The Dissertation Committee for Sook Jung Kang
certifies that this is the approved version of the following dissertation:

HEALTHY EATING HABITS AMONG KOREAN AMERICANS

Committee:

_____
Gayle M. Timmerman, Supervisor

_____
Heather A. Becker

_____
Lorraine O. Walker

_____
Carol L. Delville

_____
Brian M. Stross

HEALTHY EATING HABITS AMONG KOREAN AMERICANS

by

Sook Jung Kang B.S.N.; M.S.N.

Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

May 2012

Acknowledgements

My deepest appreciation goes to my dissertation chair and advisor, Dr. Gayle M. Timmerman, for providing me unfailing support, scholarly insight, and motivational encouragement, as well as for patiently encouraging me to keep my nose to the grindstone all through my PhD program. I would also like to appreciate the many contributions of my committee members. Dr. Heather A. Becker gave me clear ideas about study methods and data analysis as well as the opportunity to be involved in her project. Dr. Lorraine O. Walker looked at my dissertation from a broad perspective and provided me many suggestions for strengthening my research trajectory. Dr. Carol L. Delville provided me practical guidance in terms of research methods and design. Brian M. Stross, with his expertise in anthropology, helped me look at my dissertation topic from a different viewpoint. And Dr. Eileen R. Fowles gave expert advice on nutritional issues through her invaluable insights.

I would also like to thank the people of UT who helped me stay in school and maintain a healthy spirit. Fran Sonstein taught me in my master's program and made it possible for me to work as an FNP in the United States. I would also like to thank Dr. Adama Brown of the Cain Research Center, who trained me in statistical analyses, was generous with her encouragement and support. My colleagues at Cain Research Center—Tahryn Hughes, Charla Carrington, Hwa-Young Lee, and Hye-Nam Hwang—made my daily life easier in the UT School of Nursing. And as for the people in the UT School of

Nursing skills lab—Scott Hudson, Shannon Patton, April Alonzo, and Mandeep Kaur—you all made my last semester rich and joyful.

I would like to thank people and friends from the Korean Catholic Church, especially my Legio friends. I also appreciate the friendships as well as the emotional support and encouragement of my brave and loving friends, Hyung-Mee Kim, Chia-Chun Lee, Hsiu-Rong Cheng, and Sabrina Mikan.

I also want to acknowledge the Epsilon Theta Chapter of Sigma Theta Tau International for its financial support for this dissertation study and the UT School of Nursing scholarships, which supported me all through my PhD program.

To my loving family members who supported me and were right beside me all the time—my brother, Tae-Hyun Kang; sister-in-law, Seung-Hee Cho; and my lovely niece, Lilian Kang—I give my deepest thanks. My life in Austin was a blessed one because of them. I cannot wait until me, my brother, and sister-in-law all obtaining our degrees and become UT alumni. To my backbone, my father and mother, my heart and my strength originate from you. I dedicate my dissertation to you. Thank you for believing in me, supporting me, and always being there for me.

I learned through my PhD program that we are living in a fragile and unpredictable world, but that is why we are growing and evolving. Thank you, God, for making me evolve through this process.

Healthy Eating Habits among Korean Americans

Sook Jung Kang, Ph.D.

The University of Texas at Austin, 2012

Supervisor: Gayle Timmerman

The primary aim of the study was to examine the predictive relationships among personal factors (age, gender, education, income, BMI, and acculturation), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among Korean Americans (KAs). The conceptual framework was adopted from Pender's Health Promotion Model. Bivariate correlations among the study variables and hierarchical multiple regression tests were performed to determine the predictive relationships among the variables. Mediating and moderating effects were explored, as were generational differences in barriers, self-efficacy, and healthy eating habits.

The study was designed as a retrospective, cross-sectional, correlational study. A nonprobability sample of 137 KAs was recruited from KA communities by the surveys in Texas, California, Georgia, Maryland, and other states. Although none of the personal factors were significantly related to healthy eating habits, some of the strength and direction of the relationships between personal factors and healthy eating habits were changed when behavior-specific cognitions and environmental factors moderated those relationships .

The main finding of the study was that self-efficacy was the strongest predictor for healthy eating habits. An additional data obtained from this study was the discrepancy between confidence in reducing sodium intake and the actual sodium intake. Considering that high sodium intake is a problematic concern for Koreans and KAs, as well as for the general American population, further research is needed to identify the factors related to this concern and to improve this health issue. Also, further studies related to eating habits among KAs with a wide range of generational levels and geographic areas are necessary to gain a deeper understanding of their health and to promote healthy eating habits.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Caplan (1997), an anthropologist, stated that westernized eating habits of a high-fat and high-sugar diet have had tremendous influence on health throughout the world. Dietary changes observed in Asian Americans include increased intake of total energy and fat, which increases the risk for various chronic conditions such as cardiovascular disease and diabetes (Kim, Lee, Ahn, Bowen, & Lee, 2007; Kim, Yu, Chen, Cross, Kim, & Brintnall, 2000). Previous studies comparing dietary habits and health of Korean Americans (KAs) to native Koreans supported the concern that westernized food habits influence the health of KAs. For example, KAs have a higher body mass index (BMI), a higher intake of energy from fat, and a lower intake of fruits and vegetables than their counterparts in Korea (Kim et al., 2000; Park, Paik, Skinner, Spindler, & Park, 2004; Park, Murphy, Sharma, & Lolonel, 2005; Song, Hofstetter, Hovell, Paik, et al., 2004).

Nearly 1.7 million KAs live in the United States (US) (Min, 2012), and KAs have some unique characteristics in their acculturation process, eating habits, and health related findings. KAs assimilate to the new culture more slowly than other Asian Americans, especially regarding eating habits (Kim, Yu, Liu, Lim, and Kohrs, 1993). In addition, KAs have a higher educational level than non-Hispanic Whites, but have more barriers in access to health care (Kuo and Porter, 1998). These elements likely influence the eating habits of KAs in a unique way, different from other minorities living in the US.

Second generation KAs and those KAs who immigrated at children (i.e., 1.5 generation) have different eating habits compared to their parents because they were exposed to American culture in their early years; thus, their eating habits are more

influenced by American culture (Kang & Garey, 2002). However, the majority of previous studies on eating habits sampled first generation KAs who are Korean immigrants, and these studies focused primarily on the acculturation process and nutrient content of foods consumed in the US (Kim & Chan, 2004; Lynn, Kang, & Ludman, 1999; Song et al., 2004). As a result, there is a lack of research with second generation KAs whose eating habits combine two cultures. Additionally, research supports that second generation KAs tend to have less desirable health outcomes, such as a higher obesity rate compared to first generation KAs (Park et al., 2005). Therefore, the proposed study seeks to better understand what influences healthy eating habits of KAs, including both first and second generation KAs, within the framework that encompass the factors influencing individual's eating behavior and the environment for eating behaviors.

PURPOSE

The primary purpose of the study was to examine the relationships among personal factors (age, gender, education, income, BMI, and acculturation), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among KAs. A second purpose was to examine whether barriers to healthy eating, healthy eating self-efficacy, and environmental factors mediate or moderate the effect of personal factors on healthy eating habits among KAs. A third purpose of this study was to compare barriers to healthy eating, healthy eating self-efficacy, and healthy eating habits among first, 1.5, and second generation KAs.

BACKGROUND AND SIGNIFICANCE

Approximately 10% of the US population (26.4 million people) was born overseas (U.S. Census Bureau, 2001). According to the same census data, the KA population has increased roughly from 800,000 in the 1990 to 1.4 million in 2000 (U.S. Census Bureau, 2001). Major Korean immigration took place in late 1960's to mid 1980s after immigration policy changed in 1965 (Yoon, 1997). Unlike the previous immigration group in the 1900's, this group of Koreans came to the US with high educational and white-collar backgrounds (Yoon, 1997). During the 50 years after the major KA immigration in the 1960s, the number of second and third generation KAs has grown, and they have shaped their own unique culture, which includes eating habits, to be slightly different from their parents.

Most current Korean immigrants came to the US during the 1960s and 1980s for political and economic reasons, which is one of the reasons that make KAs in that generation a homogenous group. However, the composition and characteristics of KAs coming to the US has changed. These days, many KAs are coming to the US for their children's education or their own education, obtaining higher education degrees, and then settling down in the US. They are no longer coming to the US for political or economic reasons, but for better opportunities for themselves or their children. To date, the majority of previous studies on eating habits focused on first-generation KAs. There is a need to expand our target population to those who have combined both American and Korean style eating habits.

Understanding KA's eating habits is challenging. One of the reasons is that, like other immigrants, many Korean immigrants retain a large portion of their cultural eating habits (Gordon, Kang, Cho, & Sucher, 2000). Some use ethnic ingredients and cook Korean food in the same way they used to cook in Korea. As a result, selecting measures to evaluate their eating habits or nutrient intake using standard measures of US dietary intake is challenging. Another reason is that the eating habits of KAs may have a dichotomous nature. Immigrants who are first generation KAs may not change their eating habits, whereas second or third generation KAs have unique eating patterns which may blend traditional Korean foods and American foods. In order to fully understand and intervene with KAs, a broad range of eating habits should be examined.

The data acquired by the nutrition experts linking acculturation and nutrient intake supports that the more KAs are acculturated, the more they eat American foods, which may increase the risk of several chronic diseases (Kim & Chan, 2004; Lee, Sobal, & Frongillo Jr., 1999; Lynn et al., 1999; Park et al., 2005; Park et al., 2004). This partly implies that Korean foods are healthy, and the health of KAs is at increased risk when they are eating less Korean food. However, Korean food is not always healthy. Lee, Popkin, and Kim (2002) concluded that traditional Korean foods are healthy in certain aspects; specifically, they are low in fat and high in fruits and vegetables. In contrast, there are also some aspects of Korean food intake that may negatively affect health, such as a high intake of sodium and low intake of calcium. However, little is known about how much KAs acknowledge the strengths and weaknesses or the healthiness of Korean foods.

Last but not least, there have been some studies that explored acculturation level and dietary habits of KAs (Gordon et al., 2000; Kang & Garey, 2002; Lee et al., 1999; Yang, Chung, Kim, Bianchi, & Song, 2007). Also, some studies explored dietary habits alone or nutrition status of KAs (Park et al., 2005; Park et al., 2003). However, there are few studies that incorporate psychosocial, cultural, and environmental factors with eating behaviors of KAs, especially targeting health promotion and disease prevention for this population. This study addressed the gap in the previous literature and provided a more comprehensive understanding about healthy eating habits in KAs by expanding the focus from first generation to the 1.5 and second or further generation KAs.

RESEARCH QUESTIONS

Based on the conceptual framework and the review of the literature, the following research questions were explored:

1. What is the relationship among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors among KAs?
2. What are the significant predictors among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors for the dependent variable of healthy eating habits among KAs?

a. Among these factors, which factor contributes the most unique variance for healthy eating habits among KAs?

b. Among these factors, what are the significant predictors for healthy eating habits among KAs after controlling for personal factors?

3. Do barriers to healthy eating, mediate the effects of personal factors on healthy eating habits among KAs?
4. Does healthy eating self-efficacy mediate the effects of personal factors on healthy eating habits among KAs?
5. Do environmental factors mediate the effects of personal factors on healthy eating habits among KAs?
6. Do barriers to healthy eating moderate the effects of personal factors on healthy eating habits among KAs?
7. Does healthy eating self-efficacy moderate the effects of personal factors on healthy eating habits among KAs?
8. Do environmental factors moderate the effects of personal factors on healthy eating habits among KAs?
9. Are there differences in barriers to healthy eating, healthy eating self-efficacy, and healthy eating habits among first, 1.5, and second generation KAs?

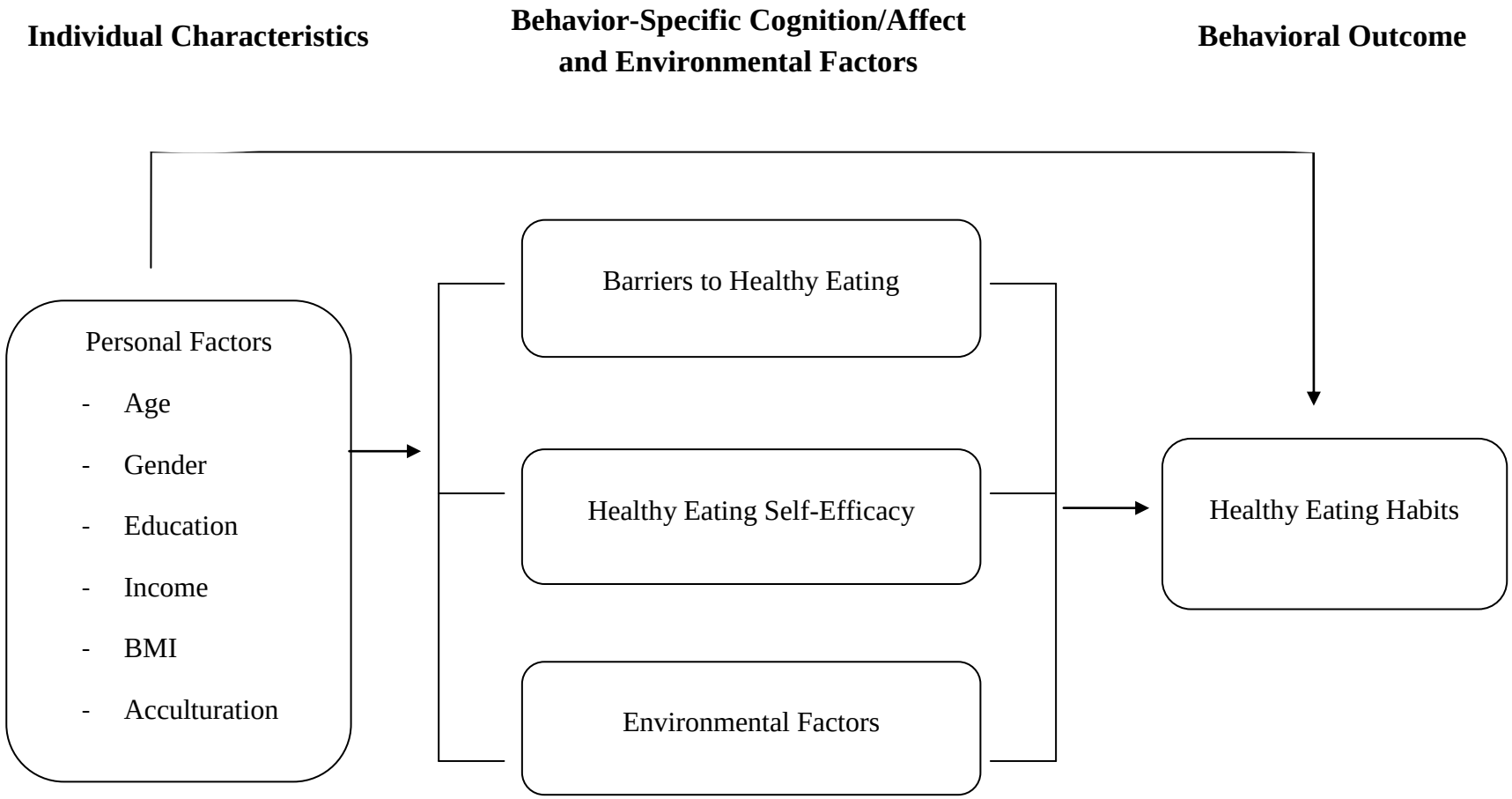
CONCENPTUAL/THEORETICAL FRAMEWORK

Pender's Health Promotion Model (HPM) was used as a theoretical framework to guide this study. HPM is useful for testing predictors of specific health-promotion

behaviors (Pender et al., 2006). The constructs in the revised HPM consist of individual characteristics (personal factors) and experiences (related prior behavior), behavior-specific cognitions and affect (perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influence), commitment to a plan of action, immediate competing demands and preferences, and behavioral outcomes which is the health promoting behavior (Pender et al., 2006). The model encompasses the complicated nature of an individual's behavior interacting with the environment.

According to the underlying assumptions of the HPM (Pender et al., 2006), people have free will in choosing their behaviors, and they tend to select more desirable health behaviors if they perceive that conditions support them to do so. With regard to health-promoting behavior, the assumptions also support the idea that the greater the perceived self-efficacy is, the more the person will engage in the behavior in spite of the internal and external conflicts within the environment (Pender et al., 2006). These assumptions guided the selection of research questions and choice of instruments.

Figure 1. Theoretical Framework for the Study Adapted from Health Promotion Model



Three major constructs (individual characteristics, behavior-specific cognitions and affect, and behavioral outcome) were selected for this study based on the literature review as shown in Figure 1. For individual characteristics, the personal factors selected for this study, which may influence the behavioral outcome of healthy eating habits in KAs include age, gender, education, income, body mass index (BMI), and acculturation. The behavior-specific cognitions/affect and environmental factors selected for this study, which motivates health-promoting behaviors (Pender et al., 2006) include barriers to healthy eating, healthy eating self-efficacy, and environmental factors. Healthy eating habits were measured for behavioral outcome.

Health-Promoting Behavior

Health-promoting behavior is the final action outcome in the HPM, and it is ultimately aimed at obtaining positive health outcomes. Since healthy eating habits were chosen to be the health-promoting behavior within the framework for this study, how to define "healthy eating" is imperative. For this study, "healthy eating" was defined as eating a diet low in fat, cholesterol, and sodium with higher complex carbohydrate intake (e.g., fruits and vegetables), which helps preventing obesity, cardiovascular disease, and certain types of cancer.

According to the model, individual characteristics and behavior-specific cognitions/affect and environmental factors directly and indirectly influence healthy eating habits. For this study, predictive relationships of selected individual characteristics and behavior-specific cognitions and affect variables were examined for their direct effects on healthy eating habits. In addition, the moderating and mediating effects of

barriers to healthy eating, healthy eating self-efficacy and environmental factors on the relationship of individual characteristics and healthy eating habits were also explored.

Personal Factors

According to Pender et al. (2006), personal factors are comprised of three categories. First, biological factors include age, gender, body mass index (BMI), and body strength. Second, psychological factors include self-esteem, self-motivation, and perceived health status. Third, sociocultural factors are race, ethnicity, acculturation, education, and socioeconomic status. In this study, age, gender, education, income, BMI, and acculturation were selected as the personal factors that may influence healthy eating habits directly and also indirectly through barriers to healthy eating, healthy eating self-efficacy, and environmental factors.

Barriers to Healthy Eating

Barriers are often considered hurdles and personal costs of performing a health behavior. Among the studies testing the HPM, 79% provided support for barriers as a determinant of health-promoting behavior (Pender et al., 2006). The examples of barriers are inconvenience, expense, difficulty, or time-consuming nature of a particular action (Pender et al., 2006). According to Pender et al. (2006), perceived barriers to action in the revised HPM affect health-promoting behavior directly as well as indirectly through decreasing commitment to a plan of action. For this study, it is hypothesized that as barriers increase, then the likelihood of healthy eating would decrease.

Healthy Eating Self-efficacy

Self-efficacy is the judgment of personal ability to organize and accomplish a particular behavior (Pender et al., 2006). Of the studies testing the HPM, 86% supported self-efficacy as a determinant of health-promoting behavior, which implies that self-efficacy is the one of the strongest predictors in the model (Pender et al., 2006). For this study, it was hypothesized that self-efficacy has a positive influence on healthy eating habits.

Environmental Factors

Environmental factors refer to situational influences in the HPM. The term "environmental factors" in this study, was derived from ANGELO (Analysis grid for environments linked to obesity) framework developed by Swinburn, Egger, and Raza (1999). Environmental factors have common components with situational influences of HPM such as accessibility, convenience, and cost (Pender et al, 2006). However, environmental factors in ANGELO framework are more specific to healthy eating habits and support that these factors are critical determinants of healthy eating habits throughout previous studies (Brug, 2008; Swinburn et al., 1999). In this study, the person who cooks the food and convenience of the Korean market were examined. It is hypothesized that these environmental factors are closely related to healthy eating habits and may be a significant predictor for healthy eating habits in KAs.

Summary

HPM is a middle range theory, and it is simple and easy to understand since the factors in the concepts are logically connected (Sakraida, 2006). This model is easy to

generalize to a variety of populations regardless of age, gender, and culture (Sakraida, 2006). HPM was used in eating habits study among different populations including Americans, Koreans, and Taiwanese (Chen, Kuo, Chou, & Chen, 2007; Duffy, 1993; Shin & Lach, 2011). As a result, the HPM is a suitable framework to apply to health-promoting behaviors such as healthy eating habits in KAs.

DEFINITION OF TERMS

Korean Americans

Conceptual definition*:* Americans of Korean descent.

Operational definition: participant's response on the screening questionnaire to "Are you Korean American?"

1st Generation Korean Americans

Conceptual definition: Korean Americans who were born in Korea and immigrated to the US, but have not received formal education in the US.

Operational definition*:* participant's response on the screening questionnaire to both "Where were you born" as being in "Korea" and "Did you attend at least one year of school (elementary, middle, or high school) in the US?" as being "no".

1.5 Generation Korean Americans

Conceptual definition: Korean Americans who came to the US and received formal education in the US.

Operational definition*:* participant's response on the screening questionnaire to both "Where were you born" as being in "Korea" and "Did you attend at least one year of school (elementary, middle, or high school) in the US?" as being "yes".

2nd or Further Generation Korean Americans

Conceptual definition: Korean Americans who were born in the US.

Operational definition: participant's response on the screening questionnaire to question "Where were you born" as being in "United Stated".

Personal Factors

Personal factors are those factors: specific to the individual, which predict health-promoting behavior; and selected by the nature of given health-promoting behavior which is healthy eating habits (Pender et al., 2006). Personal factors will be age, gender, education, income, BMI, and acculturation in this study.

Age

Conceptual definition: number of years from birth to the present.

Operational definition: participant's response on the Background Information Questionnaire to "Date of Birth".

Gender

Conceptual definition: societal meaning assigned to female and male.

Operational definition: participant's response on the Background Information Questionnaire to "Gender": 1) Female or 2) Male.

Education

Conceptual definition: highest level of education completed.

Operational definition: participant's response on the Background Information Questionnaire to "Highest level of education completed (check one)." Respondents choose from five response options: 1) Less than High School; 2)

High School Graduate; 3) Some College (at least one year); 4) Baccalaureate Degree; or 5) Master's, Doctorate, or Professional Degree.

Income

Conceptual definition: the money earned from work or received from the government.

Operational definition*:* participant's response on the Background Information Questionnaire to "What is your annual family income (check one)?" Respondents choose from six response options: 1) Less than $20,000; 2) $20,001 - $30,000; 3) $30,001 - $40,000; 4) $40,001 - $50,000; 5) $50,001 - $75,000; or 6) $75,000 - $100,000; or 7) More than $100,000.

Body Mass Index (BMI)

Conceptual definition: a standard measure to determine the degree of obesity by height and weight.

Operational definition: self-reported height, either in inches or centimeters, and weight, either in pound or kilograms, will be collected on the Background Information Questionnaire. BMI was calculated as weight in kilograms divided by height in meters squared.

Acculturation

Conceptual definition**:** "the dual process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members" (Berry, 2005. p 698).

Operational definition: Acculturation was determined by the total score of Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA).

Barriers to Healthy Eating

***Conceptual definition*:** the obstacles or personal costs that hinder individuals engaging in healthy eating.

Operational definition: Barriers to healthy eating was determined by the total score of Barriers to Healthy Eating Scale (BHES).

Healthy Eating Self-Efficacy

***Conceptual definition*:** the judgment and confidence of personal ability to engage in healthy eating (Pender et al., 2006).

Operational definition: Healthy Eating Self-Efficacy was determined by the total score of Self-Efficacy for Eating Behaviors Scale.

Environmental Factors

***Conceptual definition*:** situational influences that restrict or encourage engaging in healthy eating.

Operational definition*:* Environmental factors were determined by the response to two questions: person who cooks food and convenience (distance and time) to Korean market in the Background Information Questionnaire.

Healthy Eating Habits

***Conceptual definition*:** eating diets low in fat, cholesterol, and sodium with higher complex carbohydrate intake (fruits and vegetables) to prevent obesity, cardiovascular disease, and certain types of cancer that are related to eating habits.

Operational definition: Healthy eating was determined by the total score of Diet Habit Survey (DHS).

ASSUMPTIONS

Based on the literature review and the conceptual framework, the following assumptions were made:

1. Participants honestly and accurately answered the survey questionnaires.
2. Healthy eating habits of Korean Americans can be captured by the Diet Habit Survey.
3. People have free will in choosing their behaviors, and they tend to select more desirable health behavior if they perceive that conditions support them to do so and are motivated.

LIMITATIONS

1. The non-probability nature of the proposed sample limited generalizability. People who were more acculturated may choose not to participate in this study because they might consider themselves to be Americans. People who were less acculturated may choose not to participate in the study because of their lack of English proficiency.
2. The cross-sectional design may not reflect the dynamic process of acculturation and health behavior changes. Also, causality cannot be determined from a cross-sectional design.
3. The findings may reflect a response bias in that persons who were interested in healthy eating habits may be more likely to participate.

4. Participants may report that they eat healthier than they actually do (Kim & Han, 2004) when eating habits are measured by self-administered questionnaires. Social desirability, which is seen when conducting research studies, is shown in every culture but is especially strong in Asian culture including Korean Americans.
5. In this study, 2 environmental factors were measured. However, the 2 environmental items may not capture all the environmental influences.
6. There can be difference between self-reported and measured weight and height, generally measured height is less than reported and self-reported weight is less than measured (Jacobson & DeBock, 2001; Okosun, Bhatt, Boltri, & Ndirangu, 2008; Lim, Seubsman, & Sleigh, 2009; Ambrosi-Randic & Builian, 2007). In this study, since self-reported weight and height was used, BMI might not be as accurate as measured ones.

SUMMARY

This chapter presented the background and significance of the study emphasizing the need for the study of KAs eating habits especially including 1.5 generation and second or further generation KAs. The primary aim of the study was to examine the predictive relationships among personal factors (age, gender, education, income, BMI, and acculturation), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among KAs. The conceptual framework was adopted from Pender's Health Promotion Model (Pender et al., 2006), and the selected concepts were described followed by the operational definitions of the concepts. Findings from

this study may provide valuable insight for eating habits among KAs and may provide practical knowledge for the further studies.

Chapter 2: Review of the Literature

This chapter contains a review of the literature regarding eating habits of KAs. Using selected concepts from the Health Promotion Model (personal factors, barriers, self-efficacy, and environmental factors), research examining the relationships between these concepts and healthy eating habits in KAs is reviewed.

KOREAN AMERICANS

Korean Americans (KA) represent 11% of the Asian American population in the United States (US) which is 0.4 % of the total U.S. population (US Census Bureau, 2001). They are the fifth largest Asian population in the US following Chinese, Filipino, Japanese, and Asian Indians (Huff & Kline, 1999). According to the 2005 American Community Survey report, there were nearly 1.4 million KAs living in the US; 70% of them are first generation KAs who were born in Korea and 30% are second generation born in the US. Although first generation KAs are immigrants, if they have lived in the US more than 5 years, they were also considered to be KAs for this study. The majority of Korean Americans came to US after 1965 (Song & Moon, 1998). Many of them that came to the US with their family were highly educated, had white-collar occupations, and settled in both urban and suburban areas (Pak, 2006). According to the 2001 U.S. Census Bureau report, most KAs are located in large metropolitan cities, such as Los Angeles (24%), New York (16%), Washington DC (7%), San Francisco (5%), Chicago (4%), and Seattle (4%).

The children of KA immigrants can be divided into two groups: (1) the second generation KAs who were born and raised in the US, and (2) 1.5 generation KAs, who

were born in Korean but immigrated to the US with their parents (Pak, 2006). The term "1.5 generation" uniquely emerged for the first time with the Korean American immigrants who came to US in the 1970s with families that had young children (Hurh, 1993). Current definitions for the timing of the immigration for 1.5 generation is unclear; it can range from coming to the US in the early years (pre-school ages or elementary school ages) to the early or middle adolescent years (generally between ages of 11 and 16) (Kwon & Kim, 1993). However, according to Danico (2004), there are three main characteristics that shape 1.5 generation of KAs. First, they are cognizant of being bicultural, meaning that they can identify themselves as Korean, Korean American, and American depending on the situation. Second, although 1.5 generation can possess both Korean and American cultures, they can switch their ethnic identities depending on whom they interact with and the particular situation. For example, if a person who is in the 1.5 generation is working during the daytime with predominantly Americans, they think and act as an American. However, when they come home and have dinner with their Korean family, they consider themselves Korean. Third, 1.5 generation are generally bilingual so that they can interact with both Koreans and Americans. They might not be literate in Korean but can communicate with Koreans. Commonly, English is their first language partly because they have received their formal education in the US. These three characteristics comprise the 1.5 generation KAs and differentiate them from second generation KAs and recent immigrants.

Despite the above unique characteristics, the majority of the researchers have avoided considering this group separately but categorized them as first generation KAs.

There is a need to study 1.5 generation KAs separately because a large number of KAs belong to this group. However, the exact number of KAs belonging to the 1.5 generation has not been identified in the US. In addition, the numbers of KAs belonging to the 1.5 generation of KAs will not diminish in the future due to constant immigration to the US of young Korean families.

KAs have some unique characteristics in their acculturation process and health-related findings. According to Lynn et al. (1999), Korean immigrants tend to assimilate more slowly than other Asian immigrants and are more likely to retain their cultural traditions by KA social networks. Kalcik (1984) pointed out that immigrants' eating habits might change more slowly than other component of culture such as language and clothing, because food culture is more unique, fundamental, and private. Immigrants sometimes eat their traditional foods and feel closer to their home country, and by doing that they occasionally forget about feeling alienated by living in a foreign country. However, sometimes it is hard to retain traditional eating habits due to the lack of availability of the ingredients and environment restrictions. Also, traditional food and ethnic holidays are much easier to maintain than language because these components interfere less with other aspects of cultures (Min & Kim, 1999). As a result, although some KAs forsake their own language, they continue to eat culturally specific food on a regular basis and perceive themselves as Korean.

In addition, KAs have some unique health-related findings. According to Kuo and Porter (1998), more KAs (8%) have not seen their doctors for 5 or more years than other populations including Chinese (5.8 %), Filipino (3.4%), Japanese (5.2%), Vietnamese

(4.8%), and even Non-Hispanic whites (3.1%). These findings suggest that some KAs are not taking care of their health since they are neglecting to get health check-ups. Also, more KAs reported that their health is fair or poor (13%) compared to overall Asian Americans (9.2%) and non-Hispanic whites (8.9%) (Kuo & Porter, 1998). Although there are some studies on physical activity of KAs, there was a paucity of studies regarding the eating habits of KAs. Clearly, a better understanding about what influences health promoting behaviors of KAs, who scored their health lower than other Asian populations in the US, is needed. Studying eating habits of KAs may provide insights into an important health-promoting behavior that can influence long-term health outcomes.

EATING HABITS OF KOREAN AMERICANS

Eating Habits and Health among Korean Americans

It is evident that eating habits and nutrition have a great impact on an individual's health. However, it is challenging to study the relationship between eating habits and health because there are multiple social, psychological, and cultural factors that affect health among KAs. There does exist some studies exploring the relationship between eating habit changes and health among KAs (Lee et al., 1999; Park et al., 2005; Song et al., 2004; Yang et al., 2007).

As eating habits change, so do the disease patterns. Chronic diseases such as diabetes, cardiovascular disease, and cancer are related to the Western lifestyle and are associated with excess energy and fat intake (O'Sullivan, Ambrosini, Beilin, Mori, & Oddy, 2011). Yang et al. (2007) asserted that dietary changes of KAs in the US were related to changes in their chronic disease types.

The study (Yang et al., 2007) indicated that KA men who lived in the US less than 15 years had a prevalence of hypertension (12.5%) and digestive diseases (12.4%) similar to those in the Korea National Health Interview Survey (1999). However, KA men who lived for longer period (≥15 years) in the US had a much higher prevalence of hypertension (23.1%) and a lower prevalence of digestive diseases (0.4%).

Kim et al. (2007) compared dietary habit changes of hypertensive and normotensive KAs with native Koreans in rural Korea. Among Koreans, sodium intake is known to be related to hypertension (Lee, Park, Yoo, & Ahn, 1995), and some staple foods, such as kimchi and soy bean paste, are the major sources of sodium (Cheigh & Park, 1994). Although there were no significant differences in general diet quality between KAs and Koreans, KAs ate significantly less sodium, potassium, vegetables and fruits than Koreans. However, hypertensive KAs made less effort to decrease the sodium intake than Caucasians and African Americans (Kim, Ahn, Chon, Bowen, & Khan, 2005).

Among various chronic diseases, body weight has been studied extensively not only because obesity is one of the most noticeable changes linked to the acculturation process, but also it increases the risk for chronic diseases (Lee, Sobal, & Frongillo, 2000). In general, studies demonstrated that both KA men and women who stayed longer are more likely to have higher BMIs (Kim, Chan, & Shore, 2002; Lee et al., 2000; Park et al., 2005). Many studies did not focus on specific diseases, such as cardiovascular disease or diabetes, but demonstrated BMI as one of the indicator of KA's health status. These studies are discussed in detail later in the BMI section.

According to Yang et al. (2007), longer residence in the US was associated with eating less rice and a lower prevalence of digestive diseases, such as gastric and duodenal ulcers, and gastritis, among KA men. KA women didn't show this relationship, and the author explains that it may be due to KA women's small portion size of rice/rice dishes leading to low rice consumption. Assuming that increased rice intake is related to digestive disease could be misleading, but consuming more rice could be interpreted as consuming more traditional Korean foods such as hot, spicy, and salty dishes. This may mean the less they keep their traditional eating habits, the less they have digestive health problems. The high risk of stomach cancer in Korea, the number one cause of cancer deaths for Koreans (Jung et al., 2010), was found to be associated with the consumption of traditional Korean dishes made from hot pepper paste as well as salty and spicy foods (Yang & Kim, 1993).

Based on these studies, it seems apparent that there was a negative impact on health of KAs with their eating habit change. KAs have higher BMIs and a higher prevalence of hypertension, along with more American style eating habits compared to native Koreans. However, there were some positive impacts on health such as less prevalence of digestive diseases. Since previous studies of KAs support that eating habit change has an impact on the health of KAs, this study may identify what factors influence those healthy eating habits among KAs.

Healthy Eating Habits among Korean Americans

Several studies have compared the eating habits of KAs to their counterparts in Korea (Kim et al., 2007; Lynn et al., 1999; Park et al., 2004; Song et al., 2004) and there

were several common findings across studies. Those common findings were higher intake of energy from fat (Kim et al., 2007; 1999; Park et al., 2004; Song et al., 2004) and lower intake of fruits and vegetables (Kim et al., 2007; Song et al., 2004). Consuming less fruits and vegetables resulted in a lower vitamin intake for KAs, which may have a negative effect on health. Instead, more KAs were taking vitamin supplements than native Koreans (Lynn, Kang, & Ludman, 1999; Song et al., 2004). It was a unique component of Korean's eating habits that vegetable intake plays a central part in their diet. In fact, the vegetable intake of most Koreans was among the highest in Asian countries (Lee et al., 1999). Unfortunately, vegetable intake lessened after immigration to the US.

The positive and negative trends of dietary changes (Park et al., 2005; Song et al, 2004) are shown in Table 1. Park et al. (2004) specifically compared the adolescents' dietary profiles of American, KA, and Korean adolescents, which showed that KAs had a dietary profile midway between those of native Koreans and Americans. One noticeable finding was that Korean adolescents had the highest cholesterol intake among the groups, which should be investigated more in the future. Unfortunately, the study did not provide details about the sources of cholesterol, but only the intake of cholesterol. An additional nutritional finding was that KAs were consuming more calcium than Koreans due to increased intake of dairy products (Park, Murphy, Sharma, & Kolonel, 2005). This change may have a positive effect on health such as lowering osteoporosis risk.

In summary, eating habits of KAs were different from native Koreans. Some of the eating habits had a positive effect on health and others had a negative effect on health. Based on the results of the previous studies, reducing the negative aspects and

encouraging the positive aspects of KAs' eating habits is desirable. Healthy eating for this study was defined as eating a diet low in fat, cholesterol, and sodium with higher complex carbohydrate intake (fruits and vegetables). This healthy eating helps prevent obesity, cardiovascular disease, and certain types of cancer. DHS, an instrument to measure overall healthy eating habits, measured source and type of protein, sodium and fat intake, dairy product intake, sweet intake, and fruit and vegetable intake, and quantified and evaluated how much KAs eat healthy.

Table 1

Positive and Negative Trend of Dietary Changes after immigration among Korean Americans

Positive	Negative
Less sodium and carbohydrate	More fat as a percentage of energy
More milk (calcium),	Less fruits and vegetables
but less whole (high fat) milk	Less soy products
More whole grains	More cookies, sweets, and soda

Note. The content was derived from the result of two articles (Park et al., 2005; Song et al., 2004)

HEALTH PROMOTION MODEL AND EATING HABITS

Several research studies have used HPM to guide studies regarding nutrition or eating habits. Daggett and Rigdon (2006) have utilized HPM to guide their study creating computer-assisted instructional program explaining serving size with portion size. The author mentioned that the HPM was used because the model was appropriate in

examining multidimensional biopsychosocial processes such as eating habits (Daggett & Ridgon, 2006).

Duffy (1993) used selected components of HPM to determine the degree of engagement in health promoting behaviors including eating habits. Demographic factors, health locus of control, self-esteem, perceived health status, and health-promoting activities were examined, and those factors accounted for 88.7 % of the variance using canonical correlation. The results illustrated that men with higher income and self-esteem, but poorer health, had poorer eating habits.

A few studies used the HPM to examine elderly Korean Americans' eating habits. Sohng, Sohng, and Teom (2002) conducted a study in the US among elderly Korean immigrants to examine the relationships between health-promoting behaviors, self-efficacy, and perceived health status using HPM. Self-efficacy was significantly correlated (r = .49) with health-promoting behaviors measured by the Health Promoting Lifestyle Profile (HPLP) total score. This was consistent with previous studies finding positive relationships between self-efficacy and health-promoting behaviors (Stuifbergen & Becker 1994; Weitzel, 1989).

Shin (2008) studied predictors for physical activity and healthy eating of Koreans in the US using HPM (N=517) in her doctoral dissertation. The investigator concluded that KAs are physically inactive and have poor eating habits compared to US population. Shin concluded that HPM provided a useful theoretical framework for the study, but since some of the propositions were not met in the study, the HPM should be tested with a different population or should be modified. For example, some individual

characteristics (acculturation, physical health, and mental health) had no direct effect on physical activity or healthy eating among this population. Those variables should be retested with different instruments or on different populations. The measurements used in Shin's study (e.g., Lee's Acculturation Scale, Healthy Eating Benefits and Barriers Scale, Self-Efficacy for Eating Habits Scale, Nutrition subscale of HPLP II) were helpful to understand their cognitions and health behaviors, but some instruments need revision to have better reliability and validity.

The HPM was also used with a Thai population to examine the nutritional health-promoting behavior among women with hyperlipidemia (Kahawong, Phancharoenworakul, Khampalikit, Taboonpong, & Chittchang, 2005). Using stepwise multiple regression model, self-efficacy, age, and perceived health risks accounted for 39.6% of the variation in the healthy eating habits. Social support and BMI were not significant predictors in the study, which was not consistent with the previous studies (Kahawong et al., 2005). The investigator presumed that the reason for BMI not being a significant predictor was little variation in the sample but further investigation is warranted.

The studies using the HPM among various populations with various instruments demonstrate both consistent and inconsistent results regarding relationships among variables. The literature review of the HPM regarding nutrition or eating habits studies provided some evidence for using the HPM for this study. The relationships and the impact of each variable (personal factors, self-efficacy, barriers, and environmental factors) on healthy eating habits are further addressed in the next section.

SELF-EFFICACY AND EATING HABITS

According to Bandura (1977), self-efficacy is defined as a belief in his or her capability to perform a certain behavior. It is a potent predictor for behavior change because it facilitates a person's initial decision for activity change (Bandura, 1982). A number of studies have explored the relationships between self-efficacy and eating habits, and many found that self-efficacy is an essential factor in eating healthy. Likewise, studies supporting the relationships between self-efficacy and other personal factors also exist.

The previous studies reviewed that self-efficacy is related to other personal factors (i.e., BMI, age) and to healthy eating habits among US and Asian populations. Shin (2011) supported in her study that healthy eating self-efficacy being a significant predictor for healthy eating behavior among KAs. In this study, other independent variables were demographic factors, acculturation, physical health, mental health, perceived benefits, barriers, and self-efficacy. Among these variables, self-efficacy was the strongest predictor and perceived benefits was also a significant predictor for healthy eating. The author stressed that clinicians need to apply interventions such as cooking classes introducing healthy Korean dish recipes in order to build the confidence in regard to healthy eating for KAs.

In a study with 145 alternative high school students (Bruening, Kubik, Kenyon, Davey, & Story, 2010), self-efficacy was a significant predictor for fruit and vegetable intake ($b = 0.13$, $P < 0.05$). Another study of university students and staff, which examined predictors for healthy eating behavior, had similar results (Stranchan &

Brawley, 2009). Using stepwise regression analysis, adding self-efficacy, while controlling for nutrition knowledge, significantly increased the prediction of healthy eating outcomes.

In Thailand, Kahawong et al. (2005) conducted a study to examine the predictors for nutritional health-promoting behavior. In sample of 263 women with hyperlipidemia, perceived self-efficacy was found to be positively correlated with nutritional health-promoting behaviors ($r = .56$, $p < .001$). Among the three significant predictors of perceived self-efficacy, age, and perceived health risks ($p < .01$), self-efficacy was the strongest variable influencing nutritional health-promoting behavior, explaining 30.9% of the variation in healthy eating habits using stepwise regression. Although the sample was Asian women who might have different nutritional intake and eating patterns, self-efficacy still was a significant predictor for nutritional health-promoting behavior.

Richman, Loughnan, Droulers, Setinbeck, and Caterson (2001) conducted a weight management intervention study to assess anthropometric variables and self-efficacy in relation to eating habits among 161 non-obese women and 138 obese women. Self-efficacy was measured by Weight Efficacy Lifestyle (WEL) questionnaire, which contains four subscales. In this study, self-efficacy for healthy eating was only significantly related age ($r = .18$, $p < .05$) for obese women group. For non-obese women group, self-efficacy for healthy eating was significantly correlated to age ($r = .30$, $p < .001$) as well as BMI ($r = -.27$, $p < .001$); all four subscales for self-efficacy demonstrated significant relationships with BMI: emotions ($r = -.31$, $p < 0.001$),

availability (r = -.18, $p < 0.05$), social pressure (r = -.22, $p < 0.05$), and physical discomfort (r = -.23, P < 0.05).

BARRIERS AND EATING HABITS

According to Pender et al. (2006), there are numerous barriers that inhibit people from consistently pursuing or maintaining healthy eating habits in this modern society. Not only external factors, but also internal factors such as thoughts and feelings about specific eating habits, whether it is real or imagined, can be barriers to certain healthy eating habits (Fowles & Feucht, 2004). Previous studies supported that both external and internal barriers play an important role in healthy eating habits.

According to Bruening et al. (2010), barriers to healthy eating was a significant predictor for fruit and vegetable intake among 145 alternative high school students (b=0.45, P=0.002). Lytle et al. (2003) also studied predictors of fruits and vegetable intake among adolescents (N = 3878). Compared to those with median scores on the barrier scale, those scoring at the 10th percentile consumed 1.25 times more fruits and vegetables while those scoring at the 25th percentile consumed 1.08 times more fruits and vegetables. It can be said that the greater the perceived barriers, the fewer fruits/vegetables were consumed among adolescents. Walker, Pullen, Hertzog, Boeckner, & Hageman (2006) explored the determinants of physical activity and healthy eating habits among rural older women (N=179) guided by the HPM. By conducting canonical correlation analysis, barriers, benefits, self-efficacy, and interpersonal influences were significant factors related to healthy eating.

However, one study with KAs (Shin, 2011) did not demonstrate the significant relationship between barriers and healthy eating habits, unlike benefits ($\beta = .26$, $t = 2.26$) and self-efficacy ($\beta = .48$, $t = 4.47$), which were significant predictors for healthy eating habits using structural equation modeling (N=261).

Although there were some studies supporting the relationship between barriers and eating habits, there were few studies investigating this relationship among KAs. This study fills a gap in the literature by examining the relationship of barriers to healthy eating habits among KAs.

PERSONAL FACTORS AND EATING HABITS

Acculturation

Modern society has become more open to other cultures and embraces diverse cultures through immigration from other countries (Berry, 1997). Although the focuses of acculturation studies were initially on specific cultural groups (Berry, 1980), the standpoint of acculturation moved to interaction between cultural groups (Berry, 2008). Berry (2008) stated that acculturation is only an initial process, so globalization is the next step, and the actual results are dominant or non-dominant cultural group experiences. Possible outcomes are not only assimilation, adapting to prevailing culture, but can include: 1) integration which is maintaining existing cultures and behaviors while interacting with the dominant culture; 2) separation which is losing pre-existing cultures and behaviors without intentionally interacting with the dominant culture; and 3) marginalization which is maintaining previous cultures and behaviors with partly engaging in the dominant culture. KAs appear to maintain their culture and behaviors

after immigration to the US, so their acculturation could be defined more as integration or marginalization.

Acculturation is a complex factor to both evaluate and measure because it involves changes in attitudes, values, and behaviors, which include social and psychological factors. Generally, language proficiency, current environment, ethnic identity, and length of residence in the US are considered to be important factors when measuring acculturation. Gender is related to language proficiency because men are more socially involved in a new country; so, gender is one of the predictors for acculturation (Arcia, Skinner, Bailey, & Correa, 2007). However, the most important factors related to acculturation level were length of residence in the host country and language competence (Arcia, et al., 2007).

There are many aspects of culture: language, clothes, food, holidays, customs, values, and beliefs. Among them, Kalcik (1984) pointed out that immigrants' eating habits may change more slowly than other components of culture such as language and clothing, because food culture is more unique, fundamental, and private. However, sometimes it is hard to retain traditional eating habits due to the lack of availability of ingredients or environmental restrictions, such as limited number of ethnic markets or unique odor of the ethnic food. Also, traditional food and ethnic holidays are much easier to maintain than language because these components are less influenced by other aspects of cultures (Min & Kim, 1999). As a result, although some KAs forsake their language of origin, they continue to eat culturally specific food on a regular basis and perceive themselves as Korean. According to Lynn et al. (1999), Korean immigrants tend to adjust

to the host culture more slowly than other Asian immigrants by maintaining cultural traditions and KA social networks. Because of this propensity to retain cultural ethnicity, they are subject to live within enclaves, which allow them to have easy access to their cultural needs.

Since the majority of KAs are immigrants, the dynamics of acculturation should be considered when discussing healthy eating habits. Previous studies support that the more acculturated KAs are, the less frequently they eat traditional Korean food, the more they consume energy from fat, and the more sweets they consume (Chung, 1995; Kim & Chan, 2004). In addition, according to one study, acculturation is an important factor that influences healthy eating habits among immigrant women (Hyman, Guruge, Makarchuk, Cameron, & Micevski, 2002).

There were several studies looking at KAs' eating habits in relation to acculturation level (Kim et al., 2000; Kim & Wolpin, 2008; Kang & Garey, 2002; Park et al., 2005; Sohn & Harada, 2005; Yang, 2007; Yang et al., 2007). Most of these results were compared with acculturation level, and it was found that the more acculturated KAs are, the more likely they are to eat an American-style breakfast. Two studies (Lee et al., 1999; Lynn et al., 1999) mentioned that KAs eat more American-style breakfasts with milk, bread, and cereal, but not as many American-style dinners, which means that many KAs are continuing their traditional Korean foods in their main meal. In one study, the more acculturated the KAs are, the less they chose and ate whole (high fat) milk (Song et al, 2004).

Lee et al., (1999) conducted a study to examine the relationships between acculturation level and dietary habits among KAs. A sample of 348 KAs responded to a statewide national survey study. The study divided KAs into three groups depending on the acculturation level: acculturated, bicultural, and traditional cluster. The bicultural group was similar in number of American foods consumed to the acculturated group, but also was similar in number of Korean foods for traditional group. This finding indicates that acculturation is positively related to more American food, but also that the bicultural group which is likely the 1.5 generation or second generation young adults have eating habits halfway between Koreans and more acculturated KAs. In addition, diet quality did not vary among the three groups; the bicultural group had the highest variation in diet quality, which indicates that the eating habits of these groups need to be further explored.

Like other cultural groups, KAs maintain their traditional eating habits even though they may forsake other cultural components such as language. When studying immigrants, acculturation cannot be excluded as an important factor. Although there were a few studies that delineated the relationship between acculturation and eating habits, not many studies considered acculturation as one of the major factors that can influence eating habits. In this study, acculturation was measured as one of the personal factors that may impact healthy eating habits.

Age and length of stay in the US

Previous studies support that age is positively related to health-promoting behaviors including healthy eating habits (Bond, Jones, Cason, Campbell, & Hall, 2002; Gordon et al., 2000; Hulme et al., 2003; Kahawong et al., 2005). Hulme et al. (2003)

conducted a study among 545 Spanish speaking Hispanics to identify determinants of health-promoting behavior. There was a significant age difference in eating behaviors [F (1, 539) = 10.466, p = .001]; those 32 years or older ate healthier than the younger age groups. Three of the variables were significant predictors of overall health-promoting behavior; acculturation, emerged as the strongest predictor (β = .24), followed by the age (β = .20), and perceived health status (β = .17). A correlational study conducted by Kahawong et al. (2005) with women with hyperlipidemia demonstrated that age was a positively correlated with healthy eating habits (r = .377, p < .001) and that age was the second most powerful significant predictor for healthy eating habits followed by self-efficacy. In one study, younger participants made choices in diet based on taste, but older participants used nutritional value in making their food choices (Gordon et al., 2000).

Some studies support that age is considered as one of the predictors for healthy eating habits although some studies did not show significant relationship with eating habits. It is partly due to inter-correlation among age, length of stay, acculturation. All three variables were measured in this study.

Gender

Some studies support that women eat healthier than men (Gordon et al., 2000; Hulme et al., 2003; Johnson, 2005; Kim, Yu, et al., 2000). Hulme et al. (2003) studied gender differences in healthy eating habits, as measured by the HPLP nutrition subscale, among Spanish-speaking Hispanic adults. There was a significant gender difference in eating behavior, [F (1, 538) = 7.969, p = .005, effect size = -.015], in which women ate healthier than men. These results were consistent with findings from a study with a

sample of African Americans. Using an independent t-test, Johnson (2005) investigated the gender differences in health-promoting lifestyle among 223 African Americans residing in southeastern area of US. The results showed that women have healthier eating behaviors than men also measured by HPLP nutrition subscale [t (219) =-3.27, $p < 0.01$]. The author explained that the higher scores on the nutrition subscale for women might be due to their role within the family, responsible for grocery shopping and food preparation.

Two additional studies had similar results when examining the eating habits of KAs. Gordon et al. (2000), for instance, investigated the dietary habits and the health beliefs of KAs in San Francisco (N=193). Gender was evenly distributed for the study, 50% male and 50% female. Women consumed significantly more fruits and vegetables than men. For example, the results showed that 70% of women ate salad several times a week compared to only 53 % of men ($p < .03$). Women also consumed oranges and apples more frequently (84% and 81%) than men (61% and 63%) ($p < .001$ and $p < .01$ respectively). In a study of 103 KAs residing in the central area of US, K. K. Kim et al., (2000) found using two-sample t-test that KA men consumed higher calories, protein, total fat, and cholesterol ($p < .05$) than KA women, which is partly due to larger body size of men.

In summary, previous studies supported that women do better on eating healthy including KAs. Generally, men were more likely to be involved in the society outside the home than women (Arcia et al., 2007), which may have led men to eat more frequently outside the home, consuming more Americanized and less healthy food. However, since

these results were from studies of first generation KAs and immigrants, gender differences need to be further tested to include 1.5 and second generation KAs.

Education and Income

Since education and income have overlapping components, either education or income is typically used as the socioeconomic status indicator in many research studies. However, this does not apply to KAs because KAs typically have a higher educational level compared to other ethnic groups. According to Kuo and Porter (1998), nearly half (40%) of KAs in the US have more than a bachelor's degree, as compared to a quarter (24%) of non-Hispanic Whites. However, in spite of a high educational level, the majority of KAs' English proficiency is limited and 41% of them are linguistically isolated (Asian American Institute, 2010) despite often having studied English for an average 9 years in elementary, middle, and high schools. The combination of English proficiency and visa status may prevent them from obtaining high-income jobs or being hired from American companies (Yang, 2005). As a result, their job distribution and income may not be compatible with their educational level. Also, large portions of KAs are self-employed within the Korean community (Kim, McLeod, & Shantizis, 1992). For this reason, both education and income was measured in this study.

Previous studies supported that educational status is positively related to healthy eating habits or nutritional status. Gillman et al. (2001), for instance, conducted a study (N = 1322) among racially diverse Americans, and the results revealed that more educated people had better diet quality than less educated people. Another study among elderly Dutch (N = 5406) demonstrated that those with higher education consumed

healthier foods such as low fat foods, whole-grain products, and vitamin supplements (van Rossum, van de Mheen, Witteman, Grobbee, & Mackenbach, 2000).

Two studies were found that examined the relationship between educational level and eating habits among KAs. In s study of 110 elderly KAs (Sohng et al., 2002), those with a higher educational level had better eating habits than those with a lower educational level ($F = 3.34$, $p < .05$). In this study, among all the demographic factors, only those with a different educational level had a significant difference in healthy eating habits ($F = 4.01$, $p < .05$). In contrast, a cross-sectional descriptive study conducted by K. K. Kim et al. (2000) among KAs, 40 and 69 years old, revealed the opposite result. Educational level was dichotomized into two groups: a group with more than 12 years of education and a group with equal or less than 12 years of education. The more educated group consumed more calories, protein, total fat, and cholesterol than less educated group ($p < .05$).

Income among studies with KAs' was either not measured (Kim & Chan, 2004; Park et al., 2005; Yang et al., 2007) or income did not affect their eating habits (Sohng et al., 2002). Considering that income is not a proxy for education in the KAs, income should be separately measured as a probable predictor for healthy eating habits.

Research on the relationship between educational level and healthy eating habits in KAs has yielded conflicting results. Discrepancy among their education, income, and social status may be one of the reasons. In addition, most of the studies focused on first generation KAs, so the education and income was restricted to immigrants who had to readjust their educational background to a new environment. This study included more

1.5 and second generation KAs, so education level and income may have more variability than previous studies.

Body Mass Index (BMI)

Body mass index (BMI) is used to measure the relationship between weight and height, which is associated with body fat and health risk. According to Lauderadale & Rathouz (2000), although Asians' mean BMI is lower than other ethnicities, they have a higher percentage of body fat and more upper-body subcutaneous fat. Another interesting statement from the study is that in developed countries, there is a strong negative relationship between socioeconomic status (SES) and obesity for women; the higher the income they have, the lower the prevalence of obesity. On the other hand, in developing countries, the opposite tendency was observed; the higher the income they have, the higher the prevalence of obesity (Lauderadale & Rathouz, 2000). As a result, BMI reflects not only individual's health and eating habits, but also social backgrounds and cultural tendencies of that group.

The World Health Organization (WHO) expert consultation (2004) has announced the general BMI categorization, but those categories needed some revising for different ethnic populations. The general categories for BMI are 25-29.9 and ≥30 for overweight and obesity, respectively. However, the Korea National Statistical Office (1999) has set the BMI cutoff as 23-24.9 and 25-29.9 for overweight and obesity, respectively, in Korea. Finally, according to WHO Expert Consultation (2004), WHO suggested another standard for the Asian population at risk for cardiovascular disease and diabetes, which is 18.5-23 for increasing but acceptable risk and 23-27.4 for increased

risk, and ≥27.5 for high risk group. Although, this cutoff does not exactly parallel the overweight/obese, the cutoff has a meaningful implication. Also, it is appropriate to apply to the sample of this study.

According to Philip & James (2009), BMI is a valuable gauge for comparative purposes. For KAs, a different cutoff needs to be applied to define overweight or obesity, but still BMI figures can be utilized to compare with Americans or Koreans to acknowledge how immigration has affected the population's overall BMI. For this study, cutoff criteria for Asian Americans were applied only to describe the sample.

Ogden, Fryar, Carroll, and Flegal (2004) compared BMI of Americans from 1960s to 1999-2002 data from National Health Examination and the National Health and Nutrition Examination Surveys (NHANES). Average BMI for both men and women of 20-74 years of age was about 25 on early 1960s, but it has increased to almost 28 in 1999-2002 data. Lauderadale and Rathouz (2000) compared six Asian ethnic groups in US: Chinese, Filipinos, Koreans, Vietnamese, Japanese, and Asian Indians. The results revealed that Japanese and Filipinos had highest median BMI for men and Filipino and Asian Indian for women. Vietnamese had lowest median BMI for both men and women. Bates, Acevedo-Garcia, Alegría, and Krieger (2008) compared BMI of first, second, and third generation among Asian Americans including Chinese, Filipino, Japanese, Korean, Vietnamese, and Asian Indians using the National Latino and Asian American Survey (2002–2003). Average BMI for first, second, and third generation Asian Americans were 23.8 kg/m^2, 24.9 kg/m^2, and 26.6 kg/m^2. No data specific to BMI in first, second, and third generation KAs' was reported.

Park et al. (2005) compared BMI of US-born KA women and Korea-born KA women. The results showed that mean BMI of US-born KA women (23.6 kg/m^2) was significantly higher than Korea-born KA women (22.1 kg/m^2). Additionally, 31.4% of US-born KA women were overweight or obese whereas only 9.4% of Korea-born KA women were overweight or obese using the general BMI cutoff.

Several studies reported similar average BMIs for KAs ranging from 21 to 24 kg/m^2 (Kim & Chan, 2002; K. K. Kim et al., 2000; Lee et al., 2000; Yang et al., 2007), which were in the normal range. Some studies showed gender difference of mean BMI, but the trend was not consistent. A study of K. K. Kim et al. (2000) reported BMI of men and women (N = 103) was similar, 23.2 kg/m^2 and 23.8 kg/m^2, respectively. However, two studies reported men having a higher BMI than women (Lee et al, 2000; Yang et al., 2007). Lee et al. (2000) found that 67% of men were in normal range of BMI whereas 94% of women were in the normal range of BMI. Although the significance level was not reported, Lee et al. (2000) also described that there was a significant relationship between acculturation and BMI for men, but not for women.

Only two studies tested BMI as a predictor for healthy eating habits. According to Stranchan & Brawley (2009), BMI did not correlate with healthy eating behavior among Canadian University students (N = 101). In this study, healthy eating behavior was measured by intake of fruit and vegetable, salty snack, fast food, high calorie drinks, refined baked goods, and sweets. Also, Kahawong et al. (2005) reported that BMI was not a significant predictor for healthy eating among Thai women with hyperlipidemia (N = 263). In this study, healthy eating habits were measured by Nutritional Health-

Promoting Behavior Scale (NHPBS), consisting of five subscales: 1) low cholesterol, 2) low fat, 3) low triglyceride, 4) low sugar, and 5) high fiber diet.

Previous research did not support the predictive relationship between BMI and healthy eating habits among KAs. Generally, BMI is considered to be related to eating habits. BMI is usually measured to identify overweight and obesity rates. However, healthy eating habits include not only calorie intake or fat intake, but also fiber and sodium intake as well as balanced nutrition. As a result, BMI may be related to weight gain or fat intake, but not directly related to the whole concept of healthy eating habits. Another reason for not finding a relationship between those two factors among KAs may be related to less variability of BMI compared to other ethnicities. This study tested those relationships again and provides additional insights.

ENVIRONMENTAL FACTORS AND EATING HABITS

Environment is one component of the situational influences in the HPM. Situational influences of health-promoting behaviors include available options, physical and social surroundings, and aesthetic environment (Pender et al., 2006). In regard to eating habits, cues that trigger action such as availability of ethnic food is an example. Situational influences may be essential to developing new or more effective strategies for facilitating and maintaining health-promoting behaviors in diverse populations.

Swinburn and Raza (1999) developed a framework (ANGELO: Analysis grid for environments linked to obesity) for identifying and prioritizing environmental factors for an obese-prevalent society, and this was used to guide the choices of environmental

factors examined in this study. The authors developed two axes: environmental size (micro and macro) and type (physical, economic, political, and sociocultural).

Brug (2008) conducted a systematic review using ANGELO to identify determinants of healthy eating. The 2 dimensions from the ANGELO framework used in this study were the physical and the sociocultural environment. The physical environment refers to availability of healthy and unhealthy food choices, such as soft drink vending machines, availability of low fat items in worksite cafeterias, and ethnic grocery stores. The sociocultural environment refers to the social and cultural norms and other social influences that can restrict or encourage certain food choices, such as social pressure to engage in unhealthy habits and traditional occasions celebrated with ethnic foods.

Convenience (distance and time) to Korean food markets may be an important factor and fits in the physical environment component of the ANGELO framework. Hyman et al. (2002) conducted a systematic review to identify mechanisms that influence health risk behaviors and health-promoting behaviors, including healthy eating among new immigrant women in Canada. The authors found that one of the determinants of healthy eating for new immigrant women was availability of healthy and acceptable foods. Barriers such as distance to the market were found to hinder healthy and culturally acceptable foods among immigrant women. Since not all immigrants live with their enclaves, immigrants and ethnic minorities may be limited in their access to ethnic food stores. Like other ethnic minorities, eating habits of KAs are influenced by where they live and what access they have to Korean grocery stores and cultural institutions (Kang & Garey, 2002).

The person who cooks the food plays an important role in people's eating habits, especially for immigrants or Asian Americans. In the majority of Asian families, mothers prepare the food (Park et al., 2003), except perhaps for college students. In the context of ANGELO framework, the factor of who cooks food fits in the sociocultural environment. Depending on the person who frequently cooks food, he or she has a power to decide type of cooking or ingredients. How much that person who cooks food is acculturated may be a potent factor for the family's or individuals eating habits, so it should also be considered as sociocultural environment.

There were few studies using environmental factors when examining eating habits among KAs. However, the above two environmental factors need to be logically considered as potentially important factors within the framework of this study. Since these two environmental factors may reveal significant relationships with other variables or predictive relationship to healthy eating behavior, these environmental variables may add to our information about eating habits of KAs.

MEDIATORS AND MODERATORS

Few studies explored the mediating or moderating effects of variables that showed significant effect on healthy eating habits. Bruening et al. (2010) explored the relationship between barriers, self-efficacy, and fruit and vegetable intake among alternative high school students (N=145). Barriers revealed mediating effect of self-efficacy on fruit and vegetable consumption (b_2 = -.45, p = .002). Although testing mediating or moderating effects are exploratory in this study without specific directions,

the findings may provide additional information and explanation for other unexpected relationships.

According to Shin's (2008) dissertation, behavior-specific cognitions (benefits, barriers, or self-efficacy) did not mediate the effect of individual characteristics on health behaviors (physical activity and healthy eating). This relationship was identified through structural equation modeling. The author stated in the study that although the study did not show mediating effects, the result could not be completely compared to other studies and further studies should be performed with different measurements.

In general, testing mediating and moderating effects among multiple variables sometimes clarifies unexpected results. Mediators provide additional information about how and why the relationship between two variables occurred. On the other hand, by identifying moderating effects, better explanations can be provided regarding weaker relationship between two variables than expected (Bennett, 2000). In this study, barriers, self-efficacy, or environmental factors may mediate or moderate personal factors. With multiple variables and three constructs, meditating and moderating effect testing are explored to explain expected and unexpected relationships among those variables.

SUMMARY

Previous literature addressing KA population, background characteristics, and other predictors, such as barriers, self-efficacy, and environmental factors, was reviewed. After immigration, KAs have formed their unique eating habits, which have continuously changed through their acculturation process. According to the literature review, some of the positive aspect of Koreans' eating habits, such as high vegetable intake (Lee, et al.,

1999), have gotten worse while some negative aspects, such as high sodium intake, still remained in their diet (Kim et al., 2007). However, there were some positive changes, such as more calcium intake through dairy food, compared to native Koreans (Park, et al., 2005). Overall, as their eating habits change, their health status including disease pattern has changed negatively due to high fat intake and continued high sodium intake.

Previous literature provided information about either eating patterns or nutrition of KAs. There were some previous studies exploring relationships between eating habits and select demographic information. However, unfortunately, there was a lack of information about eating habits of KAs, encompassing both personal factors, such as gender and acculturation level, and behavior-specific cognitive factors, such as self-efficacy and barriers. According to the literature review, environmental factors are another potential aspect to be considered when studying eating habits. Nevertheless, there still is a lack of studies examining this factor within studies of healthy eating habits. Given this lack of information, this study included those multidimensional factors to fill the gaps in the literature, guided by HPM framework in KAs.

Chapter 3: Methods

This chapter describes the research design of the study, the sample, sample size determination, and study procedures. In addition, the chapter explains the instrumentation that is used in the study, the procedures and results of the pilot study for this dissertation, the data-analysis methods, and protection of human subjects.

RESEARCH DESIGN

A retrospective, cross-sectional, correlational design was used. Retrospective design is appropriate when the factors from the past are linked to the phenomenon of the present (Polit & Beck, 2004). The outcome variable of the study, healthy eating habits was measured by the Diet Habit Survey, which examined respondents' eating habits during the past month. A cross-sectional design is useful when the research describes phenomena in a fixed time point (Polit & Beck, 2004). The advantages of cross-sectional design are practicality, convenience, and economics. The correlational design was applied to understand relationships among variables without manipulating the independent variables that were used as predictors for the dependent variable (Polit & Beck, 2004).

Using a convenience sample, surveys were mailed and surveys administered in person for the study. The advantages of the mailed survey are cost-effectiveness, anonymity, and the absence of interviewer bias (Polit & Beck, 2004). However, the disadvantages of the mailed survey are anonymity, potential for low response-rate, and self-selection bias. Although anonymity can lead the participants to respond candidly,

especially when the questions are personal (Polit & Beck, 2004), at the same time it can lead to the uncertainty of whether participants are being honest (Nardi, 2003).

In order to prevent low response rates, the physical appearance of the questionnaire should be appealing (Polit & Beck, 2004). Response rate could be affected by the design of the survey packet and its ease of use. For example, the survey packet included preaddressed envelopes with stamps affixed. This may enhance the response rates by making it difficult for respondents to throw away the packet, which has monetary value (Dillman, 2007). The questionnaire will less likely be discarded and will therefore be present when the carefully-timed postcard reminder is sent. A one-page cover letter was enclosed rather than several pages of cover letter with excessive information. For the reminder, postcards instead of regular mail was used because it can be quickly turned over and read, rather than lying unopened with other mail (Dillman, 2007). In the reminder postcard, real names and real signatures were written instead of a preprinted salutation of "Dear Participant," so that it can appeal individually to each respondent, like a voice on the telephone.

SAMPLE

The population of interest in the study was adult Korean Americans living in the US. The convenience samples of KAs (at least 18 years old), able to read and speak English were recruited in several locations of the US. For the purpose of this study, persons who had severe health problems that could affect their eating patterns (e.g., diabetes and kidney disease) were excluded. Pregnant women were also excluded. In this study, both first-generation KAs who lived in the US for at least five years and second-

generation KAs who were born in the US were included. Recent immigrants (less than 5 years) were excluded because their eating habits might not reflect typical KAs' eating habits.

SAMPLE SIZE DETERMINATION

In order to calculate a realistic sample size, the investigator should acknowledge the effect size, significance level, and the power for the study. Using G Power 3.0.10 (Erdfelder, Faul & Buchner, 1996), the estimate for sample size was based on linear multiple regression: fixed model, R^2 increase. With the significance level of .05 (alpha = .05), the sample size needed for the study ranged from 97 to 188 with the effect size ranging from .10 to .20 and the power ranging from 80 to 90. For practical application, using these parameters with 9 independent variables, the total sample size of 126 with the effect size of .15 and the power of .85 was used (See Table 2).

Table 2

Estimating Sample Size to Achieve Selected Levels of Power

Power	Effect Size		
	.10	.15 (Moderate)	.20
80	166	114	88
85	184	126	97
90	207	141	108

STUDY PROCEDURE

Sampling Procedure

Participants in the state of Texas were recruited primarily through advertisements posted on bulletin boards at community sites frequented by the target population (e.g.,

local Korean grocery stores or Korean churches). For recruitment out of state, websites or online groups for KAs (e.g., local community associations or Yahoo KA communities) were utilized for recruitment. Since most of KAs were located in large inner cities such as Los Angeles (24%), New York (16%), Washington DC (7%), San Francisco (5%), Chicago (4%), and Seattle (4%) (U.S. Census Bureau report, 2001), website searches were targeted on these states. After searching for the websites, the investigator contacted the person who was in charge of distributing information or posting announcements. Another way of recruiting out of state was to recruit participants through Korean American Associations and Korean churches. After the investigator received permission to post the recruitment announcement ad, the investigator asked her personal acquaintances who lived in New York, Los Angeles, and Atlanta to post the recruitment announcement ad at Korean grocery stores, Korean churches, and Korean association meetings.

Data Collection Procedures

After the participants saw the advertisement, they contacted the investigator by either phone or email. The investigator asked several questions by phone or email to determine eligibility for the study: 1) Are you 18 years old or older?; 2) Are you Korean American?; 3) Have you lived in the United States at least five years?; 4) Are you comfortable in reading and speaking English?; and 5) Do you have any health conditions, like diabetes, that affect your eating habits? If the respondent met the criteria and agreed to participate, the investigator sent the survey packet by mail or by email as an attachment.

The survey packet included cover letter, background information questionnaire, and four survey instruments [i.e., the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA), the Barriers to Healthy Eating Scale (BHES), the Self-Efficacy for Eating Behaviors Scale (SEEBS), and the Diet Habit Survey (DHS)]. Additionally, participants received a page for them to request to receive information about their results of the Diet Habit Survey. The cover letter explained the rights of research participants, the purpose of the study, anticipated number of subjects, procedures, risks and benefits, and measures to protect confidentiality. Receipts of the completed questionnaire packets were taken as informed consent to participate in this study.

If the participant wanted to receive the personalized results of the Diet Habit survey (DHS) and relevant diet-related information, the participants answered "yes" on the paper to request this additional information. Individuals, who wanted to request the results of their DHS along with a goal sheet for the individual and tips for low-fat eating based on their individual results, completed a separate form with their name, email, and addresses.

Emails were used for a brief communication such as confirmation about the answers in the survey. If email was not provided, the investigator used the mailing address for a brief communication. This was addressed in advance in the consent form that the investigator might contact participants by email or mailing if there were missing pages or further questions.

Each survey packet had a code number assigned. An Excel file which contains the code number, participant's name, address, email, date of survey sent, and date of

survey received were created. This document was saved in the investigator's computer, which was password protected. The document was also saved in a separate flash drive in case of the investigator's computer crashes, and the flash drive was kept locked in the investigator's place with a password protected file. If participants did not return the completed packets, postcard reminders were sent approximately in three weeks to increase response rate (See Appendix D), which was tracked by the code numbers. The postcard reminder notified the participants to contact the investigator via email if they had questions or wanted an additional survey packet in case packets were lost or misplaced. If there were more than two missing pages, the investigator sent a letter with the copies of the missing pages asking to fill in the missed pages. When the researcher received the completed survey, participants received a gift card worth $ 5.

INSTRUMENTATION

The study used a demographic questionnaire including questionnaires about environmental factors and four established instruments to measure factors in the HPM: (1) the adapted Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn, Ahuna, & Khoo, 1992; Suinn, Rickard-Figueroa, Lew, & Vigil, 1987); (2) the Barriers to Healthy Eating Scale (BHES) (Fowels & Feucht, 2004); (3) the Self-Efficacy for Eating Behaviors Scale (SEEBS) (Sallis, Pinski, Grossman, Patterson, & Nader, 1988); and (4) the Diet Habit Survey (DHS) (Conner et al., 1992). All the questionnaires and instruments were in English. One of the reasons for not using Korean versions of the surveys is that the validity of the instruments may be decreased (Sperber, 2004). Also, some instruments, especially DHS, include a lot of American food items, which may be

challenging to be translated. Additionally, the process of translation and back translation was beyond the resources of this study.

Background Information Questionnaire

The Background Information Questionnaire measured age, gender, education, income, length of stay in US, living arrangements, perceived health status, generation (first, 1.5, or second), and self-reported height and weight which were used to calculate BMI (see Appendix B). Among those factors, age, gender, education, income, and BMI were used as personal factors in the theoretical framework. Other variables were used to describe the demographic characteristics of the sample. In addition to the demographic questions, three questions (e.g., person who cooks food, convenience of Korean market from home, and frequency of Korean food consumption per week) were asked to measure environmental factors. Each question was considered separately as an independent environmental factor, not to be quantified or calculated as a whole because they examined different aspects of the environment. These two environmental factor questions were embedded in the Background Information Questionnaire with the demographic questions.

BMI

Body mass index (BMI) was used to measure the relationship between weight and height, which is associated with body fat and health risk. Participants' self-reported height either in inches or centimeters and weight either in pounds or kilograms were obtained from the Background Information Questionnaire. BMI was then calculated; weight in kilograms divided by height in meters squared. Although there are other more

accurate techniques to measure body fat, this formula is particularly useful in field settings or in clinical trials where other, more complex, methods are not feasible (Heymsfield & Heshka, 2002). Self-reported BMI is an easy and inexpensive measure to obtain as an indicator of obesity for individuals. In addition, the advantages and convenience of BMI has been established across international studies and individual assessments (Prentice & Jebb, 2001).

However, there are some disadvantages of using BMI. BMI may provide misleading information due to muscle composition, aging, and racial differences (Prentice & Jebb, 2001). More to the point, BMI does not reveal the distribution of fat and intra-abdominal fat increases health risk in obese individuals (Stotts & Bergstrom, 2004). As a result, BMI might not reflect an individual's overweight status and health risk due to obesity.

Although there are controversies regarding accuracy and validity of self-reported height and weight compared to measured height and weight, self-reported heights and weights are relatively suitable measures for BMI in epidemiological and population research (Huber, 2007). Commonly, among those studies comparing self-reported and actual heights and weights, self-reported weight tends to be underestimated and self-reported height tends to be overestimated (Yannakoulia, Panagiotakos, Pitsavos, & Stefanadis, 2006; Ezzati, Martin, Skjold, Hoorn, & Murray, 2006; Huber, 2006; Engstrom, Paterson, Doherty, Trabulsi, & Speer, 2003). Although BMI could be underestimated using self-reported weight and height, 84% of the individuals were classified into the appropriate BMI categories among 275 women of reproductive age

using self-reported height and weight (Huber, 2006). Consequently, BMI calculated from self-reported weights and heights is suitable due to its convenience and fit with the study design for this study.

The Suinn-Lew Asian Self-Identity Acculturation Scale

Description

The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn et al., 1992, 1987) was developed after the Acculturation Rating Scale for Mexican Americans (ARSMA). The SL-ASIA is widely applicable to Asian populations, such as Koreans, Chinese, and Japanese, experiencing the acculturation process. The 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 calculated by dividing the total value by 21. A low score reflects low acculturation while a high score reflects high acculturation. Scores ranged from 1 (Low Acculturation, High Asian Identity) to 5 (High Acculturation, High Western Identity). Suinn et al. (1987, p 403) pointed out that the final score can also be categorized into three levels: those with a score close to 5 represent highly acculturated or Western identified; those with a score close to 3 represent bicultural; and those with a score close to 1 represent low in acculturation or Asian-identified. Although Suinn et al. (1987) did not explicitly define scores of 2 and 4, one can interpret that those with a score of 2 represent Asian-oriented bicultural and those with a score of 4 represent Western-

oriented bicultural in the same way of categorization for ARSMA (Cuellar, Harris, & Jasso, 1980).

Validity

Concurrent validity was established by comparing scores between generational levels. The assumption is that those in the first generation have the lowest acculturation levels and those in the most recent generation have the highest acculturation level. The participants were categorized based on the generational level from an item on the SL-ASIA. Using analysis of variance (ANOVA), the mean score on the scale was significantly different ($F = 7.20$, $p < .0001$) for each generation and reflected the predicted increase in acculturation scores: first generation, 2.96; second, 3.57; third, 3.78; fourth, 3.78; and fifth, 3.85 (Suinn, et al., 1987). Also, validity of SL-ASIA scores was evaluated by comparing the length of residence in the U.S. with acculturation level, and the results also indicated significant differences using ANOVA statistics ($F = 14.26$, $p < .0001$). The mean score had an expected increase of score for each group: 1) raised in Asia only scored 2.36; 2) mostly in Asia but some in U.S. scored 2.87; 3) equally in Asia and U.S. scored 2.48; 4) mostly in U.S. scored 3.33; and 5) in U.S. only scored 3.67 (Suinn et al., 1987). Lastly, total score on the scale and the score of question 20, "How would you rate yourself?" were compared and found to be significantly different using ANOVA test ($F = 15.55$, $p < .0001$). The mean values on the scale are as follows: "very Asian," 2.49 ($N = 2$); "mostly Asian," 2.91 ($N = 10$); bicultural," 3.36 ($N = 18$); "mostly Anglicized," 3.81 ($N = 29$); and "very Anglicized," 4.14 ($N = 4$) (Suinn, et al, 1987).

From the follow up study with a larger sample, concurrent validity was reevaluated by examining relationships among several proxy variables such as total years of education in the U.S., age upon attending school in the U.S., years living in the U.S., age upon immigration, years lived in a non-Asian neighborhood, and self-rating acculturation. The correlation coefficients for all of the above variables were significantly correlated with total SL-ASIA score ($p < .001$) (Suinn, et al., 1992).

Using factor analysis, five interpretable factors with factor loading of .50 or above were identified: (a) reading/writing/cultural preference; (b) ethnic interaction; (c) affinity for ethnic identity and pride; (d) generational identity; and (e) food preference (Suinn, et al., 1992). The results were compared with ARSMA scale developed by Cuellar et al. (1980), and three factors were identical. However, two factors, affinity for ethnic identity and pride and food preference, were additionally found in this scale.

Reliability

The internal consistency of the SL-ASIA was adequate. There was a Cronbach's alpha of .88 on 21 items given to 82 college students (Suinn, et al., 1987). With a larger sample, the alpha coefficient was .91 with 284 Asian Americans (Suinn et al., 1992) and .89 with 557 Asian Americans (Atkinson & Gim, 1989). Ponterotto, Baluch, & Carielli (1998) reported that in 12 various studies that included combined Asian American Groups, Chinese Americans, Korean Americans, and Japanese Americans, the Cronbach's alphas ranged from .83 to .91. The reliability coefficient from this study (N = 137) was .89.

Barriers to Healthy Eating Scale

Description

The Barriers to Healthy Eating Scale (BHES) was developed for use with pregnant women by Fowels and Feucht (2004) and was based on Pender's Health Promotion Model. The initial BHES had 18-items with 5 subscales: (1) unavailability (lack of access to a car to purchase groceries and distance to sources of groceries); (2) expense (cost of various types of food groups); (3) difficulty in engaging in healthy eating (knowing how to cook healthy meals); (4) inconvenience (adequate function of food preparation/storage appliances); and (5) preference (loss of satisfaction or preference for certain foods).

Responses are based on a 5-point Likert-type scale: strongly agree, agree, don't know, disagree, and strongly disagree. Adding the responses for each item calculates the total score. In order to avoid set bias, 5 items were negatively worded, and those items require reverse coding. The total score of the revised 16-item scale can range from 16 to 80 with the lower the score representing fewer barriers.

Validity

Content validity was evaluated with two expert panels, and a content validity index of .72 on the 18-item BHES was obtained (Fowles & Feucht, 2004). However, two items ("I have easy access to a car" and "I like to drink milk") were deleted based on the inter-item correlations. As a result, the number of questions was reduced to 16. Content validity of the 16-item scale was reevaluated with a panel of experts, and the content validity index score was .75.

Construct validity was assessed through criterion-related validity and factor analysis. Criterion-related validity testing was conducted by correlating Nutrition subscale of Health Promotion Lifestyle Profile II (HPLP- II) and BHES scores. As expected, a negative relationship was established between BHES total score and HPLP-II nutrition subscale, meaning increased barriers hamper health-promoting behaviors related to healthy eating. Exploratory factor analysis resulted in five factors and those factors accounted for 73% of the variance. In addition, the composition of the five factors matched the categories that the developer created (Fowles & Feucht, 2004).

Reliability

The two-week test-retest reliability results had a strong positive correlation (r = 79, $p < .01$). This instrument was internally consistent with a Cronbach's alpha of .71 at Time 1 and .77 at Time 2 (Fowles & Feucht, 2004). Internal consistency of the subscales Time 1 and Time 2 were also acceptable as follows: unavailability (.98, .97); expense (.99, .99); cooking healthy meals (.78, .75); inconvenience (.85, .80); and preferences (.48, .61).

The reliability coefficient for total score from this study (N = 137) was .78. The Cronbach's alpha coefficients for the subscales were: unavailability (.92); expense (.83); cooking healthy meals (.90); inconvenience (.79); and preferences (.69).

Eating Habits Confidence Survey

Description

According to Sallis, Pinski, Grossman, Patterson, and Nader (1988), changing dietary habits is difficult to initiate and maintain so there was a need for in-depth

understanding and identifying mediating factors. In this need for new perspective, Bandura (1977) developed a promising concept of self-efficacy, which is the belief that one has a capability to execute the courses of actions to obtain the desired outcome. Based on the previous findings that certain dietary habits such as high sodium and saturated fat intake are strongly related to cardiovascular disease, the authors developed the Self-Efficacy for Eating Behaviors Scale for health-related diet and exercise behaviors.

The Eating Habits Confidence Survey was adapted from the Self-Efficacy for Eating Behaviors Scale by Sallis, Pinski, Grossman, Patterson, and Nader (1988) to meet the needs for an in-depth understanding of eating behaviors and the identification of mediating factors. The concept of self-efficacy was first introduced by Bandura (1977) that it is the personal belief or confidence to conduct a certain type of behavior. Sallis et al. (1988) developed the self-efficacy scale for health-related diet based on this concept and research that indicated that certain dietary habits such as high sodium and saturated fat intake are strongly related to cardiovascular disease.

The instrument was developed in two phases. The first phase was to conduct interviews with 40 participants and verify the behavioral components from the responses. The second step was to draft questions and apply it to subjects (N=171). The original scale consisted of 61 items and respondents rated how confident they were that they can eat healthy food (i.e., low salt, low fat, and low calories) on a 5-point response format (from 1 “I know I cannot” to 5 “I know I can”). The scale consisted of 5 subscales:

resisting relapse, reducing calories, reducing salt, reducing fat intake, and behavioral skills (Sallis et al., 1988).

The scale was reduced into 20-item and to four factors by excluding the behavioral skills subscale and renamed as the "Eating Habits Confidence Survey" (J. F. Sallis, personal communication, August 27, 2010). The score is calculated by summing of all the items, with total scores ranging from 20 to 100 and higher scores indicating greater confidence to eat healthy food. Also, instructive question "How sure are you that you can do these things?" was added to guide participants to answer properly.

Validity

Comparing scores with 'not heart healthy-heart healthy dietary index' established concurrent criterion-related validity for the original scale of 61-items. The 'not heart healthy-heart healthy dietary index' was created by categorizing the food items from food frequency questionnaires. A registered dietitian grouped foods that are low in saturated fat and/or sodium (e.g., low fat milk, fish, fresh vegetables, and vegetable oil) as 'heart healthy', whereas food that is high in saturated fat and/or sodium (e.g., red meats, eggs, whole milk and sour cream) as 'not heart healthy'. Among 39 food items, 12 foods were categorized as 'heart healthy', and 27 foods were categorized as 'not heart healthy'. A 'not heart healthy/heart healthy' dietary index was ranged from 0.08 to 10.50, with high scores indicating high in fat and sodium consumption. The total score of self-efficacy was significantly correlated with the 'not heart healthy-heart healthy dietary index' with correlations ranging from -.24 to -.43. Construct validity for the original scale of 61-items

was established by factor analysis with varimax rotation accounting for 44% of the variance (Sallis et al., 1988).

Reliability

The internal consistency was established using Cronbach's alphas with the five subscales ranging from .85 to .93 (Sallis et al., 1988). Test-retest reliabilities for the scale ranged from 0.43 to 0.64 (Sallis et al., 1988). The low test-retest reliability likely indicated changes in self-efficacy over time. Factor overlap was assessed through intercorrelations within the scale that ranged from 0.35 to 0.69. Sallis et al (1988) stated that despite moderate degree of factor overlap, each factor seemed conceptually coherent regarding healthy eating behaviors.

The Cronbach's alpha coefficient for the revised 20-item Eating Habits Confidence Survey from this study (N = 137) was .90. The Cronbach's alpha coefficients for the subscales were: sticking to it (.82); reducing calories (.81); reducing salt (.83); and reducing fat (.74).

Diet Habit Survey (DHS)

Description

The most commonly used methods to measure eating patterns are 24-hour dietary recalls, 1- to 7-day food records, diet histories, and food frequency questionnaires (Block, 1982). These methods assess the nutrient composition of dietary intake reasonably well. The dietary change among KAs from acculturation demonstrates the need to focus on low fat and low sodium consumption. Thus, a dietary assessment tool targeting this population should reflect those dietary habits. How to measure healthy eating habits of

KAs, which are halfway between those of Koreans and Americans, is a challenging task. It is not easy to capture the components of traditional ingredients and cooking method through American standard nutrition calculation methods such as Nutrition Cal or MyPyramid Tracker. Although the DHS is not specific to Korean foods, it can measure certain eating behaviors and nutrition consumption patterns specific to Korean population. According to the previous literature about KAs, concerns about KA's dietary habits centered on saturated fat and salt intake, and DHS captures these components. Although DHS was developed for eating habits to reduce the risk of coronary heart disease, it was also used for other populations such as lactating women (Francois, Connor, Colewicz, & Connor, 2003), healthy adolescents (Noureddine & Stein, 2009), and Chinese-American College students (Sun, Sangweni, Chen, & Cheung, 1999).

The Diet Habit Survey (DHS) (Conner et al., 1992) was developed to measure eating behaviors during the previous month to assess the risk of coronary heart disease with 287 adults. Compared to other dietary assessment tools such as 24-hour dietary recalls, diet histories, and food frequency questionnaires, DHS is easy to administer to assess dietary habits because it measures either types (e.g., whole milk, two percent milk, one percent milk, or Nonfat /skim milk) or amount of food items consumed (e.g., How many pieces of fruit or cups of fruit juice do you consume a day?). In addition, DHS is less expensive to both buy the instrument and analyze the results, as well as less time intensive to analyze than other nutritional assessment tools.

An overall summative score is also used with higher scores representing a healthier diet including higher complex carbohydrate intake along with lower salt,

cholesterol, and saturated fat intake. Total score can be classified into five categories: current American diet (37% fat), Diet 1 (30% fat), Diet 2 (25% fat), Diet 3 (20% fat), and Diet 4 (10% fat). The criteria for categorization are different for men and women, specifically for the carbohydrate scoring, because the required energy intake is different for men and women.

Then, it is estimated that those diet categories correspond to the following three nutrition composition: 1) cholesterol (mg/day) and saturated fat (% calories); 2) salt (mg/day); and 3) carbohydrate (% calorie). For example, if a male participant obtained a total score between 170 and 220, it is assumed that this individual is on a 30% fat diet. In addition, according to the instrument, the participant is consuming less than 350 mg/day of cholesterol, 10 % calories of saturated fat, 4025mg/day of salt, and 55% calories from carbohydrates.

These 3 categories of nutrition composition, which are all related to high blood pressure and coronary heart disease, were used. For cholesterol and saturated fat category, 20 questions were used. A sample item is "Which frozen desserts are you most likely to eat at least once a month? 1) Regular ice cream (5g to 18 g fat per ½ cup), 2) Light ice cream (4g fat per ½ cup), 3) Ice milk, most soft ice cream, frozen yogurt, 4) Sherbet, low-fat frozen yogurt, or 5) None or nonfat frozen yogurt, sorbets." The score of each item was calculated based on Cholesterol-saturated Fat Index (CSI): CSI = (1.01 × g saturated fat) + (0.05 × mg cholesterol) from the selected amount of food. For each question, the selected food was computed with CSI scoring formula, and the score for each answer was given: A food with the lowest CSI score obtains the score of five, intermediate scores

represent scores of four, three, and two, and a food with the highest score obtains the score of one. Three questions about salt were scored with five being low salt use and one being high salt use. A sample item is “Which type of “salt” do you normally use? 1) Regular salt, sea salt, flavoring salts; 2) Combination of regular and Lite Salt; 3) Lite Salt, lower-sodium soy sauce, reduced-sodium flavoring salts; or 4) None or salt substitute, salt-free products.” Questions related to carbohydrate consumption gave a score of five for each serving of fruits, vegetables, grains, and beans eaten. Also, for restaurant eating, which is an additional category for measuring healthy eating, a score of five was given to low-fat choices. In this study, total score was used to measure healthy eating habits.

Validity

Construct validity was assessed using criterion-related validity by correlating the DHS with 24-hour dietary recall. A moderate correlation was found for the cholesterol and saturated fat scale (Conner et al., 1992) in two time points (r = .33 for time 1 and .42 for time 2, $p < .001$). Also, the DHS scores were correlated with changes in plasma cholesterol levels. Using data from Family Heart Study, persons eating the current American diet had significantly higher plasma total cholesterol levels and low—density lipoprotein cholesterol levels compared to those consuming a 25%-fat diet. In addition, persons who changed their dietary category to a lower percent fat category had significantly lower plasma cholesterol level (p = .008) after five years (Conner et al., 1992).

Reliability

Inter-rater reliability was established by comparing mean scores of DHS from three different dietitians. No significant differences were observed with three mean scores of the 12 participants for both cholesterol and saturated fat score (M= 61.1, 62.6, and 62.6, p = .17) or the carbohydrate score (M = 68.1, 59.6, and 63.8, p = .16). 12 different dietitians at three different time points also established test-retest reliability through its administration. Reliability coefficient of the scores was .95 for Cholesterol/Saturated Fat Score and 0.88 for Carbohydrate score (Conner et al., 1992). Noureddine and Stein (2009) reported acceptable Cronbach's alphas of .74 for overall score, .84 for cholesterol and saturated fat, but .48 for carbohydrate scores. The low internal consistency for the carbohydrate scale may be due to the carbohydrate item, "List the number of servings of the following you ate last week": 18 choices (e.g., cooked cereal, ready-to-eat cereal, English muffin, hamburger bun, bagel, pita or pocket bread, eight-inch tortilla, plain popcorn etc.)". Participants should recall all of the items and write the number. For this reason, authors presumed that the variability and unanswered items due to open-ended question affected low reliability scores for carbohydrate items as well as the reliance on recall.

PILOT STUDY

A pilot study was conducted with 18 Korean Americans who are 18 years old or older. The purpose of this pilot study was to examine the face validity of the survey instruments and the feasibility of the mailed survey procedures.

Sample in the Pilot Study

Inclusion criteria for the participants in the pilot study included: (1) being at least 18 years old; (2) being Korean American; (3) having lived in the US more than 5 years; and (4) being able to read and speak English. Exclusion criteria for the study included: (1) currently having severe health problems that could affect their eating patterns (e.g., diabetes or kidney disease); (2) if female, currently pregnant or breastfeeding.

There were two groups of participants in the pilot study. The purpose of having two groups was to examine the feasibility of the mailed survey by comparing it to the surveys administered in person. For Group 1 (mailed survey), participants were people who were contacted by word of mouth. Potential participants were screened by phone to determine eligibility for the study. When they met the criteria, the researcher sent the survey packet by mail (n=9). For Group 2 (survey administered in person), the recruiting was mainly done through the Korean American Catholic Ministry (KACM). The president of KACM announced the pilot study both through the weekly meetings and their website. The President of the KACM notified the investigator that there would be approximately 10-15 students at the next regular meeting. Thirteen people attended that meeting and 8 people completed the survey. The investigator explained about the eligibility for the study as a group and several people asked about their own eligibility for the study. Four people were dropped because of their short length of stay in the US and being age under 18 years old.

Eighteen KAs were recruited from Austin, Texas. There were 10 participants in Group 1 and 8 participants in Group 2. The mean age was 31.33 years (*SD* = 12.64), and

there were 6 female and 12 males participants. The average length of stay in US was 9.53 (*SD* = 4.73). Seven people prepared food on their own and 3 people had meals prepared by their spouses. Other sources for food preparation were the dorm cafeteria (n=2) and mom (n=6). Everyone had access to a Korean Market, and the average frequency of Korean food consumption was 7.06 (*SD* = 4.15) times per week.

Procedure in the Pilot Study

The pilot study was approved by Institutional Review Board (IRB) of the University of Texas at Austin. For the pilot study, a cover letter was used for the group 1 (mailed survey) and informed consent was used for the group 2 (survey administered in person). Informed consent comprised of the same content, but the participants were required to sign on the last page. For the larger study, only a cover letter will be used. The same methods to protect privacy and confidentiality were applied to the larger study.

For Group 1(mailed survey), after determining eligibility by phone, the researcher mailed the survey packet including cover letter, Background Information Questionnaire, four survey instruments, and request to receive additional information (see Appendix B) about their personalized results of the Diet Habit Survey, goal sheet for the individual, and tips for low-fat eating. If the participant wanted to receive the results of their Diet Habit Survey and relevant information, the participants answered, “yes” in the paper to request of additional information. Respondents were given the opportunity to complete a separate form with their name, email, and address at the time they returned the surveys, so that the additional information could be sent to them by mail.

For Group 2 (survey administered by person), the group meeting was held in the building of the University. After the researcher explained the eligibility for the study, participants received the questionnaires including informed consent, Background Information Questionnaire, four survey instruments, and request to receive additional information about their personalized results of the Diet Habit Survey. Sufficient time (40 minutes) was provided for them to complete the surveys. While the participants were completing the survey, the researcher provided additional information only if requested. The researcher also verbally asked about the clarity of the questions. After reviewing the survey, the researcher sent the personalized feedback by mail to the participants who requested them. Three participants (30%) from Group 1 (N = 10, mailed survey) and three participants (37%) from Group 2 (N = 8, survey administered in person) requested the additional information.

Data was analyzed by using Statistical Package for the Social Science (SPSS) Version 16 for Windows. The demographic data were analyzed by descriptive statistics such as frequencies, means, standard deviations, and ranges. Cronbach's alpha coefficients for reliability were determined for the Suinn-Lew Asian Self-Identity Acculturation Scale, Barriers to Healthy Eating Scale, and Eating Habits Confidence Survey.

Findings of the Pilot Study

Face validity of the survey instruments was established by asking Group 2 whether the questionnaires looked like it is measuring their eating habits even though it does not mention specific Korean foods. Participants in Group 2 said that it was not hard

to answer questions in the Diet Habit Survey, and some mentioned that it appears to reflect their eating habits of both American foods and Korean foods.

Feasibility of the mailed survey was also established by the return rate and the comparison of the descriptive results for the two groups (Table 3). For the pilot study, the return rate was 100% because the majority of the surveys were done by personal contacts. For the larger study, a lower return rate is expected. Generally, mailed questionnaires have low response rates of approximately 20 to 30 percent (Nardi, 2003). However, the researcher screened for the eligibility in advance and personalized the mail to the potential participant as well as including stamped return envelopes. These methods have shown to have modest effects on improving response rates (Dillman, 2007) and using the above multiple methods should maximize the survey response in the larger study.

In order to examine the feasibility of the mailed survey, demographic factors and mean scores of four instruments were compared between two groups using *t*-test. The group 2 with survey administered in person ($N = 8$, means acculturation level = 2.8) was shown to be significantly more acculturated than the group 1 with mailed survey ($N = 10$, mean acculturation level = 2.2) using an independent-samples *t* test, [$t\ (16) = -3.39$, $p < .001$]. The mean age of group 2 (M = 23.8, SD = 2.7) was significantly lower than the group 1 (M = 37.4, SD = 14.3) using an independent-samples *t* test, [$t\ (16) = 2.65$, $p < .05$]. In addition, length of stay in the US with years for group 2 (M = 12.0, SD = 4.8) was significantly longer than the group 1 (M = 7.3, SD = 3.6) using an independent-samples *t* test, [$t\ (15) = -2.28$, $p < .05$].

Table 3

Comparison between Group 1 and Group 2 from the Pilot Study (N=18)

Variable		N (%)		Mean (SD)	
		Group 1 (N=10)	Group 2 (N=8)	Group 1 (N=10)	Group 2 (N=8)
Age*				37.4 (14.3)	23.8 (2.7)
BMI				23.2 (4.0)	22.2 (2.3)
Length of Stay in US (Year)*				7.3 (3.6)	12.0 (4.8)
The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA)**				2.2 (.3)	2.8 (.4)
Barriers to Healthy Eating Scale				2.5 (.4)	2.3 (.4)
Eating Habits Confidence Survey				3.5 (.6)	3.7 (.8)
Diet Habit Survey				159.4(38.5)	142.7 (29.4)
Gender	Female	4 (40.0)	2 (25.0)		
	Male	6 (60.0)	6 (75.0)		
Education	High School Graduate	3 (30.0)	1 (12.5)		
	Some College	1 (10.0)	4 (50.0)		
	Baccalaureate Degree	6 (60.0)	1 (12.5)		
	Masters', Doctorate, or Professional Degree	0 (0)	2 (25.0)		
Family Income[a]	0 - $20,000	0 (0)	2 (25.0)		
	$20,001 - $30,000	0 (0)	0 (0)		
	$30,001 - $40,000	3 (30.0)	0 (0)		
	$40,001 - $50,000	6 (60.0)	1 (12.5)		
	$50,001 - $75,000	1 (10.0)	2 (25.0)		
	$75,001+	0 (0)	3 (37.5)		

Note. * $p < .05$, ** $p < .01$.

The reason for the above differences was that the data for group 2 were collected from a University social activity group so that the age and their immigration background were different from group 1. Other instruments such as BHES, Eating Habits Confidence Survey, and DHS did not have significant differences in mean scores between two groups. This supports that the method of administration did not affect the results for the main variables and that administering surveys by mail is reasonable.

There were no major missing data from pilot study. Only 3 people in group 1 (mailed survey) did not answer their weight and height. For the larger study, missing data on weight and height was also expected due to reluctance to expose their weight or height, to the absence of scales, or to frequent change in their weight.

According to the Background Information Questionnaire, there were no questions asking whether participant is 1.5 generation. As a result, there will be additional question about 1.5 generation if the participants were born in Korea (e.g., Have you spent elementary, middle, or high school in US?). Also, on the questionnaire about who prepares food, 6 people (33%) answered mother, so 'mother' as an answer choice was added. The result of 18 participants from the pilot study was included in the larger study.

DATA ANALYSIS

The data were entered into a database using the Statistical Package for the Social Science (SPSS) Windows release 18.0. The statistical significance level for all research questions were set at $p < .05$. Prior to conducting descriptive analyses, all data were examined for accuracy, as well as missing values and normality. For the missing values, especially for the instruments, the investigator followed the guidelines of the instrument

developers. If there is no guideline, mean substitution from the single imputation method was used to deal with missing data (McKnight, McKnight, Sidani, & Figueredo, 2007).

Descriptive statistics, including means, standard deviations, range of scores, and frequencies, were used to describe characteristics of participants and provide a description of study variables including total scale scores and subscales for each instrument in the study. Cronbach's alphas were used to determine internal consistency of the instruments with the study population.

Question 1

What is the relationship among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors among KAs?

Pearson correlations and point-biserial correlations were used to examine the relationships among the variables. Prior to the data analysis, assumptions were verified which are: 1) the distribution of the variables is normal; 2) requirement of homogeneity of variance (homoscedasticity); and 3) the relationship between the variables is linear.

Question 2

What are the significant predictors among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors for the dependent variable of healthy eating habits among KAs?

a. Among these factors, which factor contributes the most unique variance for healthy eating habits among KAs?

b. Among these factors, what are the significant predictors for healthy eating habits among KAs after controlling for personal factors?

Hierarchical multiple regression analyses were conducted to examine this question. Personal factors were placed in the first block and the other predictors were placed in the second block. A primary purpose of entering the variables in blocks was to estimate the effect of type or category of variables, personal factors and behavior-specific cognition and affect in this study on the dependent variable (Keith, 2006). Within the block, the predictors were entered in two ways, a simultaneous and a stepwise method. Simultaneous entering illustrates general coefficients of each variables and stepwise entering is more specific in finding the best predictors among all the predictors. Stepwise entering is useful when you have predictors and not sure which predictors to keep or discard (Keith, 2006).

Question 3

Do barriers to healthy eating, mediate the effects of personal factors on healthy eating habits among KAs?

In order to examine the mediation effect, a series of six regression analyses were conducted, one for each personal factor to be examined- age, gender, education, income, BMI, and acculturation level. To test the mediation effect, the following three regression equations were needed (Baron & Kenny, 1986).

First equation: Regressing the mediator (barrier) on the independent variable (personal factors).

Second equation: Regressing the dependent variable (healthy eating habits) on the independent variable (personal factors).

Third equation: Regressing the dependent variable (healthy eating habits) on both the independent variable (personal factors) and on the mediator (barriers).

A mediator is a variable that identifies the relationship between an independent variable and a dependent variable (Benette, 2000). In order to establish mediation effect, the following four conditions must be met (Baron & Kenny, 1986): 1) the independent variable (personal factors) significantly predicts the mediator (barriers) in first equation; 2) the independent variable (personal factors) significantly predicts the dependent variable (healthy eating habits) in second equation; 3) the mediator (barriers) significantly predicts the dependent variable (healthy eating habits) in third equation; and lastly, 4) the effect of the independent variable (personal factors) on the dependent variable (healthy eating habits) must be less in the third equation than in the second. If the independent variable has no effect on dependent variable when the mediator is controlled, perfect mediation effect occurs.

Question 4

Does healthy eating self-efficacy mediate the effects of personal factors on healthy eating habits among KAs?

Same analyses for Question 3 were used for Question 4 using healthy eating self-efficacy as a mediating factor.

Question 5

Do environmental factors mediate the effects of personal factors on healthy eating habits among KAs?

Same analyses for Question 3 were used for Question 5 using environmental factors separately as a mediating factor.

Question 6

Do barriers to healthy eating moderate the effects of personal factors on healthy eating habits among KAs?

A moderator is a third variable that influences the strength and/or direction of the relationship between an independent variable and a dependent variable (Bennett, 2000). In order to examine the moderation effect, a series of six regression analyses were conducted, one for each of the personal factors to be examined- age, gender, education, income, BMI, and acculturation level. Three steps of linear regression needs to be conducted (Bennett, 2000): 1) the independent variable (personal factors) is regressed on the dependent variable (healthy eating habits) but the independent variables do not have to be a significant predictor for the dependent variable in order to perform the next step; 2) the moderator (barriers) is regressed on the dependent variable; and 3) the interaction term, which is the cross-product created by multiplying the personal factors and barriers, is regressed on the dependent variable, healthy eating habits. The interaction term indicates a joint relationship between the independent variables (personal factors) and the moderator (barriers), which was not explained in the previous two steps. If the third

equation shows that there is a significant effect, then the moderation effect is present (Bennett, 2000).

Question 7

Does healthy eating self-efficacy moderate the effects of personal factors on healthy eating habits among KAs?

Same analyses for Question 6 were used for Question 7 using healthy eating self-efficacy as a moderating factor.

Question 8

Do environmental factors moderate the effects of personal factors on healthy eating habits among KAs?

Same analyses for Question 6 were used for Question 8 using environmental factors separately as a moderating factor.

Question 9

Are there differences in personal factors, healthy eating self-efficacy, barriers to healthy eating, and healthy eating habits among first, 1.5, and second generation KAs?

To address this question, descriptive analyses including percentages, means, standard deviations, and ranges were reported for three groups. The independent one-way ANOVA was used to determine the difference of personal factors, barriers of healthy eating, healthy eating self-efficacy, and healthy eating habits among three groups of KAs.

PROTECTION OF HUMAN SUBJECTS

Since the pilot study was approved by Institutional Review Board (IRB) of the University of Texas at Austin, amendments were added for the dissertation study on the

design of the study including the method of data collection, sample size, and data collection area. All of the participants were informed in the cover letter about how the researcher will respect the rights of human subjects with a special focus on issues related to protecting privacy and confidentiality for the participants. The cover letter included: the rights of the participant, the protection of privacy and confidentiality, the purpose of the study, the content of the survey packet, the risks and benefits of being in the study, and the investigator's contact information (see Appendix A).

For this study, completing the survey and mailing it back to the investigator were used to establish that the consent was given. This form of consent is useful and appropriate when there is a minimal risk to participating in a study. Confidentiality was protected by using code numbers for each participant. All study related data, including consent forms, background information, and questionnaires, were kept in a locked filing cabinet accessible only by the researcher. The list of contact information linking code numbers to individual names was kept separately from other documents for the confidentiality.

SUMMARY

This chapter presented the methodology that was used for this study. The design of the proposed study was a retrospective, cross-sectional, correlational study. Target sample, estimated sample size, study procedures including sampling procedure and data collection procedure, instrumentations, pilot study, and expected data analyses to answer research questions were addressed. Data were analyzed using SPSS, 16.0 to answer the

research questions. Protection of human subjects for the pilot study and larger study was also reviewed.

Chapter 4: Results

This chapter describes the results of the study. Demographic characteristics of the sample are presented. The descriptive statistics for the study variables are provided followed by the findings for each research question.

DEMOGRAPHICS OF THE SAMPLE

The demographic information is listed in Table 4. A nonprobability sample of 137 Korean Americans was recruited from Korean American communities in Texas, California, Georgia, Maryland, and other states. The result of the pilot study (N=18) was included in this study. Including the pilot study, 9 surveys were collected in person, 70 surveys by mail, and 58 through email as attachments. When collecting data electronically, the investigator sent surveys with check boxes so that the participants could answer the questions easily.

Sixty-seven (48.9%) females were recruited and 70 (51.1%) males were recruited. The average age of the participants was 33.2 (SD=9.0) and ranged from 19 to 71 years old. Overall, this was a well-educated sample with 70% having at least a baccalaureate degree. Since the majority of the data was collected at Catholic churches, 60 percent of the participants were Catholic and 27 percent were Protestants. Only one person believed in Buddhism and 11 percent reported no religion. Mean BMI was 22.8 (SD=3.4), and the majority of participants (N=92) were categorized in the normal range for BMI (18.5 – 24.9). Finally, more first generation (38%) and 1.5 generation (47%) KAs were recruited than second generation KAs (15%) in this study. The demographic information by each generation is listed in Table 5.

Table 4

Demographics of the Sample (N=137)

Variable			N (%)	Mean (SD)	Range
Age				33.2 (9.0)	19-71
Living Arrangement (# of people)				2.0 (1.3)	0-6
Frequency of eating Korean food (#/week)				7.5 (4.6)	1-21
BMI [a]				22.8 (3.4)	16.7-34.2
BMI Category[a]	Underweight	< 18.5	8 (5.8)		
	Normal	18.5 – 24.9	92 (67.2)		
	Overweight	25.0 – 29.9	24 (17.5)		
	Obese	30.0 – 39.9	5 (3.6)		
Gender	Female		67 (48.9)		
	Male		70 (51.1)		
Education[b]	High School Graduate		8 (5.8)		
	Some College		31 (22.6)		
	Baccalaureate Degree		53 (38.7)		
	Masters', Doctorate, or Professional Degree		43 (31.4)		
Family Income[c]	0 - $20,000		12 (8.8)		
	$20,001 - $30,000		7 (5.1)		
	$30,001 - $40,000		19 (13.9)		
	$40,001 - $50,000		17 (12.4)		
	$50,001 - $75,000		37 (27.0)		
	$75,001 – 100,000		21 (15.3)		
	$100,000 +		20 (14.6)		
Generation	1st		52 (38.0)		
	1.5		65 (47.4)		
	2nd		20 (14.6)		

Note. Because of missing data, total participants of some variables do not equal 137.
[a] N=129, [b] N=135, [c] N=133.

Table 4 (continued)
Demographics of the Sample (N=137)

	Variable	N (%)
Religion	Catholic	83 (60.6)
	Protestant or Presbyterian	37 (27.0)
	None	15 (10.9)
	Buddhism	1 (0.7)
	Other	1 (0.7)
States where Participants Live [d]	TX	52 (38)
	CA	28 (20.4)
	GA	27 (19.7)
	MD	13 (9.5)
	Other[e]	11 (8.0)

Note. Because of missing data, total participants of some variables do not equal 137.
[a] N=129, [b] N=135, [c] N=133, [d] N=131
[e] Other states were NY, FL, IL, VA, and WA.

Table 5

Demographics of Sample for first, 1.5, and second generation KAs (N=137)

		1st Generation (N=52)	1.5 Generation (N=65)	2nd Generation (N=20)
Age		39.9 (SD=9.2)	29.9 (SD=6.0)	26.7 (SD=5.1)
BMI		22.2 (SD=2.6)	23.0 (SD=3.8)	23.7 (SD=3.6)
Acculturation Level		41.6 (SD=6.0)	52.5 (SD=8.1)	61.5 (SD=8.3)
Frequency of eating Korean food (#/week)		8.8 (SD=4.3)	6.8 (SD=4.8)	5.9 (SD=4.0)
Gender	Female	26 (50%)	34 (52.3%)	7 (35%)
	Male	26 (50%)	31 (47.7%)	13 (65%)
Education *	High School Graduate	3 (5.8%)	4 (6.2%)	1 (5.0%)
	Some College	11 (21.2%)	14 (21.5%)	6 (30%)
	Baccalaureate Degree	15 (28.8%)	28 (43.1%)	10 (50%)
	Masters', Doctorate, or Professional Degree	23 (44.2%)	17 (26.2%)	3 (15%)
Family Income *	0 - $20,000	3 (5.8%)	7 (10.8%)	2 (10%)
	$20,001 - $40,000	10 (24.3%)	13 (20.0%)	3 (15%)
	$40,001 - $75,000	28 (53.9%)	20 (30.8%)	6 (30%)
	$75,001 – 100,000	4 (7.7%)	13 (20.0%)	4 (20%)
	$100,000 +	5 (9.6%)	12 (18.5%)	3 (15%)

Note. Because of missing data, total participants of some variables do not equal total size of the generation group.
*There were 2 missing data for education among 1.5 generation as well as for family income among 1st and 2nd generation.

DESCRIPTIVE STATISTICS

Descriptive statistics for the variables related to environmental factors are presented in the Table 6. Majority of the participants (98.5 %) had the access to the Korean market in their city. Among those, the average time to go to the Korean market by car was 15 minutes (SD = 9.7), which implies that lack of access to Korean ingredients or foods was not a barrier for consumption of Korean food. About half (53%) of the participants consumed food that was cooked by others such as mother or spouse. Among those, length of stay in the US for the cook was asked and it was 14 years in average.

Descriptive results for the instruments that were included in the theoretical framework are in the Table 7. In this study, total scores for all the instruments were used in the inferential data analysis. Total mean scores for subscales for the instruments were presented only to describe the sample. Total mean score for the Acculturation Scale was 49.7 (SD = 10.2). The possible range of the instrument was from 21 to 105 with 21 items. Suinn et al. (1987) defined three levels of acculturation that highest scores indicates highly acculturated or Western identified, midpoint score indicates bicultural, and lowest score indicates low in acculturation or Asian-identified. As a result, we can assume that the acculturation level of the participants was fairly low. Among the subscales for barriers to healthy eating, the participants scored high in barriers for the following categories: Availability (e.g., access to a car to purchase groceries), Engaging (e.g., knowing how to cook healthy meals), and Preference (e.g., preference for certain foods).

They scored low for the barriers on the following categories: Adequate Functioning (e.g., adequate functioning of storage appliances) and Cost.

Among the total scores for Eating Habits Confidence Survey subscales, reducing salt had the highest score (M = 20.4) followed by reducing fat (M = 19.9), reducing calories (M = 17.3), and resisting relapse (M = 17.2) subscales.

Table 8 describes DHS results in categories defined by the scores. Category I represents current US diet and 37% fat diet, which is the unhealthiest diet category among five DHS categories. Although participants scored highest in the salt intake subscale for the self-efficacy, the actual salt eating habits were not as good as expected with scores primarily in category II for both males and females. However, participant's dietary habits in the fats and oils category were better than the sodium intake, ranking category III for both males and females. As indicated in Table 8, according to DHS results, women were eating healthier than men in meat, fish, and poultry category, dairy products category, beverages category, and restaurants and recipes category.

Table 6
Additional Descriptive Statistics Including Environmental Factors (N=137)

Variable		N (%)	Mean (SD)	Range
Distance to Korean Market (minutes)			15.3 (9.7)	1-50
Length of Stay in the US of Cook [a] (years)			14.2 (9.0)	0-40
Korean Market in the City	Yes	134 (98.5)		
	No	2 (1.5)		
Who Prepares and Cooks Food[b]	Yourself	64 (46.7)		
	Mother	37 (27.0)		
	Spouse	21 (15.3)		
	Roommate	3 (2.2)		
	Other	9 (6.6)		
Who Does Grocery Shopping [c]	Yourself	75 (54.7)		
	Mother	33 (24.1)		
	Spouse	20 (14.6)		
	Roommate	2 (1.5)		
	Other	4 (2.9)		
Perceived Health Status[d]	Excellent	14 (10.2)		
	Very good	49 (35.8)		
	Good	56 (40.9)		
	Fair	14 (10.2)		
	Poor	2 (1.5)		
Frequency of Selecting Low Salt Items[e]	Never	16 (11.7)		
	Sometimes	48 (35.0)		
	Often	42 (30.7)		
	Always	11 (8.0)		

Note. Because of missing data, total participants of some variables do not equal 137.
[a] N=62, [b] N=134, [c] N=134, [d] N=135, [e]N =117 (The item about selecting low salt items was added after pilot study with 18 participants, so those 18 were considered as missing data).

Table 7

Descriptive Statistics for the SL-ASIA, BHES, EHCS, and DHS (N=137)

Variables (Instrument)	Number of Items	Possible Scale Range	Sample Scale Range	M	SD
SL-ASIA (Acculturation)	21	21 - 105	31 - 76	49.7	10.2
BHES (Barriers)	16	16 – 80	16 – 66	29.9	7.7
Availability	2	2 -10	2 – 10	5.3	2.8
Cost	3	3 – 15	3 – 10	4.2	1.7
Engaging	3	3 – 15	3 – 15	6.1	3.0
Adequate Functioning	3	3 – 15	3 – 15	4.8	2.2
Preference	5	5 - 25	5 - 25	9.5	3.3
EHCS (Self-Efficacy)	20	20 – 100	24 – 100	74.9	14.1
Resisting Relapse	5	5 – 25	5 – 25	17.2	4.5
Reducing Calories	5	5 – 25	6 – 25	17.3	4.8
Reducing Salt	5	5 – 25	5 – 25	20.4	4.8
Reducing Fat	5	5 - 25	5 – 25	19.9	4.2
DHS (Healthy Eating Behavior)	39	39 - 389	81 - 239	158.7	29.7
Meat, Fish and Poultry	5	5 - 30	7 – 30	15.8	5.4
Dairy Products	6	7 – 38	7.5 – 38	17.8	6.5
Fats and Oils	5	5 – 29	6.5 – 29	18.9	4.6
Sweets and Snack	3	3 – 18	3 – 18	9.6	3.1
Grains, Beans, Fruits and Vegetables	5	0 – 195	6 – 115.6	46.9	21.3
Beverages	3	3 – 16	6 – 16	12.9	2.4
Salt	5	5 – 25	7 – 24	15.2	3.7
Restaurants and Recipes	5	5 – 28	5 – 26	15.0	4.8
Seafood	2	2 - 10	2 - 10	6.7	1.6

Note. SL-ASIA = the Suinn-Lew Asian Self-Identity Acculturation Scale; BHES = the Barriers to Healthy Eating Scale; EHCS = the Eating Habits Confidence Survey; DHS = the Diet Habit Survey.

Table 8
DHS Results in Categories by Gender (N=137)

	Male	Female
Total Score	I	II
Meat, Fish, and Poultry	II	III
Dairy Products and Eggs	I	I
Fats and Oils	III	III
Sweets and Snack	I	I
Grains, Beans, Fruits and Vegetables	I	I
Beverages	III	IV
Salt	II	II
Restaurants and Recipes	II	III
Seafood	III	III

Note. There are five categories and category Ⅳ was the healthiest one in this study. Categories were divided by the scores for each subscale by gender (see Appendix B). DHS = the Diet Habit Survey; Category I = Current US diet and 37% fat; Category Ⅱ = 30% fat diet; Category Ⅲ = 25% fat diet; Category IV = 20% diet; Category Ⅴ = 10 % fat diet.

ANALYSES

Data cleaning and error checking preceded data analysis. Missing data were less than 1% and were randomly distributed. However, because the instrument for self-efficacy, Eating Habits Confidence Survey had an option of 'Does not apply' and it was counted as missing data for the analysis, 35 cases were excluded for the data analysis. Thus, simple imputation was performed only for this instrument. Within this instrument, 3.7% missing data were found. If no more than 2 items were missing out of 20 items, mean over the observed values were replaced for missing items. The advantage of this method is that means of the items can be preserved; nevertheless, variances and covariances can be biased (Huisnman, 2009). After completing simple imputation, 26 cases instead of 35 cases from the EHCS were excluded for the correlation and regression data analysis.

Frequencies including histogram and skewness were performed to identify outliers and normality. For the age variable, one outlier was found whose age was 70 years old compared to the following highest age being 60. Thus, the age of this person was recoded as 60 only for the data analysis. The assumption of normality was supported by the absolute value of skewness being less than 1.5 (Munro, 2005). For accurate interpretation, other assumptions such as linearity, homogeneity of variance, and multicollinearity of variables were tested and all were met.

Because 42% of the data were collected by email, t-test and chi-square were used to identify whether there was a difference between surveys collected by mail (N = 70) or in person (N = 9) and surveys collected by email (N = 58) as attachments. Variables that

were included in this comparison were: age, gender, education, income, BMI, acculturation, barriers, self-efficacy, person who cooks food, distance to Korean market, and healthy eating habits. Chi-square was used for categorical variables (gender, education, income, and person who cooks food). Only educational level was significantly different between two groups (X^2 [df = 3] = 8.73, $p < .05$) with the email group having higher educational level. Among the continuous variables, age, BMI, distance to Korean market, and acculturation level were significantly different between two groups (see Table 9). There were no differences in healthy eating habits total score between two groups.

Table 9
T-test of Age, BMI, Distance to Korean Market, and Acculturation Level of Two Different Data Collection Groups (N = 137)

	Mail or in Person		Email			
Variable	M	SD	M	SD	*t* (df)	*p*
Age	34.6	10.4	31.1	6.3	2.23 (131)	< .05
BMI	22.0	2.9	23.7	3.8	-2.92 (123)	< .01
Distance to Korean Market (by car in minute)	17.3	9.5	12.4	9.2	2.93 (126)	< .01
Acculturation level	46.5	9.7	53.4	9.0	-4.14 (127)	< .01

Question 1

What is the relationship among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors among KAs?

Before running correlations, the assumptions for using correlations were tested. First, the independence of observation was supported by the data collection process since

data were collected separately. Second, the assumption of linear relationships between variables was supported by viewing scatter plots. Table 10 presents the Pearson correlations between the independent variables and healthy eating habits.

Relationships among Independent Variables

Female was coded as 1 and Male was coded as 2. Gender was significantly related to income (r = .18, p < .05), BMI (r = .47, p < .01), Self-Efficacy (r = -.30, p < .01), frequency of choosing low-salt items (r = -.20, p < .05), cooking by yourself (r = -.20, p < .05), and cooking by spouse (r = .42, p < .01). Females had stronger self-efficacy or confidence to engage in healthy eating, chose low-salt items more frequently, and cooked by themselves more often than males. On the other hand, males had higher incomes and BMIs, and more males ate food cooked by their spouse.

Although more than half (67%) of the participants were in the normal range for BMI (18.5 – 24.9), there were significant relationships with other variables. Higher levels of acculturation were significantly related to higher BMIs (r = .20, p < .05). In contrast, having a strong self-efficacy (r = -.20, p < .05) was significantly related to lower BMI and eating food cooked by their spouse (r = .25, p < .01) was significantly related to higher BMI. Since men were more likely to have food cooked by their spouse and have higher BMIs, the relationship between BMI and spouse cooking may be a gender relationship.

Eating Korean food more frequently (r = -.46, p < .01) was negatively related to acculturation level, which was the expected result. Also, having food cooked by their spouse (r = -.25, p < .01) was negatively related to acculturation level.

Table 10

Correlations among Background Characteristics, SL-ASIA, BHES, EHCS, and DHS (N = 137)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. DHS	1															
2. Age	-.10	1														
3. Gender	-.09	.06	1													
4. Education	-.09	.05	.12	1												
5. Income	-.02	.05	.18*	.16	1											
6. BMI	.03	.15	.47**	.05	.20*	1										
7. SL-ASIA	.10	-.46**	.13	-.05	.10	.20*	1									
8. BHES	-.18*	.09	.15	-.06	-.12	.02	-.13	1								
9. EHCS	.27**	-.07	-.30**	.05	.05	-.20*	-.04	-.03	1							
10. Distance to Korean Market	-.01	.09	.00	.03	-.10	.05	-.04	-.05	-.05	1						
11. Frequency of Low Salt Food	.31**	.01	-.20*	.11	-.07	-.03	-.13	-.13	.14	-.10	1					
12. Frequency of Korean Food	.23**	.22**	-.06	-.04	-.08	-.09	-.46**	-.09	.01	-.06	.30	1				
13. Cook Yourself	-.09	.13	-.20*	.12	.17	-.20	-.06	-.07	-.11	.07	.06	-.19*	1			
14. Cook Roommate	-.18*	-.09	-.05	.12	-.07	-.04	.08	.03	-.01	-.01	-.14	-.09	-.14	1		
15. Cook Spouse	-.06	.42**	.42**	.13	.10	.25**	-.25**	.05	-.20*	.03	-.01	.20*	-.40**	-.06	1	
16. Cook Mother	.19*	-.38**	-.10	-.24**	-.13	.07	.27	.01	.25**	-.11	.04	.09	-.57**	-.09	-.26**	1

Note. SL-ASIA = the Suinn-Lew Asian Self-Identity Acculturation Scale; BHES = the Barriers to Healthy Eating Scale; EHCS = the Eating Habits Confidence Survey; DHS = the Diet Habit Survey. * $p < .05$, two tailed, ** $p < .01$.

Question 2

What are the significant predictors among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors for the dependent variable of healthy eating habits among KAs?

a. Among these factors, which factor contributes the most unique variance for healthy eating habits among KAs?

b. Among these factors, what are the significant predictors for healthy eating habits among KAs after controlling for personal factors?

In order to answer the question, hierarchical multiple regression with simultaneous entering within the block was performed. Variables were selected based on the theoretical framework: personal factors in the first block and barriers to healthy eating, healthy eating self-efficacy, and environmental factors in the second block. Since the variable 'frequency of Korean food' was significantly correlated with healthy eating behavior, additional regression analysis was performed with this variable in the first block (Table 9).

Relationship between Independent Variables and Dependent Variables

Healthy eating habits were significantly related to barriers to healthy eating (r = -.18, p < .05), healthy eating self-efficacy (r = .27, p < .01), frequency of consuming Korean food (r = .23, p < .01), roommate cooking (r = -.18, p < .05), and mother cooking (r = .19, p < .05). Participants with fewer barriers, more self-efficacy or confidence, more frequent consumption of Korean foods had healthier eating behaviors as measured

by the total score on the DHS. Since the person who cooks food variable is a nominal level scale, it was recoded to 4 dichotomous variables to have meaningful direction. Although roommate cooking and healthy eating habits were significantly related, only 3 people answered that roommates were cook for them; which limited the ability to conclude that it had a relationship.

Result of the Regression

For the regression analysis, 105 cases were included due to the missing data. Table 11 presents the results of the analysis. Model 1 did not explain a significant amount of the variability. However, by adding Model 2 with variables of barriers, self-efficacy, and environmental factors, the R^2 change became significant ($\Delta R^2 = .16$, ΔF [7, 91] = 2.61, $p < .05$). The significant predictors in the final model included self-efficacy ($\beta = .31$, t = 2.82, $p < .01$) and roommate cooking ($\beta = -.22$, t = -2.08, $p < .05$).

Table 12 lists the results of the regression analysis with the variable, frequency of Korean food, which was not part of the original research question. Although Model 1 did not explain significant amount of the variability, the added variable, frequency of Korean food was a significant predictor ($\beta = .27$, t = 2.51, $p < .05$). Variables in Model 2 accounted for 20% of the variance of healthy eating behavior ($R^2 = .19$, $R^2_{adj} = .08$, ΔF [7, 91] = 2.61, $p < .05$). Among the variables in Model 2, acculturation ($\beta = .24$, $t = 1.98$, $p = .05$), frequency of Korean food ($\beta = .27$, $t = 2.22$, $p < .05$), healthy eating self-efficacy ($\beta = .32$, $t = 3.00$, $p < .01$), and roommate cooking ($\beta = -.22$, $t = -2.04$, $p < .05$) were significant predictors for healthy eating behaviors.

Although 3 people answered that roommates were cooking for them, those participants were not outliers in their demographic characteristics and their eating habits. If the roommate-cooking variable was excluded, in both cases with and without frequency of Korean food consumption, model 2 did not explain a significant amount of variability. Thus, the roommate-cooking variable was not excluded in the analysis to better understand the model of the study. However, according to the answers in the survey, the roommates who cooked for them were all Koreans who lived in the US less than 5 years.

Table 11

Hierarchical Regression to Predict Healthy Eating Habits among KAs (N=105)

	Model 1				Model 2			
	B	β	*t*	*p*	B	β	*t*	*p*
Age	-.13	-.04	-.35	.73	-.33	-.10	-.77	.45
Gender (1:Female; 2: Male)	-7.26	-.13	-1.15	.25	-4.88	-.09	-.70	.48
Education	-2.10	-.07	-.65	.51	-1.98	-.06	-.62	.54
Income	1.14	.08	.75	.45	.23	.02	.15	.88
BMI	.18	.02	.19	.85	.08	.01	.09	.93
Acculturation	.22	.08	.68	.50	.32	.11	1.03	.31
	R2 = .03, R2adj = -.03; F = .55, p = .77							
Barriers					-.28	-.07	-.69	.49
Self-Efficacy**					.62	.31	2.82	< .01
Cooking: Yourself					-2.13	-.04	-.22	.82
Cooking: Mother					.88	.01	.09	.93
Cooking: Spouse					14.32	.18	1.09	.28
Cooking: Roommate*					-37.89	-.22	-2.08	< .05
Distance to Korean Market					.07	.28	.26	.80
					R^2 = .19; R^2_{adj} = .08; F = 1.69, *p* = .08			
					R^2 change = .16; F change= 2.61, *p* < .05			

Note. *p <.05. ** p < .01.

Table 12

Hierarchical Regression to Predict Healthy Eating Behavior among KAs with Frequency of Food Added (N=105)

	Model 1				Model 2			
	B	β	*t*	*p*	B	β	*t*	*p*
Age	-.28	-.08	-.76	.45	-.53	-.15	-1.24	.22
Gender (1:Female; 2: Male)	-6.67	-.12	-1.08	.28	-4.51	-.08	-.66	.51
Education	-1.55	-.05	-.49	.62	-1.78	-.06	-.57	.57
Income	1.02	.07	.69	.49	.03	.00	.02	.98
BMI	.31	.04	.33	.74	.40	.05	.42	.68
Acculturation	.64	.22	1.80	.08	.70	.24	1.98	.05
Frequency of Korean Food*	1.80	.30	2.51	< .05	1.64	.27	2.22	< .05
	R2 = .09, R2adj = .03; F = 1.40, p = .22							
Barriers					-.14	-.03	-.34	.74
Self-Efficacy**					.65	.32	3.00	< .01
Cooking: Yourself					.42	.01	.04	.97
Cooking: Mother					-1.68	-.03	-.17	.87
Cooking: Spouse					13.33	.17	1.04	.30
Cooking: Roommate*					-36.37	-.22	-2.04	< .05
Distance to Korean Market					.15	.05	.55	.92
					R^2 = .24; R^2_{adj} = .12; F = 1.99, *p* < .05			
					R^2 change = .16; F change= 2.61, *p* < .05			

Note. Frequency of Eating Korean Food was added in Model 1.

**p <.05, ** p < .01.*

Question 3

Do barriers to healthy eating, mediate the effects of personal factors on healthy eating habits among KAs?

In order to test the mediating effect, three regression models should be performed and those three regression models should be significant. The first step was to test the predictive relationship between the independent variable, personal factors in this question, and the possible mediator, barriers to healthy eating. However, none of the personal factors including age, gender, education, income, BMI, and acculturation were significant predictor for barriers. As a result, no further testing was conducted. The results from the Sobel test (Preacher & Hayes, 2004) also indicated no significant mediating effects of barriers on personal factors.

Question 4

Does healthy eating self-efficacy mediate the effects of personal factors on healthy eating habits among KAs?

In order to test the mediation effect, three regression models should be performed and those three regression models should be significant. The first step was to test the predictive relationship between independent variable, personal factors in this question, and the possible mediator, healthy eating self-efficacy. Although gender (F [1, 127] = 12.41, $p < .01$) and BMI (F [1, 121] = 4.96, $p < .05$) were significant predictors for self-efficacy, they were not significant predictors for the dependent variable, healthy eating behaviors in the second step. Thus, no further testing was performed.

However, the results from the Sobel test (Preacher & Hayes, 2004) indicated significant mediating effects of self-efficacy on gender. The indirect effect of self-efficacy on gender was -5.52 (Z = -2.43, p = .02), which was different from the method of Baron and Kenny (1986).

Question 5

Do environmental factors mediate the effects of personal factors on healthy eating habits among KAs?

There were two environmental factors: person who cooks food and distance to Korean market. However, person who cooks food was recoded as dummy variable to be used in the regression: mother cooking, yourself cooking, and spouse cooking. Roommate cooking was discarded in this test because only 3 people answered that their roommate was cooking for them. Six independent variables and four possible mediators were tested to answer this research question.

Since no independent variables showed significant predictive relationships for the dependent variable, which is the second step of the mediation effect testing, no further testing was performed. The results from the Sobel test (Preacher & Hayes, 2004) also indicated no significant mediating effects of barriers on personal factors.

Question 6

Do barriers to healthy eating moderate the effects of personal factors on healthy eating habits among KAs?

In order to test the moderation effect, three regression equations should be performed. First, the independent variable (personal factors) was regressed on the

dependent variable (healthy eating behavior). Second, the possible moderator was regressed on the dependent variable. In the third step, the interaction term for the independent variable and possible moderator was regressed on the dependent variable. To have a moderating effect, the third equation with the interaction term needs to be significance.

Six interaction terms were created by multiplying personal factors (age, gender, education, income, BMI, and acculturation) and barriers to healthy eating. Six series of regression analysis were performed and barriers to healthy eating moderated three personal factors: age, gender, and education (see Table 13).

The directions and strength of the moderating effects were explored by line graph. The directions of the moderating effects were explored by line graph. People with more barriers who were younger ate healthier whereas for those with fewer barriers, age did not matter. When barriers are low, females and males ate healthier, but females consistently ate healthier than males. Barriers moderated the relationship between gender and healthy eating habits by strengthening this relationship. People with more barriers who had a baccalaureate degree ate the healthiest. These moderating effects of barriers need to be further evaluated in the future.

Table 13

Testing Moderating Effects of Barriers by Regression

Paths	R^2	F	B	β	*t*	*p*
Moderation Effect on Age						
Age → DHS	.010	1.35	-.33	-.10	-1.16	.25
Barriers → DHS*	.034	4.69	-.71	-.18	-2.16	< .05
Age* Barriers → DHS*	.037	5.15	-.02	-.19	-2.27	< .05
Moderation Effect on Gender						
Gender → DHS	.008	1.06	-5.23	-.09	-1.03	.31
Barriers → DHS*	.034	4.69	-.71	-.18	-2.16	< .05
Gender* Barriers → DHS*	.032	4.40	-.26	-.18	-2.10	< .05
Moderation Effect on Education						
Education → DHS	.008	1.09	-3.01	-.09	-1.05	.30
Barriers → DHS*	.034	4.69	-.71	-.18	-2.16	< .05
Education* Barriers → DHS*	.176	4.18	-1.32	-.18	-2.04	< .05

Note. DHS = Diet Habits Survey (measured healthy eating habits). * $p < .05$.

Question 7

Does healthy eating self-efficacy moderate the effects of personal factors on healthy eating habits among KAs?

In order to test the moderation effect, three regression equations should be performed. First, the independent variable (personal factors) was regressed on the dependent variable (healthy eating behavior). Second, the possible moderator (self-efficacy) was regressed on the dependent variable. In the third step, the interaction term of independent variable and possible moderator was regressed on the dependent variable. To have a moderating effect, third equation should show the significance.

Six interaction terms were created by multiplying personal factors (age, gender, education, income, BMI, and acculturation) and healthy eating self-efficacy. Six series of regression analysis were performed and healthy eating self-efficacy moderated only acculturation (see Table 14).

The directions of the moderating effects were explored by line graph. Acculturation was not significantly related to healthy eating habits. However, when self-efficacy was considered, the relationship was significant. With high self-efficacy, less acculturated people ate healthier whereas with low self-efficacy, more acculturated people ate healthier.

Table 14

Testing Moderating Effects of Self-Efficacy by Regression

Paths	R^2	F	B	β	*t*	*p*
Acculturation → DHS	.009	1.19	.27	.10	1.09	.28
SE → DHS*	.306	13.06	.65	.31	3.61	< .05
Acculturation* SE → DHS*	.049	6.39	.01	.22	2.53	< .05

Note. DHS = Diet Habits Survey; SE = Self-Efficacy. * $p < .05$.

Question 8

Do environmental factors moderate the effects of personal factors on healthy eating habits among KAs?

There are two environmental factors: the person who cooks food and distance to Korean market. However, person who cooks food was recoded as a dummy variable to be used in the regression: mother cooking, yourself cooking, and spouse cooking. Roommate cooking was discarded in this test because only 3 people answered that their roommate was cooking for them. Six independent variables and four possible moderators were tested to answer this research question. Twenty-four interaction terms were created by multiplying personal factors (age, gender, education, income, BMI, and acculturation) and environmental factors (distance to Korean market and person who cooks food).

The analyses showed that mother cooking moderated four personal factors: gender, education, BMI, and acculturation (see Table 15). The directions of the moderating effects were explored by line graph. With people who frequently consume foods cooked by their mothers, males ate healthier, whereas with people who are less likely to eat foods cooked by their mothers, females ate healthier. If mother was cooking, there was a larger gap of healthy eating scores among high school graduates, people with baccalaureate degree, and graduate degree. People with high school degrees ate unhealthiest regardless of their mother cooking. If mother was cooking, people with lower BMIs ate healthier but for those less likely to eat foods cooked by their mothers, BMI did not make difference in healthy eating. If mother was cooking, those less

acculturated group ate healthier, and for those less likely to eat foods cooked by their mothers, acculturation level did not make differences in healthy eating habits.

Table 15

Testing Moderating Effects of Mother Cooking by Regression

Paths	R^2	F	B	β	*t*	*p*
Moderation Effect on Gender of Mother Cooking						
Gender → DHS	.008	1.06	-5.23	-.09	-1.03	.31
Cook M → DHS*	.037	5.11	12.73	.19	2.26	< .05
Gender×Cook M → DHS*	.044	6.10	8.97	.21	2.47	< .05
Moderation Effect on Education of Mother Cooking						
Education → DHS	.008	1.09	-3.01	-.09	-1.05	.30
Cook M → DHS*	.037	5.11	12.73	.19	2.26	< .05
Education×Cook M → DHS*	.040	5.61	3.60	.20	2.37	< .05
Moderation Effect on BMI of Mother Cooking						
BMI → DHS	.001	.09	.24	.03	.29	.77
Cook M → DHS*	.037	5.11	12.73	.19	2.26	< .05
BMI×Cook M → DHS*	.050	6.84	.65	.22	2.62	< .05
Moderation Effect on AC of Mother Cooking						
AC → DHS	.009	1.19	.27	.10	1.09	.28
Cook M → DHS	.037	5.11	12.73	.19	2.26	< .05
AC×Cook M → DHS	.042	5.85	.25	.21	2.42	< .05

Note. DHS = Diet Habit Survey; Cook M = Mother Cooking; AC = Acculturation.
* $p < .05$.

Question 9

Are there differences in personal factors, healthy eating self-efficacy, barriers to healthy eating, and healthy eating habits among first, 1.5, and second generation KAs?

The assumption of homogeneity of variance for the three analyses was met by Levene's test. ANOVA showed that there were no significant differences in barriers, self-efficacy, and healthy eating habits among first, 1.5 and second generation KAs. As a result, t-tests were performed to identify whether there was a difference between first and second generation. There were no significant differences in barriers, self-efficacy, and healthy eating habits between first and second generation (see Table 16). Although not significant, according to the mean score of DHS, second generation KAs (M = 167.5, SD = 29.8) were eating slightly healthier than 1.5 generation KAs (M = 157.8, SD = 30.0) and first generation KAs (M = 156.4, SD = 29.2).

SUMMARY

This chapter described the sample and the variables used in the study. Then, the findings of the analyses were described. In the hierarchical multiple regression, personal factors were controlled by locating them in the first block and other behavior-specific cognition/affect and environmental factors were located in the second block. None of the personal factors were significant predictors, but self-efficacy was the strongest significant predictor for health eating habits among KAs. Among the behavior-specific cognition/affect and environmental factors, none of them indicated mediating effect on the relationship of personal factors and healthy eating habits. However, barriers to healthy eating, healthy eating self-efficacy, and mother's cooking had moderating effects

on the relationship between personal factors and healthy eating habits. No significant generational differences were found on barriers, self-efficacy, and healthy eating habits among first, 1.5 and second generation KAs.

Table 16

ANOVA Results of Barriers, Self-Efficacy, and Healthy Eating Habits by Three Generation Groups

	Generation	N	M (SD)	Source	*df*	MS	F	*p*
Barriers	1st	52	31.2 (6.8)	Between Groups	2	79.71	1.35	.26
	1.5	65	29.1 (7.5)	Within Groups	133	59.05		
	2nd	19	29.9 (7.7)	Total	135			
Self-Efficacy	1st	49	73.6 (14.6)	Between Groups	2	89.06	.45	.64
	1.5	60	76.1 (13.5)	Within Groups	126	199.17		
	2nd	20	74.2 (14.9)	Total	128			
Healthy Eating Habits	1st	52	156.4 (29.2)	Between Groups	2	936.45	1.07	.35
	1.5	64	157.8 (30.0)	Within Groups	133	879.53		
	2nd	20	167.5 (29.7)	Total	135			

Note. MS = Mean Square.

Chapter 5: Discussion

This chapter discusses the study findings, evaluates the theoretical framework, and reviews strength and limitations. Implications for nursing practice, nursing research and nursing education are presented with recommendations for future research.

SUMMARY OF STUDY DESIGN

The primary purpose of the study was to examine the relationships among personal factors (age, gender, education, income, BMI, and acculturation), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among KAs. A second purpose was to examine whether barriers to healthy eating, healthy eating self-efficacy, and environmental factors mediate or moderate the effect of personal factors on healthy eating habits among KAs. A third purpose of this study was to compare barriers to healthy eating, healthy eating self-efficacy, and healthy eating habits among first, 1.5, and second generation KAs.

A total of 137 participants completed the survey. Data was collected in nine different states in the US in three ways: surveys distributed in person (N=9), mailed surveys (N=70) and surveys sent as an email attachment (N=58). Both males and females who are over 18 years old were recruited through local Korean community organizations such as churches and tennis clubs. The initial target sample size was 126, which was calculated by G Power with effect size at .15 and power at .85. Power of this study after data collection, recalculated by G power with an effect size of .15, a sample size of 137, and an alpha of .05, was .89.

Since missing data was less than 10%, listwise deletion was used for the data analysis. In order to answer the research questions, descriptive statistics, correlations, hierarchical regression, a series of simple regressions, ANOVAs, and t-tests were performed for data analysis using SPSS 16.0.

FINDINGS AND DISCUSSIONS

Sample

The average age of the participants was 33.2 (SD = 9.0) with the majority (82.5%) of the participants between 19 and 40 years old. Considering that the inclusion criterion of age for this study was over 18 years old, the participants were relatively young. Another inclusion criterion for this study was ability to read and speak English because the survey was written in English. As a result, many of the KAs who are older and not fluent in English may have been excluded. In addition, since the investigator tried to recruit 1.5 and second generation as well as first generation KAs, this may have affected the age of the sample.

The females (n = 67) and males (n = 70) were evenly distributed in this study. Since gender was a possible predictor, the investigator tried to recruit females and males equally. KAs have a higher educational level compared to average US population (Kuo & Porter, 1998), which was consistent in this study's findings (70 % had at least a Baccalaureate Degree). However, only 56% of the participants' family income was over $50,000. Income was not consistent with educational level for KAs as indicated in the previous literature.

Fifty-two first generation KAs, 65 of 1.5 generation KAs, and 20 of second

generation KAs were recruited. The reason for smaller number of 2nd generation KAs, compared to the first or 1.5 generation KAs in this study, was likely the recruitment method. The investigator mostly recruited participants through Korean American communities with snowball sampling, and many 2nd generation KAs are not always involved in KA communities. According to Kim and Pyle (2004), second generation KAs are more acculturated than first generation KAs, so there is less of a need for social interaction with other KAs through the Korean communities such as Korean churches. This may be why fewer 2nd generation KAs were recruited.

The average BMI of the participants in this study was 22.8 kg/m^2 (SD=3.4) ranging from 16.7 to 34.2. Sixty-seven percent (n=92) of the participants were in the normal range for BMI, 18% of the participants were overweight, and 4% were obese. Although there are no population-based data for KAs' BMI, several studies reported average BMIs (Kim & Chan, 2002; K. K. Kim, et al., 2000; Lee et al., 2000; Yang et al., 2007), which ranged from 21 to 24 kg/m^2. According to Ogden et al. (2004) with NHANES data of 1999-2002, average BMI of Americans increased to almost 28 kg/m^2. In comparison, the BMI for this study corresponded to previously reported average BMIs for KAs, but obviously was lower than the average BMI for Americans.

More than half of the participants (60.6%) were Catholic and 27% of the participants were Protestant. Catholicism is the second common religion for KAs followed by Protestant (Yoo & Chung, 2008). Since a lot of recruiting was done through Catholic churches, Catholicism was the most common religion in this study. Since

religion was not considered as a significant predictor for healthy eating habits based on the literature review, this religious distribution should not affect the results.

Descriptive Findings and Instruments

Descriptive Findings

Most of the participants had Korean markets in their city, and the average time to go to the Korean market by car was 15.3 minutes. We can assume that the availability of Korean foods or ingredients was not an obstacle for participants in consuming Korean food since they live close to those resources. Participants in this study were consuming both Korean food and Western style food at the same time.

In Korean society, mothers commonly cooked for their family and played a major role in influencing the eating habits of their family members (Park et al., 2003). In this study, 47% of the participants cooked for themselves, and 27% of the participants ate food cooked by their mothers. This may imply that participants in this study were more independent than Koreans or that they lived alone and had to prepare and cook food for themselves. Since the person who prepares and cooks food has the power to choose the type of food or ingredients, participants in this study had more control over their eating behavior than KAs who live with their family. For those who ate food cooked by others, the cooks were mostly KAs and the average length of stay in the US for the person who cooked was 14 years (SD= 9.0, range from 0 to 40 years). Hence, we can assume that those cooks were not new immigrants, and they may already have adjusted to the foods and cooking environment in the US, such as obtaining Korean ingredients or learning how to prepare convenient meals with a limited time and resources.

Additional information was collected on the survey that was not included in the research questions. One of the questions was perceived health status which was assessed by respondents' self-report of their health on a 5 point scale from "1 = Excellent" to "5 = Poor". In this study, 11.7% of the participants reported their health as fair or poor. A study conducted for racial and ethnic minorities in the US reported that the percent of minority men who answered fair or poor on the same question ranged from 19.7% for African Americans to 30.8% for Hispanics. The percent of women who answered fair or poor about their health ranged from 23.9% for African Americans to 36.2% for Hispanics (Liao, Tucker, Okoro, Giles, Mokdad, & Harris, 2004). In comparison, KAs in this study rated their health better than other ethnic minorities in the US. However, this finding may be due to the age of the sample being young rather than their ethnicity.

There was another additional question about choosing low salt items during grocery shopping. Four answer choices were 'Never', 'Sometimes', 'Often', and 'Always'. Forty-seven percent of the participants answered never or sometimes to this question. Considering that staple Korean foods such as kimchi and soy bean paste are extremely high sodium foods (Cheigh & Park, 1994) and high sodium intake of KAs was related to hypertension (Lee et al., 1995), this finding should be investigated in the future research.

Instruments

Cronbach alphas were calculated to evaluate the reliability of three instruments: Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA), Barriers to Healthy Eating Scale (BHES), and Eating Habits Confidence Survey (EHCS). According to Polit

and Beck (2004), A Cronbach's alpha above .70 is considered acceptable and greater than .80 is desirable. All three instruments in this study met this criterion. BHES had lower internal consistency (.78) than SL-ASIA (.89) and EHCS (.90). None of the items in the BHES increased the reliability if they were deleted. The Cronbach's alphas of the BHES 5 subscales were: availability (.92), cost (.83), engaging (.90), adequate functioning (.79), and preference (.69). The subscale for preference asked about whether they liked to eat meat, vegetables, fruits, bread, and water. Among the five BHES subscales, the average item score for the preference subscale was ranked third. The average item score indicated that 'Cost' had the lowest score, which means it was the biggest barrier, followed by 'Adequate functioning', 'Preference', 'Engaging', and 'Availability'. We can assume that preference was a barrier to eat healthy, but maybe the categorization was too broad as previously discussed by the instruments developers Fowles and Feucht (2004). Another aspect that could have affected the reliability of the score was the cultural fit of the instrument. For example, an item such as 'I like to eat bread' does not represent preferences of some KAs who do not eat bread, but eat a lot of rice. Also, according to Swagerty, Walling, & Klein (2002), up to 100% of Asians have lactose malabsorption. Thus, the item such as 'I don't buy milk because it costs too much' may not be appropriate for a population that does not consume milk due to their physiologic condition.

Acculturation level was measured by the SL-ASIA. Total mean score was 49.7 (SD = 10.2) for the 21-item acculturation scale, which can range from 21 to 105. The total mean score of acculturation was slightly lower than other studies, meaning less

acculturated. In other studies (Jackson, Keel, & Ho Lee, 2006; Roesch & Wee, 2006), the total means score of SL-ASIA for three different groups of KAs ranged from 50.8 to 68.7 with the score of 68.7 for second generation KA women. The possible reason for the lower acculturation level in this study, compared to previous work, may be the use of the snowball-sampling method. The majority of the KAs in this study were recruited through the KA churches and were likely to be less acculturated compared to KAs who do not go to Korean churches and have less interaction with KAs.

Self-Efficacy was measured by the SEEBS, and the total mean score was 74.9 (SD = 14.1). Shin (2008) used the SEEBS among KAs whose average age was 39, which was older than the average age in this study (M = 33.2). The total mean score of the SEEBS in Shin's (2008) dissertation study was lower than this study (M = 61.8, SD = 16.9). It may be assumed that the older you are, the more fixed you are with your eating habits and may subsequently feel less confident about changing eating habits to a healthier ones.

Among the four subscales of SEEBS, the subscale of reducing salt had the highest total mean score (M = 20.4, SD = 4.8), followed by fat (M = 19.9, SD = 4.2), calories (M = 17.3, SD = 4.8), and relapse (M = 17.2, SD = 4.5). Higher scores indicate having more confidence in consuming a lower sodium intake. Considering that sodium intake is high for KAs based on previous literature, there may be a knowledge gap or misunderstanding about sodium consumption for KAs. There was an additional open-ended question asking, "Do you consider Korean food as healthy food? If yes, explain why." Among 137 KAs, only 4 participants mentioned high sodium intake being a negative aspect of Korean food.

Surprisingly, 4 people answered that Korean food is healthy because it contains less sodium. This discrepancy and possible lack of knowledge needs to be further investigated especially in the light of their actual sodium intake, cooking and grocery shopping habits, and knowledge regarding sodium content in Korean foods.

Healthy eating habits were measured by the DHS, with scores that can range from 39 to 389. Since the item numbers and scoring system for each category were different, it was not meaningful to compare mean scores or average item scores for this instrument. However, the results on Table 7 could be interpreted based on mean and standard deviation scores. Higher scores indicated eating healthy. Fats and oils, beverages, and seafood were the categories that the participants scored above the midrange of possible scores.

Participants scored lowest on dairy products (M = 17.8, SD = 6.5), meaning unhealthy consumption of dairy products, as compared to the midrange of possible scores. The reason for this low score could be due to less knowledge about the negative health impact of high fat dairy products. Dairy products, especially milk and cheese, were not staple food items for KAs and many older KAs only know the positive aspects of dairy products (i.e., it is a good source of calcium). The questionnaires contained the types of diary products (e.g., whole milk, 2% milk, 1% milk, cheddar, part-skim mozzarella, or light part-skim mozzarella), and some KAs were not familiar with these various types of dairy products, which may have affected the accuracy of the responses. Another possible explanation for the unhealthy consumption of dairy products and high variability of scores may be the high rates of lactose intolerance among Koreans (Bahk & Ahn, 1977),

especially with those who are first generation. Unlike first generation KAs, 1.5 or second generation KAs tend to have increased milk consumption due to more Americanized eating habits (Jackson & Savaino, 2001) and the availability of lactose free dairy products. Lastly, the average score for the sodium items of both male and female participants corresponded to sodium consumption of 4025mg/day. According to the Dietary Guidelines for Americans (United States Department of Agriculture, 2011), Americans should consume a maximum of 2300mg/day of sodium. So KAs in this study were consuming sodium higher than the recommended amount. This result is consistent with the high salt intake of KAs found previously in the literature, which is a problematic health behavior that may contribute to chronic health problems like hypertension, heart disease, and kidney problems.

Table 8 describes the gender differences of healthy eating habits as measured by DHS. Females ate healthier than males on meat/fish/poultry, dairy products, beverages, and restaurants/recipes categories. Previous researchers found that females are usually more cognizant about their fat consumption from meat, dairy products, and beverages (Wardle et al., 2004), so the results were not surprising. When the total scores for each food group were calculated, the results were divided into five categories (from Category I to Category V) that were determined by the instrument developers (See Appendix B). Category I represents current U.S. diet of 37% fat diet which represents the most unhealthy eating habits, whereas Category V represents the most healthy dietary habits of 10% fat diet. The average score for both men and women participants fell into Category III (see Table 8), which corresponds to the 25% fat diet. To determine the categories, 5

questions asked about types of fats (e.g., butter, shortening, safflower oil or canola oil), frequency of fat consumptions (e.g., eat potato chips or fried chicken two or more times a day, once a day, once a week, less than twice a month, or never) or types of salad dressings they are using. Since Category I corresponds to the US diet of 37% diet, it is assumed that KAs either eat less fats and oils or healthier choices of fats and oils. This could be due to their effort in trying to reduce fat and oil consumption or due to the recipes for Korean foods that have minimum fat and oil. Also, two questions contain typical American foods such as French fries, doughnuts, or salad dressings, so the instrument might not reflect the sources of fat and oil commonly consumed by KAs.

Research Questions

Question 1

What is the relationship among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors among KAs?

The results of the relationships among independent variables are presented in Table 10. First, males had higher BMI (r = .47, p < .01) and were more likely to eat foods cooked by their spouse (r = .42, p < .01). Females had stronger self-efficacy (r = -.30, p < .01) and were more likely to consume foods cooked by themselves (r = -.20, p < .05). It is not surprising that female had lower BMIs and stronger self-efficacy because females tend to be more cognizant about losing weight and dieting than men (Hill, 2002). Also, it was not surprising that males were more likely to eat foods cooked by their spouse because mothers or wives commonly cook in Korean families (Park et al., 2003).

Second, participants with higher BMIs had higher incomes ($r = .20$, $p < .05$), were more acculturated ($r = .20$, $p < .05$), had less self-efficacy ($r = -.20$, $p < .05$), and were more likely to eat foods cooked by their spouse ($r = .25$, $p < .01$). Since males had higher BMIs, having less self-efficacy and being more likely to eat foods cooked by their spouse could be related to their gender. However, higher acculturation level could mean consuming more westernized food, which can lead to unhealthy eating habits and subsequently higher BMIs (Kim & Chan, 2004; Lee et al., 2000).

Third, education and income did not have a meaningful relationship with other variables in this population. This may be due to homogenous sample characteristics. More than half of the participants had at least a baccalaureate degree. Reduced variation in personal factors may have led to attenuated the strength and significance of the correlation with other variables (Alexander, 1988).

Question 2

What are the significant predictors among the independent variables of personal factors (age, gender, education, income, BMI, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, and environmental factors for the dependent variable of healthy eating habits among KAs?

a. Among these factors, which factor contributes the most unique variance for healthy eating habits among KAs?

b. Among these factors, what are the significant predictors for healthy eating habits among KAs after controlling for personal factors?

Before running the regression, relationships between independent variables and the dependent variable, healthy eating habits, were examined. Not surprisingly, participants with fewer barriers (r = -.18, p < .05), more self-efficacy (r = .27, p < .01), and more frequent consumption of Korean foods (r = .23, p < .01) were eating healthier. In addition, roommate cooking (r = -.18, p < .05) and mother cooking (r = .19, p < .05) were significantly related to healthy eating habits. It is interpreted that participants who mostly eat foods cooked by their mother tend to eat healthy and participants who mostly eat foods cooked by their roommate were likely to eat unhealthy. Mothers often endeavor to prepare healthy foods for their children's health but the effect of roommate cooking has not been studied and is not clearly understood. However, since only three people answered that they eat food cooked by their roommate, it is hard to conclude that roommate cooking was negatively related to healthy eating habits.

None of the personal factors, even acculturation level, were significantly related to healthy eating habits. The recruitment of homogenous KAs from KA communities may have led to less variation in personal factors as well as eating habits, which may also lead to less strength and significance in the relationships between personal factors and eating habits among KAs (Alexander, 1988).

Based on the results of the hierarchical multiple regression analysis with variables in the theoretical framework (see table 11), self-efficacy (β = .31, t = 2.82, p < .01) was the best predictor and roommate cooking (β = -.22, t = -2.08, p < .05) was also a significant predictor, explaining 16% of the variation in healthy eating habits. This finding suggests that KAs who had strong confidence in their healthy eating habits were

more likely to eat healthy. Also, KAs who ate food cooked by their roommate were less likely to eat healthy, but this result needs to be further studied in the future.

Based on the results of the hierarchical multiple regression analysis with variables in the framework and the variable 'frequency of Korean food' (see Table 12), frequency of Korean food ($\beta = .27$, $t = 2.22$, $p < .05$), self-efficacy ($\beta = .32$, $t = 3.00$, $p < .01$), and roommate cooking ($\beta = -.22$, $t = -2.04$, $p < .05$) were significant predictors, explaining 19% of the variation. Among those, self-efficacy was the best predictor in this analysis too.

The finding that self-efficacy was the strongest predictor ($\beta = .31$, $p < .01$) for healthy eating habits was consistent with three previous studies. For one study in an alternative high school with a majority of ethnic/racial minority students (Bruening et al., 2010), self-efficacy was a significant predictor ($b = .13$, $p < .05$) for fruit/vegetable consumption. Another study of women with hyperlipidemia in Thailand, self-efficacy was the strongest predictor ($\beta = .556$, $p < .001$) among other significant predictors, such as age and perceived health risks, for nutritional health-promoting behavior (Kahawong et al., 2005). In a study of 517 KAs (Shin & Lach, 2011), self-efficacy was also the strongest predictor among other psychosocial factors including barriers ($\beta = -.08$, $p > .05$) and benefits ($\beta = .27$, $p < .05$) for healthy eating behavior ($\beta = .34$, $p < .05$), using an English version of the survey. Among different psychosocial factors such as barriers or perceived benefits, this study supports previous studies that self-efficacy was the strongest predictor for healthy eating habits.

Although barriers to healthy eating and some of the environmental factors, like asking who cooks the food, were significantly related to healthy eating habits, those variables did not significantly predict healthy eating habits in the regression analysis. This could be due to measurement problems for barriers and environmental factors as well as correlations among predictors.

Some of the items of BHES might not reflect the barriers of healthy eating among KAs. For example, preference items "I like to eat bread" could be vague to answer if a person prefers rice to bread. Also, the items for adequate functioning such as "The stove works well where I live" might not yield the variation in answers because majority of the participants had at least of $20,000 of annual income, which means they likely had adequate utilities for the cooking. Also, all the environmental factors were single item questions, which also can yield less variation.

Last, in hierarchical multiple regression, which was used in this study, the statistical significance and the strength of the variables is affected by the order of the entry into the equation. Unlike simultaneous multiple regression, which measures only direct effect, hierarchical multiple regression estimates total effects, which includes both direct and indirect effects. Because variables in the first block have more indirect effects on dependent variable, the variables in the second block have smaller effects than do variables entered in the first block (Keith, 2006). Considering this statistical setting, all the behavior-specific cognition/affect and environmental factors were entered in the second block with all the personal factors entered in the first block. Although this entry followed the theoretical framework, there might be a different model to better explain the

findings of this study. However, it is also possible that there were other factors that were not included but crucial in predicting healthy eating habits in this study.

Question 3, 4, and 5

Questions 3, 4, and 5 tested the mediation effect of barriers, self-efficacy, and environmental factors separately on healthy eating habits. In conclusion, neither barriers, self-efficacy, nor environmental factors had a mediating effect on personal factors.

Before testing for the mediation effect, significant relationships between personal factors and possible mediating factors should be established. However, no significant relationships between personal factors and the barriers as well as environmental factors were established. For the self-efficacy variable, although significant relationships were established between personal factors (gender and BMI) and two environmental factors (who cooks the food and distance to Korean market), those personal factors were not significant predictors for healthy eating habits, which was the second step for identifying mediating factors.

However, one of the Sobel tests indicated different results. There was a significant mediating effect of self-efficacy on gender ($p < .01$). This discrepancy may come from the different analysis method. According to the method of Baron & Kenny (1986), a significant relationship between the independent variable and dependent variable should be established. In other words, it is hypothesized to have a direct effect of the independent variable to the dependent variable. As a result, the method described by Baron and Kenny has a tendency not to have significant results due to the low statistical power (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). However, the Sobel

test measures the significance of the indirect effect. Both methods have their theoretical hypothesis, so it was recommended to run two methods when measuring mediating effects (Zhao, Lynch, & Chen, 2010).

The mediating effects of those three factors were exploratory. Except for the mediating effect of self-efficacy on gender, the results of this study were consistent with the previous dissertation study of Shin (2008) showing no mediating effects of benefits, barriers, and self-efficacy on individual characteristics. The main reason for the lack of mediation effect was likely due to weak, predictive relationship between personal factors and possible mediating factors. Personal factors in this study were not closely related to either possible mediating factors or healthy eating habits. Another possible explanation would be the homogenous characteristics of the participants or that eating habits were not necessarily related to personal characteristics.

Although gender was not a significant predictor for healthy eating habits based on the regression model, healthy eating self-efficacy mediated the effect of gender on healthy eating habits using the Sobel test. According to the results, females tend to eat healthier than males, but this effect was not caused directly by their gender, rather it was mediated by the influence of their self-efficacy on healthy eating. From this finding of mediating effects, the importance of self-efficacy in eating behavior was indicated.

Question 6, 7, and 8

Question 6, 7, and 8 tested the moderation effect of barriers, self-efficacy, and environmental factors individually on healthy eating habits. Among 48 series of tests, the results of these analyses showed 8 moderating effects.

The barriers moderated the effect of age, gender, and education on healthy eating habits. Table 13 indicates the strength and direction of the moderation effects. All three personal factors were not significant predictors for healthy eating habits, but barriers moderated those effects. This means that the relationship between the above three personal factors (age, gender, and education) and healthy eating habits depends on the barriers to healthy eating variable. Although none of the personal factors were directly related to healthy eating habits, those were still relevant factors to consider when it comes to healthy eating habits.

Self-efficacy moderated the effect of acculturation on healthy eating habits. This also means that although the acculturation level was not directly related to healthy eating habits, the relationship between acculturation and healthy eating habits depended on self-efficacy. One of the environmental factors, mother cooking, also moderated the relationship between four personal factors (gender, education, BMI, and acculturation) and healthy eating habits. It can be interpreted that gender, education, BMI, and acculturation affected healthy eating habits only when environmental factors were considered together.

Testing the moderating effects of barriers, self-efficacy, and environmental factors in this study was also exploratory. Moderation effect can sometimes explain unexpectedly weak relationships between independent variables and dependent variables (Baron & Kenny, 1986). In this study, all the personal factors were not significantly related to healthy eating habits, but when other factors moderated those relationships, they became meaningful. The above results suggested that barriers, self-efficacy, and

environmental factors might be critical components to lead KAs eat healthy by strengthening or modifying those factors.

Question 9

Are there differences in barriers to healthy eating, healthy eating self-efficacy, and healthy eating habits among first, 1.5, and second generation KAs?

One study comparing first and second generation Mexican-American women indicated that those in the first generation consumed more protein, cholesterol, and calcium, while those in the second generation had eating habits resembling white non-Hispanic women (Guendelman & Abrams, 1995). Other studies among African Americans, Mexican Americans, and Japanese Americans indicated that those in the second generation had poorer diet habits than those in the first generation (Kudo, Falciglia, & Couch, 2000; Romero-Gwynn et al., 1993; Sharmat, Cade, Riste, & Cruickshank, 1999). It was also assumed that second generation KAs have poorer eating patterns than first generation, but it was not supported by the findings in this study.

Based on the ANOVA test results, there were no significant mean differences in barriers, self-efficacy, and healthy eating habits among three generations. Further tests using t-tests comparing only first and second generation also did not show the significant mean differences. The average total scores of barriers, self-efficacy, and healthy eating habits among the groups were fairly similar (see Table 16). The recruitment of this study was mainly conducted through KA communities. This may have led to homogenous characteristics which also may have led to less variation in barriers, self-efficacy, and healthy eating habits among the different generations. It is also possible that generation is

not an important factor that influences their eating behaviors, just their background characteristics.

Findings Related to the Conceptual Framework

The conceptual framework used in this study (see Figure 1) was adapted from Pender's Health Promotion Model (Pender et al., 2006). The biggest difference from the study results compared to the conceptual framework was that personal factors were not significant predictors for healthy eating habits. This was explained previously; it may be due to the homogeneity of the sample characteristics or perhaps eating habits that are more related to cognitive factors, psychosocial factors (e.g., motivation, knowledge) or external factors rather than the individual characteristics measured. Among the behavior-specific cognition, affect, and environmental factors, only self-efficacy proved to be a significant predictor. This finding is consistent with previous studies. Pender et al. (2006) has reported that previous studies support that the following variables are related or predict the health behaviors with this order: self-efficacy 86%, perceived barriers 79%, prior related behavior 75%, perceived benefits 61%, interpersonal influences 57%, and situational influences 56%. However, there may be some important factors that should be included when studying the theoretical framework (see Figure 1) to have better supporting relationships for healthy eating habits. For example, perceived benefits of action or commitment to a plan of action, which exists in the revised HPM, may need to be added to the conceptual framework that was used in this study. People who anticipate more benefit will likely have positive or reinforcing outcomes of behaviors, and people who are more committed may have a better identified strategies of their own (Pender et

al., 2006). Considering that self-efficacy was a powerful factor in healthy eating habits, other psychosocial factors might have more impact on healthy eating habits.

Environmental factors in this study correspond to situational influences, which is classified as a behavior specific cognition and affect in the revised Pender's HPM. For this study, this category has been revised to include behavior specific cognition/affect and environmental factors. However, environmental factors appear to be a different entity from cognition and affect. In conclusion, environmental factors may need to be considered as a separate entity in future research predicting health-promoting behavior using Pender's HPM.

STRENGTHS AND LIMITATIONS

George (2010) mentioned 116 studies related to health promotion regarding nutrition or eating habits, but the majority of the studies were comparing eating habits by acculturation level or focusing more on other health-promoting behaviors such as physical activity, even though eating habits and their health consequences are receiving more and more attention. This study addresses a gap in the literature by examining healthy eating habits with a focus on the behavior component among KAs. A second strength was the overall power of this study; the power was nearly 90 with moderate effect size (.15), which is a strong power in order to detect the relationships among variables (Cohen, 1987). Third, since the recruitment was conducted from 9 different states in the US, this study has a broad range of representation of KAs residing in the US. Lastly, this study included not only first generation KAs, but also 1.5 and second generation KAs, which is different from previous studies of KAs. Since first generation

or older adults immigrants do not easily change their eating habits, younger immigrants or second generation need to be included in research studies especially in relation to eating habits. The generation of 1.5 KAs has special characteristics and the term originated from KAs, so exploring their eating habits were another unique component of this study with KAs.

Despite these strengths, there were several limitations of this study: possible inaccuracy of self-reported heights and weights, the generalizability of the study, misinterpretation of a question, and measurement issues. First, instead of using measured heights and weights, self-reported heights and weights were used in this study. There is a tendency to underreport weights and to overestimated heights when self-reported ones were used. This may have affected the result of the correlation and regression analyses.

Second, for several reasons, the findings of this study cannot be generalized to all KAs living in the US. The small, convenience sample recruited through churches and KA communities were healthy persons who engage a lot with other KAs. Thus, this sample might not include KAs who are more acculturated or less engaged in KA communities.

Third, there was a question asking, “Did you attend at least one year of school (elementary, middles, or high school) in the US?” in order to distinguish first and 1.5 generation KAs. However, the investigator found two people who went to graduate school in their 20s answered yes to this question. Although the generation of these people was corrected from 1.5 to first generation, there might be other participants who misinterpreted the question. This question does not affect the main regression analysis,

but it changes the generation category, so it could have affected research question 9 asking generational differences of barriers, self-efficacy, and healthy eating habits.

Fourth, the survey consisted of 18 pages, and the last instrument asking about eating habits had 9 pages. Participants may become bored and lose their concentration when they are exposed to repeated questions (Munro, 2005). The investigator also heard from the participants when doing the survey face-to-face that the survey is too long for them and looking repeatedly how many pages were left. This might have affected answering the main questionnaire about eating habits with less caution or concentration and may have affected the findings of the study.

Fifth, the survey was written in English. When studying immigrants or ethnic minorities, sometimes a translated version of the survey is used in order to include participants with low English proficiency. In this study, the survey was not translated to Korean because of the possible decrease in the validity of instruments (Sperber, 2004) and lack of resources to translate and back translate the instruments. As a result, using only the English version survey may have excluded KAs with low acculturation and low English proficiency.

Lastly, the DHS was developed for Americans. Although it had behavioral components and foods categorized with more general terms, some food items might not be familiar to KAs who do not consume a lot of American foods. Also, there are some KAs who do the grocery shopping only at Korean markets, and those markets have fewer choices in some food categories such as milk products and meat choices. Although this measurement was the best fit to measure eating behavior of KAs, these limitations may

have affected measuring the dependent variable in this study, healthy eating habits. The BHES measuring barriers was also developed for pregnant women and the subscale for preference appeared more appropriate for Americans rather than minorities or Asians. This might also have affected measuring barriers and examining the predictors for healthy eating habits. The environmental factors were single-item questionnaires rather than multiple-item scales. Compared to multiple-item scales, single-item assessment is sometimes insufficient measure of individual's opinions, attitudes, or feelings due to their lack of precision, tendency to change over time, and limitation in scope (Di Lorio, 2005). Also, other environmental or personal factors may need to be included in order to better understand related factors for eating habits.

NURSING IMPLICATIONS AND RECOMMENDATIONS

Nursing Implications

The results for the main research question in this study asking the best predictor for healthy eating habits indicated that self-efficacy was the strongest predictor for healthy eating behavior. In the behavioral sciences, empowering self-efficacy is one of the major strategies to change the behavior (McAlister, Perry, & Parcel, 2008). According to Bandura (1997), there are four ways to enhance self-efficacy: mastery experience (e.g., goal setting activities), social modeling, improving physical and emotional states, and verbal persuasion. Also, previous studies support that dietary interventions with a longer duration, face-to-face contact, a combination of different interventions, a goal-setting component, and a small group format lead to a better

outcomes (Ammerman, Lindquist, Lohr, & Hersey, 2002; Fjeldsoe, Neuhaus, Winkler, & Eakin, 2011).

The goal setting is one of the strategies that can be incorporated in the interventions to increase the self-efficacy for healthy eating habit changes. Researchers have found that goal-setting activity in the intervention was related to increased intake of fruit juice (Latif et al., 2011). Also, one review study (Cullen, Baranowski, & Smith, 2001) indicated that when goal setting activity has been used in dietary change interventions, there consistently has been positive results. As previous studies supported (Artinian et al., 2010; Nothwehr & Yan, 2007; Shilts, Horowitz, & Townsend, 2004), interventions for KAs need to incorporate goal setting activities to increase self-efficacy for healthy eating behaviors. In order to be an effective intervention, nurses should consider providing verbal and written feedback on goals, using a combination of assigned and self-set goals, encouraging frequent goal-setting, focusing goals on behaviors (e.g., eating fruits and vegetables at least once a day) rather than biological factors (e.g., cholesterol level), and approaching KAs through the KA community so that they can share more information with each other in a comfortable environment. Using online tools or applications to monitor their daily food consumption and providing feedback from computer or nutritional experts may be another effective way to assist them set their goals.

Additional information about the discrepancy of the sodium intake was found in this study. Among relapse, calories, salt, and fat subscales for self-efficacy, participants had the highest confidence in their ability to limit sodium, but did not consume healthy amounts of sodium according to the result of Diet Habit Survey. Considering this result,

future intervention programs for KAs need to include relevant information (e.g., how to read food labels including sodium content, tips to reduce sodium intake) about sodium intake in order to address this issue and adjust their sodium intake.

High sodium intake has been gaining a lot of attention and became an important issue in their eating habits in Korea. According to the recent report, the average amount of sodium intake of Koreans was 4878mg/day, which was about 2.4 times more than 2000mg, which is recommended from World Health Organization (WHO) (Ministry of Health and Welfare, 2009). There is a campaign started in 2012 called "Reducing Sodium in your diet" is an ongoing project initiated from both Ministry and Health and Welfare (MHW) and Korea Food and Drug Administration (KFDA). The initial step of the campaign is to inform people about their high intake of sodium and introduce ways to reduce sodium and to provide low salt food items that they can choose when grocery shopping. Korean Americans also need to acknowledge that traditional Korean foods are high in sodium, so that they can be vigilant about sodium intake.

Instrument modification for KAs or Asian Americans could enhance the rigor of eating habits research. While the pilot study demonstrated that it is feasible to use DHS for measuring healthy eating habits of KAs, there was still room to improve. Adding ingredients that are more common for Asians (e.g., tofu, soy sauce, Asian fruits) could add more accuracy in measuring the intake of protein or sodium. Instruments for self-efficacy for healthy eating could also be modified with more Asian-specific information. For example, adding sesame oil instead of cream sauce or adding soy sauce in addition to

salt shaker may be a better fit for Asian Americans. This may increase the validity and reliability of the instruments as well as enhance the accuracy of the data analysis.

Despite growing numbers of KAs and the consequences of poor eating habits on health, research on nutritional health and eating behavior among KAs is the area that had not been studied in depth. Since Asian foods are deeply infused in the recipes and daily eating styles of Americans in the US, providing more information about Korean and Asian food as well as eating styles through the nutritional curriculum in nursing programs would benefit future nurses and KAs as well as other ethnicities in the US.

Recommendations for Future Research

Few studies incorporated personal factors and psychosocial factors into studying healthy eating habits among KAs. Therefore, the findings from this study provide a springboard for the future eating habits research among Asian Americans or other minorities. Further investigation about sodium intake and related knowledge needs to be done to have a better understanding of KA's eating habits. Also, instrument modification or development is needed to better capture their eating habits. For example, eating habits related self-efficacy or barrier scales including Asian staple food items such as rice instead of bread may increase the validity of the instrument. Another way to understand KAs' eating habits would be conducting qualitative studies because there exist plenty of quantitative nutritional data but little information about KAs experience or perception about their eating habits.

One of the main result of this study was that roommate cooking was a significant predictor for healthy eating habits, but only three people answered that they usually eat

foods cooked by their roommate and those were not outliers. This variable needs to be reevaluated to see whether this is a proxy for other factors such as people who lack concern about unhealthy eating habits.

Although none of the personal factors were significant predictors for healthy eating habits, those factors need to be continuously explored in order to identify the impact on eating habits. Also, although only roommate cooking was a significant predictor for healthy eating habits and mother cooking was significantly related to healthy eating habits, other environmental factors like availability of ethnic market or environmental factors not measured in this study need to be explored to better understand KAs eating habits. Since other samples of KAs may not have access to Korean markets, further study including those samples is needed to determine the impact on eating habits.

Last, there is a need to expand the recruitment of participants of the research to more acculturated KAs, especially second and third generation adult KAs. These people are harder to reach than first generation KAs who are more involved in KA communities, so there are few studies with those populations. KAs who are more acculturated may have unique eating habits, which are halfway between Korean and American eating style. Also, participants in this study lived close to Korean markets. There is a need to reach KAs who do not live with their enclaves or to explore whether this proximity is a typical pattern for KAs.

CONCLUSION

This chapter discussed the findings that were reported in chapter 4. The main finding of the study was that self-efficacy was the strongest predictor for healthy eating

habits and some variables from cognitive and affect and environmental factors had moderating effect on personal factors to healthy eating habits. The conceptual framework that was used in this study was discussed. Some findings supported the framework, but there were also unsupported findings, which may be due to the sample (i.e., small sample size or homogeneity of the KAs' characteristics) or possible factors that were not considered in this study. Finally, strengths and limitations of the study, nursing implications, and recommendations for future research were discussed.

Appendices

Appendix A

OFFICE OF RESEARCH SUPPORT

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)

FWA: 2030
Date: 02/26/10

PI(s): Sook Jung Kang — **Department & Mail Code: NURSING SCHOOL D0100**
Gayle M Timmerman — **NURSING SCHOOL D0100**

IRB Approval-IRB Protocol #: 2010-02-0023

EXEMPT DETERMINATION OF RESEARCH PROPOSAL

Title: Healthy Eating Habits among Korean Americans

Approval Period: 02/26/2010 02/25/2013 *(expires 12am [midnight] of this date.)*
This research project has been approved for a period of up to three years.

Approval determination was based on the following Code of Federal Regulations:
45 CFR 46.101(b):

(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 subjects' financial standing, employability, or reputation.

Responsibilities of the Principal Investigator(s):
Research that is determined to be Exempt from IRB review is not Exempt from protection of the human subjects. The following criteria to protect human subjects must be met:

1. The investigator assures that **all investigators and co-investigators** are **trained** in the **ethical principles**, relevant Federal Regulations and institutional policies governing human **subject research;**
2. The investigator assures **that human subjects will voluntarily consent to participate** in the research when appropriate (e.g. surveys, interviews) and will **provide subjects with pertinent information**, e.g. risks and benefits, contact information for investigators and IRB chair, etc.;
3. The investigator assures that **human subjects will be selected equitably**, so that the risks and benefits of the research are justly distributed.
4. The investigator assures that the **IRB will be immediately informed of any information, unanticipated problems** that would increase the risk to the human subjects and cause the category of review to be upgraded to Expedited or Full Review;
5. The investigator assures that the **IRB will be immediately informed of any complaints** from participants regarding their risks and benefits; and
6. The investigator assures that **confidentiality and privacy of the subjects** and the research data will be maintained appropriately to ensure minimal risk to subjects.

The above criteria are specified in the PI Assurance Statement and as the Responsible Investigator, you acknowledged you understood and accepted these conditions with the submission of your protocol. Investigators can refer to the University website www.utexas.edu/irb for specific information on training, voluntary informed consent, privacy, and how to notify the IRB of unanticipated problems.

1. **Closure:** Upon completion of the research project, a closure request must be submitted to the Office of Research Support (ORS).
2. **Unanticipated Problems:** Any unanticipated problems or complaints must be reported to the IRB/ORS immediately. For a description of unanticipated problems, please refer to the ORS webpage: http://www.utexas.edu/research/rsc/humansubjects/policies/section7.html#7.3
3. **Informed Consent:** The informed consent procedures laid out within your research proposal must be followed.
4. **Continuing Review:** If the study will continue beyond the approval period, a continuing review application must be filed.
5. **Amendments:** Amendments do not need to be filed with the ORS if the amendments do not change the risk level of the study (for example: increasing sample size, adding or removing co-PIs, adding or removing research sites, or minor modifications to the research protocol that do not affect the risk level). Changes that alter the level of risk to participants must be requested by submitting an amendment application and revised proposal to the ORS prior to those changes being implemented. For a description of the types of modifications that require an amendment application, please refer to the ORS webpage: http://www.utexas.edu/research/rsc/humansubjects/policies/section6.html#635b , or call 471-8871.

If you have questions, please call your IRB Program Coordinator for consultation.

Thank you for your help in this matter.

Sincerely,

Jody Jensen, Ph.D., IRB Chair

Title: Healthy Eating Habits among Korean Americans
Conducted By: Sook Jung Kang MSN, FNP;
The University of Texas at Austin, School of Nursing, Telephone: 512-786-4858
Gayle M. Timmerman PhD, RN, Associate Professor of the University of Texas at Austin;
Department/Office; Nursing 2.102C, Telephone: 512-471-9087

You are being asked to participate in a research study. This form provides you with information about the study. The person in charge of this research will also describe this study to you and answer all of your questions. Please read the information below and ask questions you might have before deciding whether or not to take part. Your participation is entirely voluntary. You can stop your participation at any time and your refusal will not impact current for future relationships with UT Austin or participating sites. To do so simply tell the researcher you wish to stop participation. The researcher will provide you with a copy of this consent for your records.

The purpose of this study is to examine the relationships among personal factors (age, gender, education, income, body mass index, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among Korean Americans. Fifteen participants will be recruited from the Korean American community in the Texas.

If you agree to be in this study, we will ask you to do the following things:

- Meet either individually or in a focus group with the researcher and sign this consent form.
- Fill out five instruments: (1) Background Information questionnaire, (2) the Suinn-Lew Asian Self-Identity Acculturation Scale, (3) the Barriers to Healthy Eating Scale, (4) the Self-Efficacy for Eating Behaviors Scale, and (5) the Diet Habit Survey.
- Discuss and provide feedback about the 5 questionnaires' instructions and individual items.
- On a separate page, fill out the "Request for additional information" with your address if you wish to have the results of your "Diet Habit Survey" mailed to you with more information.

Total estimated time to participate in this study is approximately 70 minutes.

Risks of being in the study:

- No major risks to participants greater than what is encountered in everyday life are anticipated. No invasive procedures are included in the study and the data obtained should not expose the subject to any psychological, social, or legal risks.
- However, completing this survey may involve risks that are currently unforeseeable.
- If you wish to discuss the information above or any other risks you may experience, you may contact the researcher and ask about the questions listed on the front page of the form.

Benefits of being in the study:

- Increased awareness or improvements in knowledge about your eating habits.
- The results of this study will contribute to the knowledge about how to promote healthy eating.

Compensation:

- There is no compensation for this pilot study

Confidentiality and Privacy Protections:

- Participants will be informed that their data will be kept confidential by the researcher.
- Code numbers will be assigned to each individual and the list linking code numbers to individual names will be kept in a locked file accessible only by the researcher.
- All questionnaires and data will be identified by code numbers.

The records of this study will be stored securely and kept confidential. Authorized persons from The University of Texas at Austin, members of the Institutional Review Board, and (study sponsors, if any) have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. All publications will exclude any information that will make it possible to identify you as a subject. 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.

Contacts and Questions:

If you have any questions about the study please ask now. If you have questions later, want additional information, or wish to withdraw your participation call the researchers conducting the study. Their names, phone numbers, and e-mail addresses are at the top of the first page. If you have questions about your rights as a research participant, complaints, concerns, or questions about the research please contact Jody Jensen, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects at (512) 232-2685 or the Office of Research Support and Compliance at (512) 471-8871 or email: orsc@uts.cc.utexas.edu.

Thank you again for participating in my study.

Sincerely,

Sook Jung Kang, MSN, FNP, Doctoral Candidate
The University of Texas at Austin, School of Nursing

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information and have sufficient information to make a decision about participating in this study. I consent to participate in the study.

Signature:_____ Date: _____

_____ Date: _____
Signature of Person Obtaining Consent

Signature of Investigator:_____ Date: _____

Survey Consent Form

Title: Healthy Eating Habits among Korean Americans
Dear: Research Participant:

I am a nurse practitioner and a doctoral candidate in the School of Nursing at The University of Texas at Austin. I am writing to ask you to participate in my dissertation study by completing the attached survey. Please read the information below and ask any questions you might have before deciding whether or not to take part in.

Your participation is completely voluntary and you can refuse to participate without any penalty. The decision not to participate will not affect your relationship with The University of Texas at Austin. If you don't wish to participate, you can simply throw away the questionnaires. It is very important that I get as many responses as possible so let me thank you in advance for completing the survey. **Total estimated time to participate** in the study is approximately 20-30 minutes.

Faculty Sponsor/Chair: Dr. Gayle Timmerman, PhD, RN

The purpose of the study is to examine the relationships among personal factors (age, gender, education, income, body mass index, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among Korean Americans. Twenty participants will be recruited from the Korean American community in the Texas for this mailed survey.

If you agree to be in this study, we will ask you to do the following things:

- Complete five questionnaires including (1) Background Information Questionnaire, (2) the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA), (3) the Barriers to Healthy Eating Scale (BHES), (4) the Self-Efficacy for Eating Behaviors Scale (SEEBS), and (5) the Diet Habit Survey (DHS).
- Mail completed surveys back in the enclosed addressed, stamped envelope.
- On a separate page, fill out the "Request for additional information" with your address if you wish to have the results of your "Diet Habit Survey" mailed to you with more information.

Risks of being in the study:

- No major risks to participants greater than what is encountered in everyday life are anticipated. No invasive procedures are included in the study and the data obtained should not expose the subject to any psychological, social, or legal risks.
- However, completing this survey may involve risks that are currently unforeseeable.
- If you wish to discuss the information above or any other risks you may experience, you may contact the researcher and ask about the questions listed on the front page of the form.

Benefits of being in the study:

- Increased awareness or improvements in knowledge about your eating habits.

- The results of this study will contribute to the knowledge about how to promote people to eat healthy.

Compensation: There is no compensation available for completing this study.

Confidentiality and Privacy Protections:

- Participants will be informed that their data will be kept confidential by the researcher.
- Code numbers will be assigned to each individual and the list linking code numbers to individual names will be kept in a locked file accessible only by the researcher.
- All questionnaires and data will be identified by code numbers.

Contacts and Questions

If you have any questions about the study, please contact Sook Jung Kang, MSN, FNP by 512-786-4858 or at the email sookjunga@mail.utexas.edu.If you have any questions about your rights as a research participant, please contact Jody Jenson, PhD, Chair, The University of Texas at Austin, and Institutional Review Board for the Protection of Human Subjects at 512-232-4383.

Your survey responses are greatly appreciated.
Thank you again for participating in my study.

Sincerely,

Sook Jung Kang, MSN, FNP, Doctoral Candidate
The University of Texas at Austin, School of Nursing

Telephone Text for Recruitment

My name is Sook Jung Kang, and I am a doctoral student at The University of Texas at Austin, School of Nursing. I am doing research for my dissertation about "Healthy Eating Habits among Korean Americans." This study will examine how various factors predict Korean Americans' healthy eating behavior. Information gained from this study could be used to promote healthy eating habits not only in Korean Americans but also in other Asian Americans. Participation is completely voluntary. You may stop participating at any time.

(Next paragraph will be different depending on the recruiting group.)

For Group 1 (mailed survey)

If you are interested in participating, I will ask you some questions to see if you meet the criteria for being in the study. If you do, then I will briefly explain the study. You can then decide whether you would like to participate or not. (Callers who are not interested or do not meet the inclusion criteria will be thanked for responding to the advertisement.)

1. Are you over 18 years old?
   (If yes, then go to the next question.)
2. Are you Korean American?
   (If yes, then go to the next question.)
3. Have you lived in the United States more than five years?
   (If yes, then go to the next question.)
4. Are you comfortable in reading and speaking English?
   (If yes, then go to the next question.)
5. Do you have any health conditions, like diabetes, that affect your eating habits?
   (If no, then go to the next question.)
6. If female, are you currently pregnant or breastfeeding?
   (If no, go to the next section.)

You have met the criteria for participating in the study. However, your participation in the study is completely voluntary. If you agree to participate in the study, we will send the survey packet by mail.

The purpose of this study is to examine the relationships among personal factors (such as age, gender, education, income, body mass index, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among Korean Americans. Twenty participants will be recruited from a Korean American community in Texas for this mailed survey study. The survey will take approximately 20 to 30 minutes to complete. If you participate and wish to receive your results on the Diet Habit Survey along with

a goal sheets and tips for low-fat eating after completing the survey, you can fill out the last page indicating that you request this additional information and it will be mailed to you. Completed surveys will be mailed back in the preaddressed, stamped envelope provided in the packet. You will be given a code number, and your name will not be on any of the surveys collected. This way the information that you provide will be confidential.

Would you be interested in participating in this study? (If yes, ask for mailing address and best phone number for contact.)

For Group 2 (survey administered in person)

If you are interested in participating, I will ask you some questions to see if you meet the criteria for being in the study. If you meet the criteria for the study, then I will briefly explain about the study. You can decide whether you would like to participate or not. (Callers who are not interested or do not meet the inclusion criteria will be thanked for responding to the advertisement.)

(Ask the same four screening questions as above with Group 1.)

You have met the criteria for participating in the study. Your participation in the study is completely voluntary.

The purpose of this study is to examine the relationships among personal factors (such as age, gender, education, income, body mass index, and acculturation level), barriers to healthy eating, healthy eating self-efficacy, environmental factors, and healthy eating habits among Korean Americans. Fifteen participants will be recruited from a Korean American community in Texas. The group meeting will be composed of two parts. For the first 40 minutes, the survey packet will be provided and you will complete four surveys. After all participants have completed the surveys, you will be asked during the group meeting to identify confusing or difficult questions in each of the surveys; you will also be asked about the clarity of the instruments' instructions. This question period will take approximately 40 minutes. If you wish to receive your results on your Diet Habit Survey along with a goal sheets and tips for low-fat eating after completing the survey, you can mark on the last page that you request this additional information and it will be mailed to you. You will be given a code number, and your name will not be on any of the information collected. This way the information that you provide will be confidential.

Would you be interested in participating in this study? (If yes, ask preferred time, date, and place.)

Appendix B

Background Information

1. Date of Birth: ___/___/_____

2. Gender : __(1) Female __ (2) Male

3. Highest level of education completed (check one):
   __(1) Less than High School __(2) High School Graduate
   __(3) Some College (at least one year) __(4) Baccalaureate Degree
   __(5) Master's, Doctorate, or Professional Degree

4. Height _____ cm OR _____ ft and _____ inches
   Weight _____Kg OR _____ lb

5. What is your annual family income (check one)?
   __(1) Less than $20,000 __(2) $20,001 - $30,000
   __(3) $30,001 - $40,000 __(4) $40,001 - $50,000
   __(5) $50,001 - $75,000 __(6) $75,001 - $100,000
   __(7) More than $100,000

6. What is your religious preference?
   __(0) None __(1) Protestant
   __(2) Catholic __(3) Buddhism
   __(4) Other _____

7. Where were you born?
   __(1) United States
   __(2) Korea __(3) Other _____

8. Did you attend at least one year of school (elementary, middle, or high school) in the US?

__(0) No __(1) Yes

9. Is there a Korean market to buy Korean food or ingredients in your city?

__(0) No (Go to Item 10) __(1) Yes

If yes, how long does it take for you to go to the Korean market by car?

_____minutes

10. How many people do you live with? (except you) _____ people

11. Who primarily prepares and cooks food? (check one)

__(1) yourself __(2) Roommate

__(3) Spouse __(4) Children

__(5) Mother

__(6) Other _____

(If not answered "(1) yourself" in item 11)

12. Is the primary cook from the above question Korean or Korean American?

__(0) No __(1) Yes

If yes, how long did he/she stay in the US? _____ years

13. Who primarily does the grocery shopping?

__(1) yourself __(2) Roommate

__(3) Spouse __(4) Children

__(5) Mother

__(6) Other _____

14. Have you been diagnosed with any of the following condition? (Please circle)

(High blood pressure, Diabetes, Kidney disease, Stroke, Heart disease, Liver disease)

Other _____

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

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

16. How often do you eat Korean food?

_____ times per week

17. When grocery shopping, how often do you choose low salt items

__(0) Never __(1) Sometimes

__(2) Often __(3) Always

18. What are your barriers to eating Korean food?

Please describe,

_____

19. What are your barriers to eating healthy?

Please describe,

_____

20. Do you consider Korean food healthy as compared to other foods in the US?

If yes, please describe the reason why you think so.

_____

_____

21. Is there anything else you would like to tell us about your eating habits as a Korean American?

_____

_____

_____

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. Which identification does (did) your mother use?
    1. Oriental
    2. Asian
    3. Asian-American
    4. Chinese-American, Japanese-American, Korean-American, etc.
    5. American

5. Which identification does (did) your father use?
    1. Oriental
    2. Asian
    3. Asian-American
    4. Chinese-American, Japanese-American, Korean-American, etc.
    5. American

6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?
   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

7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?
   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

8. 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

9. 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

10. 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

11. 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

12. 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.

13. 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

14. What contact have you had with Asia?
    1. Raised one year or more in Asia
    2. Lived for less than one year in Asia
    3. Occasional visits to Asia
    4. Occasional communications (letters, phone calls, etc.) with people in Asia
    5. No exposure or communications with people in Asia

15. 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

16. 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

17. 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?

18. 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?

19. If you consider yourself a member of the Asian group, 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

20. How would you rate yourself?
    1. Very Asian
    2. Mostly Asian
    3. Bicultural
    4. Mostly Westernized
    5. Very Westernized

21. 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

22. Rate yourself on how much you believe in Asian values (e.g., about marriage, families, education, work):

(do not believe)1 2 3 4 5(strongly believe)

23. Rate yourself on how much you believe in American (Western) values:

(do not believe)1 2 3 4 5(strongly believe)

24. Rate yourself on how well you fit when with other Asians of the same ethnicity:

(do not fit)1 2 3 4 5(fit very well)

25. Rate yourself on how well you fit when with other Americans who are non-Asian (Westerners):

(do not fit)1 2 3 4 5(fit very well)

26. There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself?

1. I consider myself basically an Asian person. Even though I live and work in America, I still view myself basically as an Asian person.
2. I consider myself basically as an American. Even though I have an Asian background and characteristics, I still view myself basically as an American.
3. I consider myself as an Asian-American, although deep down I always know I am an Asian.
4. I consider myself as an Asian-American, although deep down, I view myself as an American first.
5. I consider myself as an Asian-American. I have both Asian and American characteristics, and I view myself as a blend of both.

BARRIERS TO HEALTHY EATING

Circle the letter of the best answer for each of the following questions.

	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
1. I have to go farther than 2 miles to buy food to eat.	1	2	3	4	5
2. I have to go farther than 2 miles to buy fresh fruits and vegetables.	1	2	3	4	5
3. I don't buy milk because it costs too much.	1	2	3	4	5
4. I don't buy meat because it costs too much.	1	2	3	4	5
5. I don't buy fruits and vegetables because they cost too much.	1	2	3	4	5
6. I know how to cook meals with vegetables.	1	2	3	4	5
7. I know how to cook meals with meat.	1	2	3	4	5
8. I know how to cook healthy meals.	1	2	3	4	5
9. The stove works well where I live.	1	2	3	4	5
10. The refrigerator works well where I live.	1	2	3	4	5
11. I have the necessary kitchen tools to cook healthy meals.	1	2	3	4	5
12. I like to eat meat.	1	2	3	4	5
13. I like to eat vegetables.	1	2	3	4	5
14. I like to eat fruits.	1	2	3	4	5
15. I like to eat bread.	1	2	3	4	5
16. I like to drink water.	1	2	3	4	5

EATING HABITS CONFIDENCE SURVEY

Below is a list of things people might do while trying to change their eating habits. We are mainly interested in salt and fat intake, rather than weight reduction. Whether you are trying to change your eating habits or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months. Please circle one number for each item:

How sure are you that you can do these things?

		I know I cannot		Maybe I can		I know I can	Does not apply
1	Stick to your low fat, low salt foods when you feel depressed, bored, or tense.	1	2	3	4	5	(8)
2	Stick to your low fat, low salt foods when there is high fat, high salt food readily available at a party.	1	2	3	4	5	(8)
3	Stick to your low fat, low salt foods when dining with friends or co-workers.	1	2	3	4	5	(8)
4	Stick to your low fat, low salt foods when the only snack close by is available from a vending machine.	1	2	3	4	5	(8)
5	Stick to your low fat, low salt foods when you are alone, and there is no one to watch you.	1	2	3	4	5	(8)
6	Eat smaller portions at dinner.	1	2	3	4	5	(8)
7	Cook smaller portions so there are no leftovers.	1	2	3	4	5	(8)
8	Eat lunch as your main meal of the day, rather than dinner.	1	2	3	4	5	(8)
9	Eat smaller portions of food at a party.	1	2	3	4	5	(8)
10	Eat salads for lunch.	1	2	3	4	5	(8)
11	Add less salt than the recipe calls for.	1	2	3	4	5	(8)
12	Eat unsalted peanuts, chips, crackers, and pretzels.	1	2	3	4	5	(8)
13	Avoid adding salt at the table.	1	2	3	4	5	(8)
14	Eat unsalted, unbuttered popcorn.	1	2	3	4	5	(8)
15	Keep the salt shaker off the kitchen table.	1	2	3	4	5	(8)
16	Eat meatless (vegetarian) entrees for dinner.	1	2	3	4	5	(8)
17	Substitute low or non-fat milk for whole milk at dinner.	1	2	3	4	5	(8)
18	Cut down on gravies and cream sauce.	1	2	3	4	5	(8)
19	Eat poultry and fish instead of red meat at dinner.	1	2	3	4	5	(8)
20	Avoid ordering red meat (beef, pork, ham, lamb) at restaurants.	1	2	3	4	5	(8)

DIET HABIT SURVEY

✓ Consider your eating habits over **the last month.** You may select more than one choice for a question.

MEAT, FISH AND POULTRY

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

1. Which type of ground meat do you usually eat?

1 Regular hamburger (30% fat)
2 Lean ground beef (25% fat)
3 Extra lean/ground chuck (20% fat)
4 Ground round (15% fat)
5 Super lean (4% - 10% fat), ground sirloin (10% fat), ground turkey breast, ground chicken breast
6 Eat no ground meat

2. Which best describes your typical lunch? "Lunch meat" means ham, bologna, salami, pastrami, etc.

1 Cheeseburger, pizza, typical cheeses, egg dishes (egg salad, quiche, frittata, etc)
2 Sandwich (lunch meat, hamburger, grilled cheese,), meat/chicken entree (plain/fried), regular hot dog
3 Skip lunch or sandwich (tuna, fish, peanut butter, chicken or turkey lunch meat/light mayo, etc), turkey hot dog, vegetarian dishes
4 Tuna sandwich (w/mayo: 1 gm fat or less/Tbsp, Veggie burger (*Garden, Boca*), entree (fish [not fried], small bits of chicken or meat), low-fat yogurt,
5 Salad (low-cal dressing), low-fat vegetarian dishes, hot dog (0-2 gm fat), deli meats/fat free sandwich (w/mayo: 1 gm fat or less/Tbsp), bagel (light cream cheese)
6 Fat free vegetarian dishes, salad (fat free dressing), Veggie dog, Garden Vegan (fat free burger), nonfat yogurt, dry cereal (skim milk), bagel (fat free cream cheese)

3. Circle all of the choices that reflect the entree at your main meal.

1 Cheese (Cheddar, Jack, etc), eggs, organ meats (liver, etc), pizza, vegetarian dishes once a week or more
2 Beef, lamb, pork or ham once a week or more
3 Very lean red meat (top round or flank steak), rabbit, veal, venison or elk once a week or more
4 Chicken, turkey, crab, lobster or shrimp twice a week or more
5 Fish, scallops, oysters, clams, low-fat vegetarian dishes twice a week or more
6 Fat free vegetarian dishes, fat free seafood dishes every day

4. Estimate the number of ounces of meat, cheese, fish *and* poultry you eat in a typical day.

Include all meals and snacks. (To guide you in your estimate (a piece the size of a deck of cards = 3 oz)

1 hot dog	*= 1 ½ oz*	*1 chicken thigh*	*= 2-3 oz*	*1 slice cheese*	*= 1 oz*
4 strips bacon	*= 1 oz*	*½ chicken breast*	*= 3 oz*	*1-inch cube cheese*	*= 1 oz*
1 small burger patty	*= 3-4 oz*	*average T-bone steak*	*= 8 oz*	*meat in sandwiches*	*= 2-3 oz*

1 Eleven or more ounces a day
2 Nine to 10 ounces a day
3 Six to 8 ounces a day
4 Four to 5 ounces a day
5 Up to 1 ounce cheese *or* 3 oz lean meat, poultry, shrimp, crab, lobster *or* 6 oz fish, clams, oysters, scallops a day
6 None or up to 3 ounces shrimp, crab, lobster *or* 6 ounces fish, clams, oysters, scallops a day

5. Which of these have you eaten in the past month?

1 Bacon, sausage
2 Canadian bacon, turkey or chicken sausage
4 Vegetarian sausage (*Morningstar* links or patties, other soy sausage)
6 None

DAIRY PRODUCTS AND EGGS

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

6. Which do you usually use for drinking (don't forget lattes/mochas) or cooking?
(Most lattes/mochas contain whole milk unless you request otherwise).

1 Whole milk
2 Two percent milk
4 One percent milk, buttermilk
5 **None** or skim (nonfat) milk, nondairy beverages (*Edensoy, Rice Dream*, etc) Score_____

7. Which toppings do you use?

1 Sour cream (real or imitation including *IMO*), whipped cream
2 Light/low-fat sour cream, *Cool Whip*, *Reddi-Whip* aerosol dairy
3 *Cool Whip Lite*, regular cottage cheese, whole milk yogurt
4 Low-fat yogurt, low-fat cottage cheese, *Reddi-Whip* aerosol nondairy
5 1% fat cottage cheese, *Cool Whip Free*, soy yogurt
6 **None** or nonfat yogurt, nonfat sour cream, nonfat cottage cheese Score_____

8. Which frozen desserts are you most likely to eat at least once a month?

1 Regular ice cream (5 g to 18 g fat per ½ cup)
2 Light ice cream (4 g fat per 1/ 2 cup)
3 Ice milk, most soft ice cream, frozen yogurt (cream added), *Tofutti*
4 Sherbet, low-fat frozen yogurt, *Soy Delicious*
5 **None** or nonfat frozen yogurt, sorbets, Popsicles Score_____

9. Which kind of cheese do you use?

2 Cheddar, Swiss, Jack, Brie, Feta, Montrachet, Blue, Jarlsberg, whole milk mozzarella, Neufchatel or regular cream cheese, processed cheese (*Velveeta*, American, *Cheese Whiz*), *Kraft Delux Slices*, *Easy Cheese*, Parmesan
5 Part-skim mozzarella, light cream cheese, light Cheddar, light Jack, (*Kraft Light Naturals, Alpine Lace-Lo, Velveeta Light* or other part-skim cheeses), Cabot Vermont Cheddar (50% Light), string cheese
8 Jarlsberg Lite, *Athenos Reduced Fat Feta Cheese*
10 Light part-skim mozzarella, low-fat and light ricotta, Lite-Line, nonfat Parmesan, Cabot Vermont cheddar (75% Light), *Parm Plus*, soy/rice cheese (cheddar, mozzarella)
12 **None** or fat free cheeses (Cheddar, Jack, ricotta, cream, *Healthy Choice*, *Alpine Lace*, etc), soy (Tofu Rella), Almond (cheddar, mozzarella, etc) Score_____

10. Check the type and number of "visible" eggs you eat (scrambled, fried, etc).

1 Six or more whole eggs a week
2 Three to five whole eggs a week
3 One to two whole eggs a week
4 One whole egg a month
5 **None** or egg whites, egg substitute (*Nulaid, Egg Beaters, Scramblers, Second Nature*, etc) Score_____

11. Check the type of eggs usually used in food prepared at home or bought in grocery stores.

1 Whole eggs or mixes containing whole eggs (complete pancake mix, slice-and-bake cookies, etc)
3 Combination of egg whites, egg substitute and whole eggs
5 **None** or egg whites, egg substitute Score_____

TOTAL SCORE (DAIRY PRODUCTS AND EGGS)_____

FATS AND OILS

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

12. Which kinds of fats are used most often to cook your food (vegetables, meats, etc)?

1 Butter, shortening (with animal fat), lard, bacon grease, chicken fat
2 Shortening (with vegetable fat), vegetable oil (cottonseed)
3 Tub or stick margarine (all except canola), vegetable oil (soybean, olive)
4 Vegetable oil (safflower, corn), tub or stick margarine (canola)
5 Vegetable oil (canola)
6 **None** or use nonstick cooking spray

Score_____

13. How much of these "added" fats do you eat in the typical day: peanut butter, margarine, mayonnaise, or salad dressing (including those made with olive oil)? *Do not count fat free products.*

		Examples of amounts people often use:
1	Ten teaspoons or more	***on toast:*** *2 tsp margarine*
2	Eight to 9 teaspoons	***on salads:*** *12 tsp salad dressing*
3	Six to 7 teaspoons	***on vegetables:*** *3 tsp margarine*
4	Four to 5 teaspoons	***on sandwiches:*** *6 tsp mayonnaise, 2 tsp margarine*
5	Three teaspoons	***on potatoes:*** *3 tsp margarine*
6	**None**	***on pasta, rice:*** *3 tsp margarine, oil or 6 tsp pesto*

Score_____

14. How often do you eat potato chips, corn or tortilla chips, fried chicken, fish sticks, French fries, doughnuts, other fried foods, croissants or Danish pastries?
Do not count fat free products

1 Two or more times a day
2 Once a day
3 Two to 4 times a week
4 Once a week
5 Less than twice a month
6 **Never**

Score_____

15. Which best describes the amount of margarine, butter, peanut butter, mayonnaise or cream cheese that you put on breads, muffins, bagels, etc? *Do not count fat free products*

1 Average
2 Lightly spread (can see the bread through it)
4 "Scrape" (can barely see the spread)
5 **None**

Score_____

16. Which kind of salad dressings do you use?

1 Real mayonnaise
2 *Miracle Whip*, light mayo, Caesar, Thousand Island dressing
3 *Best Food's Low-Fat Mayo* (1gm fat/Tbs), Ranch, French, Blue Cheese or Roquefort, vinegar and oil, Italian, Russian, low-fat mayonnaise dressing, *Miracle Whip Light* dressing and Italian dressings
4 Ranch Dressing (mix and light mayo)
5 Low-cal salad dressing, Ranch Dressing (mix and low-fat yogurt)
6 **Use no salad dressing** or fat free mayonnaise, *Miracle Whip* fat free, fat free salad dressings, Ranch dressing (mix and nonfat dairy or yogurt/sour cream), vinegar, lemon juice

Score_____

TOTAL SCORE (FATS AND OILS)_____

SWEETS AND SNACKS

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

17. How often do you eat desserts or baked goods (sweet rolls, doughnuts, muffins, scones, cookies, cakes)? ***Do not count fat free versions***

1 Once a day
2 Five to 6 times a week
3 Three to 4 times a week
4 Two times a week
5 One time a week or less
6 **Never**

Score_____

18. Which of the following desserts or snacks have you eaten in the last month?

1 Croissants, cheesecake, typical cakes with frosting
2 Pies, cookies, cupcakes, muffins, scones, frosted doughnuts
3 Granola bars (*Nature Valley, Quaker Chewy*)
4 Low-fat muffins, desserts made using low-fat recipes, low-fat cookies (fig bars, ginger snaps, *Snackwell's*), low-fat granola bars (*Power Bar, Quaker Chewy low-fat*)
5 Fat free desserts including angel food cake, fat free cookies
6 **Never eat baked goods listed above** or eat fruit for dessert

Score_____

19. Which of the following snacks have you eaten in the last month?

1 Chocolate, commercial popcorn, *Poppy Cock* popcorn, caramel corn
2 Nuts, potato chips, corn chips, *Doritos* chips, microwave popcorn, homemade popcorn w/butter, *Cracker Jack*, French fries, peanut butter, party/snack crackers (*Ritz*)
4 Tortilla chips, baked potato chips, pretzels, light microwave popcorn, lightly buttered popcorn (1 tsp margarine for 3 cups popcorn), low-fat crackers (soda, graham), *Toby's Tofu Pate Original*
5 Baked tortilla chips, homemade popcorn w/no fat, fat free soda crackers and other fat free crackers, *Toby's Tofu Pate Lite*
6 **Do not eat snacks** or eat fruits and vegetables as snacks

Score_____

TOTAL SCORE (SWEETS AND SNACKS)_____

GRAINS, BEANS, FRUITS AND VEGETABLES

Consider your eating habits during the last month. For this part of the quiz, list the number of servings of the following foods you eat each day or week, as specified for the question.

20. How many pieces of fruit or cups of fruit juice do you consume a day? (not "fruit-flavored" drinks)

_____ cups or pieces Score (cups x 5)_____

21. How many cups of vegetables do you eat a day (tossed salad, cooked vegetables, soups, casseroles, etc)? (A typical serving size for tossed salad is 1 to 1 1/2 cups)

_____ cups Score (cups x 5)_____

22. How many cups of legumes do you eat a week (refried beans, split peas, white beans, black beans, blackeye peas, lentils, chili, etc)?

_____ cups Score (cups x 5)_____

23. List the number of servings of the following you ate last week. (A typical cereal bowl holds 1 1/2 to 2 cups; people typically eat 9 to 12 cups of popcorn).

	Amount eaten LAST WEEK
cooked cereal	_____ bowls/week
ready-to-eat cereal	_____ bowls/week
English muffin	_____ #/week
hamburger bun	_____ #/week
bagel (plain or flavored)	_____ #/week
Pita or pocket bread	_____ #/week
eight-inch tortilla	_____ #/week
plain popcorn (4 cups/serving)	_____ servings/week (1 microwave bag holds 10 ½ cups)
fat free or low-fat muffin	_____ muffins/week
cornbread	_____ pieces/week
Total_____	Score (svgs x 1.2)_____

	Amount eaten LAST WEEK
bread or toast	_____ slices/week
dinner or hard roll	_____ rolls/week
French/Sourdough bread	_____ slices/week
four-inch pancake	_____ pancakes/week
low-fat crackers such as soda, graham, etc (8/serving)	_____ servings/week
regular sized rice cakes (3/serving)	_____ servings/week
mini sized rice cakes (8/serving)	_____ servings/week
pretzels (1 cup or 1 large soft)	_____ cups or #/week
Total_____	Score (svgs x 0.7)_____

24. How many servings of grains and potatoes did you eat last week? Be sure to count these foods when they are in a mixed dish (casserole, burrito, etc). This includes breakfast, lunch and dinner.

	Number of servings eaten LAST WEEK	
macaroni, spaghetti and other pastas	_____ cups/week	
mashed potato	_____ cups/week	
baked potato	_____ large potato/week	
rice, corn, bulgur, barley, couscous, other grains	_____ cups/week	Score_____

Score: (cups macaroni, etc x 1.5) + (cups mashed potato x 1.5) + (number baked potatoes x 2) + (cups rice, corn, etc x 2)

TOTAL SCORE (GRAINS, BEANS, FRUITS AND VEGETABLES)_____

BEVERAGES

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

25. Which of the following reflects your habits regarding alcoholic beverages?

1 drink = *12 ounces beer*
1 1/2 ounces whiskey, gin, rum, etc
4 ounces wine
1 ounce liqueur

1 One or more drinks a day
2 Four to 6 drinks a week
3 Three drinks a week
4 One to 2 drinks a week
5 One to 3 drinks a month
6 **Do not drink alcoholic beverages** Score_____

26. Which of the following reflects your habits regarding soda pop, sweetened seltzers, sports drinks, fruit punch, etc? ***Do not count sugar free (diet) drinks***

1 can = 12 ounces
Big Gulp = 32 ounces
1 Liter = 33 ounces
2 Liter = 67 ounces

1 More than 48 ounces a week
2 33-48 ounces a week
3 25-32 ounces a week
4 12-24 ounces a week
5 **None** or less than 12 ounces a week Score_____

27. How much coffee do you drink? This includes espressos, lattes, mochas, etc.

Guidelines for Espresso Drinks
"Short" = 8-10 ounces
Small ("Tall") = 12 ounces
Medium ("Grande") = 16 ounces
Large ("Venti") = 20 ounces

1 More than 40 ounces (more than 5 cups) a day
3 25-40 ounces (4 to 5 cups) a day
4 6-24 ounces (1 to 3 cups) a day
5 **None** or less than (1 cup) a day Score_____

TOTAL SCORE (BEVERAGES)_____

SALT

Consider your eating habits during the last month. **For each question, circle all numbers that apply.**

28. Which type of "salt" do you normally use?

1 Regular salt, sea salt, flavoring salts (seasoned salt, garlic salt, onion salt, celery salt, lemon pepper, etc), regular soy sauce
3 Combination of regular and *Lite Salt*
4 *Lite Salt*, lower-sodium soy sauce, reduced-sodium flavoring salts
5 **None** or salt substitute (100% potassium chloride), Salt-free products (*Mrs. Dash*, etc) Score_____

29. How often do you add salt to your food at the table?

1 Always
2 Frequently
4 Occasionally
5 **Never** Score_____

30. Which type of salt and how much do you use in cooking potatoes, rice, pasta, vegetables, meat, casseroles and soups?

1 Regular salt (typical amount) or eat in restaurants 4 or more times a week
2 Regular salt (1/2 typical amount) or *Lite Salt* (typical amount)
4 *Lite Salt* (1/2 typical amount)
5 **None** or salt-free products (*Mrs. Dash*, etc), salt substitute Score_____

31. Which type of cereals do you use?

1 Typical dry cereals (sweetened or unsweetened) or cereals cooked with regular salt (typical amount)
3 Combination of typical dry cereals and salt-free dry cereals (Shredded Wheat, Puffed Wheat, Puffed Rice) *or* cereals cooked with regular salt (1/2 typical amount) or *Lite Salt* (typical amount)
5 **Do not eat cereal** or eat salt-free dry cereals (Shredded Wheat, Puffed Wheat, Puffed Rice, etc) *or* cereals cooked without salt

Score_____

32. How often do you use typical canned, bottled, or packaged foods:

salsa	salad dressings	boxed noodle entrees
Picante sauce	soups (chicken broth)	frozen entrees
BBQ sauce	chili	canned beans
ketchup	cured meats (lunch meat)	canned vegetables

1 More than 15 times a week or eat in restaurant 4 or more times a week
2 Ten to 14 times a week
3 Six to 9 times a week
5 Five times a week or less Score_____

TOTAL SCORE (SALT)_____

RESTAURANTS AND RECIPES

Consider your eating habits during the last month.
For each question, circle all numbers or check the choices that apply.

33. How often do you eat breakfast at a restaurant or cafeteria (this includes coffee shops)?

1 More than twice a week
2 Once or twice a week
3 Once a week if you eat low-fat (unbuttered toast or English muffin, oatmeal)
5 Less than once a month
6 **Never**

Score_____

34. How often do you eat lunch at a restaurant or cafeteria or eat "take out"?

1 Daily
2 Five days a week
3 Two to 4 days a week
4 One day a week
5 Less than once a month
6 **Never**

Score_____

35. How often do you eat dinner at a restaurant or cafeteria or eat "take out"?

1 More than 3 times a week
2 Two to 3 times a week
3 Once a week
4 Once or twice a month
5 Less than once a month
6 **Never**

Score_____

36. Check the choices you make when eating in restaurants or cafeterias.

___Select restaurants that offer low-fat choices and order those choices
___Order toast, muffins, cereal, pancakes, waffles for breakfast
___Order soup (not cream), salad or other meatless, cheeseless entrees for lunch
___Order vegetarian pizzas with half the cheese
___Avoid cheese, eggs, bacon on salads and avoid potato and macaroni salads
___Put garbanzo or kidney beans on salad at the salad bar
___Use a very small amount of salad dressing
___Order a fish, shellfish, chicken or lean red meat entree (but not fried)
___Use no more than 1 pat of margarine at any meal
___Order fruit, sorbet, sherbet, frozen yogurt or skip dessert

SCORE: (0-1 checks = 1; 2-3 checks = 2; 4-5 checks = 3; 6-7 checks = 4;
8-10 checks; or eat out less than once a month = 5)

Score_____

37. How often do you eat foods made using low-fat recipes or cook low-fat without recipes?

1 Once a month or less
2 One to 2 times a week
3 Three to 4 times a week
4 Five to 6 times a week
5 Everyday

Score_____

TOTAL SCORE (RESTAURANTS AND RECIPES)_____

SEAFOOD

Consider your eating habits during the last month. **For each question, circle all items that apply.**

38. How often do you eat fish? (tuna, snapper, perch, sole, halibut, cod, salmon, shrimp/prawns, crab, lobster, scallops, clams, oysters, sardines, etc).

1 **Do not eat fish** *or* eat fish less than once a month
2 One to 3 times a month
3 Once a week
4 Two times a week
5 Three or more times a week *or* **eat vegetarian with no added fat**

Score_____

39. Which fish (fresh, frozen or canned) have you eaten in the last month?

1 **Ate no fish in the last month**
2 Scallops, clams, mussels, snowcrab (surimi)
3 White fish (perch, cod, sole, halibut, snapper), oyster, lobster, tuna, crab
4 Trout, steelhead, herring, catfish, salmon (Atlantic, pink)
5 Salmon (Coho, red, Chinook), mackerel, sardines, shrimp/prawns, squid *or* **eat vegetarian with no added fat**

Score_____

TOTAL SCORE (FISH)_____

SCORING THE DIET HABIT SURVEY FOR 2000 CALORIES
WOMEN AND CHILDREN

Place the score for each category in the appropriate blank space.

Circle the scores for each category. Identify the categories that are closer to the goals and those that are further from the goals.

The TOTAL SCORE will give you an idea of the person's overall eating style.

The nutrients listed below the total scores provide a good estimate of the patient's diet composition.

Finally, there is space for you or your patient to list at least three ways he/she can change eating habits towards the goals.

	Current U.S. Diet 37% fat	Lower fat diet 30% fat	25% fat	20% fat	10% fat	Patient's Score
Meat, Fish and Poultry	<13	13-15	16-21	22-29	30	_____
Dairy Products and Eggs	<22	22-27	28-32	33-37	38	_____
Fats and Oils	<15	15-18	19-22	23-28	29	_____
Sweets and Snacks	<11	11	12-13	14-16	17-18	_____
Grains, Beans, Fruits, and Vegetables	<45	45-65	66-83	84-104	105-136	_____
Beverages	<9	9-11	12	13-16	13-16	_____
Salt	<14	14-17	18-21	22-25	22-25	_____
Restaurants and Recipes	<13	13-16	17-19	20-25	26-28	_____
Seafood	<5	5	6-7	8-10	8-10	_____
TOTAL	<147	147-190	191-235	236-287	288-330	

These total scores correspond to a diet with the following nutrient composition:

Cholesterol, mg/day	400	<300	<200	<100	<75	_____
Saturated fat, % calories	13	10	8	5	2	_____
Cholesterol-Saturated Fat Index/day	49	37	28	16	8	_____
Fat, % calories	37	30	25	20	10	_____
Carbohydrate, % calories	48	55	60	65	75	_____
Protein, % calories	15	15	15	15	15	_____
Sodium, mg/day	>2875	2875	2300	1725	1725	_____
Potassium, mg/day	<2535	2535	3900	3900	3900	_____

< means "less than"
> means "more than"

Suggestions for changing eating habits toward your goals:

SCORING OF THE DIET HABIT SURVEY FOR 2800 CALORIES
MEN AND TEENS

Place the score for each category in the appropriate blank space.

Circle the scores for each category. Identify the categories that are closer to the goals and those that are further from the goals.

The TOTAL SCORE will give you an idea of the person's overall eating style.

The nutrients listed below the total scores provide a good estimate of the patient's diet composition.

Finally, there is space for you or your patient to list at least three ways he/she can change eating habits towards the goals.

	Current U.S. Diet 37% fat	Lower Fat Diet 30% fat	25% fat	20% fat	10% fat	Patient's Score
Meat, Fish and Poultry	<12	12-14	15-20	21-29	30	_____
Dairy Products and Eggs	<22	22-28	29-32	33-37	38	_____
Fats and Oils	<14	14-17	18-21	22-28	29	_____
Sweets and Snacks	<11	11	12-13	14-16	17-18	_____
Grains, Beans, Fruits, and Vegetables	<70	70-96	97-l27	l28-l66	167-195	_____
Beverages	<9	9-11	12	13-16	13-16	_____
Salt	<14	14-17	18-21	22-25	22-25	_____
Restaurants and Recipes	<13	13-16	17-19	20-25	26-28	_____
Seafood	<5	5	6-7	8-10	8-10	_____
TOTAL	<170	170-220	221-277	278-349	350-389	

These total scores correspond to a diet with the following nutrient composition:

Cholesterol, mg/day	500	<350	<220	<140	<100	_____
Saturated fat, % calories	13	10	8	5	2	_____
Cholesterol-Saturated Fat Index/day	67	49	36	23	10	_____
Fat, % calories	37	30	25	20	10	_____
Carbohydrate, % calories	48	55	60	65	75	_____
Protein, % calories	15	15	15	15	15	_____
Sodium, mg/day	>4025	4025	3220	2415	2415	_____
Potassium, mg/day	<3549	3549	5460	5460	5460	_____

< means "less than"
> means "more than"

Suggestions for changing eating habits toward your goals:

Request for Additional Information

Thank you very much for your time and support.

Do you wish to receive the additional information (your personal results on the Diet Habit Survey along with tips for low-fat eating and goal sheet for individuals)? If yes, that information will be mailed to you at the address you provide below.

_____Yes _____No

If yes, how do you want to receive your information?

By Email _____ By Mail _____

Also, **compensation worth $5 will be provided.** Which one do you prefer?

__ Starbucks gift card (by mail)

__ Amazon gift card (by mail or by email) – please circle preferred method

Please fill out the blank, so that the additional info about the result or compensation can be delivered appropriately.

Name: _____

Email: _____

Address: _____

City/State/Zip_____

Phone: _____

Appendix C

From: Richard Suinn [suinn@lamar.colostate.edu]
Sent: Tuesday, January 05, 2010 5:58 PM
To: Sook Jung Kang
Title: Re: Permission to use the instrument

Here is what you need.

From: Sook Jung Kang [sookjunga@mail.utexas.edu]
Sent: Tuesday, January 05, 2010 5:09 PM
To: 'Sallis James F. (sallis@mail.sdsu.edu)'
Title: Permission to use the instrument

Dear: Dr. Sallis

I would like to get your permission to use your instrument <Self-Efficacy for Diet Behaviors> for the pilot study and doctoral dissertation.
I think it is in the public domain and can be used freely, but I would like to make sure with you for the future record.

My topic is “Healthy Eating among Korean Americans”.

Thank you for your consideration. I look forward to your response.

Sook Jung Kang, MS, FNP
The University of Texas at Austin, School of Nursing
1700 Red River, Austin, Texas, 78701

From: Fowles, Dileen R[efowles@mail.nur.utexas.edu]
Sent: Tuesday, January 05, 2010 8:07 PM
To: Sook Jung Kang
Title: RE: Permission to use the instrument
Attachment: BARRIERS TO HEALTHY EATING SCALE.doc

Of course, Sook. I’m attaching the instrument

From: Sook Jung Kang [mailto:sookjunga@mail.utexas.edu]
Sent: Tuesday, January 05, 2010 8:06 PM
To: Fowles, Eileen R
Subject: Permission to use the instrument

Dear: Dr. Fowles

I would like to get your permission to use your instrument <Barriers to Healthy Eating> for the pilot study and doctoral dissertation.
If you could allow me to use the instrument, sending an electronic copy of the instrument will be very helpful.

Thank you for your consideration. I look forward to your response.

Sook Jung Kang, MS, FNP
The University of Texas at Austin, School of Nursing
1700 Red River, Austin, Texas, 78701

From: Jim Sallis [sallis@mail.sdsu.edu]
Sent: Tuesday, January 05, 2010 7:45 PM
To: 'Sook Jung Kang'
Title: RE: Permission to use the instrument

Hello

Thanks for your inquiry. You have my permission to use the self-efficacy scale mentioned, as well as any other measure posted on my website. Best wishes for a successful study.

Jim Sallis

James F. Sallis, Ph.D.
Professor of Psychology, San Diego State Univ
Director, Active Living Research. www.activelivingresearch.org
3900 Fifth Avenue, Suite 310, San Diego, CA 92103
ph: 619-260-5535; fax 619-260-1510; sallis@mail.sdsu.eduwww.drjamessallis.sdsu.edu

From: Sook Jung Kang [mailto:sookjunga@mail.utexas.edu]
Sent: Tuesday, January 05, 2010 3:09 PM
To: 'Sallis James F.'
Subject: Permission to use the instrument

Dear: Dr. Sallis

I would like to get your permission to use your instrument <Self-Efficacy for Diet Behaviors> for the pilot study and doctoral dissertation.
I think it is in the public domain and can be used freely, but I would like to make sure with you for the future record.
My topic is "Healthy Eating among Korean Americans".
Thank you for your consideration. I look forward to your response.

Sook Jung Kang, MS, FNP
The University of Texas at Austin, School of Nursing
1700 Red River, Austin, Texas, 78701

From: Sonja Connor [connors@ohsu.edu]
Sent: Thursday, January 07, 2010 5:17 PM
To: Sook Jung Kang
Title: RE: Diet habit survey

January 6, 2010
Dear Sook Jung Kang,
You have permission to use the Diet Habit Survey for the pilot study and doctoral dissertation.
Sincerely,

Sonja L. Connor, MS, RD, LD
Research Associate Professor
Department of Medicine
Oregon Health & Science University

Appendix D

Dear:

A few weeks ago, we sent you a questionnaire for *Healthy Eating Habits among Korean Americans*. However we have not received your completed questionnaires yet. As a Korean American who is living in the US, your perspective is very important and we hope to hear from you.

If you haven't received the survey booklet or it was lost, we can send another copy. If you have any questions, or think that you have already mailed in your questionnaire, please contact me by: 512) ###-#### or Email: sookjung@utexas.edu

Cordially,

Sook Jung Kang, MSN, FNP

The University of Texas at Austin, School of Nursing

1700 Red River Austin, TX 78701

References

Alexander, R. A. (1988). Group homogeneity, range restriction, and range enhancement effects on correlations. *Personnel Psychology, 41*(4), 773-777.

Ambrosi-Randic, N., & Bulian, A. P. (2007). Self-reported versus measured weight and height by adolescent girls: a Croatian sample. *Perceptual and Motor Skills, 104*(1), 79-82.

Ammerman, A. S., Lindquist, C. H., Lohr, K. N., & Hersey, J. (2002). The efficacy of behavioral interventions to modify dietary fat and fruit and vegetable intake: a review of the evidence. *Preventive Medicine, 35*(1), 25-41.

Arcia, E., Skinner, M., Bailey, D., & Correa, V. (2007). Models of acculturation and health behaviors among Latino immigrants to the U.S. *Social Science & Medicine, 53*(1), 41-53.

Artinian, N. T., Fletcher, G. F., Mozaffarian, D., Kris-Etherton, P., Van Horn, L., Lichtenstein, A. H., . . . Burke, L. E. (2010). Interventions to promote physical activity and dietary lifestyle changes for cardiovascular risk factor reduction in adults: a scientific statement from the American Heart Association. *Circulation, 122*(4), 406-441. doi: 10.1161/CIR.0b013e3181e8edf1

Asian American Institute (2010). *Access to health care for vulnerable populations: Korean American seniors in Metropolitan Chicago*. Retrieved from http://aaichicago.org/images/LegalAdvocacy/languageaccessreport-korean.pdf

Atkinson, D. R., & Gim, R. H. (1989). Asian-American cultural-identity and attitudes toward mental-health services. *Journal of Counseling Psychology, 36*(2), 209-212.

Bahk, Y. W., & Ahn, G. S. (1977). Lactose intolerance in the Koreans. *Modern Medicine of Asia, 13*(3), 7-8.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavior change. *Psychological Review, 84*, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122-147.

Bandura, A. (1997). *Self-Efficacy: The exercise of control*. New York, NY: W. H. Freeman.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Bates, L. M., Acevedo-Garcia, D., Alegria, M., & Krieger, N. (2008). Immigration and generational trends in body mass index and obesity in the United States: results of the National Latino and Asian American Survey, 2002-2003. *American Journal of Public Health, 98*(1), 70-77. doi: 10.2105/AJPH.2006.102814

Bennett, J. A. (2000). Mediator and moderator variables in nursing research: conceptual and statistical differences. *Research in Nursing & Health, 23*(5), 415-420.

Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. M. Padilla (Ed.), *Acculturation: Theory, Models and Some New Findings* (pp. 9-25). Boulder, CO: Westview Press.

Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology-an International Review-Psychologie Appliquee-Revue Internationale, 46*(1), 5-34.

Berry, J. W. (2005). Acculturation: Living successfully in two cultures. *International Journal of Intercultural Relations, 29*, 697-712.

Berry, J. W. (2008). Globalisation and acculturation. *International Journal of Intercultural Relations, 32*(4), 328-336. doi: Doi 10.1016/J.Ijintrel.2008.04.001

Block, G. (1982). A review of validations of dietary assessment methods. *American Journal of Epidemiology, 115*(4), 492-505.

Bond, M. L., Jones, M. E., Cason, C., Campbell, P., & Hall, J. (2002). Acculturation effects on health promoting lifestyle behaviors among Hispanic origin pregnant women. *Journal of Multicultural Nursing & Health, 8(2),* 61-68.

Bruening, M., Kubik, M. Y., Kenyon, D., Davey, C., & Story, M. (2010). Perceived barriers mediate the association between self-efficacy and fruit and vegetable consumption among students attending alternative high schools. *Journal of the American Dietetic Association, 110*, 1542-1546.

Brug, J. (2008). Determinants of healthy eating: motivation, abilities and environmental opportunities. *Family Practice, 25 Suppl 1*, i50-55. doi: 10.1093/fampra/cmn063

Caplan, P. (1997). Approaches to food, health and identity. In P. Caplan (Ed), *Food, health and identity* (pp. 18). London, England: Routledge.

Cheigh, H. S., & Park, K. Y. (1994). Biochemical, microbiological, and nutritional aspects of kimchi (Korean fermented vegetable products). *Critical Reviews in Food Science and Nutrition, 34*(2), 175-203. doi: 10.1080/10408399409527656

Chen, C. M., Kuo, S. F., Chou, Y. H., &Chen, H. C. (2007). Postpartum Taiwanese women: their postpartum depression, social support and health-promoting lifestyle profiles. *Journal of Clinical Nursing, 16(8),* 1550-1560. doi: 10.1111/j.1365-2702.2006.01837.x

Chung, S. S. (1995). *Dietary change: food habits of Koreans. Dissertation Abstracts International, 56(06), 251B. (UMI No. 9535903).*

Cohen, J. (1987). *Statistical power analysis for the behavioral sciences.* (Rev. ed.). Hillsdate, NJ.: Lawrence Erlbaum Associates.

Conner, S. L., Gustafson, J. R., Sexton, G., Becker, N., Artaud-Wild, S., & Conner, W. (1992). The Diet Habit Survey: a new method of dietary assessment that related to plasma cholesterol changes. *Journal of the American Dietetic Association, 92*, 41-47.

Cuellar, I., Garris, L., & Jasso, R. (1980). An acculturation scale for Mexican American normal and clinical populations. *Hispanic Journal of Behavioral Sciences, 2*, 199-217.

Cullen, K. W., Baranowski, J., & Smith, S. P. (2001). Using goal setting as a strategy for dietary behavior change *Journal of the American Dietetic Association, 101*(5), 562-566. doi: 10.1016/S0002-8223(01)00140-7

Daggett, L. M., & Rigdon, K. L. (2006). A computer-assisted instructional program for teaching portion size versus serving size. *Journal of Community Health Nursing, 23*(1), 29-35. doi: 10.1207/s15327655jchn2301_3

Danico, M. Y. (2004). *The 1.5 Generation: Becoming Korean American in Hawai'i*. Honolulu, HI: University of Hawai'i Press.

Di Lorio, C. K. (2005). *Measurement in health behavior: Methods for research and evaluation*. San Francisco, CA: Jossey Bass.

Dillman, D. (2007). *Mail and internet surveys: The tailored design method* (3rd ed.). New York, NY: Wiley.

Duffy, M. E. (1993). Determinants of health-promoting lifestyles in older persons. T*he Journal of Nursing Scholarship, 25*(1), 23-28.

Engstrom, J. L., Paterson, S. A., Doherty, A., Trabulsi, M., & Speer, K. L. (2003). Accuracy of the self-reported height and weight in women: An integrative review of the literature. *Journal of Midwifery and Women's Health, 48(5)*, 338-345.

Erdfelder, E., Faul, F. & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, & Computers, 28*, 1-11.

Ezzati, M., Martin, H., Skjold, S., Vander Hoorn, S., & Murray, C. J. (2006). Trends in national and state-level obesity in the USA after correction for self-report bias: analysis of health surveys. *Journal of the Royal Society of Medicine, 99*(5), 250-257. doi: 10.1258/jrsm.99.5.250

Fjeldsoe, B., Neuhaus, M., Winkler, E., & Eakin, E. (2011). Systematic review of maintenance of behavior change following physical activity and dietary intervention. *Health Psychology, 30*(1), 99-109.

Fowles, E. R., & Feucht, J. (2004). Testing the barriers to healthy eating scale. *Western Journal of Nursing Research, 26*(4), 429-443. doi: 10.1177/0193945904263281

Francois, C. A., Connor, S. L., Colewicz, L. O., & Conner, W. E. (2003). Supplementing lactating women with flaxseed oil does not increase docosahexaenoic acid in their milk. *American Journal of Clinical Nutrition, 77*(226-233).

George, J. B. (2010). Health promotion model. In J. B. George (Ed.), *Nursing theories: The base for professional nursing practice* (6th ed., pp. 543-576). Fullerton, CA: Pearson.

Gillman, M. W., Pinto, B. M., Tennstedt, S., Glanz, K., Marcus, B., & Friedman, R. H. (2001). Relationships of physical activity with dietary behaviors among adults. *Preventive Medicine, 32*(3), 295-301.

Gordon, B. H., Kang, M. S., Cho, P., & Sucher, K. P. (2000). Dietary habits and health beliefs of Korean-Americans in the San Francisco Bay Area. *Journal of the American Dietetic Association, 100*(10), 1198-1201. doi: 10.1016/S0002-8223(00)00346-1

Guendelman, S., & Abrams, B. (1995). Dietary-intake among Merican-American women - Generationl differences and a comparison with white non-hispanic women. *American Journal of Public Health, 85*(1), 20-25. doi: 10.2105/AJPH.85.1.20

Heymsfield, S. B., & Heshka, S. (2002). Measurement of total energy stores. In D. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity* (pp. pp. 121-125). New York, NY: The Guilford Press.

Hill, A. J. (2002). Prevalence and demographics of dieting. In C. G. B. Fairbutn, K. D. (Ed.), *Eating disorders and obesity* (pp. 80-83). New York, NY: Guilford Press.

Huber, L. R. B. (2007). Validity of self-reported height and weight in women of reproductive age. *Maternal and Child Health Journal, 11*, 137-144.

Huff, R. M., & Kline, M. V. (1999). *Promoting health in multicultural populations; A handbook for practitioners.* Thousand Oaks, CA: SAGE publication.

Huisman, M. (2009). Imputation of missing network data: Some simple procedures. *Journal of Social Structure, 10*(1), 1-29.

Hulme, P. A., Walker, S. N., Effle, K. J., Jorgensen, L., McGowan, M. G., Nelson, J. D., & Pratt, E. N. (2003). Health-promoting lifestyle behaviors of Spanish-speaking Hispanic adults. *Journal of Transcultural Nursing, 14*(3), 244-254.

Hurh, W. M. (1993). The 1.5 generation: A cornerstone of the Korean American ethnic community In H. Y. Kwon & S. Kim (Eds.), *The emerging generation of Korean-Americans* (pp. pp. 47-79). Seoul, Korea: Kyung Hee University Press.

Hyman, I., Giuruge, S., Makarchuk, M., Cameron, J., & Micevski, V. (2002). Promotion of healthy eating among new immigrant women in Ontario. Canadian Journal of Dietetic Practice and Research, 63, 125-129. *Canadian Journal of Dietetic Practice and Research, 63*(3), 125-129.

Jackson, K. A., & Savaiano, D. A. (2001). Lactose maldigestion, calcium intake and osteoporosis in African-, Asian-, and Hispanic-Americans. *Journal of the American College of Nutrition, 20*(2 Suppl), 198S-207S.

Jackson, S. C., Keel, P. K., & Ho Lee, Y. (2006). Trans-cultural comparison of disordered eating in Korean women. *The International Journal of Eating Disorders, 39*(6), 498-502. doi: 10.1002/eat.20270

Jacobson, B. H., & DeBock, D. H. (2001). Comparison of Body Mass Index by self-reported versus measured height and weight. *Perceptual and Motor Skills, 92*(1), 128-132.

Johnson, R. L. (2005). Gender differences in health-promoting lifestyles of African Americans. *Public Health Nursing, 22*(2), 130-137. doi: 10.1111/j.0737-1209.2005.220206.x

Jung, K. W., Park, S., Kong, H. J., Won, Y. J., Boo, Y. K., Shin, H. R., . . . Lee, J. S. (2010). Cancer statistics in Korea: incidence, mortality and survival in 2006-2007. *Journal of Korean Medical Science, 25*(8), 1113-1121. doi: 10.3346/jkms.2010.25.8.1113

Kahawong, W., Phancharoenworakul, K., Khampalikit, S., Taboonpong, S., & Chittchang, U. (2005). Nutritional health-promoting behavior among women with hyperlipidemia. *Thailand Journal of Nursing Research, 9*, 91-102.

Kalcik, S. (1984). Ethnic foodways in America: symbol and the performance of identity. In L. K. Brown & K. Mussell (Eds.), *Ethnic and regional foodways in the United States* (pp. pp. 37-65). Knoxville, TN: The University of Tennessee Press.

Kang, H. L., & Garey, J. G. (2002). A survey of acculturation of food habits among first generation Koreans in the United States. *Topics in Clinical Nutrition, 17*(3), 31-43.

Keith, T. Z. (2006). *Multiple regression and beyond*. Boston, MA: Allyn and Bacon.

Kim, E. & Wolpin, S. (2008). The Korean American family: Adolescents versus parents acculturation to American culture. *Journal of Cultural Diversity, 15*(3), 108-116.

Kim, H. H., & Pyle, R. E. (2004). An exception to the exception: Second-generation Korean American church participation. *Social Compass, 51*(3), 321-333.

Kim, J., & Chan, M. M. (2004). Acculturation and dietary habits of Korean Americans. *The British Journal of Nutrition, 91*(3), 469-478. doi: 10.1079/BJN20031068

Kim, J., Chan, M. M., & Shore, R. E. (2002). Development and validation of a food frequency questionnaire for Korean Americans. *International Journal of Food Sciences and Nutrition, 53*(2), 129-142.

Kim, K. K., Yu, E. S., Chen, E. H., Cross, N., Kim, J., & Brintnall, R. A. (2000). Nutritional status of Korean Americans: implications for cancer risk. *Oncology Nursing Forum, 27*(10), 1573-1583.

Kim, K. K., Yu, E. S., Liu, W. T., Kim, J., & Kohrs, M. B. (1993). Nutritional status of Chinese-, Korean-, and Japanese-American elderly. *Journal of the American Dietetic Association, 93*(12), 1416-1422.

Kim, M. J., Ahn, Y. H., Chon, C., Bowen, P., & Khan, S. (2005). Health disparities in lifestyle choices among hypertensive Korean Americans, non-Hispanic Whites, and Blacks. *Biological Research for Nursing, 7*(1), 67-74. doi: Doi 10.1177/1099800405276820

Kim, M. J., Lee, S. J., Ahn, Y. H., Bowen, P., & Lee, H. (2007). Dietary acculturation and diet quality of hypertensive Korean Americans. *Journal of Advanced Nursing, 58*(5), 436-445. doi: 10.1111/j.1365-2648.2007.04258.x

Kim, M. J., McLeod, J. H., & Shantizis, C. (1992). Cultural competence for evaluators working with Asian-American communities: some practical considerations. In M. A. Organdi (Ed.), *Cultural competence for evaluators: A guide for alcohol and other drug abuse prevention practitioners working with ethnic/racial communities* (pp. pp.203-260). Rockville, MD: U.S. Government Printing Office.

Korea National Statistical Office (1999). *Korean National Health Interview Survey, Ministry of Health and Welfare, Seoul, Korea. . Annual report on the cause of death statistic, 1999*. Retrieved from http//meta.nso.go.kr/metasearch/metase

arch1.jsp?josa_id=19&juki_id=6351.

Kudo, Y., Falciglia, G. A., & Couch, S. C. (2000). Evolution of meal patterns and food choices of Japanese-American females born in the United States. *European Journal of Clinical Nutrition, 54*(8), 665-670.

Kuo, J., & Porter, K. (1998). Health status of Asian Americans: United States, 1992-94. *Advance Data* (298), 1-16.

Kwon, H. Y., & Kim, S. (1993). Introduction. In H. Y. Kwon & S. Kim (Eds.), *The emerging generation of Korean Americans* (pp. pp. 1-15). North Park College, Seoul, Korea: Kyung Hee University Press.

Latif, H., Watson, K., Nguyen, N., Thompson, D., Baranowski, J., Jago, R., . . . Baranowski, T. (2011). Effects of goal setting on dietary and physical activity changes in the Boy Scout badge projects. *Health Education & Behavior, 38*(5), 521-529. doi: 10.1177/1090198110385774

Lauderdale, D. S., & Rathouz, P. J. (2000). Body mass index in a US national sample of Asian Americans: effects of nativity, years since immigration and socioeconomic status. *International Journal of Obesity, 24*(9), 1188-1194.

Lee, J. K., Park, B. J., Yoo, K. Y., & Ahn, Y. O. (1995). Dietary factors and stomach cancer: a case-control study in Korea. *International Journal of Epidemiology, 24*(1), 33-41.

Lee, M. J., & Popkin, B. M. (2002). The unique aspects of the nutrition transition in South Korean: The retention of healthful elements in their traditional diet. *Public Health Nutrition, 5*, 197-203.

Lee, S. K., Sobal, J., & Frongillo, E. A. (1999). Acculturation and dietary practices among Korean Americans. *Journal of the American Dietetic Association, 99*(9), 1084-1089.

Lee, S. K., Sobal, J., & Frongillo, E. A., Jr. (2000). Acculturation and health in Korean Americans. *Social Science & Medicine, 51*(2), 159-173.

Liao, Y., Tucker, P., Okoro, C. A., Giles, W. H., Mokdad, A. H., & Harris, V. B. (2004). REACH 2010 Surveillance for Health Status in Minority Communities --- United States, 2001--2002. *MMWR. Surveillance summaries : Morbidity and mortality weekly report. Surveillance summaries / CDC, 53*(6), 1-36.

Lim, L. L., Seubsman, S., & Sleigh, A. (2009). Validity of self-reported weight, height, and body mass index among university students in Thailand: Implications for population studies of obesity in developing countries. *Population Health Metrics, 7*, 1-8.

Lynn, L. L., Kang, K. J., & Ludman, E. K. (1999). Korean elderly: Diet, food beliefs, and acculturation. *Journal of Nutrition for the Elderly, 19*(2), 1-13.

Lytle, L. A., Varnell, S., Murray, D. M., Story, M., Perry, C., Birnbaum, A. S., & Kubik, M. Y. (2003). Predicting adolescents' intake of fruits and vegetables. *Journal of Nutrition Education and Behavior, 35*(4), 170-175.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*(1), 83-104.

McAlister, A. L., Perry, C. L., & Parcel, G. S. (2008). How individuals, environments, and health behaviors interact: Social cognitive theory. In K. Glanz, B. K. Rimer & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 169-188). San Francisco, CA: Jossey-Bass.

Min, P. G. (2012). Growth and settlement patterns of Korean Americans, 1990-2010 (Report No. 4): Queens College and the Graduate Center of CUNY.

Min, P. G., & Kim, R. (1999). Struggle for ethnic identity: *narratives by Asian American professionals*. Lanham, MD: Altamira Press.

Ministry of Health and Welfare (2009). Citizen Health and Nutrition Survey Report (Vol. 4). Seoul: Ministry of Health and Welfare.

Munro, B. H. (2005). *Statistical methods for health care research*. Chestnut Hill, MA: Lippincott Williams & Wilkins.

Nardi, P. M. (2003). *Doing survey research: A guide to quantitative methods*. Allyn & Bacon

Nothwehr, F., & Yan, J. (2007). Goal setting frequency and the use of behavioral strategies related to diet and physical activity. *Health Education Research, 22*(4), 532-538.

Noureddine, S., & Stein, K. (2009). Healthy-eater self-schema and dietary intake. *Western Journal of Nursing Research, 31*(2), 201-218. doi: 10.1177/0193945908327157

O'Sullivan, T. A., Ambrosini, G., Beilin, L. J., Mori, T. A., & Oddy, W. H. (2011). Dietary intake and food sources of fatty acids in Australian adolescents. *Nutrition, 27*(2), 153-159. doi: 10.1016/j.nut.2009.11.019

Ogden, C. L., Fryar, C. D., Carroll, M. D., & Flegal, K. M. (2004). Mean body weight, height, and body mass index, United States 1960-2002. *Advance Data* (347), 1-17.

Okosun, I. S., Bhatt, D. V., Boltri, J. M., & Ndirangu, M. (2008). Self-reported and measured height and weight: impact on racial/ethnic differences in hypertension. *Ethnicity & Disease, 18*(4), 415-420.

Pak, J. H. C. (2006). *Korean American Women: Stories of Acculturation and Changing Selves*. New York, NY: Routledge.

Park, S. Y., Murphy, S. P., Sharma, S., & Kolonel, L. N. (2005). Dietary intakes and health-related behaviours of Korean American women born in the USA and Korea: The multiethnic cohort study. *Public Health Nutrition, 8*(7), 904-911. doi:10.1079/Phn2005740

Park, S. Y., Paik, H. Y., Skinner, J. D., Spindler, A. A., & Park, H. R. (2004). Nutrient intake of Korean-American, Korean, and American adolescents. *Journal of the American Dietetic Association, 104*(2), 242-245. doi: 10.1016/j.jada.2003.11.015

Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2006). *Health promotion in nursing practice* (5th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Philip, W., & James, T. (2002). A world view of the obesity problem. In D. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity* (pp. pp. 411-416). New York, NY: The Guildford Press.

Polit, D. F., & Beck, C. T. (2004). *Nursing research: Principles and methods* (7th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Ponterotto, J. G., Baluch, S., & Carielli, D. (1998). The Suin-Lew Asian Self-Identity Acculturation scale: critique and research recommendations. *Measurement and Evaluation in Counseling and Development, 31*(2), 109-124.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*(4), 717-731.

Prentice, A. M., & Jebb, S. A. (2001). Beyond body mass index. *Obesity Reviews, 2*(3), 141-147.

Richman, R. M., Loughnan, G. T., Droulers, A. M., Setinbeck, K. S., & Caterson, I. D. (2001). Self-efficacy in relation to eating behaviour among obese and non-obese women. *International Journal of Obesity, 25* 903-913.

Roesch, S. C., & Wee, C. (2006). Relations between the Big Five personality traits and dispositional coping in Korean Americans: acculturation as a moderating factor. *International Journal of Psychology, 41*(2), 85-96.

Romero-Gwynn, E., Gwynn, D., Grivetti, L., McDonald, R., Stanford, G., Turner, B., . . . Williamson, E. (1993). Dietary acculturation among Latinos of Mexican descent. *Nutrition Today, 28*(4), 6-12.

Sakraida, T. J. (2006). Health promotion model. In A. M. Tomey & M. R. Alligood (Eds.), *Nursing theorists and their work* (pp. pp. 452-471). St. Louis, MO: Mosby.

Sallis, J. F., Pinski, R. B., Grossman, R. M., Patterson, T. L., & Nader, P. R. (1988). The development of self-efficacy scales for health-related diet and exercise behaviors. *Health Education Research, 3*(3), 283-292.

Sharmat, S., Cade, J., Riste, L., & Cruickshank, K. (1999). Nutrient intake trends among African-Caribbeans in Britain: a migrant population and its second generation. *Public Health Nutrition, 2*(4), 469-475.

Shilts, M. K., Horowitz, M., & Townsend, M. S. (2004). Goal setting as a strategy for dietary and physical activity behavior change: A review of the literature *American Journal of Health Promotion, 19*(2), 81-93.

Shin, C. N. (2008). *Predictors of physical activity and healthy eating of Korean adults in the United States.* Available from ProQuest Dissertations and Theses database. (UMI No. 3351870)

Shin, C. N., & Lach, H. (2011). Nutritional issues of Korean Americans. *Clinical Nursing Research, 20*(2), 162-180. doi: 10.1177/1054773810393334

Sohn, L., & Harada, N. D. (2005). Knowledge and use of preventive health practices among Korean women in Los Angeles county. *Preventive Medicine, 41*(1), 167-178. doi: 10.1016/J.Ypmed.2004.09.039

Sohng, K. Y., Sohng, S., & Yeom, H. A. (2002). Health-promoting behaviors of elderly Korean immigrants in the United States. *Public Health Nursing, 19*(4), 294-300.

Song, Y. I., & Moon, A. (1998). *Korean American women: From tradition to modern feminism*. Westport, CT: Praeger.

Song, Y. J., Hofstetter, C. R., Hovell, M. F., Paik, H. Y., Park, H. R., Lee, J., & Irvin, V. (2004). Acculturation and health risk behaviors among Californians of Korean descent. *Preventive Medicine, 39*(1), 147-156. doi: 10.1016/J.Ypmed.2004.01.013

Sperber, A. D. (2004). Translation and validation of study instruments for cross-cultural research. *Gastroenterology, 126,* S124-128. doi: S0016508503015646

Stotts, N. A., & Bergstrom, N. (2004). Measuring dietary intake and nutritional outcomes. In M. Frank-Stromborg & S. J. Olson (Eds.), *Instruments for clinical health-care research* (3rd ed., pp. pp. 278-292). Sudbury, MA: Jones and Barlett Publishers.

Strachan, S. M., & Brawley, L. R. (2009). Healthy-eater identity and self-efficacy predict healthy eating behavior: a prospective view. *Journal of Health Psychology, 14*(5), 684-695. doi: 10.1177/1359105309104915

Stuifbergen, A. K., & Becker, H. A. (1994). Predictors of health-promoting lifestyles in persons with disabilities. *Research in Nursing & Health, 17*(1), 3-13.

Suinn, R. M., Ahuna, C., & Khoo, G. (1992). The Suinn-Lew Asian self-identity acculturation scale: Concurrent and factorial validation. *Educational and Psychological Measurement, 52*(4), 1041-1046.

Suinn, R. M., Rickard-Figueroa, K., Lew, S., & Vigil, P. (1987). The Suinn-Lew Asian self-identity acculturation scale: An initial report. *Educational and Psychological Measurement, 47*(2), 401-407.

Sun, W. Y., Sangweni, B., Chen, J., & Cheung, S. (1999). Effects of a community-based nutrition education program on the dietary behavior of Chinese-American college students. *Health Promotion International, 14*(3), 241-250.

Swagerty, D. L., Walling, A. D., & Klein, R. M. (2002). Lactose Intolerance. *American Family Physician, 65(9),* 1845-1850.

Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6 Pt 1), 563-570. doi: 10.1006/pmed.1999.0585

United States Census Bureau, (2001). *Profiles of general demographic characteristics 2000; 2000 census of population and housing*. California: Retrieved from http://www.census.gov/prod/cen2000/dp1/2kh00.pdf,2kh06.pdf.

United States Department of Agriculture (USDA) (2011). Dietary Guidelines for Americans, retrieved from http://www.cnpp.usda.gov/dietaryguidelines.htm

van Rossum, C. T., van de Mheen, H., Witteman, J. C., Grobbee, E., & Mackenbach, J. P. (2000). Education and nutrient intake in Dutch elderly people. The Rotterdam Study. *European Journal of Clinical Nutrition, 54*(2), 159-165.

Walker, S. N., Pullen, C. H., Hertzog, M., Boeckner, L., & Hageman, P. A. (2006). Determinants of older rural women's activity and eating. *Western Journal of Nursing Research, 28*(4), 449-468.. doi: 10.1177/0193945906286613

Wardle, J., Haase, A. M., Steptoe, A., Nillapun, M., Jonwutiwes, K., & Bellisle, F. (2004). Gender differences in food choice: the contribution of health beliefs and dieting. *Annals of Behavioral Medicine, 27*(2), 107-116.

Weitzel, M. H. (1989). A test of the health promotion model with blue collar workers. *Nursing Research, 38*(2), 99-104.

World Health Organization (WHO) Expert Consultation. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet, 363*(9403), 157-163. doi: 10.1016/S0140-6736(03)15268-3

Yang, E. J., Chung, H. K., Kim, W. Y., Bianchi, L., & Song, W. O. (2007). Chronic diseases and dietary changes in relation to Korean Americans' length of residence in the United States. *Journal of the American Dietetic Association, 107*(6), 942-950. doi: 10.1016/j.jada.2007.03.005

Yang, E. J. & Kim, W. Y. (1995). A study on dietary factors related to the incidence of stomach cancer and colon cancer in Korea. *Korean Journal of Nutrition, 26*, 603-614.

Yang, K. (2007). Self-assessments of health by Korean immigrant women. *Health Care for Women International, 28*(4), 329-338. doi: 10.1080/07399330601179836

Yannakoulia, M., Panagiotakos, D. B., Pitsavos, C., & Stefanadis, C. (2006). Correlates of BMI misreporting among apparently healthy individuals: The ATTICA study. *Obesity, 14(5)*, 894-901.

Yoo, D. K., & Chung, R. H. (2008). *Religion and Spirituality in Korean America*. Urbana, IL: University of Illinois Press.

Yoon, I. J. (1997). A cohort analysis of Korean immigrants' class backgrounds and socioeconomic status in the United States. *Korea Journal of Population and Development, 26*(1), 61-81.

Zhao, X. F., Lynch, J. G. J., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. *Journal of Consumer Research, 37*(2), 197-206. doi: 10.1086/651257