I, Purvi Mehta, hereby submit this original work as part of the requirements for the degree of:

Master of Science

in Health Education

It is entitled:

Social Cognitive Theory as a Predictor of Dietary Behavior and Leisure Time Physical Activity in Middle Aged Asian Indian Women

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Social Cognitive Theory as a Predictor of Dietary Behavior and Leisure Time Physical Activity
in Middle Aged Asian Indian Women

University of Cincinnati

A thesis submitted to the

Graduate School

of the University of Cincinnati

In partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE
in the Department of Health Promotion and Education
of the College of Education, Criminal Justice and Human Services

2009

By

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Abstract

AN ABSTRACT OF THE THESIS FOR THE MASTERS OF SCIENCE DEGREE IN
HEALTH PROMOTION AND EDUCATION, PRESENTED OCTOBER 27, 2009 AT THE
UNIVERSITY OF CINCINNATI

TITLE: Social Cognitive Theory as a Predictor of Dietary Behavior and Leisure Time Physical Activity in Middle Aged Asian Indian Women

MASTERS COMMITTEE MEMBERS: Dr. Manoj Sharma, Chair
Dr. Amy Bernard

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-control, and self-efficacy on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down into fruit and vegetable consumption and portion consumption. A sample of 200 participants was used to collect data over a span of one month. Participants were recruited for completing the four part questionnaire in Chicago. Valid and reliable subscales were developed for the questionnaire. Descriptive statistics, stepwise multiple regressions, and Pearson correlations were used to analyze the data. Results indicated expectations for leisure time physical activity and self control as predictive for leisure time physical activity (Adjusted R² = 0.14). No relationships were seen with the constructs of the social cognitive theory with portion size control and fruit and vegetable consumption. There was an inverse relationship between years of residence in the United States and fruit and vegetable consumption. Recommendations have been included for future studies.
Dedication

This thesis is dedicated to my late grandfathers, Harivadan Desai and Harishchandra Mehta.
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Chapter One

The Purpose

People in the United States lived in a society where they grabbed food on the go and wound up watching television for leisure instead of being physically active (Caterson & Gill, 2002). A combination of these factors had lead to the demise of health. In 2008, many people in the United States were either overweight or obese due to a poor diet and sedentary lifestyle (Caterson & Gill, 2002; Centers for Disease Control and Prevention [CDC], 2008a; National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2008). This had caused obesity to reach epidemic levels. Obesity as defined by the World Health Organization was the “abnormal or excessive fat accumulation in adipose tissue, to the extent that health is impaired” (Caterson & Gill, 2002). Reports from 2005-2006 indicated that 34% of adults, 20 years old and older, were considered obese; prevalence of obese adults had nearly doubled since 2002 in the United States (NCCDPHP, 2008). Globally, there were one billion adults overweight and about 300 million that were clinically obese.

Obesity contributed to chronic illnesses such as hypertension, diabetes mellitus and cardiovascular disease, and some cancers such as breast and colon (CDC, 2008a; NCCDPHP, 2008; Pate, Heath, Dawda & Trost, 1996). In 2002, five out of the six leading causes of death were due to chronic diseases (NCCDPHP, 2008). Individuals that were overweight or obese had a higher likelihood of being diagnosed with the chronic illnesses listed above (Pate et al., 1996). It was found that a poor diet and physical inactivity were precursors of obesity and chronic illnesses.
A high fat and carbohydrate diet due to a high frequency of fast food items and the high accessibility of unhealthy foods led to poor dietary behaviors in the United States (McCrory, Juss, Saltzman, & Roberts, 2000). Fast food items had larger portions and tasted good which led individuals to consume the entire amount (McCrory et. al, 2000). Unfortunately, the nutrient content of such meals had elevated levels of fat, especially saturated fats, and were low in fiber (McCrory et. al, 2000). The media also contributed to the dietary pattern, as 95% of the food industry’s budget was devoted to television advertisements. People were more apt to eat unhealthy food as they were advertised more and were perceived to be more attractive on commercials. This was true for women more than men.

This pattern was noted in the ethnic populations as well. Bray and Popkin (1998) noted that minorities moved towards a Western diet, which consisted of an increase in animal food, a decrease in cereals and fibers, and more than 30% of calories from dietary fat. Fats and carbohydrates were 85% of the daily caloric intake, which led to a decrease in other nutrients. Immigrants from the Asian Indian community also experienced similar changes in diet (Raj, Ganganna & Bowering, 1999). Acculturation allowed for individuals to adapt to lifestyles that were comparable to the country they were residing in (Yang et. al, 2007).

In regards to diet, a normal diet within Asian Indians varied from the typical American diet (Kandula & Lauderdale, 2005). The typical meal would consist of “rice, dal, roots and tubers, yogurt, coffee with milk, broiled Indian bread and achar” (Raj et al., 1999). Outside of these meals, deep fried snacks and sweets were served for dinner parties, or any get-togethers. Asian Indian women considered a “good diet” to be an integral role to retain good health.
Adaptation of the Western diet occurred as length of residency increased. This was also seen in leisure time physical activity.

In the United States, there was a lack of leisure time physical activity in ethnic women when compared to Caucasian women (CDC, 2007). This occurred due to the different concepts of physical activity in women of different cultures. Many ethnicities, such as Latinas and Asian Indians, valued active lifestyles and viewed physical activity in terms of household work, tending to family needs and raising children (Choudhry, 1998). These women had barriers such as “caregiving responsibilities, health concerns, and lack of motivation” which affected their time towards leisure time physical activity (King et al., 2000, p. 355). Many of these barriers were reduced over time due to acculturation. Physical activity increased in women as they viewed other women in their environment engaged in leisure time physical activity (King et. al, 2000). This held true for Asian Indians, and especially for Asian Indian women (Misra et. al, 2000).

According to the U.S. Census Bureau (2007), there were 2.5 million Asian Indians residing in the United States. This group was known to have a high incidence of cardiovascular disease and other chronic illnesses (Kandula & Lauderdale, 2005). According to the World Health Organization, by 2010, 60% of coronary heart disease will be found among Asian Indians ethnicity. Prevalence of coronary heart disease was three times higher in Asian Indian women than other ethnic groups (Nayer, 2006). Dietary behaviors and low levels of physical activity contributed to these health issues.
An emphasis was placed on active lifestyles (Sriskantharajah & Raj, 2006). Asian Indians also participated in non-leisure time physical activities such as walking/bicycling as a means of transportation, and physical activity involved at work (Kandula & Lauderdale, 2005). Due to these non-leisure time physical activities being considered as activity by Asian Indians, reports on leisure time activity for this groups appeared to be were showed minimal (CDC, 2007). A theoretical backdrop was utilized to obtain and understanding of leisure time physical activity and dietary behaviors among Asian Indian women.

The Social Cognitive Theory, developed by Bandura allowed us to understand, predict and change behaviors in individuals (Bandura, 1986). It posed that behaviors were learned through observation, imitation or modeling (Bandura, 1986). To accommodate for this, the theory worked in a triad, in which the person, environment and behavior were inter-dependent among each other. Bandura (2004) spoke of the core determinants: knowledge of health risks, self-efficacy, outcome expectations, goals, and perceived facilitators, necessary for health behaviors. People gained motivation and increased their self-efficacy if they expected concrete outcomes and the opposite was true as well (Grembowski, et. al, 1993). This allowed individuals to engage in positive behaviors.

By definition, self-efficacy was the belief individuals had in their ability to carry out a specific behavior (Bandura, 1986). It was one of the main constructs within the Social Cognitive Theory, and was known to be a “dominant predictor of behavior” (Armitage & Conner, p.176, 2000). Grembowski et. al. (1993) backed Bandura’s (1986) assertion that having a high self-efficacy for conducting health related behaviors allowed people to seek preventive care, exercise often, view their health in a more positive manner and overcome smoking behaviors.
Importantly, self-efficacy was a significant factor in performing novel, and arduous tasks and/or behaviors (Schwarzer, 2001). This combined with goals set by individuals served as the foundation for healthy behavior changes. Self-efficacy was also the best predictor of dietary behavior in adults when compared to other factors such as, social influences, age, demographics, and health knowledge (Slater 1989). The opposite also held true when referred to the influence of existing behaviors and self-efficacy (Slater, 1989).

Statement of the Problem

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-efficacy and self-control on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down to fruit and vegetable consumption and portion size. This study was significant as there were a limited number of studies on these factors within the Asian Indian community, especially among the women. As this minority group was growing in the United States, it was important to comprehend their dietary and leisure time physical activity for health improvements. Results from the study added to the knowledge base regarding the extent of the role of the chosen constructs within the social cognitive theory in predicting dietary behavior and leisure time physical activity. In particular this study helped determine which constructs were better indicators of diet and physical activity within middle aged Asian Indian women. Ultimately, these findings were useful in building future intervention and prevention programs regarding dietary behaviors and physical activity that may help prevent chronic illnesses and improve overall health for these women.
Research questions:

1. To what extent do the Social Cognitive Theory constructs of self-efficacy for leisure time physical activity, expectations, and self-control predict leisure time physical activity in middle aged Asian Indian women?

2. To what extent do the Social Cognitive Theory constructs of self-efficacy for fruit and vegetable consumption, expectations and self-control predict fruit and vegetable consumption account for variance in middle aged Asian Indian women?

3. To what extent do the Social Cognitive Theory construct of self-efficacy for portion size, expectations and self-control predict portion size in middle aged Asian Indian women?

Sub-research questions:

4. To what extent do expectations about leisure time physical activity account for variance in leisure time physical activity?

5. To what extent does self-efficacy about leisure time physical activity account for variance in leisure time physical activity?

6. To what extent does self-control about leisure time physical activity account variance in leisure time physical activity?

7. To what extent do expectations about fruit and vegetable consumption account for variance in fruit and vegetable consumption behavior?
8. To what extent does self-efficacy about fruit and vegetable consumption account for variance in fruit and vegetable consumption behavior?

9. To what extent does self-control about fruit and vegetable consumption account for variance in fruit and vegetable consumption behavior?

10. To what extent do expectations about reducing portion size for meals account for variance in portion size selection behavior?

11. To what extent does self-efficacy about reducing portion size for meals account for variance in portion size selection behavior?

12. To what extent does self-control about reducing portion size for meals account for variance in portion size selection behavior?

Hypotheses:

1. \( H_0 \): There will be no relationship between expectations of leisure time physical activity and actual physical activity in middle aged Asian Indian women.

\( H_1 \): The expectations of leisure time physical activity will have a positive relationship with leisure time physical activity in middle aged Asian Indian women.

\( H_A \): The expectations of leisure time physical activity will have a negative relationship with leisure time physical activity in middle aged Asian Indian women.
2. \( H_0 \): There will be no relationship with self-efficacy of leisure time physical activity and actual physical activity in middle aged Asian Indian women.

\( H_1 \): The self-efficacy of leisure time physical activity will have a positive relationship with leisure time physical activity in middle aged Asian Indian women.

\( H_A \): The self-efficacy of leisure time physical activity will have a negative relationship with leisure time physical activity.

3. \( H_0 \): There will be no relationship with self-control of leisure time physical activity and actual physical activity in middle aged Asian Indian women.

\( H_1 \): The self-control of leisure time physical activity will have a positive relationship with leisure time physical activity in middle aged Asian Indian women.

\( H_A \): The self-control of leisure time physical activity will have a negative relationship with leisure time physical activity in middle aged Asian Indian women.

4. \( H_0 \): There will be no relationship with expectations of fruit and vegetable consumption and actual fruit and vegetable consumption in middle aged Asian Indian women.

\( H_1 \): The expectations of fruit and vegetable consumption will have a positive relationship to predict fruit and vegetable consumption in middle aged Asian Indian women.

\( H_A \): The expectations of fruit and vegetable consumption will have a negative relationship to predict fruit and vegetable consumption in middle aged Asian Indian women.
5. **H₀**: There will be no relationship with self-efficacy of fruit and vegetable consumption and actual fruit and vegetable consumption in middle aged Asian Indian women.

**H₁**: The self-efficacy of fruit and vegetable consumption will have a positive relationship with fruit and vegetable consumption in middle aged Asian Indian women.

**Hₐ**: The self-efficacy of fruit and vegetable consumption will have a negative relationship with fruit and vegetable consumption in middle aged Asian Indian women.

6. **H₀**: There will be no relationship with self-control of fruit and vegetable consumption and actual fruit and vegetable consumption.

**H₁**: The self-control of fruit and vegetable consumption will have a positive relationship with fruit and vegetable consumption.

**Hₐ**: The self-control of fruit and vegetable consumption will have a negative relationship with fruit and vegetable consumption.

7. **H₀**: There will be no relationship with expectations of reducing portion size control for meals and actual reduction of portion size for meals.

**H₁**: The expectations of reducing portion size control for meals will have a positive relationship with reducing portion size for meals.

**Hₐ**: The expectations of reducing portion size control for meals will have a negative relationship to reducing portion size for meals.
8. **H₀**: There will be no relationship with self-efficacy of reducing portion size control for meals and actual reduction of portion size for meals.

**H₁**: The self-efficacy of reducing portion size for meals will have a positive relationship with reducing portion size for meals.

**H₂**: The self-efficacy of reducing portion size control for meals will have a negative relationship with reducing portion size for meals.

9. **H₀**: There will be no relationship with self-control of reducing portion size control for meals will have no relationship to reducing portion size for meals.

**H₁**: The self-control of reducing portion size control for meals will have a positive relationship with reducing portion size for meals.

**H₂**: The self-control of reducing portion size for meals will have a negative relationship to reducing portion size for meals.

**Operational Definitions:**

*Asian Indian Origin*: The individual is either from India or has at least one parent that is from India.

*Middle aged Asian Indian woman*: Women of Asian Indian origin between the ages of 35 and 55. For this study these women will be residing in the metro Chicago area.

*Leisure Time Physical activity*: Physical activity was defined as 30 min. of activity 5 or more days of the week, not including household duties or occupational related activities; as per recommendations made by the Centers for Disease Control and Prevention (2008).
For this study, these were determined by their recall of physical activities and minutes spent on them in the past 7 days on part one of the questionnaire.

*Portion size control:* This comprises the number of bread (chapatti, roti, paratha, puri, slices of bread, etc.), number of bowls of rice and the number of bowls of dal (lentil soup). For this study, it was determined through the dietary recall in part four of the questionnaire.

*Fruit and vegetable consumption:* Fruit and vegetable consumption was defined as the number of servings of fruits and vegetables consumed in one day. For this study, it was determined through the dietary recall in part four of the questionnaire.

*Expectations of Leisure Time Physical Activity:* Social Cognitive Theory construct that are anticipatory outcomes and the values an individual places on leisure time physical activity. Outcome expectations will be multiplied with its corresponding expectancies. This was determined by questions 14 through 18 on the questionnaire, with a range of scores between 0 (low expectations) to 45 (high expectations).

*Expectations of Fruit and Vegetable Consumption:* Social Cognitive Theory construct that are anticipatory outcomes and the values an individual places on fruit and vegetable consumption. It is the sum of multiplicative score of outcome expectations and outcome expectancies. This was determined by questions 19 through 22 on the questionnaire, with a range of scores between 0 (low expectations) to 45 (high expectations).

*Expectations of Portion Size:* Social Cognitive Theory construct that are anticipatory outcomes and the values an individual places on portion size control. It is the sum of
multiplicative score of outcome expectations and outcome expectancies (questions 28 to 32). This was determined by questions 23 through 27 on the questionnaire, with a range of scores between 0 (low expectations) to 64 (high expectations).

**Self-control of Fruit and Vegetable Consumption:** Social cognitive theory construct, referred to the control an individual has over their fruit and vegetable consumption. This was determined by questions 37 to 38 on part three of the questionnaire. A range of scores between 0 (low control) to six (high control) were possible.

**Self-control of Leisure Time Physical Activity:** Social cognitive theory construct, referred to the control an individual has over leisure time physical activity. This was determined by questions 35 to 36 on part three of the questionnaire. A range of scores between 0 (low control) to six (high control) were possible.

**Self-control of Portion Size:** Social cognitive theory construct, referred to the control an individual has over their portion size on meals. This was determined by questions 33 to 34 on part three of the questionnaire. A range of scores between 0 (low control) to three (high control) were possible.

**Self-efficacy of Fruit and Vegetable Consumption:** Social cognitive theory construct. Measures the belief that the individual can consume 5 servings of fruits and vegetables. This was measured in questions one to four in part three of the questionnaire. A range of scores between 0 (low self-efficacy) to 12 (high self-efficacy) were possible.

**Self-efficacy of Leisure Time Physical Activity:** Social cognitive theory construct. Measures the belief that the individual can engage in leisure time physical activity,
outside of occupation related and household chores. This was measured in questions five to eight in part three of the questionnaire. A range of scores between 0 (low self-efficacy) to 15 (high self-efficacy) were possible.

Self-efficacy of Portion Size Control: Social cognitive theory construct. Measures the belief that the individual can control the amount of food consumed. This was measured in questions nine to 12 in part three of the questionnaire. A range of scores between 0 (not at all sure) to 12 (very sure) were possible.

Delimitations:

1. A self-report questionnaire was administered to 200 middle aged Asian Indian women between the ages of 35 to 55 in the metro Chicago area.

2. A convenience sample was utilized.

3. Data was collected on four consecutive Saturdays in July 2009.

4. Responses obtained were from the women present at the Manav Seva Mandir temple.

Limitations:

The study was limited by:

1. Participants not accurately recalled their leisure time physical activity in the past 7 days.

2. The honesty and accuracy of the women completing the questionnaire.

3. Possible social bias from participants.

Assumptions:
An assumption of the study was that participants answered all questions honestly and accurately. It was also assumed that participants read and understood the questionnaire.

Summary

In this chapter the link between obesity and chronic illness were explored. It was found that causes such as dietary behaviors and leisure time physical activity can alleviate these issues. Reasoning for this study was provided along with the variables being explored. Research questions, hypothesis, operational definitions, delimitations, limitations and assumptions were also stated. The next chapter investigates dietary behaviors and leisure time physical activity and its relation to Asian Indian women.
Chapter Two

Review of Literature

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-efficacy and self-control on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down to fruit and vegetable consumption and portion size control. This study was significant as there were a limited number of studies on these factors within the Asian Indian community, especially among the women. As this minority group was growing in the United States, it was important to comprehend their dietary and leisure time physical activity for health improvements. Results from the study added to the knowledge base regarding the extent of the role of the chosen constructs within the social cognitive theory in predicting dietary behavior and leisure time physical activity. In particular this study helped determine which constructs were better indicators of diet and physical activity within middle aged Asian Indian women. Ultimately, these findings were useful in building future intervention and prevention programs regarding dietary behaviors and physical activity that may help prevent chronic illnesses and improve overall health for these women.

References for the review of literatures were obtained from search engines including Medline, CINAHL, Indmed, ERIC, Google Scholar, and Psycinfo. The Centers for Disease Control and Prevention and World Health Organization websites were also browsed to obtain epidemiological information. The following keywords were utilized during the search process: obesity, chronic illnesses, dietary behaviors, physical activity, Asian Indians, Asian Indian
women, Asian Indian diets, physical activity in Asian Indians, Social Cognitive Theory as a predictor of health behaviors, self-efficacy, expectations. Of the 100 articles extracted and read, only 58 were found of importance for this study. These articles focused on comprehension of obesity and chronic illnesses, dietary behaviors, leisure time physical activity, the Asian Indian community and the Social Cognitive Theory. A lack of sources specific to Asian Indian women indicated that more research on this population in regards to health behaviors was needed.

**Obesity**

People in the United States grabbed food on the go and wound up watching television for leisure instead of being active. In 2008, many people in the United States were either overweight or obese due to poor diet and sedentary lifestyle (Caterson & Gill, 2002; Centers for Disease Control [CDC], 2008a). These factors, among others, led obesity to reach epidemic levels. Obesity increased the risk of chronic illnesses such as hypertension, diabetes mellitus and cardiovascular disease, to name a few (Caterson & Gill, 2002; CDC, 2008a; National Center for Chronic Disease Prevention and Health Promotion, 2008).

Obesity as defined by the World Health Organization was the “abnormal or excessive fat accumulation in adipose tissue, to the extent that health is impaired” (Caterson & Gill, 2002, p.596). The body mass index (BMI) was a measurement used to determine the percentage of fat and muscle mass in the human body. It was useful in determining if an adult was at normal weight, overweight, or obese level. According to the Centers for Disease Control (CDC) guidelines, a BMI of 25 or higher, was considered overweight, while a BMI of 30 was obese (CDC, 2008a; CDC, 2008b). Reports from 2005-2006 indicated that 34% of adults, 20 years and older, were considered obese (NCCDPHP, 2008). The prevalence of obese adults had nearly
doubled since 2002 (NCCDPHP, 2008). Data collection from NHANES 1999-2002, indicated that 65% of adults were either overweight or obese, which was 16% higher than the results reported from NHANES 1988-1994 (CDC, 2008a).

**Chronic illnesses**

With obesity on the rise, chronic illnesses associated with it had also risen. In 2002, five out of six leading causes of death were due to chronic diseases as associated with obesity (NCCDPHP, 2008a). Individuals that were overweight or obese had a higher likelihood of being diagnosed with hypertension, diabetes mellitus, some cancers such as breast and colon, cardiovascular disease and stroke (Pate, Heath, Dawda & Trost, 1996). Studies have shown that individuals that were obese had a 10 to 50% higher risk of mortality from all causes and reports from 2005 indicated that approximately 112,000 excess deaths were due to obesity (Flegal, Graubard, Williamson, & Gail, 2005). For most of these cases, the primary cause of death was cardiovascular disease (Flegal, et al., 2005). Popkin (2002), stated that “dietary and activity changes are paralleled by major changes in health status” and that there is a “rising burden of non-communicable diseases” (p. 93). Individuals with chronic disease were known to share certain modifiable behaviors such as, smoking, poor diet, physical inactivity and obesity (Reeves &Rafferty, 2005). Reeves and Rafferty (2005) indicated that only 3% of the U.S. population adhered to healthy behaviors. They also found that poor diet and physical inactivity behaviors are precursors of obesity.
Dietary Behaviors

In 2008, approximately 85% of the American diet was composed of carbohydrates and fats (Bray & Popkin, 1998). According to the Healthy Eating Index (HEI), scores on consumption of whole grains, dark greens and orange vegetables, total fruit, milk, legumes, saturated fats, alcohol, and added sugars were low (United States Department of Agriculture, & Center for Nutrition Policy and Promotion [USDA & CNPP], 2008). The HEI 2005 also concluded that the quality of the American diet needs a positive change for health benefits to occur (USDA & CNPP, 2008). Bray and Popkin (1998) stated “to prevent or reduce obesity, one must focus on both sides of the energy balance equation and consider total energy intake and its food components along with physical activity” (p.1157).

In regards to energy intake, most Americans followed was called a “western diet” which consisted of increased animal food, decreased cereal and fiber and more than 30% of calories from fat (Popkin, 2002, p.94). According to the CDC, a nutritious diet lowered people’s chances of being diagnosed with hypertension, cardiovascular disease, diabetes, osteoporosis, stroke and some cancers (NCCDPHP, 2008a). An increase in fiber and carbohydrates along with a reduction in fat lowered calorie consumption; which in turn helped lower overweight/obesity levels (Bray & Popkin, 1998).

Some disease conditions responded well to dietary improvement. A diet rich in fruits, vegetables, low fat dairy products, reduced saturated fats and total fats was shown to reduce systolic and diastolic blood pressure by 5.5 mm Hg (Appel et al., 1997). That diet, along with reduced salt and alcohol were known to alleviate and prevent hypertension (Roberts, et al., 2002, p.2531). For diabetes, Nuttall and Gannon (2006) found that a diet low in carbohydrates and high
in protein was beneficial for male patients. A study looking at women, indicated a diet high in fiber and low in saturated and trans-fats lowered the incidence of diabetes (Hu, Manson, Stampfer, Colditz, Liu et al., 2001). An improvement in diet along with increased physical activity could reduce obesity and the chronic diseases associated with it.

A limited number of studies demonstrated that a relationship exists between dietary behaviors and physical activity. Gillman, et al. (2001) found that sedentary individuals had “diets high in saturated and trans fat and low in fiber, fruits, and vegetables are associated with a higher risk of cardiovascular diseases, cancer and other chronic diseases” (p. 296). The amounts of healthy foods consumed in sedentary individuals were fairly small, while the opposite of this relationship also held true (Gillman et al., 2001). A majority of women held the prior relationship as they were typically inactive. Outside of this paradigm, unhealthy food consumption was also related to fast food places and passive forms of entertainment.

Fast food consumption and passive entertainment held a positive relationship with body mass index (Jeffrey & French, 1998). These factors were found to be predictors of overweight and obesity. Fast food was not only served in larger portions but was high in fat, total energy and low in fibers, which lead toward body fatness (McCrary, Juss, Saltzman & Roberts, 2000). Fast food places offered a variety of foods, mainly unhealthy, which were a determinant in the number of calories and fat consumed in one sitting (McCrary et al., 2000; Story, Neumark-Sztainer, & French, 2002). That along with passive entertainment played a main role in dietary behaviors.

Media influenced passive entertainment and food consumption. Television was the widely used form of advertising by the food industry as 95% of their marketing budgets went
towards advertising (Story et. al, 2002). Positive associations were seen between advertisements
and high fat, high energy meal consumption, especially in children and adolescents (Story et. al,
2002). Jeffrey and French (1998) found a positive relationship between television and fast food
consumption. Advertisements on television made foods, high in fat more attractive; which led
people to consume them. This was seen more in women than men.

*Dietary behavior in minorities and women*

Dietary patterns in American women had shown slight improvements regarding fruit and
vegetable consumption. The five a day better health program from 1991-1997, found that
individuals consumed more fruits and vegetables on a daily basis in 1997 than 1991 (Stables,
Subar, Patterson, Dodd, Heimendinger et. al., 2002). Fruit and vegetable consumption in women
increased from 1991 to 1997, but had still not met recommended servings (Stables et. al., 2002).
The Behavioral Risk Factor Surveillance System from 1994 to 2000 indicated a decrease in fruit
juice and non-fried potatoes in U.S women, while other vegetables were consumed slightly more
(Serdula, Gillespie, Kettel-Khan, Farris, Seymour et. al., 2004). U.S. women over the age of 55
ate the recommended serving of fruits or vegetables 5 or more times a day (Serdula et. al., 2004).
On an overall note, fruits or vegetables 5 or more times a day were consumed more in 2000 than
previous years. On the other hand, this improved behavior was not present in minorities.

Minorities moved towards a Western diet, when they moved to the U.S. The Western diet
consisted of an increase in animal food, a decrease in cereals and fibers, and more than 30% of
calories from dietary fat. Fats and carbohydrates were 85% of the daily caloric intake, which was
a reason for a decrease in other nutrients. McCrory, Juss, Saltzman, & Roberts (2000) stated that
an industrial economy in the western world had a high energy diet and unhealthy foods high in
fat were affordable for people with low incomes. Thus, nutritious items were expensive and out of budget for low income individuals. It was also noted that the frequency of eating at restaurants or fast foods places was higher in the Western world. These places offered larger portions and tasted good, which lead individuals to consume the amount given. Unfortunately, elevated levels of fat, especially saturated fats, and low fiber items were being consumed. The shift in dietary behaviors was due to acculturation.

Acculturation was when individuals from other cultured adopted lifestyles comparable to the country they resided in. Traditional meals were typically consumed at dinners, while lunch and breakfast meals were more like those of the new country (Satia-Abouta, Patterson, Neuhouser, & Elder, 2002). A review of studies showed that recent Hispanic immigrants were more likely to eat food high in fat as opposed to the Hispanic immigrants residing in the United States for a longer period of time (Satia-About a et. al, 2002). A study on Mexican Americans, found that the highly acculturated they were, a lower consumption in fruits and vegetables and a slight increase in dietary fat occurred (Neuhouser, Thompson, Coronado, & Solomon, 2004). This behavior was higher in that community than the non-Hispanic Whites (Neuhoser et al., 2004).

The converse was seen in Asian Indians. Traditional Indian foods were not eaten as frequently and mixtures of other ethnic foods were consumed through out the day (Raj et. al, 1999). Contrary to the Mexican American study above, fat consumption increased, despite the reduction of ghee and deep fried snacks (Raj et. al, 1999). Jonnalagadda and Diwan (2002) found that carbohydrate and protein intake decreased while fat consumption increased in the Gujarati-Indian immigrant population. Gujarati- Indians referred to individuals from the state of Gujarat.
in India. In regards to Gujarati-Indian women, nutrient intake was dependent on length of residency and education. Despite acculturation in Asian Indians, healthy lifestyles were valued highly. This constituted active lifestyles as well.

**Physical activity**

Physical activity was important as it decreased and alleviated chronic diseases such as obesity, heart disease, hypertension, diabetes, and some cancers (CDC, 2008a; CDC, 2007). According to the Centers for Disease Control and Prevention, individuals should be active for at least 30 minutes per day for five or more days a week (Bauman, 2004; CDC 2008a). Physical activity “regulates energy intake on a high fat diet” (Murgatroyd, Goldberg, Leahy, Gilsenan, & Prentice, 1999, p.1269). Evidence showed that it aided with the energy consumption and expenditure equation, and reduced the mortality from all causes by 30% (Van Dam, Spiegelman, Franco, & Hu, 2008). A reduction in the risks/consequences of arthritis, prevention of falls and fractures and prevention for colon and breast cancer occurred in individuals that were physically active (Van Dam et al., 2008).

It was also noted that mortality from cancer, cardiovascular disease and all causes were significantly reduced in women engaged in the recommended levels of physical activity (Van Dam, et al., 2008). The recommended level of exercise also lowered blood pressure in hypertensive patients and was preventative in normotensive patients (Roberts, Vaziri & Barnard, 2002). Reduced insulin levels, oxidative stress and availability of nitric oxide resulted from increased physical activity (Roberts et al., 2002). With regards to diabetes mellitus, exercise indicated decreased risks, while watching television for many hours was directly associated with higher risks for this disease (Hu et al., 2001).
Eliminating a sedentary lifestyle along with a healthier diet were factors that decreased the chances of chronic diseases. A decrease in physical activity at work and during leisure time played a crucial role in the “genesis of obesity” (Bray & Popkin, 1998, p.1157). According to Pate et. al (1996), “Physical activity and nutrients share some metabolic pathway and can interact in various ways that influence the risk and pathogenesis of several chronic diseases” (p. 1580).

Reduced physical activity was more prevalent than in the past which resulted in increased health hazards (Pate, et. al, 1996). According to the CDC, more than 50% of adults did not participate in enough physical activity to provide important health benefits (NCCDPHP, 2008). Among adults, lower levels of physical activity were found in women and minorities than other groups (NCCDPHP, 2008).

*Physical activity in minorities and women*

“More than 60% of adults in the Western world do not exercise on a regular basis and 25% adults are sedentary” (Seefeldt, Malina & Clark, 2002, p.144). In terms of gender, women tended to have a low prevalence of physical activity, and this was especially true for women as a gender as well (CDC). U.S. women were known to have lower levels of physical activity but were steadily increasing. An 8.6% increase in physical activity in women was shown in the Behavioral Risk Factor Surveillance System (CDC, 2007). At the same time, disparities among ethnicities were still apparent, and physical activity levels needed to be increased (CDC, 2007). This was partially due to a divergence of physical activity beliefs between the Western and Eastern world.

Concepts of physical activity differed in women of different cultures. Many ethnicities, such as Asian Indians and Latinas, valued active lifestyles, but perceived physical activity in
terms of household work, tending to family needs and raising children (Choudhry, 1998). Women of ethnic backgrounds found these activities as barriers to participating in leisure time physical activity as recommended by the CDC (King, Castro, Wilcox, Eyler, Sallis et. al, 2000, p. 355). Other reasons for lack of activity were due to older age, lower education, tiredness/lack of energy, and not being in good health (King et al, 2000). Increased levels of physical activity were attributed to enjoyable scenery, seeing others exercising in the neighborhood, hills in the neighborhood and being self-conscious about physical appearance (King et. al, 2000). At the same time, self-consciousness and receiving discouraging messages about exercising were significantly related to ethnic minority women being physically active (King et. al, 2000).

To overcome barriers, social support had been viewed as an important role in getting women to become more physically active (Eyler, Brownson, Donatelle, King, Brown et. al, 1999). Middle and older aged minority women indicated that social support from family and friends was crucial in motivating them to become more active. Once the behavior became habitual, social support became integral for encouraging women to sustain moderately intense activity levels. Acculturation was also seen as a method of overcoming barriers in physical activity behaviors.

Physical activity increased in women as they viewed other women in their environment engaged in that behavior. A significant relationship was shown between the length of residency in the United States and participation in leisure time physical activity in Asian Indian women (Misra et. al, 2000). Jonnalagadda and Diwan (2005) noted Indian/Pakistani/Bangladeshi individuals in the United Kingdom had a poorer health status leading to inactivity, despite their socioeconomic and educational statuses. A significant relationship between physical activity and
longevity in the United States, higher incomes, and individuals within a normal body mass index were found in middle and older aged Asian Indians. Social support and mental well being (i.e. being happy or sad) directly affected physical activity levels.

The cultural background in other ethnicities such as Koreans, failed to place an emphasis on being physically active, as the main focus in life was given to academics and psychosocial skills (Yang, Laffrey, Stuifbergen, Im, May et. al, 2007). Although, as the number of years lived in the United States increased, immigrant women acculturated and engaged in physical activity. Outside of the length of residency, higher incomes also led Korean women to quickly acculturate. Similar patterns were seen in other Asian cultures as well.

Asian Indians

Asian Indians, which were under the umbrella of Asian Americans/Pacific Islanders, composed the fourth largest Asian group within the United States (Misra et. al, 2000). According to the Census, 2.5 million Asian Indians resided in the United States in 2007 (US Census Bureau, 2007). As of 2007, 157,126 Asian Indians were residing in the state of Illinois. In the metropolitan Chicago area, there were 116,868 Asian Indian residents as of 2005 (US Census Bureau, 2007). Data on the number of middle aged Asian Indian women in the metro Chicago area was unavailable. This group had a high incidence of cardiovascular disease and other chronic illnesses (Kandula & Lauderdale, 2005). According to the World Health Organization, by 2010, 60% of coronary heart disease will be found within the Asian Indian community. Prevalence of coronary heart disease was three times higher in Asian Indian women then other ethnic groups (Nayer, 2006). They were also at higher risks for osteoporosis and breast cancers
Thus, understanding their dietary behaviors and leisure time physical activity was necessary.

**Dietary behaviors in Asian Indians**

In terms of dietary behaviors, Asian Indians typically consumed meals high in carbohydrates, low in fat and high in fiber (Kulkarni 2004). A normal diet within Asian Indian varied from the typical American diet in terms of food preparation. The typical meal would consist of “rice, dal, roots and tubers, yogurt, coffee with milk, broiled Indian bread and achar” (Raj et al., 1999). “Dal, is a generic term for lentils, beans or split peas, which can be cooked or served raw in salad dishes; ghee is clarified butter served with rice or applied to Indian breads, paneer is homemade cottage cheese made by boiling milk and curdling it with lemon juice, vinegar, or yogurt; achar is a generic term for pickles that are prepared using vegetables or fruits such as lime and raw mango to which appreciable amounts of salt, chili powder and oil are added” (Raj et al., 1999, p.1107). Preparing the typical mean mentioned above after work hours is time consuming and often unfeasible on a working day. Thus, the Asian Indian meals are often made on weekends or special occasions and therefore, fat foods are commonly consumed.

Outside of these meals, deep fried snacks and sweets were served for dinner parties, or any get-togethers. There was a high frequency of these events in the U.S., leading to a higher consumption of these foods in a weekly basis (Raj et al., 1999). Other foods, non-traditional to the culture, consumed by this population were sodas, 2% milk, pizza, cookies, and mayonnaise about two-seven times within a week. Acculturation to the United States, yielded in a decrease of ghee, yogurt, Indian breads, rice dishes, and deep fried snacks but an increase in sodas, fruits, margarine and alcohol were noticed (Kulkarni 2004). The diet for Asian Indian residents in the
United States for 5 or more years was one composed of high saturated fats, low fiber and high fat- animal based proteins.

Asian Indian women considered a “good diet” important in retaining good health (Choudhry 1998). Results from Choudhry’s (1998) study, showed that these women believed in consuming less food as people age. It was also noted that deep fried foods, ghee and butter were considered bad on a daily basis and consumption was decreased once they were aware of its effects (Kulkarni 2004). Still Asian Indians living in the United States consumed more fast food and quick meals than those living in India, due to a lack of time for meal preparation (Kulkarni 2004).

Physical activity in Asian Indians

Good health and reduced medical risk served as motivation for being physically active within the Asian Indian community. In terms of leisure time physical activity, brisk walking two - four times a week was observed (Raj et. al, 1999). Overall leisure time physical activity levels remained lower in Asian Indians than other ethnic groups (Kandula & Lauderdale, 2005). Asian Indians participated in non-leisure time physical activity such as walking/bicycling as a means of transportation, physical activity involved work and household chores. Due to these non-leisure time physical activities, reports on leisure time activity for Asian Indians seemed low (CDC, 2007).

A lack of physical activity in the community was related to occupation (Ramachandran, Snehalatha, Latha, Manoharan & Vijay, 1999). The urban society in India lived a sedentary lifestyle, while their counterparts were engaged in constant physical activity due to their
agriculture occupations. Women in urban societies reduced their physical activity as their work was confined to household chores and rearing children, as opposed to the ladies on the farms. A majority of Asian Indian women placed an emphasis on living active lives and considered physical activity to be working around the house, and taking care of the children (Sriskantharajah & Kai, 2006). An aerobics work out was not perceived as physical activity, since nothing was accomplished in that activity (Eyler et. al, 1998).

Low participation levels in sports came about due to “cultural barriers, such as religious modesty or avoidance of mixed-sex activity, and fear of going out alone” (Sriskantharajah & Kai, 2006). In fact, the responsibility of taking care of the family, house, while living in a patriarchal culture caused Asian Indian women to neglect themselves (Choudhry 1998). In the midst of balancing employment with the house, and persistence on keeping tradition alive, the personal needs of the Asian Indian woman was lost. Interestingly, Choudhry (1998) found that Asian Indian women often associated sports with younger individuals, school time activities or professional athletes. They also saw exercise as causing pain in the joints and knees. While these women placed an emphasis on active lifestyles, they still were considered to be leading sedentary lifestyles as they did not meet the guidelines of leisure time physical activity (Sriskantharajah & Kai, 2006). Over time, acculturation factors helped alleviate barriers to leisure time physical activity. The longer Asian Indians resided in the United States, the more they participated in leisure time physical activities (Misra et. al, 2000). This association was stronger for Asian Indian women than men (Kandula & Lauderdale, 2005; Misra et. al, 2000). In order to better understand the dietary patterns and leisure time physical activities of Asian Indian women, a theoretical background was utilized.
Social Cognitive Theory

The Social Cognitive Theory developed by Bandura provided insight to understand, predict and change behaviors in individuals (Bandura, 1986). It posed that behaviors were learned through observation, imitation or modeling (Bandura, 1986). Bandura (1986) stated that “what people think, believe, and feel affects how they behave” (p.25). To accommodate for this, the theory worked in a triad, in which the person, environment and behavior were inter-dependent on each other. The person, cognition, affects and physiological events that occur and their relationship with the environment, external and internal, and behavior were observed in this theory (Bandura, 1986). Reciprocal determinism, in which the person and environment influenced each other, was in a continuous flux and varied for each behavior. On a broader spectrum, the social cognitive theory allowed for a connection between social and cognitive factors that affected behaviors.

The theory was then broken down into various constructs: self-efficacy, expectations, expectancies, environmental/situational perceptions and self-control. Bandura (2004) spoke of the core determinants, knowledge of health risks, self-efficacy, outcome expectations, goals, and perceived facilitators, as being necessary for the adoption of health behaviors. Goals, especially short term, were necessary when forming behaviors as they served as “self-incentives” and were viewed as motivators for continuing the behavior (p.144). One had to overcome barriers to engage in behaviors such as physical activity, which in turn affected self-efficacy (Bandura, 2004).
Outcome expectations were “beliefs about whether a given behavior will lead to given outcomes” (Stretcher, Devellis, Becker & Rosenstock, p. 74, 1986). Outcome expectancies were reliant on “education, personal experience and vicarious learning” of each person (Schwarzer, 1999, p. 303). Low levels of physical activity were found in college students, and were due to low outcome expectancy for that behavior (Schwarzer, 1999). In a smoking cessation program, outcome expectancy gave participants the initial motivation needed to begin the program (Pechacek & Danaher, 1979). Performance of a behavior occurred when the awareness of benefits of conducting it served as a source of motivation in an individual (Schwarzer, 2001). Outcome expectancies were also viewed as “means-ends relationships” due to their role in producing desired behaviors.

Perception of benefits and a reduction of illness associated risks were fundamental outcome expectations that affected the motivations and actions of individuals (Stretcher et al, 1986). Outcome expectancy was not sufficient without self-efficacy and were integral for healthy behaviors (Schwarzer & Renner, 2000; Stretcher et al, 1986). Both concepts were necessary in the initial stages but needed to work in conjunction with each other for maintenance (Schwarzer & Renner, 2000). The role of outcome expectancies was not as important as behavior became more habitual (Schwarzer & Renner, 2000). Bandura (2004) also noted that outcome expectancies “evoked social reactions” resulting in the initiation of a desired behavior (p. 144).

“Self-efficacy had a significant direct relationship on outcome expectancy” but outcome expectancy on its own was not a significant predictor of exercise (Conn, 1998, p. 186). People gained motivation and increased their self-efficacy if they had concrete outcomes to look
forward to. A bidirectional relationship between the two constructs allowed individuals to engage in positive behaviors.

**Self-Efficacy**

By definition, self-efficacy was the belief an individual had the ability to carry out a specific behavior (Bandura, 1986). Thus, one person can have high self-efficacy in conducting one behavior, regardless of their skill level, but low self-efficacy for a different behavior. Self-efficacy was one of the main constructs within the Social Cognitive Theory, and was known to be a “dominant predictor of behavior” (Armitage & Conner, p. 176, 2000). In fact, self-efficacy was often intertwined with self-worth since self-efficacy was often applied in behaviors that increased self-worth (Stretcher et. al, 1986). Self-efficacy was a powerful construct that was influential in all health related behaviors. A high self-efficacy for conducting health related behaviors allowed people to seek preventive care, exercise often, view their health in a more positive manner and overcome smoking behaviors (Bandura, 1986; Grembrowski et al, 1993).

Thoughts regarding the outcomes of performing a certain behavior increased self-efficacy in individuals. Self-efficacy was enhanced as one reached set goals and was diminished when goals were not met (Bandura, 2004). It encompassed the cognitive aspect of the Social Cognitive Theory, as the individual was able to visualize situations which in turn allowed them to be successful at the specific behavior they visualized (Schwarzer, 1999).

Self-efficacy was built based on a variety of different components. Skills and behavior experiences obtained from prior situations, social influences, and comprehending physiological arousal all impacted self-efficacy levels in individuals (Slater, 1989). In addition, they also
involved cognitive control, which was seen as the individuals’ ability to control their thinking and motivation and served as a predictor of self-efficacy levels (Slater, 1989). These determinants of self-efficacy, promoted adherence to health related behaviors.

This construct was important for sedentary middle-aged adults to exercise in the first three months of adopting a work out program, but was not useful past the 5 month mark (McAuley, 1992). A mixture of general self-efficacy and exercise self-efficacy were integral in predicting attendance and intensity of work outs during the 3 months (McAuley, 1992). Dishman also found similar results, in that self-efficacy was a predictor of getting individuals started with physical activity (Schwarzer, 1999). As the physical activity became rigorous, self-efficacy, kept the participants engaged in the behavior, despite the number of months they were working out (McAuley, 1992). Grembowski et al. (1993) also found that self-efficacy and performance held a reciprocal relationship for older individuals.

Better performance also allowed for other healthier changes in behavior, such as diet. Results from Grembowski et al.’s (1993) study indicated that “older adults with high efficacy expectations for exercise reduced dietary fat, and weight control were more likely to perform those behaviors and have better functional, mental health, and self-rated health than older adults with low efficacy expectation” (p.98). Schwarzer (2001) stated that self-efficacy was significant in performing novel or arduous tasks and/or behaviors. This relationship was then intertwined with goals that individuals set for themselves which then serves as the set up to healthy behavior changes such as diet.

In regards to dietary intake, self-efficacy was once again noted as the “dominant predictor” of an individual’s consuming fruits, juice and vegetables (Baronowski, Cullen &
Baronowski, 1999). For adolescents, the amount of television viewed, and food intake that was high in fat was predicted by self-efficacy. In this case, there was a higher environmental influence, as adolescents ate whatever was available to them. Another study that looked at children also found an increased self-efficacy in children of choosing healthy foods increased their intake of low fat and low sodium items (Parcel, Edmundson, Perry, Feldman, O’hara-Tompkins et.al, 1995).

Self-efficacy was also the best predictor of dietary behavior in adults when compared to other factors such as, social influences, age, demographics, and health knowledge (Slater 1989). In fact, this relationship was found to be reciprocal in that the existing behavior had an influence on the self-efficacy that the person set (Slater, 1989). Self-efficacy was more powerful when it was in accordance with lifestyle changes (Schwarzer & Renner, 2000).

This construct then became functional at the action and coping levels. Action self-efficacy utilized visual imagery and outcome expectancies to get individuals motivated to begin enacting a specific behavior (Schwarzer & Renner, 2000). Coping self-efficacy was useful to overcome daily barriers preventing people from engaging in their selected behavior and allowed for its maintenance.

Barriers were an important issue as they impacted self-efficacy (Conn, 1998). For instance, fear of environment or perceived difficulty of a behavior would lower self-efficacy and deter an individual from performing that behavior. Results from Conn’s (1998) study revealed that “barriers had a significant direct negative impact on exercise and significant indirect negative effect on exercise behavior through self-efficacy” (p. 186).
Summary

Obesity and chronic illnesses were health problems in the United States in 2008. Increased levels of obesity increased the prevalence of its associated chronic illnesses such as heart disease, diabetes and hypertension. Ethnic groups, such as the Asian Indian community, were at higher risks for being diagnosed with coronary heart disease and other chronic illnesses. Risks for these health concerns were modifiable through dietary behaviors and leisure time physical activity. Factors accountable for these behaviors were due to the influence of media, an industrialized society in which physical activity levels are reduced, and fast food consumption. Fast food in particular was detrimental towards health as larger portion sizes and high calorie food was being consumed by individuals in the United States.

In regards to physical activity, many individuals faced barriers that inhibited this behavior. This was especially seen in ethnic women. Many women were caught up with being caretakers and their occupation which deemphasized physical activity in their lifestyle. Certain ethnicities did not place value on women being physically active and were embedded with living active lifestyles for health purposes. For instance, walking to work, working around the house, running after children and the like were considered as physical activity. A discrepancy on surveys occurs since questions regarding those activities are not mentioned; which leads to reports indicating a lack of physical activity within the ethnic group and their women. This was especially important with Asian Indians as their diet and perceptions of physical activity varied.
Asian Indian women within this group exhibited lower levels of physical activity and a high energy diet, which placed them at higher risks for chronic illnesses than other women. Acculturation was a factor that enabled these behaviors within this ethnic group. The Social Cognitive Theory, served as a theoretical model that aided in the comprehension and modification of behaviors. Self-efficacy, expectations and self-control constructs within this theory were used to obtain an understanding of the likelihood of women being engaged in healthy behaviors such as fruit and vegetable consumption, portion size control and leisure time physical activity. In conclusion, information regarding these behaviors within middle aged Asian Indian women was needed to alleviate health problems.
The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-efficacy and self-control on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down to fruit and vegetable consumption and portion size. This study was significant as there were a limited number of studies on these factors within the Asian Indian community, especially among the women. As this minority group was growing in the United States, it was important to comprehend their dietary and leisure time physical activity for health improvements. Results from the study added to the knowledge base regarding the extent of the role of the chosen constructs within the social cognitive theory in predicting dietary behavior and leisure time physical activity. In particular this study helped determine which constructs were better indicators of diet and physical activity within middle aged Asian Indian women. Ultimately, these findings were useful in building future intervention and prevention programs regarding dietary behaviors and physical activity that may help prevent chronic illnesses and improve overall health for these women.

Design

A cross sectional design was utilized, as it studied a large pool of participants while being time and cost efficient. Associations between the chosen Social Cognitive Theory constructs and selected dietary behaviors, and leisure time physical activity were determined through this design. Unfortunately, a cause and effect relationship was not detectable through this design. At
Methods

the same time, information obtained regarding the prevalence of behaviors was for the given
time period and behaviors may have varied on a different day. For the purpose of this study, a
cross sectional design was the best fit.

Population and Sample

The research was directed towards middle aged Asian Indian women between the ages of 35 and 55 in the metro Chicago area. According the U. S Census Bureau (2007) Chicago had the fourth largest Asian Indian population in the United States. There were approximately 116,868 Asian Indians as of 2006. Based on this information, a sample size of 200 participants was needed for the study. The population correlation coefficient was 0.20, with a power of 0.80 and an alpha level at 0.05 was used to determine the sample size (Polit & Hungler, 1999). Women were recruited from the gathering areas at the Manav Seva Mandir Temple for four consecutive Saturdays in the month of July, 2009. Many Asian Indian women go to this temple and was thus an ideal center for data collection. Women at the temple represented different socioeconomic backgrounds and different geographic areas within the metro Chicago area. Participants were assured by the researcher that participation was voluntary and anonymity would be maintained. They were also informed they were able to withdraw from the study at any time.

Instrumentation

Participants were asked to fill out a four part questionnaire (see Appendix A). The first part was a recall of their leisure time physical activity levels in the past seven days using the Survey on Exercise in Minority Communities. Permission to use the survey was obtained prior to usage. This instrument was already developed and was deemed reliable and valid. The survey
asked women if they had participated in any free time physical activity other than that done at their jobs or at home. If so, they were asked to indicate the amount of time they spent doing that activity.

The next section consisted of 38 questions which utilized a four point Likert scale survey developed by the researcher. This portion utilized Social Cognitive Theory constructs of expectations, self-efficacy and self-control while measuring their leisure time physical activity, fruit and vegetable consumption, and portion size.

The four point Likert scale ranged from three (very important, very sure, strongly agree) to zero (not at all important, not at all sure, strongly disagree). Of the 38 questions, questions one to four measured self-efficacy for fruit and vegetable consumption, questions five to eight measured leisure time physical activity and questions nine to 12 measure portion size control. A range of scores from zero to 12 were possible for each factor of self-efficacy. Questions regarding expectations were broken down to outcome expectations and expectancies, since expectations were calculated as a multiplicative score of the two. Outcome expectations, for leisure time physical activity were measured from questions 13 to 17, fruit and vegetable consumption was measured in questions 18 to 22 and portion size control was measured from questions 23 to 27. Expectancies were measured in questions 28 to 32. A range of scores for expectations were from zero to 64 were possible for each factor. Finally, self-control for leisure time physical activity was measured on questions 33 to 38, portion size control was measured on questions 33 to 34, leisure time physical activity was measured on questions 35 to 36 and fruit and vegetable consumption was measured on questions 37 to 38. A range of scores from zero to nine were possible. After the completion of these questions, participants filled out a dietary recall
from the past 24 hours (questions 39 to 42), which was developed by the researcher. Finally, demographic questions (questions 43 to 47) regarding age, length of residency, occupation levels and education levels were asked. A total of 47 questions were asked on the last three portions of the survey. Validity and reliability of the surveys were determined prior to data collection.

Face and content validity was measured by a panel of experts. The panel consisted of six experts from the University of Cincinnati (See Appendix B). Professors with expertise in Health Promotion Education, nutrition, and exercise physiology were utilized. Each expert was given a set of instructions, which provided them information regarding the questions to refer to. They were also asked to assess whether the questions were culturally/socially appropriate, accurately measured the factors and chosen constructs. The questionnaire was provided along with the instructions. They also indicated any items that needed further explanation. Changes were made to the survey accordingly and given back to the experts for a final review.

Reliability was determined through a Cronbach’s alpha and a test-retest procedure. Cronbach’s alpha was used for internal consistency to ensure items are measuring the given constructs. Attempts to conduct a test-retest with 25 middle aged Asian Indian women in Cincinnati, OH was made but failed. Participants for this portion did not respond for the retest portion. Numerous phone calls and messages were left but no responses were made. After all validity and reliability tests were completed, data collection began.

**Procedures**

Prior to data collection, approval from the researcher’s thesis committee and the Institution Review Board (IRB) was obtained in June 2009. Permission from the Manav Seva
Mandir was contacted and permission was obtained via written consent for participant recruitment in the gathering hall (see Appendix C). These facilities were chosen as many middle aged Asian Indian women gathered at these locations. Data was collected until 200 surveys were collected from middle aged Asian Indian women, with data collection lasting no more than for four consecutive weekends in the month of July.

At the temple, the researcher was stationed at the center of the room with a small table. A pile of surveys were placed on one end and on the other was a manilla envelope for women to place completed surveys. The researcher greeted women in the waiting area and asked them if they were interested in participating in a study that looked at dietary behavior and leisure time physical activity in middle aged Asian Indian women. They were verbally assured of anonymity and ability to withdraw from the study at any point; this information was also provided on the cover letter of the questionnaires. Upon agreement of participation a survey packet was handed to them. The survey packet included a cover letter, a consent form, the questionnaires and a clipboard and pen for survey completion. The cover letter explained the purpose and importance of the study, and the researchers’ contact information. They were told to sign the consent form and return it to the researcher before answering the questionnaires. Participants were also informed by the researcher to not write their names on any of the pages to ensure anonymity in the study. They were also advised to keep the cover letter and were told to call the number provided if any questions came up or were interested in acquisition of the results. Thereafter, each woman took a seat in the waiting area and filled out the packet while the researcher recruited other women. Upon completion of the surveys, the woman inserted them into the manilla envelope set on the center table and placed the clipboards on the table as well. The researcher thanked each woman after the survey was handed in.
Data Analysis

All data was entered into a personal Dell laptop by the researcher and analysis was conducted on SPSS’s PASW 18.0. Descriptive statistics were obtained for demographic information. Pearson correlations were utilized to determine relationships between constructs within the social cognitive theory and individual variables (leisure time physical activity, fruit and vegetable consumption and portion control). Stepwise multiple regressions were conducted for all of the surveys. Based on the analysis, it was assumed that the selected construct held a positive relationship among leisure time physical activity, fruit and vegetable consumption and portion size consumption. This allowed us to account for significant proportions of variance between the chosen constructs within the social cognitive theory and leisure time physical activity, fruit and vegetable consumption and portion size. Alpha levels were set to .05 to determine significance.

Summary

This chapter explored the target population, instrumentation, procedures and data analysis for the study. A sample of 200 women will be surveyed at the Manav Seva Mandir temple to obtain results for the study. Results from the data are shown in the next chapter.
Chapter Four

Results

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-control, and self-efficacy on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down into fruit and vegetable consumption and portion size control. This study was significant as there were a limited number of studies on these factors within the Asian Indian community, especially among the women. As this minority group was growing in the United States, it was important to comprehend their dietary and leisure time physical activity for health improvements. Results from the study added to the knowledge base regarding the extent of the role of the chosen constructs within the social cognitive theory in predicting dietary behavior and leisure time physical activity. In particular this study helped determine which constructs were better indicators of diet and physical activity within middle aged Asian Indian women. Ultimately, these findings were useful in building future intervention and prevention programs regarding dietary behaviors and physical activity that may help prevent chronic illnesses and improve overall health for these women.

Chapter one addressed the problem, purpose, research questions, hypotheses and operational definitions. Chapter two reviewed literature on obesity, dietary behaviors and physical activity behaviors, their connection to Asian Indian women and the predictors of the Social Cognitive Theory – self efficacy, expectations and self control. In chapter three, the
methodology of the study was discussed. This chapter looks at the description of participants and the results of the study.

**Respondents**

The sample consisted of 200 middle aged Asian Indian women who completed a paper and pencil survey. Once 200 women had submitted surveys, the study was closed off. There were approximately 116,868 Asian Indians as of 2006 in Chicago, Illinois. While going through the surveys, not all participants had filled the survey in its entirety. Seventy eight women left the dietary recall and leisure time physical activity portions empty. Two participants chose not to reveal their age and 14 did not answer the number of years they have resided in the United States.

**Reliability Coefficients for Instruments**

Table 4.1 shows the Cronbach’s alpha that was conducted to test internal consistency. Most of the items were reliable for the study except for the self control of fruit and vegetable consumption and portion consumption. The low alpha values for these items were due to the scale being newly developed. This matter has been further discussed in chapter five.
Table 4.1 *Reliability Coefficients (Cronbach’s alpha) for Self Efficacy, Expectations and Self Control*

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Subscale</th>
<th>Alpha levels</th>
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<tr>
<td><strong>Self Efficacy</strong></td>
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<tr>
<td></td>
<td>Fruit and Vegetable Consumption</td>
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<td></td>
<td>Physical Activity</td>
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<td></td>
<td>Portion Consumption</td>
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</tr>
<tr>
<td><strong>Expectations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fruit and Vegetable Consumption</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>Physical Activity</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>Portion Consumption</td>
<td>0.95</td>
</tr>
<tr>
<td><strong>Self Control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fruit and Vegetable Consumption</td>
<td>.38</td>
</tr>
<tr>
<td></td>
<td>Physical Activity</td>
<td>.61</td>
</tr>
<tr>
<td></td>
<td>Portion Consumption</td>
<td>.31</td>
</tr>
</tbody>
</table>
Demographic and Background Characteristics

Tables 4.2, 4.3 and 4.4 illustrate the demographic and background characteristics of the participants. The mean age of the participants was 44.87 years with a range of 35 to 55 years and a standard deviation of 6.58, as indicated in Table 4.2. An average of 17.66 years with a range of 0-40 years (standard deviation 9.78) were spent in the United States by the participants. It is important to note that not all participants filled out their age or years of residency in the United States, as shown under the n values in Table 4.2.

Table 4.2 Summary of the Demographic Characteristics of the Sample of Middle Aged Asian Indian Women

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>St. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>198</td>
<td>35</td>
<td>55</td>
<td>44.87</td>
<td>6.58</td>
</tr>
<tr>
<td>Number of Years in the U.S</td>
<td>186</td>
<td>0</td>
<td>40</td>
<td>17.66</td>
<td>9.78</td>
</tr>
</tbody>
</table>

Table 4.3 depicts frequencies of the various educational levels completed by the participants. Of the 200 participants, four chose not to answer this demographic question. There were 14.8% that only held a high school diploma, while a majority, 58.7%, had completed their bachelor’s degree. Some participants held higher degrees: 21.4% had a masters’ and 5.1% held a professional or doctorate degree.
Table 4.3 *Summary of Educational Levels Sample of Middle Aged Asian Indian Women*

<table>
<thead>
<tr>
<th>Educational Levels</th>
<th>n</th>
<th>%</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School or less</td>
<td>29</td>
<td>14.8</td>
<td>14.8</td>
</tr>
<tr>
<td>Completed Bachelors Degree</td>
<td>115</td>
<td>58.7</td>
<td>73.5</td>
</tr>
<tr>
<td>Completed Masters Degree</td>
<td>42</td>
<td>21.4</td>
<td>94.9</td>
</tr>
<tr>
<td>Completed Doctorate or Prof. Degree</td>
<td>10</td>
<td>5.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.4 shows frequencies of how often the participants worked. A majority of the participants answered this demographic question except for one. Of those that responded, 19.1% stayed at home, 20.6% worked part time and 60% were employed full time.

Table 4.4 *Summary of Employment Levels of the Sample of Middle Aged Asian Indian Women*

<table>
<thead>
<tr>
<th>Employment Levels</th>
<th>n</th>
<th>%</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay at home</td>
<td>38</td>
<td>19.1</td>
<td>19.1</td>
</tr>
<tr>
<td>Part Time</td>
<td>41</td>
<td>20.6</td>
<td>39.7</td>
</tr>
<tr>
<td>Full Time</td>
<td>120</td>
<td>60.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 4.5 illustrates the summary of the dependent variables in the sample of middle aged Asian Indian women. All participants filled out the physical activity portion but not all had completed fruit and vegetable consumption (n = 122) and portion consumption (n= 126). The mean fruit and vegetable consumption score was 3.53 with a standard deviation of 1.99, while portion consumption had a mean of 10.17 with a standard deviation of 3.73. Fruit and vegetable consumption ranged from none to nine servings, while portion consumption varied from one to 21 portions in the past 24 hours. Physical activity had a mean of 21.97 minutes with a standard deviation of 27.28. Participants engaged in physical activity from zero minutes to 240 minutes.

Table 4.5 \textit{Summary of Dependent Variables in the Sample of Middle Aged Asian Indian Women}

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and Vegetable Consumption</td>
<td>122</td>
<td>0.00</td>
<td>9.00</td>
<td>3.53</td>
<td>1.99</td>
</tr>
<tr>
<td>Portion Consumption</td>
<td>126</td>
<td>1.00</td>
<td>21.00</td>
<td>10.17</td>
<td>3.73</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>200</td>
<td>0.00</td>
<td>240.00</td>
<td>21.97</td>
<td>27.28</td>
</tr>
</tbody>
</table>

Table 4.6 illustrated the distribution of means and standard deviations for the self efficacy scale. The scaled measured self efficacy levels, respectively, for fruit and vegetable consumption, physical activity and portion consumption. The possible range of scores for each
item (total of four) under fruit and vegetable consumption were 0-3, with an overall possible range of scores from 0-12; a similar possible range was set for portion consumption. While the possible range of scores for each item under physical activity was similar to the prior two, the overall possible range of scores for this measure was 0-15. The mean for fruit and vegetable consumption was 7.00 with a standard deviation of 2.77, for portion consumption the mean score was 8.05 (standard deviation = 2.46), while the physical activity mean score was 9.84 standard deviation = 2.88).

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Possible range Obs.</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and Vegetable Consumption</td>
<td>200</td>
<td>0-12</td>
<td>0-12</td>
<td>7.00</td>
<td>2.77</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>200</td>
<td>0-15</td>
<td>0-15</td>
<td>9.83</td>
<td>2.88</td>
</tr>
<tr>
<td>Portion Consumption</td>
<td>200</td>
<td>0-12</td>
<td>0-12</td>
<td>8.05</td>
<td>2.46</td>
</tr>
</tbody>
</table>

Table 4.7 displayed the means and standard deviations for expectations scale which measured fruit and vegetable consumption, physical activity and portion consumption.
Expectations were calculated by multiplying outcome expectations, five individual items per measurement, with outcome expectancies, which were also five individual items each and then summed for a total score for the respective measurements. A possible range for each measurement was from 0-45. The mean score for fruit and vegetable consumption was 26.76 with a standard deviation of 11.66, for physical activity the mean was 27.32 (standard deviation = 10.68) while the mean for portion consumption was 25.66 (standard deviation = 10.96).

Table 4.7 Distributions of Means and Standard Deviations for the Sample of Middle Aged Asian Indian Women’s Expectation Levels

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Possible Range</th>
<th>Obs. Range</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and Vegetable Consumption</td>
<td>200</td>
<td>0-45</td>
<td>0-45</td>
<td>26.76</td>
<td>11.66</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>200</td>
<td>0-45</td>
<td>0-45</td>
<td>27.32</td>
<td>10.68</td>
</tr>
<tr>
<td>Portion Consumption</td>
<td>200</td>
<td>0-45</td>
<td>0-45</td>
<td>25.66</td>
<td>10.96</td>
</tr>
</tbody>
</table>

Table 4.8 illustrated the means and standard deviations for the self control scale for the respective measurements. A possible range of scores from 0-6 was possible for fruit and vegetable consumption and physical activity. For the portion consumption measurement, a range of scores from 0-3 was possible. The mean score for fruit and vegetable consumption was 2.82 with a standard deviation of 2.02, for physical activity the mean was 3.37 (standard deviation = 1.62), while the mean for portion consumption was 2.03 (standard deviation = .82). Portion size
was changed to portion consumption due to the lack of responses or responses failed to include number of items consumed. Therefore, portion size could not be determined and the variable was changed to portion consumption.

Table 4.8 Distribution of Means and Standard Deviations for the Sample of Middle Aged Asian Indian Women’s Self Control Levels

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Poss. Range</th>
<th>Obs. Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and Vegetable Consumption</td>
<td>200</td>
<td>0-6</td>
<td>0-6</td>
<td>2.82</td>
<td>2.02</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>200</td>
<td>0-6</td>
<td>0-6</td>
<td>3.37</td>
<td>1.62</td>
</tr>
<tr>
<td>Portion Consumption</td>
<td>200</td>
<td>0-6</td>
<td>0-6</td>
<td>2.03</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Figure 4.1, 4.2, 4.3 and 4.4 depict the distribution of fruit and vegetable consumption, portion consumption and physical activity, respectively. Normal distributions were found for fruit and vegetable consumption and portion consumption while a skew to the right was found for physical activity. In order to normalize the skewed data, the natural log of minutes spent in leisure time physical activity was taken. Figure 4.4 illustrated the normalized curve from the natural log of physical activity.
Results

Figure 4.1. Fruit and Vegetable Consumption in the Past 24 Hrs in the Sample of Middle Aged Asian Indian Women
Figure 4.2. Number of Portions Consumed in the Past 24 Hrs in the Sample of Middle Aged Asian Indian Women
Results

Figure 4.3. Participation in Leisure Time Physical Activity in the Sample of Middle Aged Asian Indian Women
Figure 4.4. *Natural Log of Participation in Leisure Time Physical Activity in the Sample of Middle Aged Asian Indian Women*
Correlations

Pearson correlations were conducted for fruit and vegetable consumption, physical activity and portion consumption with age, education levels and the number of years of residence in the United States. Table 4.9, 4.10, 4.11 illustrate these relationships. In regards to physical activity (Table 4.9), a significant positive relationship was seen between self efficacy, self control, expectations and the number of minutes individuals participated in physical activity. A significant negative relationship was seen between age and education for this measurement. Table 4.10 illustrated significant positive relationships between self efficacy, self control, age and expectations for portion consumption while a negative relationship was seen among age and education. Significant positive relationships between self efficacy, self control and expectations for fruit and vegetable consumption, while a negative relationship was seen between self efficacy and age, as shown in Table 4.11.
Table 4. Pearson Correlations for Leisure Time Physical Activity in the Sample of Middle Aged Asian Women

<table>
<thead>
<tr>
<th></th>
<th>If yes, how many minutes?</th>
<th>Self efficacy leisure time physical activity</th>
<th>Expectations</th>
<th>Self Control</th>
<th>Age in U. S.</th>
<th>No. yrs.</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, how many minutes?</td>
<td>r: .245**</td>
<td>.328**</td>
<td>.022</td>
<td>-.063</td>
<td>.078</td>
<td>-.032</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p: .000</td>
<td>.000</td>
<td>.754</td>
<td>.377</td>
<td>.290</td>
<td>.653</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 200</td>
<td>200</td>
<td>199</td>
<td>198</td>
<td>186</td>
<td>196</td>
<td></td>
</tr>
<tr>
<td>Self efficacy leisure time</td>
<td>r: .328**</td>
<td>.554</td>
<td>1.045</td>
<td>-.119</td>
<td>.030</td>
<td>.009</td>
<td></td>
</tr>
<tr>
<td>leisure time physical activity</td>
<td>p: .000</td>
<td>.000</td>
<td>.000</td>
<td>.553</td>
<td>.723</td>
<td>.067</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 200</td>
<td>200</td>
<td>200</td>
<td>199</td>
<td>198</td>
<td>186</td>
<td>196</td>
</tr>
<tr>
<td>Expectations</td>
<td>r: .328**</td>
<td>.554</td>
<td>1.248</td>
<td>-.042</td>
<td>.026</td>
<td>.131</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p: .000</td>
<td>.000</td>
<td>.000</td>
<td>.553</td>
<td>.723</td>
<td>.067</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 200</td>
<td>200</td>
<td>200</td>
<td>199</td>
<td>198</td>
<td>186</td>
<td>196</td>
</tr>
<tr>
<td>Self Control</td>
<td>r: .022</td>
<td>.405</td>
<td>.248</td>
<td>1.043</td>
<td>.047</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p: .754</td>
<td>.000</td>
<td>.000</td>
<td>.552</td>
<td>.526</td>
<td>.983</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 199</td>
<td>199</td>
<td>199</td>
<td>199</td>
<td>197</td>
<td>185</td>
<td>195</td>
</tr>
<tr>
<td>Age</td>
<td>r: -.063</td>
<td>-.119</td>
<td>-.042</td>
<td>.043</td>
<td>1</td>
<td>-.026</td>
<td>-.165</td>
</tr>
<tr>
<td></td>
<td>p: .377</td>
<td>.095</td>
<td>.553</td>
<td>.552</td>
<td>.722</td>
<td>.021</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 198</td>
<td>198</td>
<td>198</td>
<td>197</td>
<td>198</td>
<td>185</td>
<td>195</td>
</tr>
<tr>
<td>No. yrs U. S.</td>
<td>r: .078</td>
<td>.030</td>
<td>.026</td>
<td>.047</td>
<td>-.026</td>
<td>1</td>
<td>-.114</td>
</tr>
<tr>
<td></td>
<td>p: .290</td>
<td>.680</td>
<td>.723</td>
<td>.526</td>
<td>.722</td>
<td>.123</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 186</td>
<td>186</td>
<td>186</td>
<td>185</td>
<td>185</td>
<td>186</td>
<td>185</td>
</tr>
<tr>
<td>Education</td>
<td>r: -.032</td>
<td>.009</td>
<td>.131</td>
<td>.002</td>
<td>-.165</td>
<td>-.114</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>p: .653</td>
<td>.896</td>
<td>.983</td>
<td>.021</td>
<td>.123</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: 196</td>
<td>196</td>
<td>196</td>
<td>195</td>
<td>195</td>
<td>185</td>
<td>196</td>
</tr>
</tbody>
</table>
Table 4.10. *Pearson Correlations for Portion Consumption in the Sample of Middle Aged Asian Indian Women*

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>No. of yrs in the U.S.</th>
<th>Education</th>
<th>No. of portions</th>
<th>Self efficacy portion consumption</th>
<th>Expectations</th>
<th>Self Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>r</td>
<td>-.026</td>
<td>-.165</td>
<td>.042</td>
<td>-.101</td>
<td>-.015</td>
<td>.162</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.722</td>
<td>.021</td>
<td>.638</td>
<td>.157</td>
<td>.829</td>
<td>.023</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>198</td>
<td>185</td>
<td>195</td>
<td>126</td>
<td>198</td>
<td>198</td>
</tr>
<tr>
<td>Number of years in the United States</td>
<td>r</td>
<td>-.026</td>
<td>1</td>
<td>-.114</td>
<td>-.060</td>
<td>-.078</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>185</td>
<td>186</td>
<td>185</td>
<td>122</td>
<td>186</td>
<td>186</td>
</tr>
<tr>
<td>Education</td>
<td>r</td>
<td>-.165</td>
<td>1</td>
<td>.051</td>
<td>.045</td>
<td>.078</td>
<td>.044</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.021</td>
<td>.123</td>
<td>.571</td>
<td>.529</td>
<td>.275</td>
<td>.539</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>195</td>
<td>185</td>
<td>196</td>
<td>124</td>
<td>196</td>
<td>195</td>
</tr>
<tr>
<td>number of portions</td>
<td>r</td>
<td>.042</td>
<td>-.060</td>
<td>.051</td>
<td>1</td>
<td>-.130</td>
<td>-.066</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.638</td>
<td>.509</td>
<td>.571</td>
<td>.147</td>
<td>.461</td>
<td>.881</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>126</td>
<td>122</td>
<td>124</td>
<td>126</td>
<td>126</td>
<td>126</td>
</tr>
<tr>
<td>Self Efficacy for Portion Consumption</td>
<td>r</td>
<td>-.101</td>
<td>-.078</td>
<td>.045</td>
<td>-.130</td>
<td>1</td>
<td>.474</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.157</td>
<td>.292</td>
<td>.529</td>
<td>.147</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>198</td>
<td>186</td>
<td>196</td>
<td>126</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Expectations</td>
<td>r</td>
<td>-.015</td>
<td>.061</td>
<td>.078</td>
<td>-.066</td>
<td>.474</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.829</td>
<td>.406</td>
<td>.275</td>
<td>.461</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>198</td>
<td>186</td>
<td>196</td>
<td>126</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Self Control</td>
<td>r</td>
<td>.162</td>
<td>.002</td>
<td>.044</td>
<td>-.013</td>
<td>.415</td>
<td>.433</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.023</td>
<td>.978</td>
<td>.539</td>
<td>.881</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>197</td>
<td>185</td>
<td>195</td>
<td>126</td>
<td>199</td>
<td>199</td>
</tr>
</tbody>
</table>

*Indian Women*
Table 4.11 *Pearson Correlations for Fruit and Vegetable Consumption in the Sample of Middle Aged Asian Indian Women*

<table>
<thead>
<tr>
<th></th>
<th>Self Efficacy for Fruit and Vegetable Consumption</th>
<th>Expectations for Fruit and Vegetable Consumption</th>
<th>Self Control for Fruit and Vegetable Consumption</th>
<th>Total Fruit and Vegetable Consumption</th>
<th>Age</th>
<th>No. of years in the United States</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Efficacy for Fruit and Vegetable Consumption</td>
<td>r</td>
<td>.535**</td>
<td>.438**</td>
<td>.059</td>
<td>-</td>
<td>-.042</td>
<td>.023</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.517</td>
<td>.018</td>
<td>.565</td>
<td>.749</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>200</td>
<td>200</td>
<td>198</td>
<td>122</td>
<td>198</td>
<td>186</td>
</tr>
<tr>
<td>Expectations for Fruit and Vegetable Consumption</td>
<td>r</td>
<td>.535**</td>
<td>1</td>
<td>.321**</td>
<td>.056</td>
<td>-</td>
<td>-.021</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.543</td>
<td>.388</td>
<td>.780</td>
<td>.617</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>200</td>
<td>200</td>
<td>198</td>
<td>122</td>
<td>198</td>
<td>186</td>
</tr>
<tr>
<td>Self Control for Fruit and Vegetable Consumption</td>
<td>r</td>
<td>.438**</td>
<td>.321**</td>
<td>1</td>
<td>-.083</td>
<td>-</td>
<td>-.087</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.366</td>
<td>.243</td>
<td>.238</td>
<td>.723</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>198</td>
<td>198</td>
<td>198</td>
<td>121</td>
<td>196</td>
<td>184</td>
</tr>
<tr>
<td>Total Fruit and Vegetable Consumption</td>
<td>r</td>
<td>.059</td>
<td>.056</td>
<td>-.083</td>
<td>1</td>
<td>.080</td>
<td>-.222**</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.517</td>
<td>.543</td>
<td>.366</td>
<td>.379</td>
<td>.016</td>
<td>.349</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>122</td>
<td>122</td>
<td>121</td>
<td>122</td>
<td>122</td>
<td>118</td>
</tr>
<tr>
<td>Age</td>
<td>r</td>
<td>-.167*</td>
<td>-.062</td>
<td>-.084</td>
<td>.080</td>
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<td>-.026</td>
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<tr>
<td></td>
<td>p</td>
<td>.018</td>
<td>.388</td>
<td>.243</td>
<td>.379</td>
<td>.722</td>
<td>.021</td>
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<td></td>
<td>n</td>
<td>198</td>
<td>198</td>
<td>196</td>
<td>122</td>
<td>198</td>
<td>185</td>
</tr>
</tbody>
</table>
Regression Models

A stepwise regression was conducted for the dependent variables: fruit and vegetable consumption, physical activity and portion consumption. Self efficacy, self control, expectations, age, employment levels, education levels and years of residency in the United States were independent variables that were being tested against the dependent variables. Scores for the dependent variables had to be normally distributed for a regression to have taken place. Fruit and vegetable consumption and portion consumption were normally distributed, while physical activity had a skew to the right. Due to the skewed data for physical activity, the natural log of minutes participants engaged in physical activity was used to obtain a normal distribution, as shown in Figure 4.4.

Table 4.1 summarizes fruit and vegetable consumption scores regressed for self efficacy, expectations, self control, age, employment levels, and number of years residing in the United States. An inverse relationship between fruit and vegetable consumption and the number of year of residence in the United States was seen. This model had an adjusted R² of 0.042 which indicated there was a 4.2% variance for fruit and vegetable consumption scores.

Table 4.13 shows the natural log of physical activity scores regressed for self efficacy, expectations, self control, age, employment levels, and number of years residing in the United States. An inverse relationship was held with self control and education levels, while a positive relationship was seen with expectations. This model had an adjusted R² of 0.142, which indicated a 14.2% variance for physical activity scores.
Portion size was undeterminable due to the lack of responses on the dietary recall section of the survey. Those that responded failed to include the exact amount they consumed. Due to these issues, portion size was undeterminable, but an estimate of number of portions consumed was calculable. Numbers of portion consumption scores were regressed for self efficacy, expectations, self control, age, employment levels, and number of years residing in the United States. No significant relationships were found for these scores. This was further discussed in chapter five.

Table 4.12 Parameter Estimates from the Final Regression Model for Fruit and Vegetable Consumption Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Unstandardized Coeff.</th>
<th>Std. Error</th>
<th>Std. Coefficients Beta</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(constant)</td>
<td>4.34</td>
<td>0.38</td>
<td></td>
<td>11.57</td>
<td>0.00</td>
</tr>
<tr>
<td>No. of Yrs in the U.S</td>
<td>-0.05</td>
<td>0.02</td>
<td>-0.23</td>
<td>-2.47</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table 4.13 Parameter Estimates from the Final Regression Model for Physical Activity Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Unstandardized Coeff.</th>
<th>Std. Error</th>
<th>Std. Coefficients Beta</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(constant)</td>
<td>3.16</td>
<td>0.22</td>
<td></td>
<td>14.41</td>
<td>0.00</td>
</tr>
<tr>
<td>Expectations</td>
<td>0.02</td>
<td>0.01</td>
<td>0.33</td>
<td>3.74</td>
<td>0.00</td>
</tr>
<tr>
<td>Education</td>
<td>-0.19</td>
<td>0.08</td>
<td>-0.22</td>
<td>-2.48</td>
<td>0.02</td>
</tr>
<tr>
<td>Self Control</td>
<td>-0.09</td>
<td>0.04</td>
<td>-0.20</td>
<td>-2.26</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Summary

This chapter looked at the descriptive and analytical statistics conducted for the data collected. Portion size control had to be altered to portion consumption due to the limited responses on the dietary recall and the lack of accurate reporting of portions for those that had responded. In the next chapter findings of the results will be discussed along with the limitations, and future recommendations.
Discussion

Chapter Five
Discussion

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-efficacy and self-control on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down to fruit and vegetable consumption and portion size control. Later on portion size was changed to number of portions consumed. This study was significant as there were a limited number of studies on these factors within the Asian Indian community, especially among the women. As this minority group was growing in the United States, it was important to comprehend their dietary and leisure time physical activity for health improvements. Results from the study added to the knowledge base regarding the extent of the role of the chosen constructs within the social cognitive theory in predicting dietary behavior and leisure time physical activity. In particular this study helped determine which constructs were better indicators of diet and physical activity within middle aged Asian Indian women. Ultimately, these findings were useful in building future intervention and prevention programs regarding dietary behaviors and physical activity that may help prevent chronic illnesses and improve overall health for these women. This chapter discusses the testing of research hypothesis, conclusions, limitations and recommendations.
Testing Research Hypothesis

Hypothesis 1

Predictive hypothesis (H1). The expectation of leisure time physical activity will have a positive relationship to leisure time physical activity in middle aged Asian Indian women. Pearson correlations conducted for testing the relationship between leisure time physical activity and expectations of it showed a significant positive relationship, \( p = 0.000, R^2 = 0.142 \). Based on the results, the null hypothesis which stated there will be no relationship between expectations of leisure time physical activity and actual physical activity in middle aged Asian Indian women was rejected.

Hypothesis 2

Predictive hypothesis (H1) 2. The self-efficacy of leisure time physical activity will have a positive relationship to leisure time physical activity in middle aged Asian Indian women. Pearson correlations conducted to this hypothesis revealed no significant relationship, \( p = 0.697 \). Based on the results, the null hypothesis which stated there will be no relationship with self-efficacy of leisure time physical activity and actual physical activity in middle aged Asian Indian women was not rejected.

Hypothesis 3

Predictive hypothesis (H1) 3. The self-control of leisure time physical activity will have a positive relationship to leisure time physical activity in middle aged Asian Indian women. Pearson correlations conducted to test this hypothesis indicated a significant inverse
relationship, $p = 0.026$, $R^2 = 0.142$. Based on the result, the null hypothesis which stated there will be no relationship with self-control of leisure time physical activity and actual physical activity in middle aged Asian Indian women was rejected.

Hypothesis 4

Predictive hypothesis (H1) 4. The expectations of fruit and vegetable consumption will have a positive relationship to predict fruit and vegetable consumption in middle aged Asian Indian women. Pearson correlations conducted to test this hypothesis revealed no significant relationship, $p = 0.987$. Based on the result, the null hypothesis which stated there will be no relationship with expectations of fruit and vegetable consumption and actual fruit and vegetable consumption in middle aged Asian Indian women was not rejected.

Hypothesis 5

Predictive hypothesis (H1) 5. The self-efficacy of fruit and vegetable consumption will have a positive relationship with fruit and vegetable consumption in middle aged Asian Indian women. Pearson correlation conducted for this hypothesis indicated no significant relationship, $p = 0.331$. Based on the result, the null hypothesis which stated there will be no relationship with self-efficacy of fruit and vegetable consumption and actual fruit and vegetable consumption in middle aged Asian Indian women was not rejected.
Hypothesis 6

Predictive hypothesis (H1) 6. The self-control of fruit and vegetable consumption will have a positive relationship with fruit and vegetable consumption. Pearson correlations conducted for this hypothesis showed no significant relationship, \( p = 0.185 \). Based on the result, the null hypothesis which stated there will be no relationship with self-control of fruit and vegetable consumption and actual fruit and vegetable consumption was not rejected.

Hypothesis 7

Predictive hypothesis (H1) 7. The expectations of reducing portion consumption control for meals will have a positive relationship with reducing portion size for meals. Pearson correlations conducted for this hypothesis revealed no significant relationship, \( p = 0.209 \). Based on the result, the null hypothesis which stated there will be no relationship with expectations of reducing portion size control for meals and actual reduction of portion consumption for meals was not rejected.

Hypothesis 8

Predictive hypothesis (H1) 8. The self-efficacy of reducing portion consumption for meals will have a positive relationship with reducing portion size for meals. Pearson correlations conducted to test this hypothesis indicated no significant relationship, \( p = 0.110 \). Based on the result, the null hypothesis which stated there will be no relationship
with self-efficacy of reducing portion size control for meals and actual reduction of portion consumption for meals was not rejected.

Hypothesis 9

Predictive hypothesis (H1) 9. The self-control of reducing portion consumption control for meals will have a positive relationship with reducing portion size for meals. Pearson correlation conducted for this hypothesis revealed no significant relationship, $p = 0.457$. Based on this result, the null hypothesis which stated there will be no relationship with self-control of reducing portion consumption control for meals will have no relationship to reducing portion size for meals, was no rejected.

Pearson correlations were also conducted to test relationships between leisure time physical activity, fruit and vegetable consumption and portion size with demographic variables of age, education, years of residency in the United States and employment. Correlations between leisure time physical activity and the selected demographic variables indicated a significant inverse relationship with education levels, $p = 0.015$. Thus, higher levels of education meant fewer Asian Indian women engaged in leisure time physical activity. The number of years of residence in the United States and fruit and vegetable consumption were found to have a significant inverse relationship, $p = 0.015$. Hence, years of residence increased for Asian Indian women, they were less likely to consume fruits and vegetables as opposed to those residing in the U.S. for a shorter period of time. Due to the lack of responses on the dietary recall, significant relationships
Discussion

were not seen. If more participants answered these questions, correlations would be possible.

Conclusions

The purpose of the study was to determine to what extent the selected constructs within the social cognitive theory account for variance in the dietary behaviors and leisure time physical activity of middle aged Asian Indian women. Specifically, the role of expectations, self-efficacy and self-control on dietary behavior and leisure time physical activity on middle aged Asian Indian women were determined. Dietary behavior was broken down to fruit and vegetable consumption and portion consumption. Portion consumption was originally portion size control. The change in variable took place due to a limited number of participants responding to the dietary recall and those that did respond did not accurately record the number of items they consumed. Therefore, portion size could not be calculated. Results of this study found that expectations and self-control were able to explain some variance in dietary behaviors and leisure time physical activity. Two out of nine hypotheses were found to be significant. Of the other independent variables, education, and number of years of residency in the United States were also found to account for variance in dietary behaviors and leisure time physical activity.

Fruit and Vegetable Consumption

Results indicated that the number of years in the United States was the only significant predictor of fruit and vegetable consumption. The relationship between the two is an inverse. The longer an individual resides in the United States the amount of fruits and vegetables consumed is lowered. This is perhaps due to acculturation. Immigrants adopt behaviors of the natives as their
length of residency increases. In this case, it would appear, Asian Indians started conforming to Western dietary behaviors, which are typically low in fruits and vegetables and higher in fats, meats, other proteins and carbohydrates.

_Leisure Time Physical Activity_

A log transformation of minutes engaged in physical activity was conducted for a regression to take place. Results revealed that self control, expectations and education were the only significant predictors for participation in leisure time physical activity. Self control held an inverse relationship with leisure time physical activity. If an individual sets goals and rewards for their participation in leisure time physical activity, they are not as likely to be engaged in this activity. Questions regarding self control asked the participant about goals and rewards they set for themselves. Asian Indian women tend to place a lower emphasis on exercising, as indicated in prior research. They view household chores and tending to family as forms of exercise. Due to this paradigm, self control could have an indirect relationship with leisure time physical activity.

Expectations, on the other hand, held a positive relationship with this variable. When an individual places values and benefits towards leisure time physical activity, they are more likely to participate in leisure time physical activity. Outcome expectations and expectancies regarding more energy, overall healthiness, healthy weight and being happier were multiplied with each other and then summed for an overall expectation score. Participants’ values and benefits on these aspects of a healthy lifestyle made them more likely to exercise, which confirms findings from earlier studies (Choudhry, 1998; Sriskanthalrajah & Kai, 2006).
Finally, education held an inverse relationship with leisure time physical activity. This implies that individuals with higher levels of education are less likely to engage in leisure time physical activity. As noted in earlier studies, an emphasis was placed on higher education and none towards exercise (Sriskantharajah & Kai, 2006; Yang et. al, 2007). Thus, as more individuals sought higher education, the priority of exercising decreased.

Self efficacy was not a significant variable for leisure time physical activity or dietary behaviors. While this is a salient construct in the social cognitive theory, it held no importance among Asian Indian women. Previous studies indicated its role in practicing these behaviors but had no mention of its effects on ethnicities. Thus, it does not seem to be a valuable variable with this target population. This could be due to the fact that, Asian Indian women tend to have a fatalistic disposition, which is contrary to self efficacy (Hastings, 2000). That paired with a patriarchal society leaves little room for self efficacy to play a significant role with the target population.

**Discussion**

Data on leisure time physical activity were skewed and log transformation was considered to be essential for analysis. Regressions for this variable were run on the log transformation of minutes engaged in leisure time physical activity. Studies indicated that variables such as age, lower education and lack of energy served as barriers in leisure time physical activity (Eyler et. al, 1999; King et. al, 2000). In this study, lower education was found to have an opposite relationship. Asian Indian women with a lower education level were more likely to participate in leisure time physical activity than those with higher education, such as a
masters or PhD/professional degree. Previous studies also indicated that Asian Indian women placed value on being active. This was confirmed in our study, as participants’ expectations were directly related to involvement in leisure time physical activity.

Self control was the other social cognitive theory construct that held a significant relationship with this variable. Prior research indicated that self-consciousness and receiving discouraging messages about exercise, led women to increase their levels of physical activity (King et. al, 2000). This was confirmed in our findings. The less they set goals and rewards towards leisure time physical activity, the more likely they were to partake in it.

For fruit and vegetable consumption, length of residency was the only significant variable. Prior studies indicated that Asian Indians shifted towards a diet high in fats and carbohydrates, with limited consumption of fruits and vegetables (Satia et. al, 2000; Yang et. al, 2007). This was confirmed with our findings of an inverse relationship between the length of residency in the United States and the number of fruits and vegetables consumed. As length of residency increases, acculturation takes place, which leads to immigrants to practice similar dietary habits as the natives (Jonnalagadda & Diwan, 2002; Raj et. al, 1999). In this case, Asian Indian immigrants began to follow a Western diet rich in meats, fat and carbohydrates from fast food and junk food (i.e. chips, cookies, candies).

For portion consumption, no significant variables were found. Portion consumption was originally conceptualized as portion size. However a large majority of participants did not provide information on portion size. This was attributed to the lack of responses on the dietary recall portion of the survey along with many participants unable to recall the exact number of
items consumed in each sitting. Therefore, portion size was not measurable but a consumption score was calculated from the information participants provided. This measure was a total number of portions eaten in 24 hours.

Self efficacy was not a significant variable for leisure time physical activity or dietary behaviors. While this is a salient construct in the social cognitive theory, it held no importance among Asian Indian women. Previous studies indicated its role in practicing these behaviors but had no mention of its effects on ethnicities (Bandura, 2004; Slater, 1989). Thus, it is not a valuable variable with the target population. In addition, Asian Indian women tend to have a fatalistic disposition, which is contrary to self efficacy (Hastings, 2004). That paired with a patriarchal society leaves little room for self efficacy to play a significant role with the target population.

**Limitations of the study**

Results were based on a self-report survey, which could have included both participant bias and dishonesty. As this was a self-report survey based study, recall was a potential problem. In addition, participants may not have full understood or may have misinterpreted questions that might have misrepresented the responses. This study utilized a cross-sectional method, which supplied us with information for that particular point in time. Answers might have varied if the survey was given at a different time. Also, nothing can be said about the time sequence of the associations found in this study.

Location served as another limitation in the study. Data was collected at one Hindu temple in the Chicago area. Participants in the study may not be representative of all Asian
Indian women. Hence, there is a possibility that answers might vary at a different temple or region in the country. In addition, women that may not attend temple at all are not accountable in the study.

Participation in the study served as another limitation, as no incentive was given. This might have led to participants not filling out the dietary portion of the survey. It also allowed for self selection bias to occur. Those that were interested in the survey took part in it, while others steered away. Many participants refused to take the survey as they did not have time or did not comprehend the English language as well.

Many participants had problems recalling their diet from the previous day or skipped that section. This led to a lack of significant findings for portion size. At the same time, those that responded failed to write the portion size. Due to this issue, portion size had to be referred to as portion consumption, as we did not have an accurate number of items consumed.

The survey used for the study was newly constructed, since other surveys could not be used for the selected target population. Some items on the survey were found to have a low Cronbach’s alpha.

Implications for Practice

Findings suggest a need for intervention programs focused on improving leisure time physical activity levels and dietary behaviors, as defined by the study. Keeping in mind data for dietary behaviors were not accurate due to a low recall, it was found the length of residency led to lower fruit and vegetable consumption. While acculturation takes place, it is crucial to teach
Discussion

these women to keep up with positive dietary habits. This will allow for reverse dietary acculturation practices to occur.

At the same token, an emphasis on expectations towards leisure time physical activity needs to be present, in order to increase the number of women exercising. In specific, women with higher education degrees need to be targeted, as they exhibited lower levels of leisure time physical activity. It would also be of importance to develop interventions that did not consist of teaching goal setting and rewards for the selected health behaviors.

Recommendations for future research

A need exists for future studies exploring expectations and self control with leisure time physical activity, fruit and vegetable consumption and portion size. Future studies should also be conducted in other temples in Chicago or other cities, to gain a better understanding of these behaviors in Asian Indian women. Replication of this study in another large city is also recommended as it would allow for a comparison of data in different areas. The comparison would allow for better interventions for the target population. It would also be of interest to compare Asian Indian women that have resided in the United States for more than five years versus less than five years; due to residency being a significant variable with dietary behavior. Future studies could also investigate differences among women from various regions in India (i.e North Indian v. South Indian or East Indian v. West Indian). It might also be of interest to compare older Asian Indian women with middle aged Asian Indian women, for practical purposes.
For future purposes, a refined dietary recall which allows for portion size to be measured is also recommended. This would allow for a higher response rate, which would allow significant results to be reached. It might be best to study dietary behaviors along with length of residency and education levels. These variables would give an in depth comprehension of dietary changes. This would in turn allow for refined intervention practices to aid levels of obesity and its associated chronic illnesses.

Future studies can further investigate the role of social support, and expectations the family holds in regards to leisure time physical activity. At the same time, it would also be of interest to do a retrospect study to understand patterns of leisure time physical activity and dietary behaviors.

Summary

Expectations and self control from the social cognitive theory play a significant role in determining leisure time physical activity within middle aged Asian Indian women. It is important to note that self efficacy does not serve as a vital factor within the selected target population. Other variables such as education levels and length of residency serve as important factors in leisure time physical activity and dietary behaviors. Acculturation occurs as length of residency increases in the U.S. for Asian Indian women. In regards to dietary behaviors, this was an important variable that led to lower fruit and vegetable consumption. Interventions that counter the dietary effects of acculturation and increase involvement of leisure time physical activity using expectations and self control need to be developed. Additionally, these findings
suggest the need for more research in this area to obtain a better comprehension of leisure time physical activity and dietary recall in middle aged Asian Indian women.
References:


http://www.cdc.gov/nccdphp/dnpa/nutrition/health_professionals/index.htm


References


Appendix A

University of Cincinnati

Physical activity, Fruit and Vegetable Consumption & Portion Size Consumption Survey

Directions: Participation in this survey is voluntary and anonymous. Your thoughts/comments would be greatly appreciated. Please circle the number that best describes your view. (Please write your telephone number, as you will be asked to take the survey twice.)

Fruits and Vegetables: Fruits and Vegetables are defined as any fresh, frozen or canned fruit, juice or vegetable. Fried items (like french fries) or dessert items (like apple pie) do not apply.

Exercise: Exercise is defined as any free time activity involving large muscle groups (chest, legs, back, etc.) that does not include household duties or occupational related activities.

Portion size: Portion size is defined as the number of bread slices (chappati, puri, etc.), rice cups, cups of dal, cups of fruit (only fresh, frozen or canned – NO dessert items), and cups of vegetables (only fresh, frozen or canned – NO fried items).

Self-Efficacy

Fruits and Vegetables: Fruits and Vegetables are defined as any fresh, frozen or canned fruit, juice or vegetable. Fried items (like french fries) or dessert items (like apple pie) do not apply.

Exercise: Exercise is defined as any free time activity involving large muscle groups (chest, legs, back, etc.) that does not include household duties or occupational related activities.
**Portion size**: Portion size is defined as the number of bread slices (chappati, puri, etc.), rice cups, cups of dal, cups of fruit (only fresh, frozen or canned – NO dessert items), and cups of vegetables (only fresh, frozen or canned – NO fried items).

1. **I am sure I can eat 5 cups of fruits and vegetables each day.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2. **I am sure I can eat 5 cups of fruits and vegetables every day even if I do not like their taste.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

3. **I am sure I can eat 5 cups of fruits and vegetables even if my family does not like to eat them.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

4. **I am sure I can eat 5 cups of fruits and vegetables even if they are costly.**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
5. I am sure I can exercise for at least 30 minutes every day.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

6. I am sure I can exercise for 30 minutes every day even if I am tired.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

7. I am sure I can exercise even if no one in my family is joining with me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

8. I am sure I can exercise with friends that are joining with me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

9. I am sure I can exercise with family that is joining with me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

10. I am sure I can control the amount of food I eat during lunch time.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
11. I am sure I can keep myself from eating excess food during breakfast, lunch, dinner and snack times.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

12. I am sure I can control the amount of (salty?) snacks (crackers, cookies, chips, etc.) I eat each day.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

13. I am sure I can control the amount of food I eat during dinner time.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Expectations

Fruits and Vegetables: Fruits and Vegetables are defined as any fresh, frozen or canned fruit, juice or vegetable. Fried items (like french fries) or dessert items (like apple pie) do not apply.

Exercise: Exercise is defined as any free time activity involving large muscle groups (chest, legs, back, etc.) that does not include household duties or occupational related activities.

Portion size: Portion size is defined as the number of bread slices (chappati, puri, etc.), rice cups, cups of dal, cups of fruit (only fresh, frozen or canned – NO dessert items), and cups of vegetables (only fresh, frozen or canned – NO fried items).
14. If I exercise in my free time for at least 30 minutes per day, I will have more energy?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

15. If I exercise in my free time for at least 30 minutes per day, I will feel more confident in myself

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>1</td>
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<td>3</td>
</tr>
</tbody>
</table>

16. If I exercise in my free time for at least 30 minutes per day, I will feel happier with myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

17. If I exercise in my free time for at least 30 minutes per day, I will be able to keep a healthy weight.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
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<td>3</td>
</tr>
</tbody>
</table>

18. If I exercise in my free time for at least 30 minutes per day, I will feel overall healthier.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>3</td>
</tr>
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</table>
19. If I eat 5 or more cups of fruits and vegetables every day, I will have more energy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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</tr>
</tbody>
</table>

20. If I eat 5 or more cups of fruits and vegetables every day, I will feel more confident in myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
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<td>3</td>
</tr>
</tbody>
</table>

21. If I eat 5 or more cups of fruits and vegetables every day, I will feel happier with myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>3</td>
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</tbody>
</table>

22. If I eat 5 or more cups of fruits and vegetables every day, I will be able to keep a healthy weight.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

23. If I eat 5 or more cups of fruits and vegetables every day, I will feel overall healthier.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
24. If I control the amount of food on my plate, I will have more energy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

25. If I control the amount of food I put on my plate, I will feel more confident in myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

26. If I control the amount of food I put on my plate, I will feel happier with myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

27. If I control the amount of food I put on my plate, I will be able to keep a healthy weight.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

28. If I control the amount of food on my plate, I will feel overall healthier.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
29. It is important that I have more energy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
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</table>

30. It is important that I am more confident in myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
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</table>

31. It is important that I feel happier with myself.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

32. It is important that I am able to keep a healthier weight.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

33. It is important that I am overall healthier.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
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<td>0</td>
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<td>2</td>
</tr>
</tbody>
</table>
Self-Control

Fruits and Vegetables: Fruits and Vegetables are defined as any fresh, frozen or canned fruit, juice or vegetable. Fried items (like french fries) or dessert items (like apple pie) do not apply.

Exercise: Exercise is defined as any free time activity involving large muscle groups (chest, legs, back, etc.) that does not include household duties or occupational related activities.

Portion size: Portion size is defined as the number of bread slices (chappati, puri, etc.), rice cups, cups of dal, cups of fruit (only fresh, frozen or canned – NO dessert items), and cups of vegetables (only fresh, frozen or canned – NO fried items).

34. I set goals to control the amount of food I put on my plate.

<table>
<thead>
<tr>
<th>Always</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
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</table>

35. I reward myself with something other than food, for eating the five cups of fruits and vegetables each day.

<table>
<thead>
<tr>
<th>Always</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
36. I set goals to join in free time physical activity for at least 30 minutes everyday.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

37. I reward myself with something other than food for joining in free time physical activity for at least 30 minutes every day.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
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<tbody>
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<td></td>
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</table>

38. I set goals to eat 5 cups of fruits or vegetables every day.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
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<tbody>
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</table>

39. I reward myself with something other than food for eating 5 cups of fruits or vegetables every day.

<table>
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<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
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</table>

Leisure Time Physical Activity Recall

Think carefully about the past day. Did you participate in any leisure time physical activity (such as aerobics class, gardening, jogging, swimming, walking, riding a bicycle or dancing) other than that at your regular job or daily duties? Please circle yes or no and then write the number of minutes on each line.
No  Yes  If yes, how many minutes? _____

**Dietary Recall:**

List all the foods/drinks you have eaten in the past 24-hours. Also list an approximate portion size.

Breakfast –

Morning Snack –

Lunch –

Afternoon Snack –

Dinner –

Nighttime Snack
Demographics

40. Age: ___

41. Number of years in the United States: ___

42. Education:
   - High school or less ___
   - Completed Bachelors Degree ___
   - Completed Masters Degree ___
   - Completed Doctorate of Professional Degree ___

43. Do you work?
   - Yes____  No_____ (IF YES…)
      - Only at home ___
      - Part time ___
      - Full time ___
44. From what part of India do you belong to?

| Region |  
|--------|---
| North  | ___ |
| South  | ___ |
| West   | ___ |
| East   | ___ |

45. Do you live in the metro Chicago area?

| Response |  
|----------|---
| Yes      | Yes  |
| No       | No___ |
Appendix B

Panel of Experts

1.) Randall Cottrell, D.ED., CHES

Program Coordinator and Graduate

526 Teachers College

University of Cincinnati

P.O. Box 210002

(Expertise: Measurement/Instrument Development)

2.) Paul Branscum, RD, Graduate Student

Department of Health Promotion and Education

University of Cincinnati

526 Teachers College

P.O. Box 210002

(Expertise: Subject Matter)
3.) Manoj Sharma, M.B.B.S, CHES, Ph.D.

Professor

526 Teachers College

University of Cincinnati

P.O. Box 210002

(Expertise: Measurement/Instrument Development and Subject Matter)

4.) Brad Wilson, Ph.D.

Professor

526 Teachers College

University of Cincinnati

P.O. Box 210002

(Expertise: Subject Matter)

5.) Prasanna Gurumurthy, MS, Med
Graduate Student
Ohio State University
(Expertise: Target Population)

6.) Amy Bernard, Ph.D., CHES
Associate Professor
526 Teachers College
University of Cincinnati
P.O. Box 210002
(Expertise: Instrument Development)
Email to Subject Experts

June 9, 2009

Dear __________:

I am a graduate student in Health Promotion and Education at the University of Cincinnati and am conducting my masters research on dietary behaviors and leisure time physical activity among middle aged Asian Indian women. The title of my thesis is, “Social Cognitive Theory as a Predictor of Dietary Behavior and Leisure Time Physical Activity in Middle Aged Asian Indian Women”. Based on your expertise in at least one of the following areas, (1) Asian Indian women, (2) Social Cognitive Theory, (3) instrument development, or (4) nutrition, you have been identified as an expert to help me establish content validity of my instrument. In the attached instrument, you are requested to read the definitions and comment upon each item and subscales with regard to the following:

- Readability:
  - Is the meaning of each item clear and language appropriate for 5th grade reading level?

- Face Validity:
- Does each item appear to measure the intended construct as operationally defined?

- Content Validity:
  - Do the items adequately assess each Social Cognitive Theory construct within the universe of content as operationally defined?

Kindly respond to all the questions and return the instrument with your valuable comments to me by June 12, 2009. After making changes based on the inputs from the expert panel the revised instrument will again be e-mailed to you by June 15, 2009 for a second review. The comments on the second round would be expected to be received by June 19, 2009. If you have any questions I can be reached at (517)303-5172 or via email at mehtapi@email.uc.edu. I am extremely thankful for your time and would like to convey my anticipatory gratitude for your valuable comments on the instruments.

Sincerely,

Purvi Mehta

Advisor: Dr. Manoj Sharma, MBBS, PhD
Appendix D

IRB Approval

June 30, 2009

Purni Mehta
Dept. of Health Promotion and Education

RE: IRB # 09-08-09-04E "Social Cognitive Theory as a Predictor of Dietary Behaviors and Leisure Time Physical Activity in Middle Aged Asian Indian Women"

The University of Cincinnati Institutional Review Board – Social and Behavioral Sciences (UC IRB-S) has reviewed your research project and has granted approval under Expedited category 45 CFR 46.110.

<table>
<thead>
<tr>
<th>APPROVAL DATE:</th>
<th>June 30, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPIRATION DATE:</td>
<td>June 30, 2010</td>
</tr>
</tbody>
</table>

The following document versions are included in this approval:

- Consent v. 09-30-09
- Protocol Version Dated 08-30-09
- Recruitment Email v. 8-30-09

The research MUST be conducted EXACTLY as approved. You must report to the Chair of the UC IRB-S any changes affecting the protocol upon which this certification is based. No changes may be made without prior approval by the Board except those necessary to eliminate immediate hazards.

Attached you will find some or all of the following:

1. APPROVED consent(s): document is locked and shows the IRB approved / expires date stamp. You MUST use this version (with IRB approved / expires date stamp) with your participants.
2. Investigator Responsibilities: these apply to all UC research team members involved with human subject research.

Should your project extend beyond the expiration date, you must submit a Progress Report form A MONTH BEFORE THE EXPIRATION DATE indicating that the project is continuing. You will need to attach to the Progress Report a copy of the first signed consent (with IRB approved / expires date stamp) to document use of the approved versions.

IT IS YOUR RESPONSIBILITY to keep track of your project's expiration date and to submit a Progress Report either to continue or to close your study. If the IRB-S does not reapprove your research by the specified expiration date, ALL research activities MUST STOP, including recruitment and enrollment of participants, interventions and interactions with current participants, collection of data, and data analysis.

Chair, UC-IRB-S

Institutional Review Board -
Social/Behavioral Sciences
University of Cincinnati
PC Box 32097
Cincinnati, OH 45267-0567

G-08 Withrow Hall
(513) 558-5784 Phone
(513) 558-4111 Fax

Statement regarding International Conferences on Hermaproxy and Good Clinical Practices

The University of Cincinnati Institutional Review Board is duly constituted (including sex and race requirements for diversity), has written procedures for initial and continuing review of clinical trials, provides written informed consent forms to all research participants, and retains records pertaining to the review and approval process, all in compliance, who required standards of 21 CFR Parts 50, 56 and 812 Rules of Federal Regulations. This institution is in compliance with the ICH-GCP and all they correspond to FOR也好8 regulations.

An affirmative action/equal opportunity institution
Appendix E

Manav Seva Mandir Consent

I give Purvi Mehta permission to 
gut her data collection done at Manav Seva Mandir Temple. She can pass out and 
retrieve her survey until she is done.

[Signature]

7/31/09
7/5/09