acculturated. Assimilation implies the individual's adoption of an entirely new identity as a member of the matrix society (Spector, 1996). Identity is commonly divided into that which is ethnic and that which is racial. Ethnic identity relates to "ways of responding to and dealing with the majority culture's views of . . . minority group[s] " (Mok, 1999, p. 106). Racial identity is the degree to which a member of an ethnic group or people considers his or her ethnic background as important (Thompson et al., 2000).

Acculturation has been evaluated on the basis of language, the length of residency, cultural orientation of daily life, and ethnic self-identification (Arcia, Skinner, Bailey, & Correa, 2001), but there does not seem to be any single gold standard; rather, each parameter makes a meaningful contribution to the measure of a person's acculturation. Among the factors affecting the level of acculturation are age, income, education, length of residency, self-efficacy, social support, and generational status (Abe-Kim, Okazaki, & Goto, 2001; Neff & Hoppe, 1992; Salabarria-Pena et al., 2001). Of the various parameters, Arica et al. (2001) found that the most critical indicators of acculturation were language competence and length of residency in the new country. In another study, Liem et al. (2000) showed that a change from one cultural environment to another had an emotional impact on immigrants in their daily lives. The authors also found that the age of

the individual does not affect the acculturation process, whereas generational status and length of residency affect the process significantly.

No gender differences in acculturation have been reported (Lee et al., 2000); nevertheless, gender is surely an important factor to consider in acculturation studies because men and women show different characteristics during the acculturation process. For example, women are more likely to be sociable, and men are likely to be more self-reliant (Abe-Kim et al., 2001). Lee and her colleague (2000) reported no relationship between education and the physical health effects from acculturation among Korean immigrants. The explanation for this lack of a relationship was that Korean immigrants are more likely to take low-paying jobs even when their educational levels are high (Zeng & Xie, 2004).

Ethnicity, race, and culture are important factors in explaining how women view physical activities in their daily lives (Ainsworth, 2000). Any understanding of physical activity must take into account the cultural background of the individuals (Sternfeld, Cauley, Harlow, Liu, & Lee, 2000). A qualitative study of physical activity among minority women, including Filipino Americans and Chinese Americans (Eyler et al., 1998), reported that most of the women did not regard their daily housework, walking, and workday activities as representing true physical activity. Instead, these women thought of physical activity as referring to such pastimes as jogging, swimming, bicycling, and aerobics. Because of these definitions of what physical activity was, the women did not

identify themselves as exercisers even though their daily activities incorporated ample amounts of physical exertion. If the women had included housework, walking, and workday activities in their assessments of their personal levels of physical activity, they would have met 87 percent of the recommended level of physical activity (Ainsworth et al., 1999), that is, 30 minutes of moderate intensity physical activity a day. According to Ainsworth and her colleagues' study based on 12 days of physical activity records (Ainsworth et al., 1999), over 85 percent of the African American and Native American women reported household chores and walking as exercise. Their most moderate-intensity activities were home related, for example, household chores and child care.

Acculturation and Health-Related Behaviors

Cultural background also has a significant effect on the adoption and maintenance of physical activity. In particular, women of a Korean background often view inactivity as socially desirable, perhaps because physical activity in Korea is considered less important than academic, social, or psychological performance. Even after immigration, academic ability is more valued because many Korean immigrant parents believe that one of the few compensations for their hard life in a foreign society is their children's achievement in academics. In an interesting study on Korean American children (Chong, 1994), Korean Americans who were born in Korea considered their children's academic competence more important than the children's gross motor skills.

Traditional gender roles correlate with health status; that is, Korean immigrant women are generally more vulnerable to poor health than Korean immigrant men. For example, Korean women immigrants show a higher incidence of depression than men, perhaps because of the increased stress from changing roles and family relations in the U.S. (Lin et al., 1992). Korean girls have been taught to be good wives and wise mothers. Thus, based on inflexible sex-role expectations, Korean immigrant women have to maintain their traditional roles as wives and mothers, but at the same time they must assume unfamiliar roles as workers outside the home.

Many health-related behaviors, both positive and negative, can be ascribed to the acculturation process. The following reports from previous studies are examples of changes in these behaviors as the length of residency in the U.S. increases.

In a study of healthy Chinese Americans aged 25 to 70 years (Liou & Contento, 2001), the participants' selection of low-fat alternatives over high-fat foods significantly correlated with higher levels of acculturation. In another study (Rabinowitz & Duran, 2001), less acculturated industrial workers, mostly Hispanics, perceived high barriers to their use of hearing protection.

Hispanic American and Asian American adolescents who spoke only English at home showed almost twice the risk of lifetime smoking than those who spoke their ethnic language at home (Unger et al., 2000). For that study, acculturation was linked to the language used at home. When smoking-related

psychological variables were included in a model along with acculturation, acculturation became insignificant, and the psychological variables were negatively significant factors to smoking. The psychological variables included perceived access to cigarettes, perceived positive consequences of smoking, best friend's smoking, cigarette offers, and refusal self-efficacy. If their best friends smoked, they were twice as likely to smoke as others who had nonsmoking friends around them. Interestingly, English-language usage was associated with a higher rate of one's best friend smoking and receiving cigarette offers, and a lower level of cigarette refusal self-efficacy.

More acculturated Mexican American mothers are less likely to maintain adequate immunization programs for their children, according to Prislin, Suarez, Simspon, and Dyer (1998). In that study, most respondents were married, unemployed, lacked health insurance, and were enrolled in the WIC (Women, Infant, and Children) Program. Highly acculturated mothers perceived less parental responsibility, had less favorable attitudes to immunization, and saw more barriers to immunization.

According to 1992-1995 data from a National Health Interview Survey (Lauderdale & Rathouz, 2000), Asian American adults aged 18 to 59 years showed a low rate of obesity; however, when the study controlled for the effects of age and ethnicity, U.S.-born women were 3.5 times more likely to be obese than foreign-born women. Among the foreign-born, the greater the length of residency in the U.S., the greater was the risk of being overweight or obese.

Individual Characteristics

Biological Factor (Age)

According to Scharff, Homan, Kreuter, and Brennan (Scharff et al., 1999), as women grow older, the proportion of women who engage in an adequate amount of total physical activity decreases from 59 to 33 percent. Women less than 30 years old (59%) were almost twice as likely to engage in physical activity than women more than 60 years old (33%). Likewise, according to the 1997-1998 National Health Interview Survey (Schoenborn & Barnes, 2002), the proportion of adults engaging in at least some form of regular physical activity was 39 percent for 18 to 24 year olds, as compared with 25 percent for those who were 75 years and older. The same pattern of physical activity involvement was found even in the data from the 1999-2002 National Health Interview Survey (Schoenborn, 2004).

In addition, according to one study, there is a change in physical activities among African Americans and European Americans during the transition from elementary school to junior high school (Garcia, Pender, Antonakos, & Ronis, 1998). The girls in that study reported less social support for physical activity as well as more barriers to regular activity. In a study conducted by Spanier and Allison (2001), older respondents were less likely to be active than younger respondents. The mean age of their population was 37 years (SD =11.25).

In a study of a diverse population (Scharff et al., 1999), the younger women reported a greater number of barriers to exercise than the older women. The most common barrier cited by younger women was lack of time, and older women cited bad weather most frequently. Younger women, however, reported higher self-efficacy for physical exercise than middle-age and older women.

Sociocultural Factors

Acculturation

In a mail survey, Lee, Sobal, and Frongillo (2000) found that Korean American immigrants engaged more frequently in light physical activity (for example, walking, golfing, and bowling) than vigorous physical activity (for example, aerobics, running, swimming, and bicycling). Acculturated Korean immigrant women had significantly greater levels of light physical activity than did more traditional Korean immigrant women. In another study, however, one focusing on Japanese Americans (Harada et al., 2000), acculturation status did not significantly predict levels of physical activity when the effects of other socio-demographic and health variables were controlled.

Finally, more acculturated Mexican American adults showed more involvement in leisure-time physical activity. In a study of Mexican American immigrants, individuals who were less acculturated (that is, who were Spanish speaking or Spanish-and-English speaking, were born in Mexico, and had lived in

the U.S. for less than 5 years) were more likely to be inactive than their more acculturated counterparts (Crespo et al., 2001).

Income and Education

Among adults aged 20 years and older, inactivity was prevalent for those living below the poverty line, that is, living on a family income less than $20,000 per year (Crespo, Ainsworth, Keteyian, Heath, & Smit, 1999; Crespo et al., 2001). For Japanese Americans, income was a significant predictor of involvement in physical activity (Harada et al., 2000). According to the 1997-98 NHIS, adults who were below the poverty level were less likely to engage in light-moderate and vigorous physical activities than others (Schoenborn & Barnes, 2002). People with more income and education are more likely to engage in leisure-time physical activity (Grzywacz & Marks, 2001).

Education and income have been thought to measure the same thing because they share a high portion of variance; however, that may not always be true with immigrants. For example, a characteristic of Korean Americans is their high educational levels compared to those of other ethnic groups. According to the 1992-94 NHIS, around 40 percent of Koreans in the U.S. have received a bachelor's degree or higher, while around 24 percent of non-Hispanic Whites have done likewise (Kuo & Porter, 1998). However, Koreans experience difficulties with English just as most other immigrants do who come from countries whose languages are strikingly different from English. This language

difficulty can prevent Koreans from getting high-salaried jobs. Therefore, the characteristic of their job distribution is different. In fact, according to Kim, McLeod, and Shantizis (1992), Korean immigrants are more likely to be self-employed.

Marital Status

Women's marital status is associated with their physical activity. The transition from being married to being single did not affect the level of physical activity, but the transition from being single to being married positively changed the level of physical activity over a 10-year period (King, Kiernan, Ahn, & Wilcox, 1998). In a study conducted at various workplaces, Schmitz, French, and Jeffery (1997) found that married women among the participants (N = 3.672) engaged in lower levels of habitual leisure-time activity than did single women. Another study, however, one that focused on Caucasian and minority women (Ransdell & Wells, 1998), found that marital status was a significant predictor of higher leisure-time activity among African American and Mexican American women.

Thus, two studies showed opposite results regarding the relationship between physical activity and marital status. The source of this ambiguity probably lies in the different ways the researchers measured physical activity. Schmitz et al. measured the average weekly frequency and intensity of 12 leisure-time physical activities and categorized the physical activity scores into four

levels. Ransdell and Wells, on the other hand, considered energy expenditures over 24-hour periods, which included household physical activities and 42 leisure-time physical activities. Ransdell and Wells, moreover, incorporated the frequency, intensity, and duration of activity as parameters in the calculation of energy expenditure. This approach revealed a difference in how White women and African American or Mexican American women expended energy. The White women showed more leisure-activity energy expenditure than either the African American or Mexican American women, but the non-White women showed greater total energy expenditure over the 24-hour observation period because of their higher household energy expenditure. The Ransdell and Wells study, therefore, may provide better measurements of female populations who have comparatively high expenditures of household physical activity; however, the authors did not clearly explain how marital status influences a woman's engagement in leisure-time physical activity.

Behavior-Specific Cognition-Affect

Certain determinants influence any person's decision to adopt or maintain a sufficient amount of daily physical activity to ensure general health, but the configuration of those determinants differs among racial/ethnic groups and age groups. Some determinants, however, extend across groups, for example, motivation, self-efficacy, social support, and barriers such as time, access, and injury (Sherwood & Jeffery, 2000).

Self-Efficacy

Self-efficacy is regarded as one of the primary factors related to behavior change (Bandura, 1997; Conn, 1998). For example, exercise self-efficacy is a strong predictor of exercise behavior (Clark, 1999; Horne, 1994; McAuley, 1992; Sallis, Hovell, Hofstetter, & Barrington, 1992; Sherwood & Jeffery, 2000). Resnick (2001), moreover, showed that self-efficacy is positively associated with exercise behavior among adults aged 65 years or older. In addition, self-efficacy has been shown to be significantly related to physical activity among elderly Korean immigrants (Sohng et al., 2002). In a study by Sallis, Hovell, and Hofstetter (1992), self-efficacy caused people to increase their physical activity to the point that those who had been sedentary became physically active. The degree of self-efficacy has also predicted levels of activity among rural homemakers (Horne, 1994) and has discriminated between highly active and moderately active women (Rodgers & Gauvin, 1998).

Perceived Barriers and Benefits

Another important factor related to the amount of physical activity is the person's perceived barriers to physical activity (Wu & Pender, 2002). A perceived barrier can be understood as complementary to self-efficacy; that is, self-efficacy requires some sort of barrier (a restrictive condition) that the person must overcome (Bandura, 1997). Thus, a measure of a woman's self-efficacy for

exercise is the size of the barrier the woman is willing to surmount to start or continue her exercise activity. For example, efficacy is expressed in a woman's determination and confidence that she is going to exercise even when she has a large amount of work to do at home. Perceived barriers have been studied as a powerful dimension in analyses of a variety of behaviors.

As indicated by Clark (1999), perceived barriers are negatively correlated to the level of physical activity. In a cross-sectional study of perceived determinants of exercise in American adults, Brownson, Baker, Housemann, Brennan, and Bacak (2001) reported several personal barriers; for example, the subjects lacked the time, felt too tired, felt they were active enough at their jobs, or lacked motivation. Elderly African American women were more likely to indicate family responsibility as a barrier to participating in exercise activity than were elderly African American men (Walcott-Mcquigg & Prochaska, 2001). Scharff et al. (1999) found that women aged 49 years and younger had more barriers to activity than older women, but the younger women also had more self-efficacy for performing activity in spite of the barriers.

In contrast to the perceptions of barriers, there are also perceptions of benefits from physical activity. These benefits include improvements to overall health, mental health, and social interactions (Juarbe et al., 2002). In a 16-week intervention study (Caserta & Gillett, 1998), sedentary and obese women who, at follow-up reported exercising more often, were more likely to report perceived

benefits of exercise. In addition, older people who perceived more benefits from exercise tended to exercise more (Kutner, Barnhart, Wolf, McNeely, & Xu, 1997).

Social Support

Social support is a strong correlate to physical activity, as shown by Treiber, Baranowski, Braden, Strong, Levy, and Knox (1991). Regardless of race and occupation, having the support of one's family was significantly related to a woman's engagement in leisure-time physical activity. In addition, among African American women, family support of exercise correlated significantly and positively with physical activity at work. The support of a friend, on the other hand, related positively to participation in sports and leisure activities.

The amount of physical activity among sedentary men was affected by their self-efficacy, age, and environment; however, the amount of physical activity among sedentary women was affected by education and support from others (Sallis, Hovell, Hofstetter et al., 1992). In addition, among homemakers, perceived social support was a significant predictor of their intention to become active (Horne, 1994).

Among women from diverse groups, social support is positively associated with the level of involvement in sports and exercise (adjusted OR: 2.34, 95% CI: 1.83-2.98) (Sternfeld, Ainsworth, & Quesenberry, 1999). Women with strong social support for exercise are twice as likely to be active (that is, active at least 30 minutes on 5 or more days of the week) than women with low

social support for exercise (Eyler et al., 1999). There was no significant difference, however, between the effects of support from friends and the effects of support from family on participation in regular physical activity. Eyler and her colleagues concluded that social support from others might not significantly influence how much one is active once physical activity becomes a habit.

Support from family and friends predicts a change of exercise activities among community dwelling adults (Sallis, Hovell, & Hofstetter, 1992). According to Wallace, Raglin, and Jastremksi's study (1995), women who joined fitness programs with their spouses had a higher rate of adherence after one year than those who joined without spouses. Friends, however, seem to have more influence on older adults' involvement in exercise. Among adults aged 65 years and older, there was a significant difference between exercisers and non-exercisers in whether they had a friend's support (Resnick et al., 2002). In addition, a friend's support indirectly influenced exercise behavior through self-efficacy.

Among health club members, marital status and socialization with people met at the health club predict the frequency of exercise (Unger & Johnson, 1995). Social support from friends, however, is more important to those who do not have family. Thus, friendship seems to motivate exercise behavior, but more so with single people.

In the Ontario Survey (Spanier & Allison, 2001), familial structure was predictive of low levels of physical activity, and other social support factors were

predictive of higher levels of physical activity. In this study, social support was defined by four factors: familial structure (for example, parental and marital status), social quantity (for example, number of close friends), functional support (for example, instrumental support), and social frequency (for example, frequency of contact with close friends).

Summary and Conclusion

This chapter has reviewed the importance of physical activity among Korean immigrant women and the relationship between acculturation and health-related behaviors, mainly physical activity. In addition, individual characteristics and behavior-specific cognition and affect were reviewed in relation to physical activity.

Even though research on physical activity has become popular, few studies have addressed physical activity in the lives of midlife Korean immigrant women. Research is especially needed to shed light on how acculturation affects (for better or worse) health-promoting behaviors among those women. Therefore, this study, using a health-promotion model of physical activity, measures the relationships among acculturation, physical activity, and other variables.

CHAPTER 3

METHODS

This chapter describes the design of the study, the population and sample, and the procedure for protecting the confidentiality of the participants. In addition, the chapter explains the procedures for data collection, the types of instrumentation, the data-analysis methods, and the pilot study that preceded the study.

Research Design

This *ex post facto* study determined relationships between individual characteristics, behavior-specific cognition and affect, and physical activity among Korean midlife immigrant women. The study was based on a health-promotion model of physical activity.

An *ex post-facto* ('from after the fact' in Latin) method is a type of nonexperimental approach that is useful for investigations into relationships among phenomena when there is no manipulatable control (Polit & Hungler, 1999). The *ex post facto* method can also be referred to as a correlational study. This investigative method is practical and relatively inexpensive to implement, and it is useful when little is known about the phenomena under study. On the other hand, the method, like nonexperimental research designs in general, is weak in its ability to reveal causal relationships.

Population and Sample

The target population of the study was the Korean immigrant women in the U.S. The sample included 121 community-residing Korean immigrant women. Inclusion criteria were as follows: (1) self-identified original ethnicity as Korean women or Korean American women, (2) the ability to read and write either English or Korean, (3) age between 40 and 65 years, and (4) absence of physical illnesses or disabilities that would limit daily physical activities.

The estimated sample size for this study was calculated using nQuery Advisor 5.0. The pilot study for this study found that Pearson's *r* among variables ranged between .17 and .43. With an α of .05 and a power of .80, the sample size needed in this study (see Table 1) would lie between 266 (for an effect size of .17) and 37 (for an effect size of .43). However, practical considerations limited the sample to 121, which provided a power of 80 percent for $r = .25$ and 97 percent for $r = .35$, with an α of .05 and a two-sided test.

Table 1
Estimating Sample Size to Achieve Selected Levels of Power

Power	Effect Size (Pearson's γ)						
	.17	.20	.25	.30	.35	.40	.43
60	167	120	76	52	38	28	24
80	266	191	120	82	59	44	37

Procedures for Data Collection

The sample was recruited by the use of flyers posted on public bulletin boards in the community (for example, bulletin boards in local Korean grocery stores or Korean ethnic churches in the Central Texas area). Additionally, informal leaders in church activity groups were consulted for help in attracting candidates to the study. Korean immigrants tend to live in well-defined areas throughout the nation, and they have distinct living patterns. More than 80 percent are involved in Korean ethnic churches (Min, 1992), and most are involved in Korean immigrant associations.

Women who wanted to know more about the study were asked to contact the researcher or cooperating informal leaders. If the women (self-referrals) expressed a wish to participate in the study, the researcher checked their eligibility via phone or in person. After establishing their eligibility, the researcher sent them a questionnaire by U.S. mail. A total of 280 questionnaires were distributed, and 121 were returned, for a response rate of 43.2 percent.

Protection of Human Subjects

The pilot study was approved by the Institutional Review Board (IRB) of the University of Texas at Austin. Because changes (for example, from a two-time measurement for test-retest reliability to a one-time measurement) were made to the study design after the pilot study, an amendment was added to the description of the study, which was also approved by the IRB. In keeping with IRB

guidelines, each potential participant of this study received detailed information about the purpose and method of the study. The participants were assured that any information they divulged would remain confidential and would be released only with their consent. In addition, each participant signed and returned to the researcher her informed consent form by U.S. mail prior to or at the time of the completion of her survey. After all identification of participants was removed, the returned questionnaires and the consent forms were stored in a locked file cabinet to which only the researcher had access.

No additional consent from an institution was required because notices were placed on public bulletin boards, a method requiring no permission, to announce the study.

Pilot Study

A pilot study was conducted with 32 Korean midlife immigrant women aged 40 to 65 years. The purpose of the pilot study was to assess the clarity and the psychometric properties of the two translated instruments (the Suinn-Lew Asian Self-Identity Acculturation Scale and the Kaiser Physical Activity Survey) and to determine the feasibility of the data collection procedure.

Preparation of Instruments

Translation and Back Translation

Using the methods of Brislin (1970) and Dimmitt (1996), a psychometric study was conducted that involved translating and testing the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) and the Kaiser Physical Activity Survey (KPAS) for the Korean population. First, these questionnaires were translated into Korean. These translations included the instrument instructions, questions, and response options. Second, the translated Korean versions were translated back into English. Third, the original English version and the back-translated English version were compared for content equivalence. Finally, the reliability of the Korean versions was assessed.

For this procedure, the researcher recruited a bilingual graduate student who was fluent in both English and Korean and a monolingual person who was a native speaker of English. Neither person had previously seen the English version of these two instruments. The researcher gave each person a set of instructions, both orally and in writing, that included appropriate information about the context of the study so that they could fully render the relevant semantic content of the instruments. The translations (English to Korean, Korean to English, and the comparison of the two English versions) were done in a small, quiet research room. Both persons were asked not to communicate with each other regarding the content of the instruments.

The procedure began with the researcher initially translating the original English version of the SL-ASIA and the KPAS instruments to Korean. This English-to-Korean translation was then given to the bilingual person, who translated the version back into English (Brislin, 1970). Both translators used *Webster's Collegiate Dictionary* and *Prime's English-Korean Dictionary* for references. The monolingual English speaker then compared the two English versions of the instruments (that is, the original English version and the back-translated version) for content equivalence. Based on this comparison, the original English versions of these instruments and/or the Korean versions were modified to produce the most appropriately expressed versions of the original questions. At this stage, a procedure called *decentering*, as proposed by Brislin (1970), was adopted to eliminate socially or culturally sensitive elements from these instruments. Some items in the translated Korean questionnaires were changed after the meanings in the original English version were clarified during the comparison of the English versions.

Finalizing the Korean Version of the Instruments

After the back-translation, the researcher finalized the Korean version of these instruments for use in an actual survey. Four Koreans, whom the researcher regarded as the focus group, were asked to check the quality of the Korean translation and provide feedback (in Korean) regarding the clarity and accuracy of meaning for each question (Frank-Stromborg & Olsen, 1997). The focus group,

which was composed of health professionals and laypersons, was able to point out ambiguous questions in the instruments and to discuss individual items with the researcher.

After the Korean version of the questionnaires was formulated, reliability tests for that version were conducted. The tests were similar to those used for the original English version (Streiner & Norman, 1995).

Sample in the Pilot Study

The participant-eligibility criteria for the pilot study were that they live in the U.S., were women of Korean nationality, spoke and read Korean, and were between the ages 40 and 65 years. Persons were excluded if they had severe problems related to the heart or respiratory system or if they suffered cancer, osteoarthritis, or rheumatoid arthritis, any of which could affect their mobility.

The participants were women who had responded to flyer advertisements posted on bulletin boards in Korean grocery stores, Korean ethnic churches, and the Korean immigrant women's website. Because the number of self-referred women was small (n=7) after one month's posting, the researcher asked informal leaders who had close contact with Korean immigrant women to refer women to the pilot study.

Potential participants were asked their nationality, age, and general health condition. As discussed previously, each candidate received detailed information about the purpose and method of the study, and each submitted an informed

consent form by U.S. mail prior to their interview. The participants were assured of privacy, and they were told that no information they might volunteer would be disclosed without their consent.

Thirty-two women were recruited from Korean American communities in Texas, California, and New Jersey. All of the women were born in Korea. The mean age was 47.47 years (*SD* = 6.0), and their average education was 16.1 years (*SD* = 1.39). The length of residency in the U.S. ranged from 26 months to 426 months, with an average of 190.8 months (*SD* = 108.3). Twenty-seven participants (84.4%) were married, and 20 participants (62.5%) reported they were living with a spouse and children. Twenty-six participants were Protestant (81.3%), and 93.8% (N=30) reported they were either financially secure or somewhat secure. Seventeen participants (63.2%) reported that their health was either good or very good.

Procedures of the Pilot Study

If the women met the inclusion criteria and they agreed to participate in the study, they and the researcher discussed the time and place for the survey interview. The data were gathered at two times: Phase 1 and Phase 2. In Phase 1, the participants filled out the questionnaires. For baseline measurements, their perceived health status and demographic data (age, gender, education, length of residency in the U.S., place of birth, and income) were assessed. Then the scores of the Korean versions of the instruments were calculated to determine levels of

acculturation, self-efficacy, perceived barriers and perceived benefits, and physical activities. The survey required approximately 40 minutes for each participant.

Two weeks after the participants completed the first phase, they were asked to again fill out the physical activity questionnaire and return it by U.S. mail (Phase 2). The purpose of this second completion of the questionnaire was to check test-retest reliability. This second phase took approximately 10 minutes.

Data were analyzed by using the Statistical Package for the Social Sciences (SPSS) Version 11.5 for Windows. The demographic data were analyzed for descriptive statistics, such as means, standard deviations, and frequencies (Table 2). Cronbach's alpha coefficients for reliability were determined for the Suinn-Lew Asian Self-Identity Acculturation Scale. Two-week test-retest correlational coefficients were obtained for the Kaiser Physical Activity Survey.

Table 2
Demographic Information from the Pilot Study (N=32)

Variable		*n* (%)	Mean (*SD*)	Range
Age			47.47 (6.01)	40 - 63
Education			16.13(1.39)	12 - 18
BMI			21.62 (1.90)	17.19 – 25.71
Length of Residency in U.S. (Month)			190.81(108.27)	26 - 426
Marital Status	Married	27(84.4)		
	Divorced	2 (6.3)		
	Widowed	3(9.4)		
Living Arrangement	Alone	1(3.1)		
	With spouse or partner only	5(15.6)		
	With children only	5(15.6)		
	With spouse and children	20(62.5)		
	With parents	1(3.1)		
Religion	Protestant	26(81.3)		
	Catholic	3(9.4)		
	Buddhist	1(3.1)		
	Other	1(3.1)		
	None	1(3.1)		
Family Income	0-$19,999	1(3.1)		
	$20,000-$39,999	2(6.3)		
	$40,000-$49,999	2(6.3)		
	$50,000-$69,999	10(31.3)		
	$70,000+	17(53.1)		
Financial Stability	Secure	5(15.6)		
	Somewhat secure	25(78.1)		
	Insecure	2(6.3)		
Place of Birth	Korea	32(100)		
Perceived Health Status	Poor	1(3.1)		
	Fair	14(43.8)		
	Good	14(43.8)		
	Very good	3(9.4)		

Findings of the Pilot Study

The Suinn-Lew Asian Self-Identity Acculturation Scale

After the pilot study, five items were deleted from the instrument because of the unique characteristics of the target population. For example, all participants were born and raised in Korea, and 25 participants (86%) indicated that questions about their parents' identity were irrelevant. For those reasons, four items were excluded from the study: Items 4 and 5 (mother and father's identification) and items 6 and 7 (friends' ethnic origin up to 18 years of age). In addition, Item 14 (type of contact with Korea) was excluded since possible answers were not mutually exclusive for the first generation of immigrants. For example, many women indicated they had been raised one year or more in Korea, occasionally visited Korea, and/or occasionally communicated with people in Korea. After those five items were eliminated, the adapted SL-ASIA scale (16 items) showed moderate internal consistency ($\alpha = .74$).

The Kaiser Physical Activity Survey

This survey has four subscales: household/caring activity (11 items), occupational activity (12 items), active living habits (4 items), and sports/exercise activity (15 items). The two-week test-retest reliability coefficients for the subscales were .47, .71, .64, and .80, respectively. The low reliability coefficients

can be explained by the small number of items and the small sample size (Mangione, 1995; Polit & Hungler, 1999). The most frequently reported leisure-time activities were swimming, golf, and walking. Eight (25%) reported they did not exercise at all.

Instruments

The dissertation study used six instruments: (1) a demographic questionnaire, (2) the adapted Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn et al., 1992; Suinn et al., 1987), (3) the Exercise Self-Efficacy (Bandura, 1997, 2001; Shin et al., 2001), (4) the Exercise Benefits/Barriers Scale (Jang & Shin, 1999; Sechrist et al., 1987), (5) the Exercise Social Support Scale (Pender, 1998; Shin & Jang, 2002), and (6) the Kaiser Physical Activity Survey (Ainsworth et al., 2000). Table 3 is a summary of the instruments, and the following subsections describe each.

Table 3
Instrument Information

	Variable	Instrument	Subscale	# of items	Reliability
Individual Characteristics and Experience	Acculturation	Adapted Suinn-Lew Asian Self-Identity Acculturation Scale	Acculturation	16	.82
Behavior-Specific Cognition and Affect	Physical Activity Self-Efficacy	Exercise Self-Efficacy Scale		18	.96
	Perceived Physical Activity Benefits and Barriers	Exercise Benefits/Barriers Scale	Benefits scale	27	.95
			Barriers scale	13	.81
	Physical Activity Social Support	Exercise Social Support Scale	Spouse support	7	.94
			Children support	7	.94
			Other family support	7	.97
			Friend support	5	.80
Behavioral Outcome	Physical Activity	Kaiser Physical Activity Survey	Household/caring activity	11	.47
			Occupational activity	12	.71
			Active living habits	4	.64
			Sports/exercise activity	15	.80

Demographic Questionnaire

The demographic questionnaire developed for this study measured age, marital status, body mass index (BMI: weight and height either in English or the metric system), educational level (year of attained education), income and adequacy of income (secure, somewhat secure, or insecure), living arrangements, religion, year of immigration, place of birth, and menopausal status, which was categorized as premenopausal, early perimenopausal, late perimenopausal, postmenopausal, and surgical menopause (Avis, Assmann, Kravitz, Ganz, & Ory, 2004). Length of residency in the U.S. was converted to a year unit based on the difference between time of data collection and time of immigration. Perceived health status was measured by a single-item question: "In general, how would you rate your health?" A scale from 1 (*Poor*) to 5 (*Excellent*) was provided for the response to the question.

Since marital status and income were not continuous variables, they were coded as dummy variables. For marital status, "1" was assigned to married women and "0" was assigned to the others. According to the Federal Poverty Income Limits Guideline (Center for Public Policy Priorities, 2004), $ 36,800 per year for a family of four was considered low income in 2003, which is less than 200 percent of the poverty level. Originally, income had five possible categorical answers, but the answers were combined into three categories before dummy coding: less than $39,999, between $40,000 and $69,999, and $70,000 or more.

These dummy variables were labeled low income (low income vs. others), mid-income (mid-income vs. others), and high income (high income vs. others), respectively.

The Suinn-Lew Asian Self-Identity Acculturation Scale

The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn et al., 1992; Suinn et al., 1987) was developed after the Acculturation Rating Scale for Mexican Americans. The SL-ASIA is widely used with Asians, such as Koreans, Chinese, and Japanese. The Cronbach's alpha for this 21-item questionnaire was .91 in a study of 284 Asian American university students (Suinn et al., 1992). Concurrent validity was assessed by significant relationships among years living in the U.S., age upon immigration, years living in a non-Asian community, and total years of education in the U.S. (Suinn et al., 1992).

The original questionnaire consists of 21 multiple-choice items addressing the following areas: language (4 items), identity (4 items), friendships (4 items), behaviors (5 items), generational/geographic background (3 items), and attitudes (1 item). The final score for the original 21-item questionnaire is normally calculated by dividing the total value by 21; however, because of their irrelevancy, five items were excluded from the study: mother and father's identification (Items 4 and 5), friends' ethnic origin up to 18 years of age (Items 6 and 7), and type of contact with Korea (Item 14). Consequently, the score for the 16-item

questionnaire was calculated by dividing the total value by 16. Scores ranged from 1 (*Low Acculturation, High Asian Identity*) to 5 (*High Acculturation, High Western Identity*). Cronbach's alpha for this study was .82.

Exercise Self-Efficacy

Physical activity self-efficacy (Bandura, 1997, 2001; Shin et al., 2001) was measured by the Exercise Self-Efficacy Scale. This scale was developed by Bandura to measure one's confidence in his or her ability to perform exercise routines regularly under various circumstances (for example, during bad weather, when feeling depressed, and when having too much work to do at home). The scale consists of 18 items, each related to a different routine. The answers range from 0 (*Cannot Do*) and 100 (*Certain Can Do*). The score for physical activity self-efficacy was calculated by dividing the total value by 18. Higher scores on the scale indicate greater perceived efficacy to participate in physical activity. This scale was later translated into Korean and was tested by Shin, Jang, and Pender (Shin et al., 2001) with Korean adults with chronic diseases, and Cronbach's alpha was .94. For this study, Cronbach's alpha was .96.

Exercise Benefits/Barriers Scale

Perceived physical activity benefits and barriers were measured with the Exercise Benefits/Barriers Scale (Jang & Shin, 1999; Sechrist et al., 1987). This

scale consists of 40 items (27 items for benefits; 13 items for barriers). Response to each item was given on a 4-point Likert scale (*Strongly Agree* to *Strongly Disagree*). The score for each subscale was calculated by the sum of its items. A high score for benefits means that the participant perceived benefits from exercise positively. A high score for barriers means that the participant perceived more barriers to exercise. This instrument was originally developed by Sechrist, Walker, and Pender (Sechrist et al., 1987). The translated Korean version was tested by Jang and Shin (Jang & Shin, 1999) with Korean adults with chronic diseases. The two-week test-retest reliability scores for the scale were .889 for all items, .893 for benefits, and .772 for barriers. The Cronbach's coefficient alpha was .94. Cronbach's alpha for this study was .95 and .81 for benefits and barriers, respectively.

Exercise Social Support

Physical activity social support was measured by the Exercise Social Support Scale developed by Pender (1998). The 27-item scale consists of 12 statements regarding whether family members and friends/coworkers encourage or praise the respondent's efforts to engage in physical activity. The translated Korean version of exercise social support was tested by Shin (1999). In a study of Korean adults with chronic diseases, spouse as a family member was added, and Cronbach's alpha coefficient for the total score was .93.

There are four subscales: spouse support, children support, other family support, and friend support. The questionnaire items are scored on a three-point scale (*Never* to *Often*). The higher the score, the greater the exercise social support. Cronbach's alpha was .91, .94, .94, .97, and .80 for the total scale and four subscales, respectively, in the study.

Kaiser Physical Activity Survey

Physical activity was measured with the Kaiser Physical Activity Survey (KPAS). The KPAS, which Ainsworth, Sternfeld, Richardson, and Jackson (2000) developed by modifying the Baecke Habitual Physical Activity Questionnaire, was designed specifically to assess activity in women, whose activities take different forms from those of men. For example, women's lack of participation in recreational sports or work activities can be explained by the amount of time they must spend in their household activities (Ainsworth, 2000).

In scope, the KPAS covers important activities related to women's lives. This self-administered questionnaire consists of four subscales: household/caring activities (11 items), occupational activities (12 items), active living habits (4 items), and sports/exercise activities (15 items). Each item is scored on a five-point scale. After being reversely coded, where necessary, the items in each area were summed and divided by the number of items. Therefore, the index score for each subscale ranged between 1 and 5. For example, there were four questions in

the active living habits index. First, items about watching television were reversely coded. Then, all the items were totaled and divided by 4. The total score was a sum of subscales. The possible range of the total score was between 1 and 20. A higher score means greater physical activity.

The one-month test-retest reliability score ranged from .79 to .91 (Ainsworth et al., 2000). In a study with women aged 20 to 60 years, the KPAS showed significant relationships with direct/indirect measures of physical activity, such as the Caltrac accelerometer, physical activity records, cardiorespiratory fitness (VO2 peak), and percent body fat (Ainsworth et al., 2000).

Data Analysis

Data were checked for missing values, distribution, and multicollinearity. The normality of these main variables was acceptable based on kurtosis and skewness analyses. Multicollinearity was checked for all the study variables by using correlations, tolerances, and variance inflation factors (VIF). Stevens (1996) notes that a correlation coefficient greater than .8 indicates multicollinearity. Also, a VIF higher than 10 or a tolerance lower than .01 would indicate multicollinearity. None of the variables in this study met Stevens' criteria, so multicollinearity was not a problem.

An alpha level of .05 was used for all statistical tests. Descriptive statistics (frequency, means, and standard deviation) were used to describe the sample and

variables using SPSS 12.0 for Windows. In addition, a nonparametric test (the Mann-Whitney U test) was used to compare groups with small sample sizes. Bivariate correlations and simple regression analyses were conducted to answer Research Questions 1 and 2. A series of regression analyses testing the mediation effects was conducted to answer Research Question 3. To test for mediation, the following regression equations were necessary (Baron & Kenny, 1986, p.1177).

First equation: Regressing the mediator on the independent variable.

Second equation: Regressing the dependent variable on the independent variable.

Third equation: Regressing the dependent variable on both the independent variable and the mediator.

In addition, to establish mediation, the following conditions must be met (Baron & Kenny, 1986, p.1177; Kenny, 2003).

First, the independent variable significantly affects the mediator.

Second, the independent variable significantly affects the dependent variable.

Third, the mediator significantly affects the dependent variable.

Fourth, the effect of the independent variable on the dependent variable must be less in the third equation than in the second. To establish the complete mediation effect, the effect of the independent variable on the dependent variable controlling for the mediator should be zero.

Summary

An *ex-post facto* study was used to examine the relationships among individual characteristics and experiences, behavior-specific cognition and affect, and physical activity of Korean midlife immigrant women. One hundred and twenty-one participants were recruited by convenience sampling from the Korean community in the Texas area.

A pilot study demonstrated that the translated-Korean versions of the instruments had adequate reliability when they were used in surveys of Korean immigrant women. The population represented by the sample was severely restricted in terms of characteristics such as education level and marital status, but that could be explained by the small sample size. Overall, the pilot study indicated that the data collection method in this study was feasible, but additional work was necessary to acquire a more representative sample of the population.

CHAPTER 4

ANALYSIS AND INTERPRETATION OF FINDINGS

This chapter presents the results of the study, which include describes the demographic characteristics of the sample and the descriptive statistics for the study variables. Then, the chapter answers the research questions and interprets the findings.

Demographic Characteristics of Subjects

A nonprobability sample of 121 Korean immigrant women was recruited from Korean American communities in Texas. All participants except two women were born in Korea. Those two women reported that they were born in the U.S. but raised in Korea and that they moved to the U.S. after they were grown. In this study, all participants were considered to be first-generation immigrants because they came to the U.S. after they were 15 years old. Their lengths of stay in the U.S. ranged from 1 year to 37.5 years, for an average of 14.5 years (*SD*=9.5). The demographic information is listed in Table 4.

The average age of the participants was 47 (*SD*=5.9), and their mean year of education was 14.2 (*SD*=3.0). One hundred and five participants were married. Eleven women were separated, divorced, or widowed, and four women lived alone. Slightly fewer than half of the women (49.6%) worked outside the home. Ninety-one percent of the women reported that their financial status was secure or

somewhat secure. Eighty percent of the women were Protestant, and the other 20 percent reported other religions.

The general health status of the sample is summarized in Table 5. Approximately 46 percent of the women reported that their general health was either poor or fair. Their mean BMI was 22.3 (*SD* = 3.2), and, while 20 percent of the women were overweight, none was obese. Twenty-six percent (n = 29) of the women were menopausal. Among those, eight women had undergone a hysterectomy (30.8 %).

Table 4
Demographic Characteristics of Participants (N=121)

		n	%	*M*	*SD*
Age				47.01	5.86
Education (years)				14.17	3.02
Length of Residency in U.S. (years)				14.49	9.45
Age upon Immigration				32.55	8.61
BMI				22.29	3.21
Occupation	Housewife	61	50.4		
	Employed	60	49.6		
Marital Status [a]	Married	105	86.8		
	Divorced/Widowed	11	9.2		
	Never Married	4	3.3		
Living Arrangement [a]	Alone	4	3.3		
	With spouse or partner	11	9.2		
	With children only	16	13.3		
	With spouse and children	87	72.5		
	With others	2	1.7		
Religion	Protestant	97	80.2		
	Catholic	13	10.7		
	Other	1	0.8		
	None	10	8.3		
Family Income per Year [a]	0-$39,999	34	28.3		
	$40,000-$69,999	40	33.3		
	$70,000+	46	38.3		
Feelings about Financial Status [a]	Secure	39	32.5		
	Somewhat secure	70	58.3		
	Insecure	11	9.2		

[a] N=120

Table 5
Health-Related Characteristics of Participants (N=121)

		n	%	*M*	*SD*
BMI				22.29	3.21
Perceived General Health [a]	Poor	4	3.3		
	Fair	55	45.8		
	Good	43	35.8		
	Very Good	13	10.8		
	Excellent	5	4.2		
Menopausal Status [b]	Surgical Menopause	8	7.1		
	Postmenopause	21	18.6		
	Late Perimenopausal	9	8.0		
	Early Perimenopausal	12	10.6		
	Premenopausal	63	55.8		

[a] N=120, [b] N=113

Descriptive Statistics for the Major Study Variables

Table 6 shows the range, mean, standard deviation, kurtosis, and skewness for age, family income, length of residency in the U.S., level of acculturation, self-efficacy, perceived barriers and benefits, social support, and physical activity. The normality of these main variables was acceptable based on kurtosis and skewness.

Table 6
Descriptive Statistics for the Major Study Variables

Variable	N	Range	*M*	*SD*	Skewness	Kurtosis
Age	121	40-65	47.01	5.86	1.167	0.908
Education (yrs)	119	6-22	14.17	3.02	-0.130	0.522
Length of Residency (yrs)	117	0.9-37.5	14.49	9.45	0.216	-1.051
Total Acculturation	121	1.06-3.31	2.22	0.46	-0.013	-0.239
Self-Efficacy	121	0-100	40.06	22.59	0.428	-0.106
Perceived Barriers	121	13-41	25.79	5.57	-0.118	-0.299
Perceived Benefits	121	42-108	82.93	12.69	-0.179	0.659
Social Support	121	0-3	1.79	0.51	-0.022	0.750
o *Spouse support*	121	0-3	2.04	0.78	-1.072	1.155
o *Children support*	121	0-3	1.94	0.76	-1.025	1.282
o *Other family support*	121	0-3	1.12	0.98	0.080	-1.286
o *Friend support*	121	0-3	2.14	0.49	-0.570	1.933

Table 6
Descriptive Statistics for the Major Study Variables (Continued)

Variable	N	Range	*M*	*SD*	Skewness	Kurtosis
Physical Activity	121	3.5-14.46	9.78	2.00	-0.414	0.139
o *Household/caring activity*	120	1.22-4.33	2.81	0.62	0.233	-0.025
o *Occupational activity*	73	1.25-4.5	2.86	0.82	0.150	-0.762
o *Active living habits*	120	1-4.5	2.68	0.73	-0.015	-0.611
o *Sports/Exercise activity*	121	1-4	2.61	0.82	-0.048	-1.198

Individual Characteristics

Income and financial security were significantly associated (Spearman's rho = -.40, $p < .001$). High income was significantly related to marital status ($r = .19$) and acculturation ($r = .25$), but not to education ($r = .17$). Low-income status was significantly related to age ($r = .22$) and marital status ($r = -.27$). Education was positively related to acculturation ($r = .20$), but negatively related to length of residency in the U.S. ($r = -.34$). The majority of women were married (86.8%). There was no significant age difference between unmarried and married women (48.4 yr ± 7.7 vs. 46.9 yr ± 5.6, p=.466).

Acculturation

SL-ASIA scores ranged from 1.1 to 3.3 ($M = 2.2$; $SD = .46$). The internal consistency of the adapted SL-ASIA was supported by a Cronbach's alpha of .82. The SL-ASIA was significantly related to length of residency in the U.S. ($r = .45$, $p < .001$), indicating that the longer the women had lived in the U.S., the greater their acculturation. Women with high family incomes showed higher acculturation levels ($t = -2.74$, $p = .008$) than those with low family incomes.

Cognition and Affect

PA Self-Efficacy

PA self-efficacy scores ranged from 0 to 100 ($M = 40.1$, $SD = 22.6$). The internal consistency was supported with a Cronbach's alpha of .96. Only four participants (3.3%) considered that their self-efficacy was zero, and those women reported that they did not participate in any sports or exercise. Their active living habits score was lower than those with higher self-efficacy scores, but there was no statistical significance (mean rank 51.50 vs. 60.81, $z = -.530$, $p = 0.596$).

There was a significant positive relationship between total physical activity and self-efficacy ($r = .21$, $p = .021$). Self-efficacy was moderately related to the active living subscore ($r = .49$, $p < .001$) and the participation in sports and exercise subscore ($r = .53$, $p < .001$). However, self-efficacy was not significantly related to age, income, acculturation, or length of residency.

Perceived PA Benefits/Barriers

Perceived benefits scores ranged from 42 to 108 ($M = 82.9$, $SD = 12.7$). Perceived barriers scores ranged from 13 to 41 ($M = 25.8$, $SD = 5.6$). Cronbach's alpha coefficients were .95 and .81 for the benefits and barriers scales, respectively. There was a significant inverse relationship between benefits and barriers ($r = -.34$, $p < .001$.).

Perceived barriers were negatively related to total physical activity (r = -.18, p = .048). Barriers were not related to the household and occupational activity subscale , but were weakly to moderately related to the active living subscale (r = -.28, p = .002) and to the sports and exercise subscale (r = -.30, p = .001).

Perceived benefits were positively related to total physical activity (r = .31, p = .001). Although not significantly related to household/caring and occupational activity, perceived benefits were significantly related to the active living habits (r = .28, p =.002) and to sports/exercise activity (r = .49, p < .001). Perceived benefits were also significantly related to high family income (r = .20, p = .03) and to marital status (r = .22, p = .018), indicating that women who were married perceived greater benefits from physical activity.

PA Social Support

PA social support scores ranged from 0 to 3 (M = 1.79, SD = .51). Cronbach's alpha was .91 for the total score and ranged between .80 and .97 for the spouse, children, other family and friend subscales.

Forty-seven participants (38.8%) reported no social support from other family members. Social support from spouse and friends was significantly related to total physical activity as well to active living habits and sports/exercise activity. Longer residency in the U.S. was negatively related to the "children support"

subscore, indicating that the longer the women had lived in the U.S. the less support for physical activity they received from their children (r = -.22, p = .016). Married women reported higher social support than unmarried women (p <.001); the major contributor to this difference was the spouse support subscore.

Physical Activity

The total physical activity scores ranged from 3.5 to 14.46 (M = 9.78, SD = 2.0). The means for the household/caring activity, occupational activity, active living habits, and sports/exercise activity subscales ranged from 2.6 (SD = .82) to 2.9 (SD = .82).

For the majority of participants, household/caring activity did not include the care of children younger than 5 years of age, disabled children, or elderly persons. In addition, most participants were not involved in any heavy outdoor work or major home decoration or repair. Sixty participants (49.6 %) had jobs outside the home, and 42.4 percent thought that their work was physically more demanding than that of other women in their age group. The percentage of participants who reported that they were always physically tired after work was 34.2.

Approximately 27 percent (n = 32) of the participants walked or bicycled more than 30 minutes per day. Seventy percent of the participants watched television more than 1 hour but less than 2 hours per day. There was no

significant relationship between the number of hours of TV watching and sports/exercise activity (F (4,115) = .391, p = .814). The most frequently reported sports and exercise were walking, swimming, golf, and running. Fifty-four women (45%) reported that they played sports and exercised more than once a week. Eighty-one (66.9%) reported that they were involved in at least one kind of sport or exercise, and 18 (14.9%) participants were involved in three kinds of sports and exercise. Forty-four percent of the women thought that their recreational physical activity was more than that of other women their age (n = 53). When the total physical activity for married women was compared with that of unmarried women (Table 8), the married women were significantly more active than the unmarried women in sports/exercise activity (z = -2.448, p = .014). Although the married women's mean scores were slightly higher for household/caring activity, occupational activity, active living habits, and total physical activity, the difference did not reach statistical significance (See Table 7).

Table 7
Difference in Physical Activity by Marital Status

		N	*M* (*SD*)	Mean Rank	*z*	*p*
Household/caring activity	Unmarried	15	2.59 (.85)	52.0	-.959	.337
	Married	104	2.85 (.58)	61.2		
Occupational activity	Unmarried	11	2.67 (1.01)	32.6	-.682	.495
	Married	61	2.89 (.80)	37.2		
Active living habits	Unmarried	15	2.47 (.74)	50.2	-1.180	.238
	Married	104	2.70 (.72)	61.4		
Sports/exercise activity	Unmarried	15	2.12 (.69)	40.0	-2.448	.014
	Married	105	2.68 (.81)	63.3		
Total physical activity	Unmarried	15	9.13 (1.92)	46.9	-1.623	.105
	Married	105	9.86 (2.01)	62.5		

Note: Mann-Whitney U test was conducted because of small sample size of unmarried group

Analysis of Research Questions

Research Question 1: Relationships between Individual Characteristics and Physical Activity

There were no significant relationships among age, acculturation, and physical activity (see Table 9). Women with more education reported significantly less occupational activity (r = -.32, p = .006) and more sports/exercise activity (r = .18, p = .045). The married women reported more sports/exercise activity (r = .23, p = .012) than did the unmarried women.

Research Question 2: Relationships between Cognition and Affect and Physical Activity

There were significant relationships between cognition and affect and physical activity (see Table 10). Higher self-efficacy (r = .21, p = .021), lower perceived barriers (r = -.18, p = .048), higher perceived benefits (r = .31, p = .001), and greater social support (r = .36, p < .001) were significantly related to total physical activity. In addition, these cognition and affect variables were significantly related to living habits (r = .28 to .49, p < .01) and sports/exercise activity (r = .25 to .53, p < .01), but not to household/caring activity or occupational activity. Social support from a spouse was significantly related to total physical activity. However, it was interesting that social support from

children was significantly related to household/caring activity ($r = .21$, $p = .023$), but not to occupational activity, active living habits, or sports/exercise activity.

Research Question 3: Mediation Effect of Cognition and Affect

To test the four conditions for a mediation effect of the cognition and affect, a series of bivariate correlations and regression analysis was performed. The independent variables were individual characteristics such as age, income, education, marital status, acculturation, and length of residency. Cognition and affect (physical activity self-efficacy, perceived physical activity barriers/benefits, and physical activity social support) were tested to determine if they mediated the relationships between the individual characteristics and physical activity.

First, the relationships between individual characteristics and cognition and affect were examined by bivariate correlations. As shown in Table 8, age was significantly related to social support from children ($r = -.18$, $p = .048$); income (high vs. others) and acculturation were related to perceived benefits ($r = .20$, $p = .030$; $r = .19$, $p = .041$). Length of residency in the U.S. was significantly related to social support from children ($r = -.22$, $p = .016$). Marital status (married) was positively related to perceived benefits ($r = .22$, $p = .018$), total social support ($r = .32$, $p = <.001$), and social support from children ($r = .57$, $p < .001$).

Table 8
Relationships between Individual Characteristics and Cognition and Affect

	SE	Barr	Bene	SS	SS_S	SS_C	SS_F	SS_Fr
Age	.04	-.04	.06	-.10	.03	-.18*	-.11	.11
Income_low	.08	-.01	-.16	-.17	-.17	-.07	-.09	-.09
Income_mid	-.15	.06	-.04	.02	-.01	.00	.05	.00
Income_high	.10	-.06	.20*	.13	.16	.07	.04	.10
Education	.09	.01	.10	.13	.15	.15	-.00	.04
Marital Status	.11	.04	.22*	.32**	.57**	.17	.02	.06
Acculturation	.07	.03	.19*	.05	.02	-.00	.12	-.06
Length of Residency	-.10	.08	.00	-.14	-.07	-.22*	-.01	-.04

Note: Income_low: low income vs. others; Income_mid: mid income vs. others; Income_high: high income vs. others; SE: Self-efficacy; Barr: Perceived Barriers; Bene: Perceived Benefits; SS: Total Social Support; SS_S: Spouse Support; SS_C: Children Support; SS_F: Other Family Support; and, SS_Fr: Friends Support
* < 0.05 ** < 0.01

Second, the relationships between individual characteristics and physical activity were examined with bivariate correlations. As shown in Table 9, low income was inversely related to sports/exercise activity (r = -.18, p = .045), indicating that persons with lower incomes were less likely to participate in sports/exercise activity than were persons with higher incomes. Sports/exercise activity was positively related to education (r = .18, p = .045) and marital status (married) (r = .23, p = .012). Education was significantly related to occupational activities (r = -.32, p = .006), and income was positively related to household/caring activity (r = .24, p = .009).

Table 9
Relationships Between Individual Characteristics and Physical Activity

	Total PA	Household/ caring Activity	Occupational activity	Active Living Habits	Sports/ Exercise activity
Age	.07	.00	.05	-.05	.13
Income_low	-.11	-.18	-.10	.05	-.18*
Income_mid	.13	-.07	.23	.00	.08
Income_high	-.04	.24**	-.15	-.07	.11
Education	.02	-.09	-.32**	.11	.18*
Marital Status	.12	.14	.10	.11	.23*
Acculturation	.09	.11	-.21	.02	.06
Length of Residency	.03	.01	-.09	-.13	-.01

Note: Income_low: low income vs. others; Income_mid: mid income vs. others; Income_high: high income vs. others;
* < 0.05 ** < 0.01

Third, the relationships between cognition and affect and physical activity were examined by bivariate correlations. As shown in Table 10, total physical activity was significantly related to self-efficacy (r=.210, p=.021), perceived barriers/benefits (r = -.180, p = .048 and r = .307, p = .001), and total social support (r = .360, p < .001). Active living habits and sports/exercise activity were also significantly related to these cognition/affect characteristics (See Table 10). However, there was no significant relationship between cognition and affect and occupational activity. Household/caring activity was related only to social support from children (r = .207, p = .023).

Table 10
Relationships Between Cognition and Affect and Physical Activity

	Total PA	Household/ caring Activity	Occupational activity	Active Living Habits	Sports/ Exercise activity
SE	.21*	.12	-.16	.49**	.53**
Barr	-.18*	.04	.05	-.28**	-.30**
Bene	.31**	.08	-.07	.28**	.49**
SS	.36**	.17	-.05	.25**	.25**
SS_S	.41**	.07	-.07	.31**	.40**
SS_C	.18	.21*	-.21	.16	.13
SS_F	.13	.12	.17	.01	-.07
SS_Fr	.27**	-.07	-.11	.25**	.37**

Note: SE: Self-efficacy; Barr: Perceived Barriers; Bene: Perceived Benefits; SS: Total Social Support; SS_S: Spouse Support; SS_C: Children Support; SS_F: Other Family Support; and, SS_Fr: Friends Support
* < 0.05 ** < 0.01

According to these analyses, there existed three possible mediation effects of cognition/affect characteristics in the relationship between marital status (married-not married) and sports/exercise activity. To test each mediation effect, two hierarchical regression equations were computed. The dependent variable was sports/exercise activity. In Equation 1, the independent variable was entered at Step 1, and the mediator variable was entered at Step 2. In Equation 2, the mediator variable was entered at Step 1, and the independent variable at Step 2.

First, there was a mediation effect of perceived benefits on the relationship between marital status and sports/exercise activity (Figure 2, Table 11). Of the variance in sports/exercise activity, 5.3 percent was explained by marital status. After controlling for the effect of perceived benefits, however, the analysis showed that only 1.6 percent of the variance was explained by marital status, which was 3.7 percent less than before. Therefore, it was concluded that perceived benefits mediated the relationship between marital status and sports/exercise activity.

Figure 2. Mediation Effect of Perceived Benefits

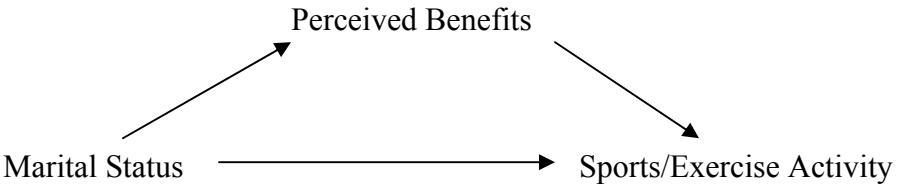


Table 11
Multiple Regression Analyses Testing the Mediation Effects of Perceived Benefits on the relationship of Marital Status to Sports/Exercise Activity

Variable	*r*	R^2	Adj R^2	R^2 Change	*F* Change	*p*
Equation1						
Marital Status	.23	.053	.05	.053	6.586	.012
Perceived Benefits	.51	.257	.24	.204	32.137	.001
Equation2						
Perceived Benefits	.49	.241	.23	.241	37.443	.001
Marital Status	.51	.257	.24	.016	2.532	.114

Note:
Dependent Variable: Sports/Exercise Activity
Marital Status was entered at Step 1 and Perceived Benefits was entered at Step2 for Equation 1, and vice versa for Equation 2.

Second, there was a mediation effect of total social support on the relationship between marital status and sports/exercise activity (Figure 3, Table 12). As mentioned for the previous mediation effect, marital status explained 5.3 percent of the variance in sports/exercise activity. After controlling for the effect of total support, only 2.4 percent of the variance was explained by marital status,

which was 2.9 percent less than before. Thus, total social support partially mediated the relationship between marital status and sports/exercise activity.

Figure 3. Mediation Effect of Total Social Support

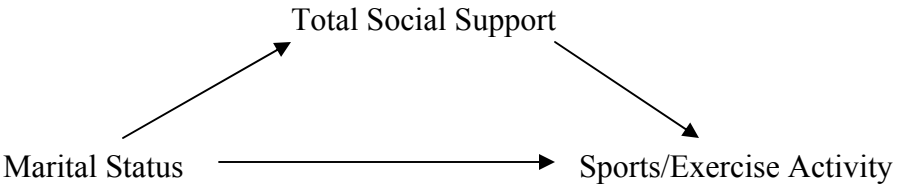


Table 12
Multiple Regression Analyses Testing the Mediation Effects of Total Social Support Between Marital Status and Sports/Exercise Activity

Variable	*r*	R^2	Adj R^2	R^2 Change	*F* Change	*p*
Equation 1						
Marital Status	.23	.053	.05	.053	6.586	.012
Total Social Support	.30	.088	.07	.036	4.570	.035
Equation 2						
Total Social Support	.25	.064	.06	.064	8.070	.005
Marital Status	.30	.088	.07	.024	3.138	.079

Note:
Dependent Variable: Sports/Exercise Activity
Marital Status was entered at Step 1 and Total Social Support was entered at Step 2 for Equation 1, and vice versa for Equation 2.

Third, there was a mediation effect of social support from the spouse on the relationship between marital status and sports/exercise activity (Figure 4, Table 13). When the effect of social support from the spouse was controlled, the variance explained by marital status before (5.3%) completely disappeared. Thus, social support from the spouse had a mediation effect on the relationship between marital status and sports/exercise activity.

Figure 4. Mediation Effect of Social Support from Spouse

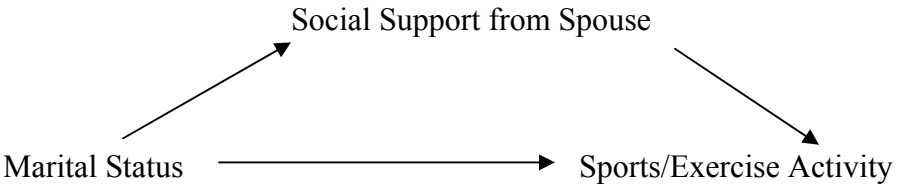


Table 13
Multiple Regression Analyses Testing the Mediation Effects of Social Support from Spouse Between Marital Status and Sports/Exercise Activity

Variable	*r*	R^2	Adj R^2	R^2 Change	*F* Change	*p*
Equation1						
Marital Status	.23	.053	.05	.053	6.586	.012
Social Support from Spouse	.41	.169	.15	.116	16.303	.000
Equation2						
Social Support from Spouse	.41	.169	.17	.169	23.940	.000
Marital Status	.41	.169	.15	.000	.005	.942

Note:
Dependent Variable: Sports/Exercise Activity
Marital Status was entered at Step 1 and Social Support from Spouse was entered at Step2 for Equation 1, and vice versa for Equation 2.

Indirect Relationships among Main Study Variables

Although some variables did not meet all of the assumptions for a mediation effect, some indirect relationships were found among variables in the study. An indirect relationship (X1→X2→X3), rather than a mediation effect, exists when no significant relationship is present between an independent (X1) and a dependent variable (X3), but the independent variable (X1) is significantly related to a mediator (X2), and the mediator (X2) is significantly related to the dependent variable (X3) (Davis, 1985).

Two patterns of indirect relationships were found in the study: (a) a cumulative relationship and (b) a noncumulative relationship. Marital status had cumulative relationships to total physical activity, active living habits, and sports/exercise activity via perceived benefits, total social support, and social support from spouse. Other variables had noncumulative relationships. These relationships are shown in Tables 14 to 17.

According to Davis (1985), the total effect of a noncumulative relationship is calculated by multiplying two correlation coefficients. This process is the same as that used to calculate standardized path coefficients (beta weights) (Davis, 1985). The total effect would be much smaller when individual coefficients were multiplied, even though individual coefficients between two variables might be large. For example, the correlation coefficients between marital status and perceived benefits and between perceived benefits and total physical activity

indicated medium effect sizes (r = .22 and r = .31, respectively), but when they were multiplied, the total effect was .068, which is smaller than the value of its smallest link. For this reason, "even though a path contains strong effects, if one of the links is tiny, the total path effect will be tiny" (Davis, 1985, p 56). In addition, the total effect of noncumulative relationships was calculated by the summated product of individual correlation coefficients.

Income, level of acculturation, and marital status indirectly influenced total physical activity (Table 14). Income had an indirect effect on total physical activity through perceived benefits. Level of acculturation and length of residency in the U.S. did not influence total physical activity, but there were indirect relationships among them through perceived benefits (r = .059). Marital status had an indirect effect on total physical activity via perceived benefits, total social support, and social support from spouse; the total effect was .417 (.068 + .115 + .234).

Table 14
Indirect Relationship with Total Physical Activity

Independent	Intervening	Dependent	Total Effect
Income_high	Perceived Benefits	Total Physical Activity	.20 X .31 =.062
Level of Acculturation	Perceived Benefits	Total Physical Activity	.19 X .31 =.059
Marital Status	Perceived Benefits Total Social Support Social Support from Spouse	Total Physical Activity	(.22X.31) + (.32X.36) + (.57X.41) =.417

Length of residency in the U.S. did not directly influence household/caring activity, but there was a weak, indirect relationship among those variables through social support from children (Table 15).

Table 15
Household/Caring Activity

Independent	Intervening	Dependent	Total Effect
Length of Residency in U.S.	Social Support from Children	Household/Caring	-.22X.21=-.048

In addition, income and level of acculturation indirectly influenced active living habits and sports/exercise activity through self-efficacy and perceived benefits (Table 16 and 17). Marital status had a cumulative indirect effect on active living habits via perceived benefits, total social support, and social support from spouse; the total effect was .32 (.06 + .08 + .18).

Table 16
Physical Activities from Active Living Habits

Independent	Intervening	Dependent	Total Effect
Income_high	Perceived Benefits	Active Living Habits	.20X.28 =.056
Acculturation	Perceived Benefits	Active Living Habits	.19X.28 =.053
Marital Status	Perceived Benefits Total Social Support Social Support from Spouse	Active Living Habits	(.22X.28) + (.32X.25) + (.57X.31) = .32

Table 17
Indirect Relationship with Sports/Exercise Activity

Independent	Intervening	Dependent	Total Effect
Income_high	Perceived Benefits	Sports/Exercise	.20X.49 =.098
Acculturation	Perceived Benefits	Sports/Exercise	.19X.49 =.093

Discussion of the Findings

In accordance with a health-promotion model of physical activity, relationships between individual characteristics, behavior-specific cognition and affect, and physical activity were studied among Korean midlife immigrant women. The results showed that 33.1 percent of the sample was not engaged in any form of exercise, which is similar to the findings of previous studies (Centers for Disease Control and Prevention, 2000; Kang et al., 1997). Of the women who participated in BRFSS for Texas (Centers for Disease Control and Prevention, 2000), 30.5 percent had not engaged in any form of exercise in the previous month. Thirty-six percent of Korean women in California had not exercised in the preceding month (Kang et al., 1997). Data for the intensity of exercise showed, however, opposite results. The women in the present study participated more frequently in vigorous exercise such as jogging, aerobics, and swimming than they did in light exercise activity such as walking and golfing (91 reports vs. 46 reports). In contrast, Lee, Sobal, and Frongillo (2000) reported that Korean American immigrants engaged more frequently in light physical activity than vigorous physical activity.

The most frequently reported single exercise was walking, which confirms previous studies by Walsh et al. (2001), Laffrey (2000), and Ainsworth et al. (1999). The percentage of women who regularly participated in more than two kinds of sports/exercise was 32.2. Even though there was no significant

relationship between age and total physical activity, occupational activity was slightly higher for the older women in the sample. This trend differs from that revealed in a study of African American and Native Americans between 40 and 83 years of age (Ainsworth et al., 1999). In another study (Gu & Eun, 2002), elderly Korean immigrants in the U.S. were less engaged in exercise than elderly adults in Korea. In contrast, this study showed that age was inversely related to active living habits and positively related to sports/exercise activity. Except for active living habits, the other components of total physical activity (occupational, sports/exercise activity) increased as the women became older, which was not quite the same trend as reported in Scharff et al. (1999) .

When the portion that each area of activity contributes to one's total physical activity was estimated, each area represented about the same amount of activity: household/caring activity (30 % ± 7.8), occupational activity (26.3 % ± 6.8), active living habits (27.6 % ± 6.6), and sports/exercise activity (27.2 % ± 7.8). It was assumed that most of the daily activities were composed of nonleisure-time physical activity, as indicated in the Canada Fitness Survey (Weller & Corey, 1998), even though daily energy expenditures were not calculated in this study.

There were no significant relationships between acculturation and cognition and affect, except for perceived benefits. This result was similar to that from a study of Japanese Americans (Harada et al., 2000), but it was different

from the findings in studies of Mexican American adults (Crespo et al., 2001) and those from another study of Korean immigrant women (Lee et al., 2000). Those differences might be explained by the use of different measures of acculturation or to differences in patterns of acculturation. To become fully acculturated, a person must be at least a third-generation resident (Spector, 1996). Since most of the women in this study were first-generation immigrants, in spite of their different lengths of residency in the U.S., their level of acculturation did not vary when compared with other behaviors in the sample.

Acculturation has been shown to be positively or negatively associated with various health-related behaviors, such as low-fat diet (Liou & Contento, 2001), use of hearing protection (Rabinowitz & Duran, 2001), immunization (Prislin et al., 1998), smoking (Unger et al., 2000), overweight and obesity (Lauderdale & Rathouz, 2000), and participation in physical activity (Crespo et al., 2001; Harada et al., 2000; Lee et al., 2000). Thus, it was surprising that level of acculturation did not show any significant relationship with any of the components of total physical activity in this sample, even though it could be seen that, as women became acculturated, they became slightly more involved in active living habits and sports/exercise. However, indirect relationships among variables showed that the level of acculturation influenced active living habits and sports/exercise activity via perceived benefits. The more acculturated women tended to perceive more benefits, and women with more benefits were more likely

to engage in active living habits and sports/exercise activity as well as total physical activity.

As previous studies showed (King et al., 1998; Ransdell & Wells, 1998; Schmitz et al., 1997), marital status was important among women, but mostly in relation to household/caring activity. When total physical activity was compared between the married and unmarried women, the married women engaged in more activities in general, as well as in each component (household/caring, occupational, active living habits, sports/exercise activity) of total activity, than did the unmarried women; however, this difference reached statistical significance only in sports/exercise activity. This finding that married women engaged in more sports/exercise activity was consistent with that of Ransdell and Wells (1998).

This study found that perceived physical activity benefits, total support, and spouse social support influenced the relationship between marital status (married vs. unmarried) and sports/exercise activity. Even though this study could not support any causal relationship because of the limitations of the study design and statistical analyses, this result suggests that marital status itself may not predict women's engagement in sports/exercise activity. In other words, the influence of marital status on sports/exercise activity would not be significant if married women had not perceived any benefits of physical activity or they had not had any support of physical activity, especially from their spouses.

Women with low incomes had less participation in sports/exercise activities than those with higher incomes, which confirmed previous studies (Crespo et al., 1999; Crespo et al., 2001). In addition, women with high incomes engaged in more sports/exercise activity as well as occupational activities. Income was considered a better social indicator than education for the sample because immigrants tend to have lower-skilled jobs than their education would indicate (Zeng & Xie, 2004) . Education was considered redundant if it was measured with income, and education did not show any relationship to activity among women in the mid-income class of this population. In this sample, however, the more educated women reported greater occupational activity.

As previous studies have indicated (Eyler et al., 1999; Sallis, Hovell, & Hofstetter, 1992; Sternfeld, Ainsworth et al., 1999), women in this sample who had greater support from others were more likely to participate in sports/exercise activity. In fact, the highest social support scores were spouse's support and friends' support, indicating that the main sources of encouragement for physical activity were husband and friends. However, these sources of support were not significantly related with age, income, or level of acculturation. In addition, level of education was positively related to sports/exercise activity. However, there was a lack of significant relationships between cognition and affect and household/caring and occupational activity. This absence of significance might be explained by the fact that the instruments used in this study to measure cognition

and affect were specific to exercise. It would be important in future research to develop instruments that directly target cognition and affect for physical activity and its components.

Older women reported fewer barriers to exercise and lower self-efficacy for exercise than did younger women in a study with a diverse population (Scharff et al., 1999). This study, however, showed that age was inversely related to perceived barriers and positively related to self-efficacy. Although not significant, this trend suggests that as women become older, their perception of barriers may decrease, and their perception of self-efficacy might increase.

There were significant relationships for cognitive and affect characteristics with total physical activity and with active living and sports/exercise activity. Women with higher self-efficacy reported greater sports/exercise involvement and more active living habits, which bears out previous studies (Clark, 1999; Horne, 1994; McAuley, 1992; Sallis, Hovell, Hofstetter et al., 1992; Sherwood & Jeffery, 2000). In addition, sports/exercise activity and active living habits showed positive relationships with perceived benefits and negative relationships with perceived barriers, as has been reported in previous studies (Caserta & Gillett, 1998; Clark, 1999; Kutner et al., 1997). Social support from others, especially spouses and friends, was an important predictor in this study, and this too was revealed in previous studies (Resnick et al., 2002; Sallis, Hovell, Hofstetter et al., 1992; Sternfeld, Ainsworth et al., 1999).

Summary

The study showed no significant relationship between acculturation and total physical activity among Korean midlife immigrant women; however, there was an indirect relationship between acculturation and total physical activity via perceived benefits. In addition, physical activity had significant bivariate relationships with self-efficacy, perceived barriers and benefits, and social support. There were mediation effects in the relationship between marital status and sports/exercise activity; the mediator variables were perceived benefits, total social support, and spouse support.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the study and presents some concluding remarks. In addition, the chapter examines issues regarding the theoretical perspective and methodology of the study. Finally, the chapter discusses the implication of the study for future nursing research and presents recommendations for further investigations.

Conclusions of the Study

The purpose of this *ex post-facto* study was to examine relationships among individual characteristics (age, acculturation, income, education, and marital status), cognition and affect (physical activity self-efficacy, perceived physical activity barriers/benefits, and physical activity social support), and physical activity (household/caring activity, occupational activity, active living habits, and sports/exercise activity) among Korean midlife immigrant women. A health-promotion model of physical activity adapted from Pender's Health Promotion Model was used to guide this study.

A nonprobability sample of 121 Korean midlife immigrants was recruited by flyers in Korean communities in Central Texas (with a 43.2% return rate). Women who agreed to participate in the study sent signed consent forms and the completed questionnaires to the researcher in prepaid envelopes either in person

or via the U.S. mail. Six instruments were used for the study: (1) a demographic questionnaire, (2) the adapted Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA), (3) the Exercise Self-Efficacy, (4) the Exercise Benefits/Barriers Scale, (5) the Exercise Social Support Scale, and (6) the Kaiser Physical Activity Survey.

All data were checked for skewness, kurtosis, and multicollinearity. According to accepted statistical conventions, there was no violation of data integrity requiring further analysis. To answer the research questions, bivariate correlations and a series of regression analyses were conducted using the SPSS 12.0.

The more acculturated the participants, the more physical activity they reported, but this finding was not statistically significant so that generalization is not supportable. Greater education levels among the women were related to less occupational activity and more sports/exercise. Married women reported more sports/exercise activity than non-married women. As reported in previous research, there were significant bivariate relationships between cognition and affect (self-efficacy, perceived barriers, perceived benefits, total social support) and engagement in more physical activity. Women's perceived physical activity benefits, total support, and spouse's social support influenced the relationship between marital status (married vs. unmarried) and sports/exercise activity in separate analyses.

Additionally, the study revealed indirect relationships; namely, income, level of acculturation, length of residency in the U.S., and marital status indirectly influenced the amount of total physical activity. The length of residency in the U.S. did not directly influence household/caring activity, but there was an indirect relationship among these variables through social support from children. Income and acculturation indirectly influenced the amount of physical activity from active living habits and sports/exercise activity through self-efficacy and perceived benefits.

In conclusion, this study contributes to our knowledge about the types of physical activity among Korean immigrant midlife women. Their physical activity (total activity, daily active living habits, occupational activity, and sports/exercise activity) was measured and compared with that of other populations, both other immigrants and the general population in the U.S. Acculturation did not play an important role in these women's involvement in physical activity. The study nevertheless provides valuable information in that few other studies have focused on this population, and even those few have shown a great variation in their findings. In addition, this study showed that income and marital status were significantly related to cognition and affect and physical activity. Finally, cognition and affect showed significant relationships with total physical activity, active living habits, and sport/exercise activity as hypothesized in the health-

promotion model of physical activity, even though those significant relationships were not shown with household/caring activity and occupational activity.

Theoretical and Methodological Issues

Theoretical Issues

A health-promotion model of physical activity was used to guide this study. Analyses for the mediation effect of cognition and affect were conducted to answer the research questions. From this model, only three mediation effects of cognition and affect were found in the relationships between individual characteristics and physical activity. These results do not support any causal relationships among the variables in the model because of the limitations of the study design and statistical analyses. The findings do support, however, further investigation with the model to see whether causal sequences might exist among the variables with a Korean immigrant population.

As indicated by Pender (Pender et al., 2002), acculturation can be an important individual characteristic in a Health Promotion Model; therefore, acculturation was incorporated into the model. As shown in this study, acculturation did not significantly influence any of the cognition and affect nor did it influence sports/exercise activities in the sample; however, more studies regarding the role of acculturation in health-promoting behaviors should be conducted to more clearly ascertain the role of acculturation.

Methodological Issues

Return Rate and External Validity

In mail surveys, response rates between 60 percent and 70 percent are considered acceptable (Mangione, 1995). This study, however, showed a return rate of 43 percent, which is low. A total of 280 questionnaires was distributed to women who had verbally agreed to participate in the study, but only 121 questionnaires were returned. Consequently, one of the concerns regarding the low response rate was that a portion of the targeted population may not be represented in the results (Mangione, 1995).

Because the sample in the study was recruited on a nonprobability basis, the degree that the sample represents the population has some limitation. When compared with the general immigrant population, the women were highly educated, had a higher income, were mostly married, and were mostly Protestant. As a result, those differences, as well as the small sample size, place more limits on how well some individual characteristics in the analyses may represent those characteristics in the general population.

Measurement of Cognition and Affect for Physical Activity

There were few available instruments to measure cognition and affect related to general physical activity. Therefore, cognition and affect regarding physical activity were measured by instruments designed to measure exercise

cognition and affect. The study revealed no relationships for cognition and affect with household/caring and occupational activity. Based on these findings, further research needs to develop instruments for measuring physical activity related to cognition and affect, which include household/caring and occupation.

Cognition and affect, however, may not be relevant to household/caring and occupation. In the underlying theories of the HPM (Pender et al., 2002), people have free will in choosing their behaviors, and they are more likely to choose well if cognition and affect conditions encourage them to do so. According to Korean women's perceptions (Im & Choe, 2004; Yang, 2004), however, household/caring and occupation may not be behaviors that they would choose with free will, because these physical activities stem from a sense of obligation rather than choice. In addition, after completing obligatory household/caring and occupational activities, women may have little time or energy for sports/exercise activity.

Measurement of Acculturation

Acculturation was measured with an adaptation of SL-ASIA and by the length of residency in the U.S. The adapted SL-ASIA was translated into Korean, and five items were excluded from the original SL-ASIA because those items were not relevant for Korean women. According to an e-mail conversation with Dr. Suinn (personal communication, July 10, 2003), if translation is necessary, the

SL-ASIA may not be a good instrument for this population because the level of acculturation would be low. For this study, however, the translation was acceptable because the number of years living in the U.S. was fairly well distributed in the sample. Moreover, Dr. Suinn (personal communication, March 9, 2004) was concerned that any change in the instrument would affect results, so that those results could not be compared with those of other studies using the same instrument. This study, however, had few alternative choices as to an instrument for this population.

In spite of their relatively long residency in the U.S., the participants in this study showed a low level of acculturation, even though there was a significant positive relationship between those two variables. The relationships of acculturation with all other main variables except perceived benefits were not statistically significant. It is necessary to confirm these SL-ASIA results with a larger and more diverse sample in future studies. In addition, even though patterns of acculturation can be similar, acculturation changes over time may vary among different people (Berry, 1980; Phinney, 2003). For that reason, studies to find a better indicator for measuring acculturation among this population are needed.

Implications for Nursing

The size of the immigrant population and their offspring in the U.S. has been increasing rapidly and now represents a large portion of the population. The

time is right to launch a major research effort to discover how the daily behaviors and conditions of immigrants benefit or threaten their health. Specifically, a rigorous investigation is needed to determine the relationships and/or dynamics between individual characteristics and cognition/affect and health-promoting behaviors in this population.

Furthermore, nursing researchers need to study how to strengthen the individual attributes and social conditions that enhance women's engagement in physical activity. For example, because income is seldom controllable, health professionals and researchers should pay attention to the health needs of lower-income immigrant families and study how those families can compensate for their limited resources. Increasing women's perceived benefits of physical activity is another way to encourage more engagement in physical activity.

In spite of the widely acknowledged health benefits of physical activity, physical inactivity is still common among Korean immigrant women, and future studies should continue to monitor and counter that inactivity. In addition, health professionals need to encourage these women to become more involved in active living.

Recommendations for Future Research

Based on the findings of this study, recommendations for future research are as follows:

1. Replication of this study with a larger sample size might be needed. A larger sample size is needed for future research not only to obtain a greater variety of individual characteristics, but also to verify the possible causal relationships among variables with other samples of the Korean immigrant population.
2. Comparisons between men and women might be needed to acquire information as to how active men are and to determine how acculturation works differently for the two sexes in regard to involvement in physical activity.
3. After verification of the SL-ASIA with larger and more representative samples, studies need to turn to the design of acculturation instruments to develop a better tool for measuring acculturation accurately and efficiently.
4. Physical activity should be determined with both direct and indirect measurements. In addition, future studies should examine exercise adherence in the immigrant population.

Summary

This chapter has summarized the study and presented its conclusions. In addition, the chapter has discussed the implications of the study in regard to nursing and has listed a number of recommendations for future research. Despite

concerns regarding theoretical and methodological issues, the results from this study contribute to our understanding of physical activity among Korean midlife immigrant women.

Appendix 1: Instruments (English/Korean)

Demographic Questions

Please answer the following questions so we can understand your background.

1. What is your age? _____

2. What is the highest grade you've completed in school? _____

3. Did you go to school in the U.S.?

   (1) Yes (2) No → Go To Item 5.

4. (If you said "Yes" in Item 3), Please check all the schools you went to in the U.S.

   (1) Elementary (3) High School (5) Graduate School (Master)

   (2) Junior High School (4) College (6) Graduate School (Doctoral)

5. What is your weight and height?

   Weight _____kg OR _____lb

   Height _____cm OR _____ft.

6. What is your marital status?

   (1) Never Married (4) Divorced

   (2) Married (5) Widowed

   (3) Separated

7. Whom do you live with right now?

   (1) Alone (4) With spouse and children

   (2) With spouse or partner only (5) With others _____

   (3) With children only

8. What is your religion?

   (1) Protestant (4) Other _____

   (2) Catholic (5) None

   (3) Buddhism

9. What is your family income (per year)?

   (1) 0—$19,999 (4) $50,000—$69,999

   (2) $20,000—$39,999 (5) $70,000+

   (3) $40,000—$49,999

10. How do you feel about your financial status?

    (1) Secure (2) Somewhat secure (3) Insecure

11. Where were you born?

(1) United States → Go To Item 14.

(2) Korea (3) Other _____

(If you said "Korea or Other" in Item 11)

12. When did you come to the U.S.? _____year _____month

13. Whom did you come to the U.S. with? (Please check all that apply.)

(1) Parent(s) (3) Children (5) Other _____

(2) Spouse (4) Alone

14. In general, how would you rate your health?

(1) Poor (2) Fair (3) Good (4) Very good (5) Excellent

15. Please check your menopausal status.

(1) Menses has stopped as a result of surgery (for example, a hysterectomy).

(2) Menses has stopped for at least 12 months without surgery.

(3) Menses has occurred in the past 12 months, but not in the last 3 months.

(4) Menses has occurred in the past 3 months, but has become less predictable.

(5) Menses has occurred in the past 3 months with no decrease in predictability.

Adapted SUINN-LEW ASIAN SELF-IDENTITY ACCULTURATION SCALE (SL-ASIA)

INSTRUCTIONS: The questions which follow are for the purpose of collecting information about your historical background as well as more recent behaviors which may be related to your cultural identity. Choose the one answer which best describes you.

1. What language can you speak?
   1. Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
   2. Mostly Asian, some English
   3. Asian and English about equally well (bilingual)
   4. Mostly English, some Asian
   5. Only English
2. What language do you prefer?
   1. Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
   2. Mostly Asian, some English
   3. Asian and English about equally well (bilingual)
   4. Mostly English, some Asian
   5. Only English
3. How do you identify yourself?
   1. Oriental
   2. Asian
   3. Asian-American
   4. Chinese-American, Japanese-American, Korean-American, etc.
   5. American
4. Whom do you now associate with in the community?
   1. Almost exclusively Asians, Asian-Americans, Orientals
   2. Mostly Asians, Asian-Americans, Orientals
   3. About equally Asian groups and Anglo groups
   4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
   5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
5. If you could pick, whom would you prefer to associate with in the community?
   1. Almost exclusively Asians, Asian-Americans, Orientals
   2. Mostly Asians, Asian-Americans, Orientals
   3. About equally Asian groups and Anglo groups
   4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
   5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups

6. What is your music preference?
   1. Only Asian music (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
   2. Mostly Asian
   3. Equally Asian and English
   4. Mostly English
   5. English only
7. What is your movie preference?
   1. Asian-language movies only
   2. Asian-language movies mostly
   3. Equally Asian/English English-language movies
   4. Mostly English-language movies only
   5. English-language movies only

8. What generation are you? (circle the generation that best applies to you:)
   1. 1st Generation = I was born in Asia or country other than U.S.
   2 . 2nd Generation = I was born in U.S., either parent was born in Asia or country other than U.S.
   3. 3rd Generation = I was born in U.S., both parents were born in U.S, and all grandparents born in Asia or country other than U.S.
   4. 4th Generation = I was born in U.S., both parents were born in U.S, and at least one grandparent born in Asia or country other than U.S. and one grandparent born in U.S.
   5. 5th Generation = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.
   6. Don't know what generation best fits since I lack some information.

9. Where were you raised?
   1. In Asia only
   2. Mostly in Asia, some in U.S.
   3. Equally in Asia and U.S.
   4. Mostly in U.S., some in Asia
   5. In U.S. only
10. What is your food preference at home?
   1. Exclusively Asian food
   2. Mostly Asian food, some American
   3. About equally Asian and American
   4. Mostly American food
   5. Exclusively American food
11. What is your food preference in restaurants?
   1. Exclusively Asian food
   2. Mostly Asian food, some American
   3. About equally Asian and American
   4. Mostly American food
   5. Exclusively American food

12. Do you
    1. read only an Asian language
    2. read an Asian language better than English
    3. read both Asian and English equally well
    4. read English better than an Asian language
    5. read only English
13. Do you
    1. write only an Asian language
    2. write an Asian language better than English
    3. write both Asian and English equally well
    4. write English better than an Asian language
    5. write only English
14. If you consider yourself a member of the Asian group (Oriental, Asian, Asian-American, Chinese-American, etc., whatever term you prefer), how much pride do you have in this group?
    1. Extremely proud
    2. Moderately proud
    3. Little pride
    4. No pride but do not feel negative toward group
    5. No pride but do feel negative toward group
15. How would you rate yourself?
    1. Very Asian
    2. Mostly Asian
    3. Bicultural
    4. Mostly Westernized
    5. Very Westernized
16. Do you participate in Asian occasions, holidays, traditions, etc.?
    1. Nearly all
    2. Most of them
    3. Some of them
    4. A few of them
    5. None at all

Exercise Self-Efficacy Scale

DIRECTIONS: A number of situations are described below that can make it hard to stick to exercise regularly (3 or more times a week). On the items below, please rate your confidence that you can perform exercise on a regular basis. Please rate your degree of confidence by recording in each of the blank spaces a number from 0 to 100 using the scale below.

0 10 20 30 40 **50** 60 70 80 90 **100**
Cannot do at all — Moderately certain can do — Certain can do

1. When I am feeling tired	0	10	20	30	40	50	60	70	80	90	100
2. When I am feeling under pressure from work	0	10	20	30	40	50	60	70	80	90	100
3. During bad weather	0	10	20	30	40	50	60	70	80	90	100
4. After recovering from an injury that caused me to stop exercising	0	10	20	30	40	50	60	70	80	90	100
5. During or after experiencing personal problems	0	10	20	30	40	50	60	70	80	90	100
6. When I am feeling depressed	0	10	20	30	40	50	60	70	80	90	100
7. When I am feeling anxious	0	10	20	30	40	50	60	70	80	90	100
8. After recovering from an illness that caused me to stop exercising	0	10	20	30	40	50	60	70	80	90	100
9. When I feel physical discomfort when I exercise	0	10	20	30	40	50	60	70	80	90	100
10. After a vacation	0	10	20	30	40	50	60	70	80	90	100
11. When I have too much work to do at home	0	10	20	30	40	50	60	70	80	90	100
12. When visitors are present	0	10	20	30	40	50	60	70	80	90	100
13. When there are other interesting things to do	0	10	20	30	40	50	60	70	80	90	100
14. If I don't reach my exercise goals	0	10	20	30	40	50	60	70	80	90	100
15. Without support from my family or friends	0	10	20	30	40	50	60	70	80	90	100
16. During a vacation	0	10	20	30	40	50	60	70	80	90	100
17. When I have other time commitments	0	10	20	30	40	50	60	70	80	90	100
18. After experiencing family problems	0	10	20	30	40	50	60	70	80	90	100

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.

	SA	A	D	SD
1. I enjoy exercise.				
2. Exercise decreases feelings of stress and tension for me.				
3. Exercise improves my mental health.				
4. Exercising takes too much of my time.				
5. Exercise tires me.				
6. Exercise increases my muscle strength.				
7. Exercise gives me a sense of personal accomplishment.				
8. Places for me to exercise are too far away.				
9. Exercising makes me feel relaxes.				
10. Exercising lets me have contact with friends and persons I enjoy				
11. I am too embarrassed to exercise.				
12. It costs too much money to exercise.				
13. Exercising increases my level of physical fitness.				
14. Exercise facilities do not have convenient schedules for me.				
15. My muscle tone is improved with exercise.				
16. Exercising improves functioning of my cardiovascular system.				
17. I am fatigued by exercise.				
20. I have improved feelings of well being from exercise.				
19. Exercise increases my stamina.				
20. Exercise improves my flexibility.				
21. Exercise takes too much time from family relationships.				
22. My disposition is improved by exercise.				
23. Exercising helps me sleep better at night.				
24. I will live longer if I exercise.				

25. I think people in exercise clothes look funny. 26. Exercise helps me decrease fatigue. 27. Exercising is a good way for me to meet new people. 28. My physical endurance is improved by exercising. 29. Exercising improves my self-concept. 30. My family members do not encourage me to exercise. 31. Exercising increases my mental alertness. 32. Exercise allows me to carry out normal activities without becoming tired. 33. Exercise improves the quality of my work. 34. Exercise takes too much time from my family responsibilities. 35. Exercise is good entertainment for me. 36. Exercising increases my acceptance by others. 37. Exercise is hard work for me. 38. Exercise improves overall body functioning for me. 39. There are too few places for me to exercise. 40. Exercise improves the way my body looks.				

Exercise Social Support

During a usual week, how much do the people in your family do these things with you? Place a check (√) in a box under each person for your answer.

		Spouse				Children				Brother(s)/Sister(s)/Parent(s)			
		Never	Sometimes	Often		Never	Sometimes	Often		Never	Sometimes	Often
Take me to play sports or exercise	L1.				L2.				L3.			
Exercise with me	L4.				L5.				L6.			
Encourage me to exercise or play hard	L7.				L8.				L9.			
Play games/sports with me	L10				L11.				L12.			
Plan family sport activities (bike, swim, walk, shoot baskets)	L13				L14.				L15.			
Praise me for exercising	L16				L17.				L18.			
Complain about my exercising	L19				L20.				L21.			

During a normal week, how much do your **friends** do these things with you?

		Never	Sometimes	Often
Play games/sports with me	L22.			
Exercise with me	L23.			
Encourage me to exercise or play hard	L24.			
Praise me for exercising	L25.			
Criticize me for exercising	L26.			

KAISER PHYSICAL ACTIVITY SURVEY

SECTION I. HOUSEHOLD AND FAMILY CARE ACTIVITIES
First, we want to know about your activities at home, not including activities you may do at your home or other people's home for pay. During the past year (12 months back from today), how much time did you spend...

1. Caring for a child or children under 2 years of age	1) None or less than 1 hour a week 3) Less than 1 hour but more than 20 hours a week 5) More than 20 hours a week
2. Caring for a child or children between 2 and 5 years of age	1) None or less than 1 hour a week 3) Less than 1 hour but more than 20 hours a week 5) More than 20 hours a week
3. Caring for a disabled child or elderly person (only count time actually spent in feeding, dressing, moving, etc.)	1) None or less than 1 hour a week 3) Less than 1 hour but more than 20 hours a week 5) More than 20 hours a week
4. Preparing meals or cleaning up from meals on weekdays	1) None or less than *1/2* hour a day 2) More than 1/2 hour but less than 1 hour a day 3) More than 1 hour but less than one and half hours a day 4) More than one and half hours but less than 2 hours a day 5) More than 2 hours a day
5. Preparing meals or cleaning up from meals on weekends	1) None or less than *1/2* hour a day 2) More than 1/2 hour but less than 1 hour a day 3) More than 1 hour but less than one and half hours a day 4) More than one and half hours but less than 2 hours a day 5) More than 2 hours a day
6. Doing major cleaning, such as shampooing carpets, waxing floors, or washing walls or windows?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week

7. Doing routine cleaning such as dusting, laundry, vacuuming, or changing linens?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
8. Going grocery shopping and pushing a shopping cart?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
9. Doing gardening or yard work, such as mowing lawn or raking leaves?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
10. Doing heavy outdoor work, such as chopping wood, tilling soil, shoveling snow, or baling hay?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
11. Doing major home decoration or repair, such as plumbing, tiling, painting or building?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week

SECTION II. OCCUPATIONAL ACTIVITIES
Now, some questions about your employment situation.

12. What is your occupation? (if more than one job, describe your occupation for the job with the most hours worked per week) _____-	
13. What is the name of your employer, business or company? _____	
14. What kind of business or industry is this? (For example, hospital, newspaper publishing, mail order, house, auto engine manufacturing, etc.) _____	
15. What are your most important specific activities or duties? (For example, selling cars, keeping account books, etc.) _____	
16. Which best describes your current occupation:	1) Employee of private company, business or individual for wages, salary, or commissions 2) Employee of Federal government 3) Employee of state or local government 4) Self employed in own business, professional practice or farm/Working without pay in home, family business or farm
17. In comparison with other women your age, do you think your work is physically...	1) much lighter 2) lighter 3) the same as 4) heavier 5) much heavier
18. After work, are you physically tired..	1) Never 2) Seldom 3) Sometimes 4) Often 5) Always
19. When you are working at your current occupation, how often do you do each of the following a. Sit _____ b. Stand _____ c. Walk _____ d. Lift heavy loads _____ e. Sweat from exertion _____	1) Never 2) Seldom 3) Sometimes 4) Often 5) Always

SECTION III. ACTIVE LIVING HABITS

This next section asks about the general level of physical activity involved in your daily routine during the past year.

20. How many minutes a day do you usually walk and/or bicycle to and from work, school or errands?	1) Less than 5 min 2) More than 5 min but less 15 min 3) More than 15 min but less than 30 min 4) More than 30 min but less than 45 min 5) More than 45 min
21. Did you watch television?	1) Less than 1 hour a week 2) More than 1hour a week but less than 1 hour a day 3) More than 1 hour a day but less than 2 hours a day 4) More than 2 hours a day but <4 hours a day 5) More than 4 hours a day
22. Did you walk (for at least 15 minutes at a time)?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
23. Did you bike (for at least 15 minutes at a time)?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week

SECTION IV. PARTICIPATION IN SPORTS AND EXERCISE:
Finally, we want to ask about your participation in sports and exercise during the past year.

24. In comparison with other women of your own age, do you think your recreational physical activity is...	1) Much less 2) Less 3) Same as 4) More 5) Much more 6)
25. Did you play sports or exercise?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
26. Did you sweat from exertion during sports or exercise?	1) Never or less than once a month 2) Once a month 3) 2-3 times a month 4) Once a week 5) More than once a week
27. During the past year, did you participate in any of these activities or in any other similar activities not included in the list?	yes/no
If yes, respondent continues with following questions. 28 Whlch sport or exercise did you do most frequently? (Specify only one)	_____
29. How many months in this past year did you do this activity?	1) < 1 2) 1-3 3) 4-6 4) 7-9 5) >9
30 How many hours a week did you usually do this activity?	1) Less than 1 hour 2) 1-2 hour 3) 2-3 hour 4) 3-4 hour 5) More than 4 hour

31. Did you do any other exercise or play any other sport in this past year?	yes/no
If yes, respondent continues with following questions. 32 What was the second most frequent sport or exercise you did? (Specify only one)	_____
33. How many months in this past year did you do this activity?	1) < 1 2) 1-3 3) 4-6 4) 7-9 5) >9
34. How many hours a week did you usually do this activity?	1) Less than 1 hour 2) 1-2 hour 3) 2-3 hour 4) 3-4 hour 5) More than 4 hour
35. Did you do any other exercise or play any other sport in this past year?	yes/no
If yes, respondent continues with following questions. 36. What was the third second most frequent sport or exercise you did? (Specify only one)	_____
37. How many months in this past year did you do this activity?	1) < 1 2) 1-3 3) 4-6 4) 7-9 5) >9
38. How many hours a week did you usually do this activity?	1) Less than 1 hour 2) 1-2 hour 3) 2-3 hour 4) 3-4 hour 5) More than 4 hour

아래의 질문들에 대답해주십시요.

1. 당신의 나이는 몇살입니까? _____
2. 당신의 최종학력은 어디까지입니까? _____
3. 당신은 미국에서 학교를 다니신 적이 있습니까?

   (1) 예　　(2) 아니오 → 5 번으로 가세요.

   4. (3 번에 "예"라고 대답하셨다면), 미국에서 다니셨던 학교를 모두 골라주세요.

      (1) 초등학교　　(3)고등학교　　(5)대학원 (석사과정)

      (2) 중학교　　(4)대학교　　(6)대학원 (박사과정)

5. 당신의 몸무게와 키는 얼마입니까?

   몸무게 _____kg 또는 _____lb

   키　　_____ cm 또는 _____ft.

6. 당신의 결혼상태는?

   (1) 결혼한적 없음　　(3) 별거　　(5) 사별

   (2) 결혼　　(4) 이혼

7. 지금 당신은 누구와 같이 살고 계십니까?

   (1) 혼자　　(4) 남편과 아이들

   (2) 남편이나 파트너　　(5) 다른 사람들과 같이 _____

   (3) 아이들

8. 당신의 종교는 무엇입니까?

   (1) 기독교　　(3) 불교　　(5) 없음

   (2) 천주교　　(4) 기타 _____

9. 당신가족의 수입은 일년에 얼마입니까?

   (1) 0—$19,999　　(4) $50,000—$69,999

   (2) $20,000—$39,999　　(5) $70,000+

   (3) $40,000—$49,999

10. 당신은 경제적으로 어떤 상태에 있습니까?

    (1) 안정적　　(2) 비교적 안정적　　(3) 불안정

11. 당신은 어느곳에서 태어났습니까?

    (1) 미국　　(2) 한국　　(3) 기타지역 _____

12. 당신은 언제 미국에 오셨습니까? _____년 _____월

13. 당신은 누구와 미국에 오셨습니까? (해당하는 것을 모두 골라주세요)

(1) 부모님 (3) 자녀들 (5) 기타 _____

(2) 배우자 (4) 혼자

14. 일반적으로 당신의 건강은 어떻다고 생각하십니까?

(1) 나쁨 (2) 양호 (3) 좋음 (4) 매우 좋음 (5) 훌륭함

15. 당신의 폐경여부에 해당하는 것을 골라주세요.

(1) 수술에 의한 폐경 (예, 자궁적출술).

(2) 지난 1년동안 생리가 없음.

(3) 지난 1년동안 생리가 있었으나, 최근 3개월동안은 생리가 없음.

(4) 최근 3개월동안은 생리가 있었으나 점점 예측이 불가능해지고 있음.

(5) 최근 3개월동안 생리가 있었으며 양이 정상이고 예측도 가능함.

문화적응척도

아래의 질문들은 당신의 문화적 정체성과 관련될지도 모르는 당신의 역사적 배경과 최근의 행동들에 대한 정보에 관한 것들입니다. 가장 적합하다고 생각되는 하나를 골라주십시요. (당신께 해당되지 않는 질문에는 X 표시를 해주십시요)

1. 당신이 사용할수 있는 언어는 무엇입니까?
    1) 한국어만
    2) 대부분 한국어, 영어 조금
    3) 한국어와 영어 똑같이 잘 함
    4) 대부분 영어, 한국어 조금
    5) 영어만
2. 당신은 어떤 언어를 선호하십니까?
    1) 한국어만
    2) 대부분 한국어, 영어 조금
    3) 한국어와 영어 똑같이
    4) 대부분 영어, 한국어 조금
    5) 영어만
3. 당신의 정체성에 대해서 어떻게 설명하시겠습니까?
    1) 동양인 (Oriental)
    2) 아시아인(Asian)
    3) 아시아계 미국인(Asian American)
    4) 한국계 미국인(Korean American)
    5) 미국인(American)

4. 당신의 지역사회에서 어떤 사람들과 어울려 지냅니까?
    1) 대부분 배타적으로 아시아인, 아시아계 미국인, 동양인
    2) 대부분 아시아인, 아시아계 미국인, 동양인
    3) 대강 비슷하게 아시아인들과 백인들
    4) 대부분이 백인들, 흑인들, 멕시코사람들 또는 다른 비 아시아계 사람들
    5) 대부분 배타적으로 백인들, 흑인들, 멕시코사람들 또는 다른 비 아시아계 사람들
5. 당신이 하나를 고른다면, 지역사회에서 어떤 사람들과 어울리기를 원합니까?
    1) 대부분 배타적으로 아시아인, 아시아계 미국인, 동양인
    2) 대부분 아시아인, 아시아계 미국인, 동양인
    3) 대강 비슷하게 아시아인들과 백인들
    4) 대부분이 백인들, 흑인들, 멕시코사람들 또는 다른 비 아시아계 사람들
    5) 대부분 배타적으로 백인들, 흑인들, 멕시코사람들 또는 다른 비 아시아계 사람들

6. 어떤 음악을 좋아합니까?
    1) 한국음악만
    2) 대부분 한국음악
    3) 한국음악과 미국음악 똑같이
    4) 대부분 미국음악
    5) 미국음악만
7.어떤 영화를 좋아합니까?
    1) 한국어로 된 영화만
    2) 한국어로 된 영화를 대부분
    3) 한국나 영어로 된 영화 똑같이
    4) 영어로 된 영화를 대부분
    5) 영어로 된 영화만
8. 당신은 몇세대입니까? (가장 적합한 것을 하나만 고르세요.)
    1) 1 세대 (나는 미국이 아닌 아시아에서 태어났다)
    2) 2 세대 (나는 미국에서 태어났지만, 내 부모님중의 한분은 한국이나 다른 아시아에서 태어나셨다)
    3) 3 세대 (나는 미국에서 태어났고, 내 부모님 두분다 미국에서 태어나셨고, 조부모님들이 한국이나 다른 아시아에서 태어나셨다)
    4) 4 세대 (나는 미국에서 태어났고, 내 부모님 두분다 미국에서 태어나셨고, 조부모님 한분은 한국이나 다른 아시아에서 태어나셨으나, 다른 한분은 미국에서 태어나셨다)
    5) 5 세대 (나는 미국에서 태어났고, 내 부모님 두분다 미국에서 태어나셨고, 조부모님들도 미국에서 태어나셨다)
    6) 정보가 부족해서 내가 어느 세대에 속하는지 모르겠다
9. 어디에서 자랐습니까?
    1) 한국에서만
    2) 대부분은 한국에서, 그리고 미국에서 조금
    3) 한국과 미국에서 반반씩
    4) 대부분은 미국에서, 그리고 한국에서는 조금
    5) 미국에서만
10. 집에서 어떤 음식을 즐겨먹습니까?
    1) 배타적으로 한국음식
    2) 대부분 한국음식, 약간의 미국음식
    3) 한국음식과 미국음식을 거의 반반씩
    4) 대부분 미국음식
    5) 배타적으로 미국음식

11. 음식점에서 어떤 음식을 즐겨먹습니까?
    1) 배타적으로 한국음식
    2) 대부분 한국음식, 약간의 미국음식
    3) 한국음식과 미국음식을 거의 반반씩
    4) 대부분 미국음식
    5) 배타적으로 미국음식
12. 당신은?
    1) 한국어만 읽을수 있다
    2) 영어보다는 한국어를 더 잘 읽는다
    3) 영어와 한국어를 똑같이 잘 읽는다
    4) 한국어보다 영어를 더 잘 읽는다
    5) 영어만 읽을수 있다
13. 당신은?
    1) 한국어만 쓸수 있다
    2) 영어보다는 한국어를 더 잘 쓸수있다
    3) 영어와 한국어를 똑같이 잘 쓸수있다
    4) 한국어보다 영어를 더 잘 쓸수있다
    5) 영어만 쓸수 있다

14. 당신이 아시아집단 (당신이 선호하는 동양인, 아시아인, 미국계 아시아인, 미국계 한국인 중에서)에 속해 있다고 여긴다면, 당신은 그 집단에 대해 얼마나 자랑스럽게 생각하십니까?
    1) 매우 자랑스럽다
    2) 그럭저럭 자랑스럽다
    3) 거의 자랑스럽지 않다
    4) 자랑스럽지 않지만 그 집단에 대해 반감은 없다
    5) 자랑스럽지 않고 그 집단에 대해 반감이 있다
15. 당신을 어떻게 평가하시겠습니까?
    1) 매우 한국적이다
    2) 대부분 한국적이다
    3) 두가지 문화를 다 가지고 있다
    4) 대부분 서구화되어있다
    5) 매우 서구화되어있다
16. 당신은 한국행사나 명절, 또는 전통등에 참여하는 편입니까?
    1) 거의 모두
    2) 대부분
    3) 어떤 것만
    4) 아주 적은 부분만
    5) 전혀 아무것도

운동에 관한 자기 효능감

당신은 아래에 주어진 상황에서 얼마나 규칙적으로 (주 3 회 이상) 운동을 할 수 있다고 확신하는지를 점수(0-100 점)에 "∨"표 하여 주십시오

<보기> 0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100

전혀 할 수 없다 보통으로 확신할 수 있다. 확실하게 할 수 있다.

내용	점수
피곤하다고 느낄때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
해야 할 일로 인해 부담감을 느낄 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
날씨가 안 좋을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
몸이 다쳐서 운동을 중단했다가 회복한 뒤에	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
개인적인 어려움이 있거나 또는 어려움을 겪고 난 후에	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
우울할 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
불안할 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
질병에 걸려 운동을 중단했다가 회복한 후에	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
운동시 신체적으로 불편함을 느낄 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
휴가 후에	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
집에 할 일이 아주 많을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
방문객이 있을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
흥미 있는 다른 할 일이 있을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
내가 세운 운동 목표에 도달하지 못할 경우	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
내가 운동할 수 있도록 가족이나 친구가 날 지지해 주지 않을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
휴가동안	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
시간을 써야 할 다른 일이 있을 때	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100
가족간의 어려움을 겪은 후에	0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 90 – 100

운동-유익/장애성 도구

다음의 운동에 관한 각 문항에 동의하는 정도를 "V" 표시하여 주십시오.

	매우 동의	동의	동의 안함	전혀 동의 안함
1. 나는 운동을 즐긴다.				
2. 운동은 나의 스트레스나 긴장감을 줄여준다.				
3. 운동은 나의 정신건강을 향상시킨다.				
4. 운동은 내 시간을 많이 빼앗아 간다.				
5. 운동은 나를 지치게 한다.				
6. 운동은 내 근육의 힘을 증가시킨다.				
7. 운동은 내게 개인적인 성취감을 준다.				
8. 운동할 장소가 너무 멀리 떨어져 있다.				
9. 운동은 긴장을 풀어준다.				
10. 운동은 친구나 사람들과 사귀게 해 준다.				
11. 나는 운동하는 것이 어색해서 운동을 할 수가 없다				
12. 운동을 하는데 돈이 너무 많이 든다.				
13. 운동은 나의 체력을 증가시킨다.				
14. 운동시설의 스케줄이 나에게 불편하게 짜여져 있다.				
15. 운동으로 내 근력이 향상된다.				
16. 운동은 내 심장혈관 기능을 향상시킨다.				
17. 운동은 나를 피곤하게 한다.				
18. 나는 운동을 하면 더욱 평안해 진다.				
19. 운동은 나의 정력을 증가시킨다.				
20. 운동은 나의 유연성을 향상시킨다.				
21. 운동은 내가 가족과 함께 할 시간을 많이 빼앗아간다				
22. 운동은 내 성질을 좋게 해 준다.				
23. 운동은 밤에 잠이 잘 오게 한다.				
24. 내가 운동을 한다면 더 오래 살 것이다.				

	매우 동의	동의	동의 안함	전혀 동의 안함
25. 내게는 운동복을 입은 사람들이 우습게 보인다				
26. 운동은 내가 피로를 덜 느끼도록 한다.				
27. 운동은 내가 새로운 사람들을 만날 수 있는 좋은 방법이다.				
28. 내 신체 지구력은 운동으로 향상된다.				
29. 운동은 내 자신에 대해 긍정적으로 생각하게 한다.				
30. 나의 가족은 내가 운동하는 것을 격려하지 않는다.				
31. 운동은 내 정신을 맑게 해 준다.				
32. 운동은 내가 피곤해 하지 않고 일상생활을 할 수 있도록 한다.				
33. 운동은 내 업무의 질을 향상시킨다.				
34. 운동은 내가 가족을 위해 사용할 시간을 너무 많이 빼앗아 간다.				
35. 운동은 내게 좋은 오락이다.				
36. 운동을 통해서 다른 사람들이 나를 더 많이 받아 들이도록 한다.				
37. 운동은 나에게 힘든 일이다.				
38. 운동은 나의 전체적인 신체 기능을 향상시킨다.				
39. 내가 운동을 할 장소가 너무 적다.				
40. 운동은 나의 외모를 보기 좋게 한다.				

운동에 대한 사회적 지지 측정 도구

평상시에 가족들이 여러분과 함께 다음의 문항에 해당되는 일들을 얼마나 자주 합니까? 가족 구성원 각각에 대해서 해당되는 칸에 표시(√)하여 주십시오.

	배우자				자녀				형제/자매/부모			
		전혀 아니다	가끔 그렇다	자주 그렇다		전혀 아니다	가끔 그렇다	자주 그렇다		전혀 아니다	가끔 그렇다	자주 그렇다
스포츠나 운동을 하는데 나를 데리고 간다	1				2				3			
나와 함께 운동한다	4				5				6			
내가 열심히 운동을 하도록 격려한다	7				8				9			
나와 함께 게임이나 스포츠를 한다	10				11				12			
가족스포츠활동을 (자건거타기, 수영, 산책 등) 계획한다	13				14				15			
내가 운동하는 것을 칭찬한다	16				17				18			
내가 운동하는 것을 불평한다	19				20				21			

평상시에 여러분의 친구/동료들이 여러분과 함께 다음의 문항에 해당되는 일들을 얼마나 자주 합니까? 해당되는 칸에 표시(√)하여 주십시오.

		전혀 아니다	가끔 그렇다	자주 그렇다
나와 함께 게임이나 스포츠를 한다	22			
나와 함께 운동한다	23			
내가 열심히 운동을 하도록 격려한다	24			
내가 운동하는 것을 칭찬한다	25			
내가 운동하는 것을 불평한다	26			

카이저 신체 활동량 설문지

1. 집안일과 가족돌봄 활동

저희는 당신이 집안에서 어떤 활동을 하고 계시는지에 대해서 여쭤보고자 합니다. 오늘부터 12 개월를 거슬러올라가서 지난 1 년동안 당신의 다음과 같은 일들에 얼마나 시간을 소모했는지 대답해 주십시요. (단, 돈을 받기위해 당신의 집이나 다른사람의 집에서 행해진 활동은 포함시키지 말아 주십시요.)

1. 2 살 아래의 아이(들)를 돌봄	1)전혀 또는 일주일에 한시간 미만 3) 일주일에 1 시간이상 그러나 20 시간미만 5) 일주일에 20 시간이상
2. 2 살과 5 살 사이의 아이(들)를 돌봄	1)전혀 또는 일주일에 한시간 미만 3) 일주일에 1 시간이상 그러나 20 시간미만 5) 일주일에 20 시간이상
3. 장애아나 노인을 돌봄 (먹이기, 옷입히고 벗기기, 움직이는것 등만 포함)	1) 전혀 또는 일주일에 한시간 미만 3) 일주일에 1 시간이상 그러나 20 시간미만 5) 일주일에 20 시간이상
4. 주중에 식사준비하고 치우기	1) 전혀 또는 하루에 30 분 미만 2) 하루에 30 분이상 그러나 1 시간미만 3) 하루에 한시간 이상 그러나 90 분미만 4) 하루에 90 분이상 그러나 2 시간미만 5) 하루에 2 시간 이상
5. 주말에 식사준비하고 치우기	1) 전혀 또는 하루에 30 분 미만 2) 하루에 30 분이상 그러나 1 시간미만 3) 하루에 한시간 이상 그러나 90 분미만 4) 하루에 90 분이상 그러나 2 시간미만 5) 하루에 2 시간 이상

6. 대청소 (카펫빨기, 바닥 윤내기, 벽이나 창문닦기)	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상
7. 일반적인 청소 (먼지떨기, 빨래하기, 청소기 돌리기, 침대보 갈아끼우기)	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상
8. 시장가기와 쇼핑카트 밀기	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상
9. 정원또는 뒷마당 가꾸기 (잔디깎기, 낙엽치우기)	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상
10. 힘든 바깥일 (나무 자르기, 땅뒤집어 엎기/땅고르기, 눈치우기 등)	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상
11. 집안 꾸미기나 집고침 (하수도고침, 타일부치기, 페이트칠하기, 짓기)	1)전혀 또는 한달에 한번이하 2)한달에 한번 3)한달에 2-3 번 4)일주일에 한번 5)일주일에 한번 이상

2. 직업

다음은 당신의 직업에 관련된 질문들입니다.

12. 당신의 주된 직업은 무엇입니까? (직업이 하나이상이면 더 많이 일하는 것을 적어주세요) _____	
13. 당신이 일하는 곳의 회사이름을 적어주세요. _____	
14. 이곳은 어떤 일을 하는곳입니까? (병원, 신문사, 자동차만드는곳 등) _____	
15. 당신의 주된 업무는 무엇입니까? (차파는것, 재정담당 등) _____	
16. 아래의 것들중 어떤 것이 지금 당신의 직업을 가장 잘 설명해 주고 있습니까?	1) 일반회사의 직원 2) 정부의 직원 3) 자영업 4) 무보수로 집안일을 돕거나 가족의 사업을 도움
17.내 나이또래의 다른 여성들과 비교했을때, 당신의 직업은 신체적으로 어떤 일이라고 생각하십니까?	1)매우 가벼운 일이라고 생각한다 2)가벼운 일이라고 생각한다 3)비슷하다고 생각한다 4)힘든 일이라고 생각한다 5)매우 힘는 일이라고 생각한다
18. 일을 마치고 난후 당신은 신체적으로 피곤하십니까?	1)전혀 그렇지 않다 2)거의 그렇지 않은편이다 3)때때로 그렇다 4)가끔 그렇다 5)늘 그렇다
19. 현재직업활동을 할때 얼마나 자주 다음과 같은 일을 하십니까? 가) 앉아서 일한다 _____ 나) 서서 일한다 _____ 다) 걷는다 _____ 라) 무거운 것을 든다 _____ 마) 땀을 흘린다 _____	1)전혀 그렇지 않다 2)거의 그렇지 않은 편이다 3)때때로 그렇다 4)자주 그렇다 5)늘 그렇다

3. 활동적인 생활습관

다음의 질문들은 지난일년동안의 당신의 일상생활에서 행해진 일반적인 수준의 신체활동에 대한 질문들입니다.

20. 일하러가거나, 학교가거나, 볼일을 보러갈때 당신의 하루에 몇분정도 걷거나 자건거를 타십니까?	1) 5 분미만 2) 5 분이상 15 분미만 3) 15 분이상 30 분미만 4) 30 분이상 45 분미만 5) 45 분이상
21. 당신은 텔레비젼을 시청하십니까?	1) 일주일에 1 시간미만 2) 일주일에 1 시간이상, 하루에 1 시간미만 3) 하루에 1 시간이상 2 시간미만 4) 하루에 2 시간이상 4 시간미만 5) 하루에 4 시간이상
22. 당신은 걷습니까? (한번에 적어도 15 분동안)	1) 전혀 또는 한달에 1 번미만 2) 한달에 한번 3) 한달에 2-3 번 4) 일주일에 한번 5) 일주일에 한번 이상
23. 당신은 자건거를 타십니까? (한번에 적어도 15 분동안)	1) 전혀 또는 한달에 1 번미만 2) 한달에 한번 3) 한달에 2-3 번 4) 일주일에 한번 5) 일주일에 한번 이상

4. 스포츠

마지막으로, 다음은 지난일년동안 당신이 참여하신 운동과 스포츠에 대한 질문입니다.

24. 당신또래의 다른 여성분과 비교했을때, 여가시간동안 당신의 신체활동량은	1) 훨씬 적다고 생각한다 2) 적다고 생각한다 3) 같다고 생각한다 4) 많다고 생각한다 5) 훨씬 많다고 생각한다
25. 스포츠나 운동을 하십니까?	1) 전혀 또는 한달에 한번미만 2) 한달에 한번 3) 한달에 2-3 번 4) 일주일에 한번 5) 일주일에 한번 이상
26. 여가시간에 스포츠나 운동을 하는동안 나는 땀을	1) 매우 자주 흘린다 2) 자주 흘린다 3) 가끔 흘린다 4) 거의 흘리지 않는다 5) 전혀 흘리지 않는다
27. 지난 1 년동안, 참여하신 스포츠나 운동이 있습니까?	1) 예 2) 아니오
28. (만약 27 번에 예라고 대답하셨다면) 어떤 스포츠나 운동을 **주로** 하셨습니까?	_____
29. 지난 일년동안 이 스포츠나 운동을 몇달하셨습니까?	1) 한달미만 2) 1-3 달 3) 4-6 달 4) 7-9 달 5) 9 달 초과
30. 이 스포츠나 운동을 일주일에 몇시간이나 하십니까?	1) 1 시간 미만 2) 1-2 시간 3) 2-3 시간 4) 3-4 시간 5) 4 시간 초과

31. 지난 일년동안 또 다른 스포츠나 운동에 참여하신 적이 있습니까?	1) 예 2) 아니오
32. (만약 31 번에 예라고 대답하셨다면) **두번째**로 자주하는 스포츠나 운동은 무엇입니까?	_____
33. 지난 일년동안 이 스포츠나 운동을 몇달하셨습니까?	1) 한달미만 2) 1-3 달 3) 4-6 달 4) 7-9 달 5) 9 달 초과
34. 이 스포츠나 운동을 일주일에 몇시간이나 하십니까?	1) 1 시간 미만 2) 1-2 시간 3) 2-3 시간 4) 3-4 시간 5) 4 시간 초과
35. 지난 일년동안 또 다른 스포츠나 운동에 참여하신 적이 있습니까?	1) 예 2) 아니오
36. (만약 35 번에 예라고 대답하셨다면) **세번째**로 자주하시는 스포츠나 운동은 무엇입니까?	_____
37. 지난 일년동안 이 스포츠나 운동을 몇달하셨습니까?	1) 한달미만 2) 1-3 달 3) 4-6 달 4) 7-9 달 5) 9 달 초과
38. 이 스포츠나 운동을일주일에 몇시간이나 하십니까?	1) 1 시간 미만 2) 1-2 시간 3) 2-3 시간 4) 3-4 시간 5) 4 시간 초과

Appendix 2: Permission to Use Instruments

Date: Thu, 10 Jul 2003 16:02:07 -0600

From: Richard Suinn <suinn@lamar.colostate.edu>

To: Kyeongra Yang <yangkr@mail.utexas.edu>

Subject: Re: permission to use your questionnaire

2 unnamed text/enriched 24.05 KB

We do not have a Korean version. If your participants are only able to read in Korean, and are all recently in the US, then you actually do not need to measure acculturation levels...because they should all be low acculturation. On the other hand, if there is some distribution of number of years living in the US...and some prefer Korean, then your translation would be useful and you have my permission...I would like a copy.

Dear Colleague: -1 of 6-

You have my permission to use the SL-ASIA scale. It is duplicated below . Please note that if you feel your sample is one that requires reading a translated version, this could mean that your sample is very restricted to a first generation. If so, then by definition you would not have enough subjects who represent the various levels of acculturation (low to middle to high). If so, then this restricted range will prevent you from testing any hypothesis regarding how □evel of acculturation?or acculturation differences has effects.

Also note the usual principles regarding use of standardized tests: if you revise any part of the test - order of questions, wording of answers, etc. - then it may be questionable whether the test still is valid. Certainly, the question can be raised about whether the same norms can be used to interpret the results. If you choose to do such a revision, you should discuss the matter with a colleague who is a methodologist, or your advisor if you are a student.

After some thoughts about acculturation and its measurement, I have added questions 22-26 to the original 21 item scale. These questions can serve to further classify your research participans in ways that use current theorizing that acculturation is not linear, unidimensional but multi-dimensional and orthogonal. These new items were developed based on writings of those who felt that a linear, unidimensional scale was insufficient. Hence, we wrote some added items as a potential separate way of classifying the subjects...if the original scale did not turn out predictive. We have not obtained any validity/reliability info on these added items, but hope that users of the added items will share their results with me.

Date: Thu, 10 Jul 2003 22:05:48 -0500

From:	npender@umich.edu
To:	Kyeongra Yang <yangkr@mail.utexas.edu>
Subject:	Re: Permission to use your questionnaire

Dear Kyeongra:

You have my permission to translate the Exercise Benefits/Barriers Scale
into Korean. Before you do, you might check with one of my colleagues in
Korea to see if she has a translated version that she can share. You can
reach Dr. YunHee Shin at:

yhshin@wonju.yonsei.ac.kr

Tell her that I suggested you contact her.

Good luck with your work!

Nola J. Pender

Date:	Sun, 13 Jul 2003 10:32:45 +0900
From:	YunHee Shin <yhshin@wonju.yonsei.ac.kr>
To:	Kyeongra Yang <yangkr@mail.utexas.edu>
Subject:	Re: Exercise Benefits/Barriers Scale in Korean

Part(s):

2	운동유익성과 장애성.hwp	application/octet-stream	44.72 KB	
3	자아효능감도구.hwp	application/octet-stream	39.50 KB	

Hello !

I'm wondering if you can read Korean in your computer.
I send the two scales through attached file.
I hope those are helpful for you.
Bye!
YunHee Shin

Date:	Wed, 11 Feb 2004 22:43:44 -0600
From:	npender@umich.edu

To: Kyeongra Yang <yangkr@mail.utexas.edu>

Subject: Re: Permission to use your questionnaire (Exercise Social Support)

You have my permission to use the exercise social support scale. Good luck
with your academic work.

Nola J. Pender

--On Wednesday, February 11, 2004 2:31 PM -0600 Kyeongra Yang
<yangkr@mail.utexas.edu> wrote:

> Dear Dr. Pender,
>
> Hello, I'd like to get your permission to use your exercise social
> support in my dissertation study. I've got the translated versin into
> Korean from Dr. Yunhee Shin.
>
> Thank you.
>
> Sincerely,
> Kyeongra
>
++
> Kyeongra Yang, MPH, RN.
> Doctoral Candidate
> The University of Texas at Austin
> School of Nursing
> Austin, Texas
> yangkr@mail.utexas.edu

Date: Tue, 10 Feb 2004 16:50:39 -0500 (EST)

From: "Prof. Frank Pajares" <mpajare@emory.edu>

To: Kyeongra Yang <yangkr@mail.utexas.edu>

Subject: Re: permission to use "exercise self-efficacy scales"

You bet. No permission is required. Do you think you could send
me a pdf file of the scale in Korean?

Frank Pajares

On Tue, 10 Feb 2004, Kyeongra Yang wrote:

> Hello,
>
> I'd like to get Dr. Bandura's permission to use his exercise self-efficacy scale. I've got the Korean version of it. Would it be okay for me to use it for
> my dissertation?
>
> Thank you so much.
> Kyeongra
>

Prof. Frank Pajares
Division of Educational Studies
1784 N. Decatur Rd., Suite 240
Emory University
Atlanta, GA 30322

Tel: (404) 727-1775
Fax: (404) 727-2799
http://www.emory.edu/EDUCATION/mfp

Associate Editor
Journal of Educational Psychology
JEP email: jep@emory.edu
JEP phone: 404-727-2626
JEP fax: 404-727-2799

Date: Mon, 04 Aug 2003 17:02:21 -0700
From: "B. Ainsworth" <bainswor@mail.sdsu.edu>
To: Kyeongra Yang <yangkr@mail.utexas.edu>
Cc: bxs@dor.kaiser.org
Subject: Re: Kaiser Physical Activity Survey

Hello,

I have no problem with you translating the KPAS into Korean. I will copy
this message to the developer, Dr. Barbara Sternfeld, and if she has

objections, she will let you know.

Best wishes,
Barb Ainsworth

At 03:48 PM 8/4/2003 -0500, you wrote:
>Dear Dr. Ainsworth,
>
>Thank you so much for your email. Can I use Kaiser Physical Activity
>Survey for
>my dissertation and translate into Korean? I think it is also in the public
>domain and can be used freely; However, I'd like to make sure with you for
>the
>future record.
>
>Again, thanks a lot!
>
>Sincerely,
>Kyeongra Yang

Appendix 3: IRB Approval and Informed Consent

OFFICE OF RESEARCH SUPPORT & COMPLIANCE

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 (512) 471-8871 - FAX (512 471-8873)
North Office Building A Suite 5.200 (Mail code A3200)

Date: **9/18/2003**

PI(s): **Shirley C Laffrey** Department & Mail Code: **NURSING SCHOOL** **D0100**

Kyeongra Yang **NURSING SCHOOL** **D0100**

Dear: **Shirley C Laffrey** **Kyeongra Yang**

IRB APPROVAL – IRB Protocol # **2003-09-0016**

Title: **Physical Activities among Middle-aged Korean Immigrant Women: A pilot study**

In accordance with Federal Regulations for review of research protocols, the Institutional Review Board has reviewed the DRC's exempt status assessment of the above referenced protocol and found that it meets Exempt Approval under the category designated below for the following period:

Your study has been approved from 09/16/2003 - 09/16/2004

Exempt Category of Approval:

☐ 1. Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
(i) research on regular and special education instructional strategies, or
(ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

☒ 2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:

(i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; **and**
(ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subject's financial standing, employability, or reputation

☐ 3. Research involving the use of educational tests, survey or interview procedures, or observing public behavior that is not exempt under number 2 above, if the subjects are public officials or candidates for public office or a federal statute requires that the confidentiality of personally identifiable information will be maintained throughout the research and thereafter.

☐ 4. Research involving the collection or study of existing data, documents, records, pathological or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, either directly or through identifiers linked to the subjects. To qualify for this exemption, the data, documents, records or specimens must be in existence before the project begins.

☐ 5. Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine:
(i) Public benefit or service programs;
(ii) procedures for obtaining benefits or services under those programs;
(iii) possible changes in or alternatives to those programs or procedures; or
(iv) possible changes in methods or levels of payment for benefits or services under those programs.

IRB Protocol # **2003-09-0016** Approval Dates: **09/16/2003 - 09/16/2004**

☐ 6. Taste and food quality evaluation and consumer acceptance studies, involving adults only.

x **Please use the attached approved consent forms**

_____ **You have been granted Waiver of Documentation of Consent**
According to 45 CFR 46.117, an IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either:

_____ The research presents no more than minimal risk **AND**

_____ The research involves procedures that do not require written consent when performed outside of a research setting

45 CFR 46.117(c)(2)

or

_____ The principal risks are those associated with a breach of confidentiality concerning the subject's participation in the research **AND**

_____ The consent document is the only record linking the subject with the research

45 CFR 46.117(c)(1)

_____ **You have been gratned Waiver of Informed Consent**
According to 45 CFR 46.116(d), an IRB may waive or alter some or all of the requirements for informed consent if:

_____ The research presents no more than minimal risk to subjects;

_____ The waiver will not adversely affect the rights and welfare of subjects;

_____ The research could not practicably be carried out without the waiver; and

_____ Whenever appropriate, the subjects will be provided with additional pertinent information after they have participated in the study.

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report **immediately** to the IRB any severe adverse reaction or serious problem, whether anticipated or unanticipated.
(2) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.
(3) Insure that only persons formally approved by the DRC enroll subjects.
(4) If relevant to your study, please use **only** a currently approved consent form (remember approval periods are for 12 months or less).
(5) **Protect the confidentiality of all personally identifiable information collected and train your staff and collaborators on policies and procedures for ensuring confidentiality of this information.**
(6) Submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change.
(7) Please note that this office will send out a reminder prior to the end of your approval period (typically at the end of the 12 months). At this time we will ask you to give us an update on whether the study is still in progress and/or has had any changes that need to be reviewed for approval.
(8) Notify the IRB and the DRC when the study has been completed and complete the Final Report Form.
(9) Please help us help you by including the above protocol number on all future correspondence relating to this protocol.

Thank you for your help in this matter.

Sincerely,

Clarke Burnham, Ph.D., Chair
Institutional Review Board

cc: DRC

OFFICE OF RESEARCH SUPPORT & COMPLIANCE

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, TX 78713 (512) 471-8871 - FAX (512) 471-8873
North Office Building A, Suite 5.200 (Mail Code A3200)

Date: **4/20/2004**

PI(s): **Shirley C Laffrey**	Department & Mail Code:	**NURSING SCHOOL**	**D0100**
Kyeongra Yang		**NURSING SCHOOL**	**D0100**

Dear: **Shirley C Laffrey** **Kyeongra Yang**

IRB APPROVAL - IRB Protocol # **2003-09-0016**

Title: **Physical Activities among Middle-aged Korean Immigrant Women**

In accordance with Federal Regulations for review of research protocols, the Institutional Review Board has reviewed the above referenced protocol and found that it met approval for the following period of time:

Your amendment has been approved from 04/20/2004 – 09/16/2004
The following requested changes have been approved:

protocol modification; title changed, questionnaire revision; consent form updated

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report **immediately** to the IRB any severe adverse reaction or serious problem, whether anticipated or unanticipated.
(2) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.
(3) Insure that only persons formally approved by the IRB enroll subjects.
(4) Use **only** a currently approved consent form (remember approval periods are for 12 months or less).
(5) **Protect the confidentiality of all personally identifiable information collected and train your staff and collaborators on policies and procedures for ensuring confidentiality of this information.**
(6) Submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change.
(7) Submit a **Continuing Review Report** for continuing review by the IRB. **Federal regulations require IRB review of on-going projects no less than once a year** (a Continuing Review Report form and reminder letter will be sent to you 2 months before your expiration date). Please note however, that if you do not receive a reminder from this office about your upcoming continuing review, it is the primary responsibility of the PI not to exceed the expiration date in collection of any information. Finally, it is the responsibility of the PI to submit the Continuing Review Report before the expiration period.
(8) Notify the IRB when the study has been completed and complete the Final Report Form.
(9) Please help us help you by including the above protocol number on all future correspondence relating to this protocol.

Thank you for your help in this matter.

Sincerely,

Andrew Karberg, M.A.
Office of Research Support & Compliance

cc: DRC

OFFICE OF RESEARCH SUPPORT & COMPLIANCE

THE UNIVERSITY OF TEXAS AT AUSTIN

P. O. Box 7426, Austin, Texas 78713 (512) 471-8871 - FAX (512 471-8873)
North Office Building A, Suite 5.200 (Mail code A3200)

Date: **7/9/2004**

PI(s): **Kyeongra Yang** Department & Mail Code: **NURSING SCHOOL** **D0100**
Shirley C Laffrey **NURSING SCHOOL** **D0100**

Dear: **Kyeongra Yang** **Shirley C Laffrey**
IRB APPROVAL – IRB Protocol # **2003-09-0016**

Title: **Physical Activities among Middle-aged Korean Immigrant Women**

In accordance with Federal Regulations for review of research protocols, the research study listed above has been re-approved for the following period of time:

Your research study has been re-approved from 07/09/2004 – 07/09/2005

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report **immediately** to the IRB any severe adverse reaction or serious problem, whether anticipated or unanticipated.
(2) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.
(3) Insure that only persons formally approved by the IRB enroll subjects.
(4) Use **only** a currently approved consent form (remember approval periods are for 12 months or less).
(5) **Protect the confidentiality of all personally identifiable information collected and train your staff and collaborators on policies and procedures for ensuring confidentiality of this information.**
(6) Submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change.
(7) Submit a **Continuing Review Report** for continuing review by the IRB. Federal regulations require **IRB review of on-going projects no less than once a year** (a Continuing Review Report form and reminder letter will be sent to you 2 months before your expiration date). Please note however, that if you do not receive a reminder from this office about your upcoming continuing review, it is the primary responsibility of the PI not to exceed the expiration date in collection of any information. Finally, it is the responsibility of the PI to submit the Continuing Review Report before the expiration period.
(8) Notify the IRB when the study has been completed and complete the Protocol Closure Report.
(9) Please help us help you by including the above protocol number on all future correspondence relating to this protocol.

Thank you for your help in this matter.

Sincerely,

Charles Burnham, Ph.D., Chair
Institutional Review Board

cc: DRC

IRB# _____

Informed Consent to Participate in Research

The University of Texas at Austin

You are being asked to participate in a research study. This form provides you with information about the study. The Principal Investigator (the person in charge of this research) or his/her representative will also describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you don't understand before deciding whether or not to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

Title of Research Study:

Physical Activities among Korean Midlife Immigrant Women in the U.S.

Principal Investigator(s) (include faculty sponsor), UT affiliation, and Telephone Number(s):

Kyeongra Yang, Doctoral Candidate, School of Nursing, (512) 345-7762
Professor Shirley Laffrey, School of Nursing, (512) 471-9949

Funding source:

American Nurses Foundation
Epsilon Theta Chapter, Sigma Theta Tau International Honor Society of Nursing

What is the purpose of this study?

The purpose of this study is threefold: (1) to investigate the level of physical activity among Korean midlife immigrant women in the U.S., (2) to identify for this population any relationships between individual characteristics and behavior-specific cognition and affect, on one hand, and the level of physical activity, on the other, and (3) to examine any mediation effects of behavior-specific cogition on the relationships between individual characteristics and the

level of physical activity. One hundred fifty participants will be recruited from Korean American community in the Texas area.

What will be done if you take part in this research study?

The data will be gathered by questionnaires. This study will use six instruments: (1) a demographic questionnaire, (2) the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA), (3) the Exercise Self-Efficacy, (4) the Exercise Benefits/Barriers Scale, (5) the Exercise Social Support Scale, and (6) the Kaiser Physical Activity Survey. It will take approximately 40 minutes.)

When the researcher receives the signed consent from you, questionnaires will be mailed to you with a stamped self-addressed return envelope. In addition, you will receive a postage-paid, return postcard which allow the researcher know who do not need any reminders. You will mail the postcard back separately from the questionnaire when you return the survey.

About 10 days after questionnaires are sent out to you, you will get a reminder card if you do not mail the postcard to the researcher.

At the completion of the survey, you will receive a retail store gift card valued at $5 as a gift for your time and help with this study.

What are the possible discomforts and risks?

There are minimal risks for participation in this study. A potential risk is the amount of time required to answer questions during the survey and to mail questionnaires to the researcher. In order to minimize any potential risk for you, the survey will be conducted at a time and place determined by you. If you wish to discuss the information above or any other risks you may experience, you may ask questions now or call the Principal Investigator listed on the front page of this form.

What are the possible benefits to you or to others?

There is potential of an increased awareness of your own physical activity and your health status. There is, however, no guarantee that you will receive any benefit from this study other than knowing that the information may help future

knowledge about an aspect of our understanding of acculturation and physical activity of midlife Korean immigrant women.

If you choose to take part in this study, will it cost you anything?

No.

Will you receive compensation for your participation in this study?

At the completion of the survey, you will receive a retail store gift card valued at $5 for thank you for your time and help with this study.

What if you are injured because of the study?

No medical treatment will be provided or available in case of injury as a result of participation in this study.

If you do not want to take part in this study, what other options are available to you?

Participation in this study is entirely voluntary. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with The University of Texas at Austin, Korean grocery stores, or Korean ethnic churches.

How can I withdraw from this research study and who should I call if I have questions?

If you wish to stop your participation in this research study for any reason, you should contact: Kyeongra Yang at (512) 345-7762. You are free to withdraw your consent and stop participation in this research study at any time without penalty or loss of benefits for which you may be entitled. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

In addition, if you have questions about your rights as a research participant, please contact Clarke A. Burnham, Ph.D., Chair, the University of Texas at

Austin Institutional Review Board for the Protection of Human Subjects, 512/232-4383.

How will your privacy and the confidentiality of your research records be protected?

Authorized persons from The University of Texas at Austin and the Institutional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. Your research records will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed.

Will the researchers benefit from your participation in this study?

Your participation will contribute to increase knowledge about acculturation and physical activity of Korean immigrant women.

Signatures:

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

_____

Signature and printed name of person obtaining consent

Date

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

_____

Printed Name of Subject Date

_____

Signature of Subject Date

_____

Signature of Principal Investigator Date

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