

**DEVELOPING EDUCATIONAL MESSAGES: A QUALITATIVE STUDY WITH ASIAN  
INDIAN MOTHERS TO UNDERSTAND THEIR ATTITUDES, BARRIERS, AND  
FACILITATORS IN PRACTICING CHILD FEEDING BEHAVIORS**

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## **ABSTRACT**

### **DEVELOPING EDUCATIONAL MESSAGES: A QUALITATIVE STUDY WITH ASIAN INDIAN MOTHERS TO UNDERSTAND THEIR ATTITUDES, BARRIERS, AND FACILITATORS IN PRACTICING CHILD FEEDING BEHAVIORS**

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A dramatic increase in the prevalence of childhood overweight has been observed among all ethnic and racial groups. The risk of overweight for Asian Indian children increases with longer residence and acculturation to the US. In addition, a shift to a higher proportion of Asian Indians born in the US is likely to result in higher rates of overweight in Asian Indian children. Parents, particularly mothers, are key in developing a home environment that fosters healthful eating among children via use of specific child feeding behaviors. Positive feeding behaviors such as regular family meals, parental modeling of healthy eating, and availability and accessibility of healthy foods at home are shown to have healthy nutrition outcomes in children. Negative behaviors such as letting children watch TV while eating may lead to overconsumption of energy. Negative behaviors which are also controlling such as pressuring children to eat, offering one food as a reward to eat another, and restricting children's consumption of certain foods may increase children's risk for overweight by disrupting their natural ability to self-regulate energy intake.

This study was conducted into two stages: 1) assessment stage and 2) message development and testing stage. Using the Theory of Planned Behavior as a conceptual framework, the first stage used qualitative methodology to assess how Asian Indian mothers' underlying beliefs about expected outcomes of feeding behaviors, perceived behavioral control, and subjective norm influenced their feeding behaviors. In-depth interviews were conducted with

27 Asian Indian mothers (of children 5-10 years old) using projective techniques. The findings revealed that Asian Indian mothers were highly motivated by nutrition outcomes when practicing all feeding behaviors. Cultural beliefs related to religion, ethnic identity, and traditional foods also influenced the practice of feeding behaviors. Pressuring to eat was often practiced despite the perception of ineffectiveness. Use of food rewards and TV to control children's food intake despite the clear understanding of undesirable nutrition outcomes was found.

In stage two, nine nutrition education messages were adapted from those developed by the United States Department of Agriculture and 29 new messages were developed based on behavioral beliefs, facilitators, and barriers unique to Asian Indian mothers identified in stage 1 of this research. These messages were tested using cognitive interviews with ten AI mothers for comprehensibility, agreeability with the information, and feasibility of acting on the message. Mothers were receptive to 31 messages, with minor revisions made to five messages to improve clarity and increase acceptability. Two messages that received strong negative responses were deemed inappropriate for this population. Nutrition professionals working with Asian Indian families may use the final messages in education materials to help mothers develop healthy child feeding practices.

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This dissertation is dedicated to my sweet daughter Ziya, for she is my strength and motivation to continue helping mothers accomplish their child feeding goals.

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## **CHAPTER ONE: INTRODUCTION**

Worldwide, the prevalence of overweight among children has increased dramatically. In particular, the United States is at the top of prevalence rankings. According to the NHANES data, the prevalence of overweight among children and adolescents, defined as the Body Mass index (BMI) at or above the 95<sup>th</sup> percentile of the gender-specific BMI growth charts (Kuczmarski et al., 2002), increased significantly between 1999-2000 and 2003-2004 (Ogden et al., 2006). Over this period the prevalence of overweight increased from 10.3 to 13.9% for children aged 2-5 year, from 15.1 to 18.0% for children aged 6-11 years and from 14.8 to 17.4% for adolescents aged 12-19 (Ogden et al., 2006). Although the recent data from NAHANES showed that the prevalence of childhood overweight has been steady over the period of ten years, the rates still remain high (Ogden et al., 2010). The prevalence of childhood overweight is rising in all ethnic and racial groups in the US (Ogden et al., 2008).

Asian American is one of the largest, most diverse, and fastest growing ethnic minority populations in the US (US Bureau of Census, 2010). There are fewer US data on the health and weight status of Asian American children compared to the children of other ethnic groups (Popkin & Udry, 1998; Thorpe et al., 2004). Using the 85<sup>th</sup> percentile as a cutoff point for overweight, the National Longitudinal Study of Adolescent Health reported that 20.6% of the Asian American adolescents were overweight (Popkin & Udry, 1998) and a study of New York elementary school children reported the rate of overweight was 30.2% for Asian American children (Thorpe et al., 2004). Although the rates of childhood overweight reported in these studies were lower compared to other ethnic groups, the risk of overweight in Asian Americans

increases with acculturation to the US (Lauderdale & Rathouz, 2000), duration of residence in the US, and birth in the US (Popkin & Udry, 1998).

The epidemic of overweight and obesity inflicts significant disadvantages on both the individual and the society due to increased risk of disease and death, and health care costs (Allison, Zannolli, & Narayan, 1999; Must & Strauss, 1999). Asian Indians, in particular, are at a high risk of chronic health conditions such as diabetes, hypertension, cardiovascular disease and associated complications from these conditions (Dowse et al., 1990; Kim et al., 1976; McKeigue et al., 1989; Ramachandran et al., 1992; Singh et al., 2001). In addition, in adults, a BMI below the usual cutoff for obesity is associated with higher health risks in people of Asian origin when compared to other populations (Misra, 2003). Therefore, a lower prevalence of overweight in Asian American children does not necessarily reflect an equivalent lower level of health risk.

Asian Indians make up the third largest Asian population, and represent one of the fastest growing populations in the United States (US Bureau of Census, 2010). By the year 2050, the number of Asian Indians living in the United States is predicted to be at two million (Bouvier & Agresta, 1985; O'Hare & Felt, 1991). It is also estimated that the proportion of overweight in Asian Indians will increase with more US-born Asian Indians and longer residence in the US (Lauderdale & Rathouz, 2000). As a result, research addressing this population is critically important. Unfortunately, practically no health education or promotion intervention has been designed in the US to prevent overweight specifically for Asian Indian community (Sharma, 2006).

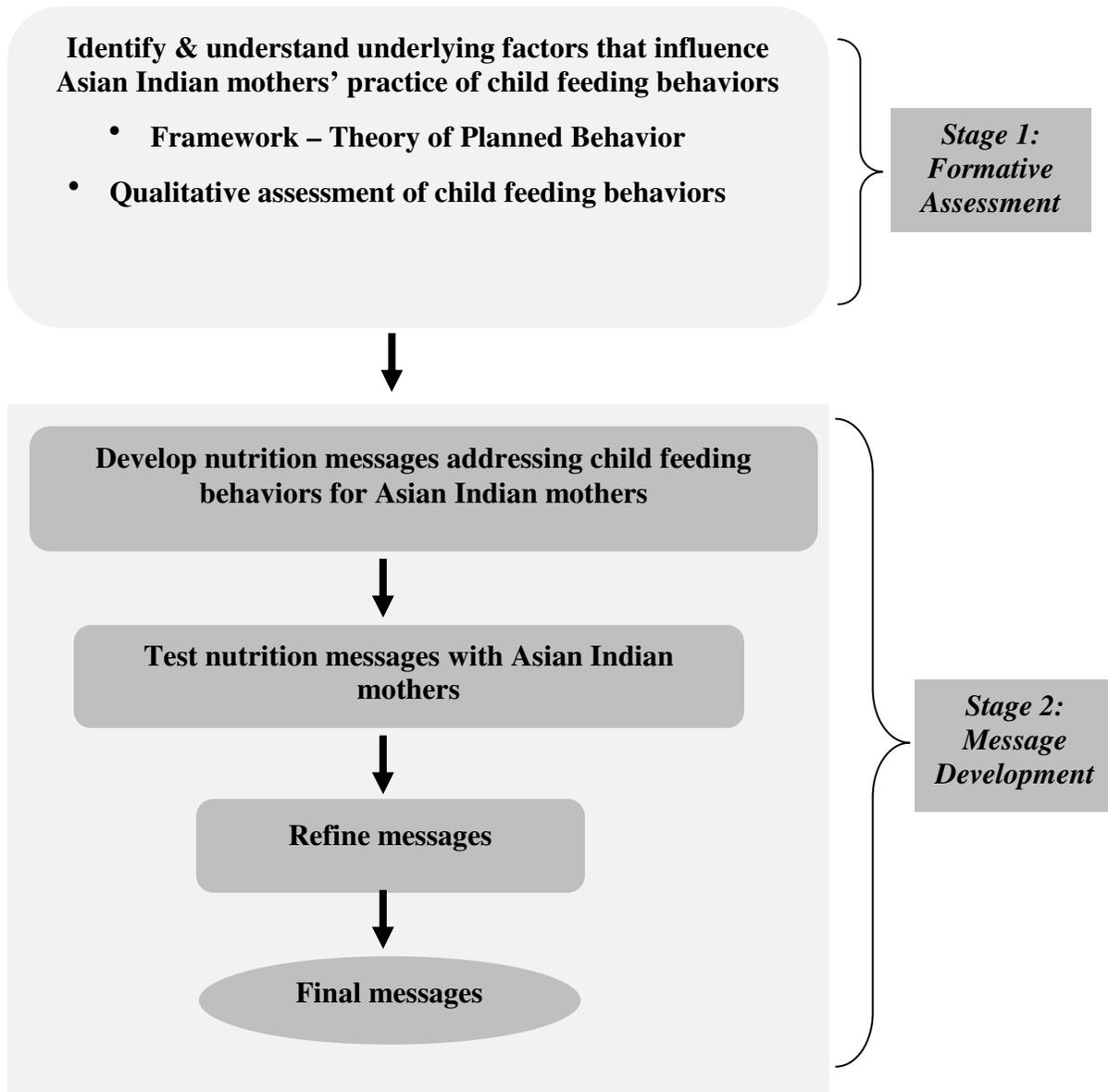
Although the etiology of overweight is multifactorial, parental role in feeding children has been implicated as an important influential factor in affecting children's eating and weight status (Patrick & Nicklas, 2005; Rhee, 2008; Ventura & Birch, 2008). Parents, particularly mothers are

critical in fostering healthful eating among children via several ‘child feeding behaviors’ (Patrick & Nicklas, 2005; Ritchie et al., 2005). Studies have shown relationships between children's food choices and direct feeding behaviors such as pressuring children to eat, restricting children’s consumption of certain foods, and offering one food as a reward for eating another (Birch & Fisher, 1998). Behaviors indirectly related to feeding children by providing an environment such as, parental modeling (Birch & Marlin, 1982), making healthy foods available and accessible at home (Baranowski et al., 1999), having regular family meals (Gillman et al., 2000), and allowing children to watch television viewing during eating (Francis & Birch, 2006) also influence children’s eating habits. Targeting these feeding behaviors that are relevant to childhood overweight is a highly promising strategy for childhood obesity prevention (Lindsay et al., 2006). However, studies on child feeding behaviors of Asian Indians living in the US are limited.

Parental child feeding behaviors have been targeted in health and nutrition education programs aimed at childhood overweight prevention. Recently, United States Department of Agriculture (USDA) and Food and Nutrition Services developed nutrition messages to address most, but not all, child feeding behaviors (United States Department of Agriculture [USDA], 2008). These messages were developed based on qualitative assessment of child feeding behaviors of low-income Caucasians, African Americans, and Mexican American mothers; they may not be applicable or may need to be adapted for use with Asian Indian mothers. Construction of clear, effective, and culturally relevant messages, therefore, requires a careful assessment of current child feeding behaviors of Asian Indian mothers.

This study was conducted in two stages (Figure 1-1). Stage 1: the assessment stage consists of theory driven assessment (Theory of Planned Behavior) of underlying motivators and barriers in practicing child feeding behaviors. Theory of Planned Behavior (Ajzen, 1991)

explains the behavior by examining perceived motivations, social context, and facilitators and barriers in relation to the behavior. Stage 2: the message development stage consists of development and testing culturally appropriate educational messages containing recommendations for appropriate feeding behaviors. Information in stage 1 was used a guiding framework for developing the messages.



**Figure 1-1. Research Stages**

The remainder of this chapter is devoted to reviewing relevant literature to provide the reader with an understanding of the research area and emphasize the need for research study. First few sections provide an overview of Asian Indians including their background, immigration history and demographic and cultural characteristics, dietary acculturation and eating habits, and health issues concerning Asian Indians. The next few sections discuss prevalence of childhood overweight in the US and associated health concerns. An ecological model of childhood overweight followed by home food environment and parental role in feeding children is discussed to provide an understanding of importance of eight child feeding behaviors studied in this research. Finally, parental beliefs about food and health of children followed by motivators and barriers in health promoting behaviors are provided.

## **Review of Related Literature**

### **Asian Americans and Asian Indians in the US**

The term Asian refers to people having origins to any of the original populations of the Far East, South East Asia, or the Indian subcontinent (Barnes & Bennett, 2002). Asian Americans are a heterogeneous population living throughout the United States, and are characterized by a wide variety of languages, dialects, and cultures. Asian population is one of the largest, most diverse, and fastest growing ethnic minority populations in the US (US Bureau of Census, 2012). According to the US Bureau of Census (2012), the total Asian population in the US increased by 43% from 10.2 million to 14.7 million (2012). Asian Indians are the people who originate from India. India is an ancient country immersed in diversity in terms of caste, religious groups, and languages (Kakar, 1978; Ross, 1967). They are part of the larger subgroup of Asians known as South Asians. In addition to Indians, South Asians include people from

Pakistan, Bangladesh, Nepal, Burma, Sri Lanka, Afghanistan, Bhutan, and the Maldives. Asian Indians make up the third largest Asian population, and represent one of the fastest growing populations in the US (US Bureau of Census, 2010). By the year 2050, the number of Asian Indians living in the US is predicted to be at two million (Bouvier & Agresta, 1985; O'Hare & Felt, 1991).

### **Immigration of Asian Indians to the US and their Characteristics**

In the US, as a result of the 1965 Immigration Act, visas were extended to Asian Indians who were mainly college-educated urban middle-class professionals, or to those who sought advanced university training as graduate students (Das & Kemp, 1997). Since then the number of Asian Indians grew rapidly in the US. Asian Indians are often characterized as being a part of model minority with the human capital characteristics necessary for socioeconomic success. For example, Asian Indians are more highly educated than the overall US population. The data from the US Bureau of Census (2000) show that highest percentage of Asian Indians (64%) have a Bachelor's degree compared to other Asian groups in the US and the total US population. India was under British rule for about 200 years and till today English has continued to remain as one of the official languages used in India for higher education, and to conduct official businesses and commercial transactions. As a result, Asian Indian immigrants especially coming from urban areas of India to the US are proficient in both spoken and written English language (Dasgupta, 1989; Mehta & Belk, 1991; US Bureau of Census, 2000).

There is a highest percentage (77%) of Asian Indian men in the labor force compared to men from other Asian groups in the US and the total US population, and 54% of Asian Indian women are in the labor force (US Bureau of Census, 2000). Typically, Asian Indians are

described occupationally as belonging to the professional and managerial class (Fernandez & Liu, 1986). Compared to 34% of the overall US population and 45% of the total Asian population, 60% of Asian Indians were in management, professional, and related occupation (US Bureau of Census, 2000). In addition, Asian Indian men (\$ 51, 904) and women (\$35,173) had the highest median earning of all Asian men/women and all US workers. The median annual income of Asian Indian families was also higher (\$70, 849) than the median of all families in the US as well as all other Asian families in the US. While the overall US poverty rate was 12.4 %, it was 9.9 % for Asian Indians, which was also lower than all other Asian population in the US (US Bureau of Census, 2000). Low-income, poverty levels, and higher unemployment rates are not likely to exist among this group of immigrants (Khairullah & Khairullah, 1999). These characteristics suggest that Asian Indians have assimilated very well economically into American society.

Studies show that Asian Indian immigrants have a tendency for bicultural functioning mainly because of their prior experience with the British colonial rule of India (Kurian & Ghosh, 1983; Saran, 1985; Wakil, Siddique, & Wakil, 1981). Although, Asian Indians are fluent in English and have had some exposure to Western values (Leonard-Spark & Saran, 1980), studies have also reported that some Asian Indian immigrants in Western cultures continue to hold on their traditional values, beliefs, and expectations as a part of their lifestyle. Therefore, they tend to maintain a relatively collectivistic orientation (i.e. emphasizing the extended family, traditional gender roles, obedience to elders, and group interdependence), many years after immigration (Patel, Power, & Bhavnagri, 1996; Segal, 1991; Sodowsky, Kwam, & Pannu, 1995). In general, the pattern commonly noted for many Asian Indian immigrants is that they tend to affirm their ethnicity, often by 'reinventing' Indian culture on foreign soil (Dasgupta, 1998).

Thus, Asian Indian immigrants may be more ‘Indian’ than the people they left behind and/or may retain a sense of a culture that no longer exists in India (Dasgupta, 1998). These characteristics suggest that Asian Indians do not culturally assimilate completely into American society.

Religion is an important facet of Asian Indian culture and, as such, is a potential influence on acculturation preferences (Mulatti, 1995). Asian Indian immigrants as a group tend to be highly religious, often more so in the host society than they were in India (Williams, 1988). Research on Asian Indian and other immigrant groups has found that religious activities serve to reinforce participants’ ethnicity, bind them more closely to their particular ethnic group, and familiarize the next generation with their heritage and traditions (Dasgupta, 1998; Sheth, 1995; Williams, 1988).

### **Acculturation and Eating Patterns of Asian Indians**

The term ‘acculturation’ refers to the process by which racial/ethnic minority individuals adapt to the dominant culture and the resulting changes in their beliefs, values, and behavior from coming in contact with the new culture and its members (Sam & Berry, 1995). “Dietary acculturation” refers to the process that occurs when members of a migrating group adopt the eating patterns/food choices of the new environment (Negy, 1992; Satia et al., 2001). Research indicates that as a part of acculturation process, Asian immigrants may retain certain traditional foods, find new ways to use traditional foods, exclude other foods, and/or consume new (non-traditional) foods (Pan et al., 1999) resulting in healthful and/or unhealthful dietary changes.

Very few studies have examined the dietary intake of Asian Indian population in the US. Early studies have found that acculturative changes in Asian Indian’s eating patterns include

altered vegetarian status and meal patterns, changes in the frequency of use of Asian Indian foods, and inclusion of other ethnic foods (Gupta, 1976; Karim et al., 1986). According to Raj (1999), consumption of traditional mixed dishes based on cereals, legumes, and/or vegetables decreased after coming to US due to lengthy preparation time required for many dishes. Frequent consumption of non-traditional foods such as cola beverages, pizza, mayonnaise, and cookies was observed among one third of the respondents. Jonnalagadda and Diwan (2002) found that the nutrient intake of Gujarati Asian Indian immigrant showed both inadequacies and excesses of select macro and micronutrients suggesting that these nutrient inadequacies and excesses can impact the overall health and risk of chronic diseases of these individuals. There were significant differences in macronutrient intake based on the duration of stay in the United States. Another study by Jonnalagadda et al. (2005) indicated the dietary intake of Asian Indian does not meet the established US dietary guidelines. A survey of food consumption practices among Asian Indian adults in the New York City and Washington, D.C. areas showed that acculturation of this population in the US has led to more frequent selection of American or other ethnic foods for main meals and replacement of traditional sweets with cookies, doughnuts, and other Western pastries. Research has shown that dietary changes are associated with increased risk of abdominal obesity, diabetes, and cardiovascular disease, along with certain cancers (breast, colorectal, and prostate), demonstrating possible negative influence of dietary acculturation (Wahlquist, 2002).

### **Health Issues Concerning Asian Indians**

Many studies have reported high rates of diabetes, coronary heart disease (CHD), and hypertension among South Asians worldwide. Studies in the United Kingdom have found that

South Asians' risk of CHD death is as much as 40% above whites, and that they have a 2 to 3 fold higher incidence of hypertension and diabetes compared to white population in the UK (Cappuccio et al., 1997; Cappuccio et al., 2002). Studies of South Asians in the United Kingdom (Landman et al., 2001) and other countries (Dowse et al., 1990; Middelkoop et al., 1999) have shown a high prevalence of diabetes and a few studies of South Asians in the United Kingdom found lower Body mass indices (BMI) despite high rates of diabetes (Patel et al., 1999). The South Asian Association for Regional Cooperation (SAARC) reported that cardiovascular disease mortality and morbidity, as well as non-insulin-dependent diabetes, among expatriate South Asian populations are higher than in any other expatriate ethnic group worldwide (Srivastava, 2002).

Studies suggest that Asian Indians in particular, are at increased risk for any level of obesity and central fat distribution, when compared to European descent persons (Dowse et al., 1990; Kim et al., 1976; McKeigue et al., 1989; Ramachandran et al., 1992). Health issues facing the Asian Indian immigrant population include diabetes, hypertension, cardiovascular disease, and the associated complications from these conditions. A study conducted in 1996 including 1,688 immigrants Asian Indians reported a higher prevalence of CHD and non-insulin dependent diabetes Mellitus compared to the US White population (Enas et al., 1996). Other studies, however, have found high rates of CHD but not hypertension among Asian Indians (Enas et al., 1996; Jha et al., 1993)

Studies have also noted a difference in the prevalence of chronic diseases in native and immigrant Asian Indians in the western countries. Asian Indian immigrants in several western countries, such as UK and Canada, have been found to be at greater risk of morbidity and mortality as compared to the native and other immigrant populations (Anand et al., 2000;

McKeigue et al., 1989; McKeigue et al., 1991). In immigrant Asian Indians, prevalence of hypertension (12-20%), diabetes (6-8%), and coronary heart disease (7-14%) has been found to be higher than native rural Indians residing in India and Western populations (Singh et al., 2001).

Another major concern for Asian Indians in the US and in western countries is the increased risk of becoming overweight. Many immigrants originate from the countries where the prevalence of overweight is lower than it is in the US (Gordon-Larson et al., 2003; Singh et al., 2001), and they are in better health than their counterparts who were born in the US (Frisbie et al., 2001). However, these health advantages decrease with their duration of residence. The likelihood of becoming obese increases the longer the immigrants live in the US (Gordon-Larson et al., 2003; Frisbie et al., 2001). Studies have found that the prevalence of obesity among adult immigrants living in the US for the last 15 years approached that of adults born in the US (Gordon-Larson et al., 2003; Ogden et al., 2006; Wee, 2004). This evidence indicates that after immigration to the US, the immigrants are more likely to become obese and develop negative health conditions.

### **Prevalence of Childhood Overweight in the US**

The prevalence of overweight and obesity is considered as an important public health issue in the US (Healthy People 2020, 2010). Healthy People 2020 identified overweight and obesity as 1 of the 10 leading health indicators. According to the recent estimates of the prevalence of overweight, 10.7% of children aged 2 to 5 years and 17% of children aged 6 to 11 years are overweight in the US (Healthy People 2020, 2010). Data from two NHANES surveys (1999–2000 and 2003–2004) show that the prevalence of overweight is increasing: for children aged 2–5 years, prevalence increased from 10.3% to 13.9%; for those aged 6–11 years,

prevalence increased from 15.1% to 18.8%; and for those aged 12–19 years, prevalence increased from 14.8% to 17.4%. Although the recent data from NAHANES showed that the prevalence of childhood overweight has been steady over the period of ten years, the rates still remain high and are not declining (Ogden et al., 2010). Recent research conducted by Basu (2010) forecasted the distribution of BMI in children (6–17 years) in the US by age group, sex, and race over the period 2004–2014. This research showed that among children, stabilities within BMI categories were low during 2004–2005, and compared with 2001–2002, transition probabilities into overweight class 2 from other BMI categories increase substantially. Forecast predicted significant increases in the risk of overweight category among children 6 to 9 years old (5% to 14% in 5 years), with a greater increase anticipated in males.

There are few US data on the health and weight status of Asian Americans compared to other ethnic groups. Gordon-Larsen and colleagues (2003) studied the data from 13,113 U.S. adolescents from grades 7-12 enrolled in the National Longitudinal Study of Adolescent Health and found the prevalence of overweight in Asian American male teens as 22.8% and female teens as 10.4%. A study of New York elementary school children used BMI-for-age at or above 85<sup>th</sup> percentile as a cutoff for overweight. They found overweight rates of 14.4% and obesity rates of 30.2% for Asian American from kindergarten to fifth grade (Thorpe et al., 2004). The National Longitudinal Study of Adolescent Health has reported a high prevalence of overweight (20.6%) in Asian American adolescents in grade 7-12 using 85<sup>th</sup> percentile as a cutoff for overweight (Popkin & Udry, 1998). Although, these studies reported a lower rate of overweight compared to other ethnic groups, the risk of overweight in Asian Americans increases with acculturation to US (Lauderdale & Rathouz, 2000). According to the National Longitudinal Study of Adolescent Health, Asian American adolescents born in the US to immigrant parents

are more than twice as likely to be overweight as foreign-born adolescents who move to the US (Popkin & Udry, 1998).

### **Health Issues Concerning Childhood Overweight**

The epidemic of overweight and obesity inflicts significant disadvantages on both the individual and the society due to increased risk of disease and death, and health care costs (Allison, Zannolli, & Narayan, 1999; Must & Strauss, 1999; Reilly et al., 2003; Finkelstein, Fiebelkorn, & Wang, 2003). Childhood overweight has numerous psychosocial, physical, and economic consequences. Childhood overweight affects self-esteem and has negative consequences on cognitive and social development (Tremblay et al., 2000). Conditions such as type 2 diabetes, diabetes mellitus, hypertension, and hypercholesterolemia, which were primarily seen in adults, are becoming more common among children as the prevalence of overweight increases (Must & Strauss, 1999). Because childhood overweight often persists into adulthood, a rising number of adults will be at increased risk of these conditions as well as of cardiovascular disease, osteoarthritis, and certain types of cancer (Manson & Bassuk, 2003). In general, obesity epidemic constitutes a substantial decrease in quality of life and life expectancy and accounts for billions of dollars in health care spending (Fontaine & Redden, 2003; Katzmarzyk & Janssen, 2004).

Lauderdale and Rathouz estimated (2000) that the proportion of overweight Asian Indian children will increase with more US born Asian Indians and longer residence in the US, which can be predicted to be very high due to the rapid influx of Asian Indians in the US over the past years and in the future (Robert, New York Times, 2008). As a result, the number of Asian Indian children with health complications associated with overweight will also increase. In addition, due

to the existing high risk of health conditions such as CHD, hypertension, and diabetes at a lower BMI, the rise in prevalence of overweight will put Asian Indians in an exceedingly worse situation than ever. The most effective way to reduce the rising trend in overweight is to intensify the efforts to prevent overweight among children. Unfortunately, there are limited health education or intervention programs to reduce overweight specifically for Asian Indians (Sharma, 2006). This could also be due to the paucity of information on Asian Indian population in the US. Furthermore, most of the current intervention programs in the US are targeted to low-income groups. Asian Indians, in general, are affluent and are not welfare recipients and therefore are not the primary target for most of the current overweight prevention efforts.

### **Ecological Model of Childhood Overweight**

Davison and Birch (2001) developed the 'Ecological Model of Predictors of Childhood Overweight' to better understand the influence of multiple factors on the development of childhood overweight (Figure 1-2). This model is based on the Ecological Systems Theory (EST) by Bronfenbrenner (1988). According to this model, child's behavioral patterns such as dietary intake, physical activity and sedentary behaviors (such as television viewing) can place a child at a risk of overweight. Davison and Birch referred these factors as 'child-risk factors'. The development of child-risk factors, in turn, is shaped by several environmental factors at micro and macro level. At micro level two major environmental factors comprise of home environment (such as child feeding practices, food availability in the home, parent dietary intake, etc.), and school environment. These factors at micro level are closest to the child and contain structures with which the child is in direct contact and therefore can be directly influenced. The home environment includes parenting styles and family characteristics such as child feeding practices,

types of food available in the home, nutritional knowledge of parents, parent dietary intake, etc. The school environment includes characteristics such as structured periods for activity, dietary quality of lunches, etc. At macro level these factors consist of community, demographic and other societal characteristics (such as ethnicity, socio economic status, accessibility of convenience food and restaurants, etc.). The child is not in direct contact with these structures but they can influence child's development by affecting the structures in the microenvironment.

Adapted from Davison, K. & Birch, L. (2001). Obesity Reviews, 2, 159-171.

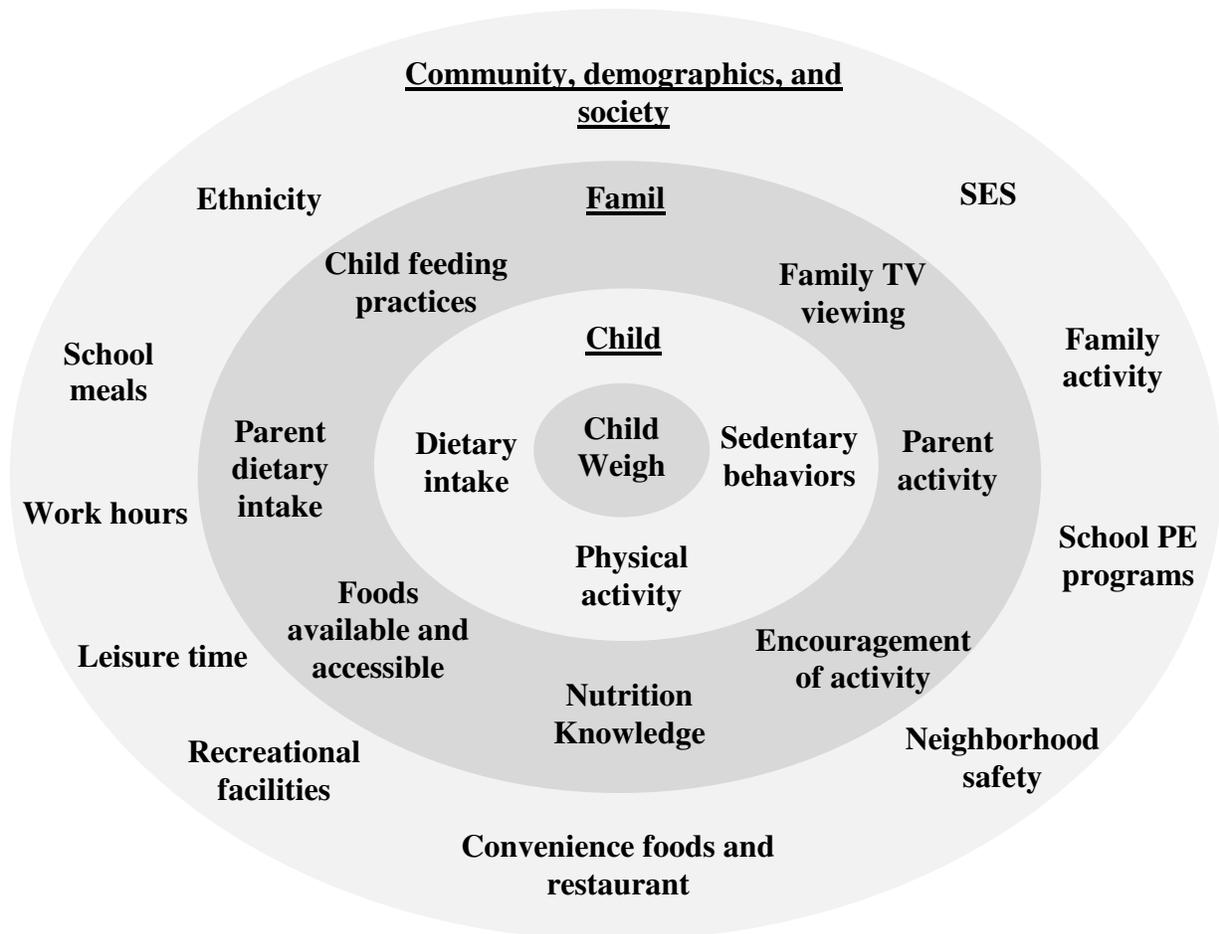


Figure 1-2. Ecological Model of Predictors of Childhood Overweight

## **Home Food Environment and Parents' Role in Feeding Children**

The Ecological Model elucidates that the etiology of childhood overweight is multifactorial (Davison & Birch, 2001) and in consensus with several other researchers, it implicates parental role in feeding children as an important influential factor in affecting children's eating and weight status (Davison & Birch 2001; Patrick & Nicklas, 2005; Rhee, 2008; Ventura & Birch, 2008). Parents are the key agents to develop a home environment, through various behaviors, that fosters healthful or unhealthful eating among children. Parents shape their children's home food environment in a variety of ways – by determining the meal structure (Gillman et al., 2000), by the foods they make available and accessible (Baranowski et al., 1993; Baranowski et al., 1999), by direct modeling influences, by the way they interact with the children in the eating context - feeding styles and practices (Birch & Fisher, 1998), and by the extent of media exposure at home (Coon et al., 2001). A focus on home food environment and parents' role in feeding children provides an important context and a promising area for targeting childhood overweight prevention efforts (Patrick & Nicklas, 2005; Ritchie, 2005).

The next few sections review literature pertaining to each of the eight child feeding behaviors assessed in this study. Although, the findings of these studies are primarily obtained from studying Caucasians, African Americans, and Mexican Americans, attempts have been made to review the few studies that are available on Asian Americans or Asian Indians for relevant sections.

**Family meals.** Family meals are an important component of the family food environment as they offer family members an opportunity to interact while they eat together. Gillman et al. (2000) reported that eating family dinners was associated with healthful dietary

intake patterns, including more fruits and vegetables, less fried foods and soda. In adolescents, the presence of the family at the dinner meal has been positively associated with the consumption of fruit, vegetables, and dairy foods, and lower likelihood of skipping breakfast (Videon & Manning, 2003). In Another study, family meal frequency during adolescence predicted higher intakes of fruit, vegetables, dark-green and orange vegetables, and key nutrients and lower intakes of soft drinks ( $P<0.05$ ) during young adulthood (Larson et al., 2007). Parents can influence children's eating habits by controlling where the meals are eaten and with whom. Companionship at mealtime, establishing a positive atmosphere and modeling appropriate feeding behaviors have been shown to increase children's intake of basic food groups (Stanek, Abbot & Cramer, 1990). Eating together engenders family conversations about healthy eating (Gillespie et al., 1989). Conversation at family dinners is an opportunity to provide nutritional information to children by the parents. The opportunity to observe parents and sibling eating and enjoying foods encourages children's consumption of those foods, and the factor parental modeling can come into play (Campbell, Crawford, & Hesketh, 2007). The foods served at a family dinner are less likely to be ready-prepared foods (Gillman et al., 2000). Thus, a positive social interaction and comments about food during meal may increase healthy eating behaviors (Hendy & Raudenbush, 2000).

Research has highlighted the importance of family meals for child's diet quality. However, Campbell et al. (2002) showed that parents' work commitments and busy schedule make it difficult for families to have meals together. More educated parents find it difficult to cook evening meals. Boutelle et al. (2003) showed that 30% of the families were too busy to eat together as a family most nights. Almost half of the adults reported that adults' and children's schedules made it difficult to have meals together. Similar findings were reported by Neumark-

Sztainer (2003) in which almost half of the surveyed adolescents reported that difficult schedules prevented families from eating together on a regular basis.

Most studies assessing meal frequency and its influence of children's and adolescents' food intake either did not include Asian American or they included Asian American in very low proportions such that no valid conclusions could be made for Asian Americans (Neumark Sztainer, 2003; Videon & Manning, 2003). In a qualitative study (Cluskey et al., 2008), Asian parents reported lower frequency of dining out and they were least likely to describe their child's activities as impacting family meals. Neumark-Sztainer (2003) also indicated that Asian American families reported the highest frequency of family meals. Similarly, in a recent study Asian American teens reported eating more family meals per week than did their White, African American, Hispanic, and Native American counterparts (Neumark-Sztainer, 2006). Boutelle et al. (2006) reported that Asian American parents and Asian American adolescents were less likely to report purchase of fast-food meals for dinner. In another study, the predictors of the importance that Asian mothers gave to family meals were based on health motivations as well as need to eat familiar food (Marquis & Shatenstein, 2005). Mamun et al. (2005) examined maternal attitude toward family meals and adolescents' overweight in Australia. He found that Asian mothers were less likely than White mothers to feel that eating together was not important. Mothers who reported that eating together was not important were more likely that their child consumed a lot of fast food and soft drinks and watched more television. However, it is not known if all these findings are applicable to Asian Indians since these studies included Asian Americans in general.

**Television viewing and eating.** Family meals increase the opportunity to have healthful dietary intakes; however viewing television (TV) during mealtime can dilute this effect. By age 17, the average US child has spent 15,000 to 18,000 hours watching television compared to 12,000 hours in school (Anderson et al., 1998). Children consume a significant proportion of energy during television viewing (Matheson et al., 2004). A recent randomized clinical trial showed that reducing television viewing can lower BMI in young children by changing the energy intake (Epstein et al., 2008). Higher frequency of television viewing during meals is associated with lower fruit and vegetable consumption, higher fat consumption (Boutelle et al., 2003; Coon et al., 2001), and increased energy intake (Wiecha et al., 2006). Consumption of high-fat food, savory snacks, and sweet snacks increases with hours of television watched (Campbell, Crawford & Ball, 2006; Woodward et al., 2006). Television viewing might influence the diet of the children by increased exposure to food advertisements, and an increased requests and preferences for the advertised foods (Borzekowski & Robinson, 2001; Taras et al., 1989). Television viewing also provides a context that encourages frequent snacking or overeating (Francis, Lee, & Birch, 2003) and parents who allow greater TV exposures are more likely to have poor knowledge of, or less concerns about nutrition (Coon et al., 2001). Francis and Birch (2006) reported that food consumption while watching TV results in increased energy intake in pre-school children. The possible mechanism for increased energy intake while watching TV could be explained by another study that showed TV viewing during mealtime overrides the physiologic signals of satiation and satiety in 14 year old boys (Bellissimo et al., 2007).

**Food availability and accessibility.** Availability of foods at home is the strongest predictor of future consumption of those foods by children (Reinaerts et al., 2007). In general,

children are more likely to eat the foods that they are served most often, and they tend to prefer to eat foods that are readily available in the home (Birch, 1982). Children's food preferences and consumption are learned through repeated exposure to foods (Birch, 1992; Logue et al., 1988; Pliner et al., 1992). Because parents are responsible for making food available to children, they can have a profound impact on children's preferences and hence consumption of foods.

Qualitative research on adolescents suggests that availability of unhealthful foods has been a barrier to making healthy food choices. (Neumark-Sztainer et al., 1999; O'Dea, 2003).

Qualitative and quantitative studies of adolescents have consistently reported that the adolescents perceive the availability of fruits, vegetables and dairy foods and the absence of unhealthful alternative to influence their intakes of these foods (Auld et al., 2002; Hill et al., 1998; Neumark-Sztainer et al., 1999; O'Dea, 2003). Parents reported that fruit, juice and vegetable availability and accessibility was significantly correlated to their fruit, juice and vegetable intake at home among lower income fourth and fifth grade African American and Euro-American children (Baranowski et al., 1993) and for predominantly Euro-American third-grade girls (Reynolds et al., 1999). Gable and Lutz (2000) found that parents who reported a greater availability of sweets in the home indicated their children ate more fats and sugars. Availability of chips and salty snacks was positively associated with children's eating of these foods, and presence of bread was negatively associated with children's sugar and junk food intake.

Other research has demonstrated the importance of not only availability but also accessibility of healthier foods on children's food consumption (Baranowski et al., 1999; Cullen et al., 2003). When foods are easily accessible and ready to be eaten, children are more likely to eat them. For example, when foods are in accessible locations (i.e., locations easy for the child to reach such as in a bowl on a table or on a lower shelf in the refrigerator) and in age-appropriate

sizes (e.g., apple wedges, carrot sticks) children are more likely to eat them (Baranowski et al., 1999; Cullen et al., 2003).

**Parental modeling.** Parental modeling is defined as a process of observational learning in which the behavior of the parents acts as a stimulus for similar behavior in their child. The concept of modeling is a core construct of Bandura's social cognitive theory (Bandura, 1971). Parental modeling is thought to occur through four functions: observational learning, disinhibiting or inhibiting behavior, facilitating similar response and setting cognitive standards for self-regulation (Perry & Furukawa, 1980; Rosenthal et al., 1979). Observational learning occurs when a model exhibits a novel response, and the observer learns the behavior for the first time. The second function, disinhibiting or inhibiting behavior, occurs when the observer sees the negative or positive consequences of a model's action, which then serves to strengthen or weaken the inhibition of responses by the observer. The third function is facilitating similar response, which occurs when the behavior of the model serves as a cue for the observer's actions. Finally, setting cognitive standards for self-regulation is defined as providing standards for the observer to judge adequacy of performance.

Early studies suggest that toddlers are more likely to sample unfamiliar foods after they have seen an adult eating the food, and they are more likely to eat when they see their mother eating rather than a stranger (Harper & Sandres, 1975). Similarly, two-to five-year-old children accept a novel food more quickly than when adults eat a similar food rather than when adults eat a different food (Addessi et al., 2005). The mother's own food behaviors - with regard to time of eating, types of food liked or disliked, and place where eating occurred in the home - were correlated with the child's food behaviors (Seagren & Terry, 1991). Parents' behaviors with

regard to dietary characteristics, food preferences, food intake and intake regulation (e.g., dietary inhibition), eating-related attitudes, and body dissatisfaction are likely to be related to these same behaviors in children (Perry et al., 1980; Brown & Ogden, 2004). Parental consumption is a significant predictor for determining their child's intake of fruits, vegetables, and dairy foods. Children's intake of fruits and vegetables was positively related to parents' intake of fruit and vegetables (Fisher et al., 2002; Gibson et al., 1998), and parents' modeling of healthful dietary behaviors was associated with lower dietary fat intake (Tibbs et al., 1990). Furthermore, the importance of parental modeling is supported by the success of child weight control programs where parents are targeted as a primary agent of change. In these programs parents are encouraged to adopt healthy eating behaviors themselves and therefore model these behaviors for their children (Epstein et al., 1990; Golan & Crow 2004; Golan et al., 1998).

Research has shown that children not only model their parents' food intake, but also their attitude toward food, their body dissatisfaction and dieting behaviors. For example, mothers of girls with anorexia showed greater body dissatisfaction than mothers of non-disordered girls (Hall & Brown, 1982). Likewise, dieting daughters were more likely to have dieting mothers (Pike et al., 1991) and parents who reported dietary inhibition or problems controlling their own intake were likely to have daughters who showed similar patterns (Cutting et al., 1999). Children also resemble their parents in food neophobia (Pliner & Pelchat, 1986; Pliner & Pelchat, 1991). Research therefore emphasizes the role of observational learning with a particular role for parent attitude and behavior. Children's attitude toward food, choices in food selection and timing of meals are in great part a result of parental modeling.

**Parenting styles and feeding styles.** Parenting style refers to the behavioral methods used by parents to establish, maintain, modify or control children's behaviors. The patterns of parental behaviors have been conceptualized in terms of amount and quality of two underlying dimensions - demandingness (or parental control) and responsiveness (or parental support) (Maccoby & Martin, 1983). In the domain of general parenting, demandingness refers to the extent to which parents show control, maturity demands, and supervision in their parenting. Responsiveness refers to the extent to which parents show affective warmth, acceptance and involvement. Based on these two dimensions, parenting can be classified as one of the four specific parenting styles: 1) Authoritative style (high demandingness and high responsiveness) is characterized by personal involvement, nurturance, reasoning and structure; 2) Authoritarian style (high demandingness and low responsiveness) is characterized by restrictive, punitive, rejecting and power assertive behaviors; 3) Indulgent style (low demandingness and high responsiveness) is characterized by warmth and acceptance in conjunction with a lack of monitoring of child behavior; 4) Uninvolved style (low demandingness and low responsiveness) is characterized by little control and involvement with the child. Studies on parenting styles have demonstrated that authoritative parenting style is associated with the most positive developmental outcomes in children (Darling & Steinberg, 1993; Maccoby & Martin, 1983).

Hughes and colleagues (2006) explained feeding styles based on the definition of parenting styles by focusing exclusively on parenting styles related to child feeding behaviors. Therefore, similar to parenting styles, feeding styles can be determined by a combination of the two underlying dimensions of demandingness and responsiveness. In the feeding domain, demandingness refers to *how much* the parent encourages eating and responsiveness refers to *how* the parent encourages eating, that is, in a responsive or non-responsive way (Hughes et al.,

2005). Similar to the parenting styles, feeding styles represent the caregiver's approach to maintaining or modifying children's behaviors with respect to eating. Birch and Fisher (1995) identified three child-feeding patterns that follow Baumrind's (1971) taxonomy of parenting styles: authoritative, permissive, and authoritarian.

Authoritarian feeding is characterized by attempts to control the child's eating with little regard for the child's choices and preferences (Patrick et al., 2005). Researchers describing authoritarian feeding styles have reflected on parental attempts to one-sidedly control the child's food intake and eating practices through commands, instructions (Hepstinstall et al., 1987), directives, coercion or restriction (Johnson & Birch, 1993). Authoritarian parenting practices include using food to pacify, reward (Birch, Zimmerman, & Hind, 1980; Baughcum et al., 1998), punish, or prompt children to eat when not hungry (Casey & Rozin, 1989).

Permissive feeding is characterized by what might be termed "nutritional neglect", whereby the children are allowed to eat whatever they want in whatever quantities they want (Patrick et al., 2005). With permissive feeding, little or no structure is provided, and choices are limited only by what is available (Birch & Fisher, 1995). Permissive feeding has been associated with drinking less milk and lower consumption of all nutrients except fat (Anliker et al., 1992; Eppright et al., 1970).

Finally, Authoritative feeding represents a balance between authoritarian and permissive feeding styles whereby the child is encouraged to eat healthy foods, but is also given some choices about eating options (Patrick et al., 2005). Research describing authoritative feeding styles suggests using discussion, negotiation, reasoning (Iannotti et al., 1994), providing rationales (Cousins, Power, & Olvera-Ezzell, 1993; Heptinstall et al., 1987), and praising the child (Stanek, Abbot & Cramer, 1990). Authoritative feeding style attempts to shape or guide a

child's behavior, thereby facilitating the development of dietary self-control, and is associated with consumption of more fruits and vegetables and lower intake of "junk foods" (foods high in fat and sugar; as defined by the authors) in children (Gable & Lutz, 2000).

**Parenting practices and feeding practices.** Parenting styles describe parent-child interactions across a wide range of situations, whereas parenting practices by definition are domain-specific (Darling & Steinberg, 1993). According to Ventura & Birch (2008), parenting practices are less trait-like and more responsive to context. Therefore, within a parent, parenting style is consistent but parenting practice can differ across children within the same family depending on child's age, gender, eating behavior, and weight status. When parenting practices are applied to the child-feeding context, they represent specific behavioral strategies that parents employ to control what, how much, or when their children eat. Therefore, feeding practices include behaviors such as pressuring children to eat, using food rewards, restricting access to select foods or groups or use of food to pacify or control.

The greatest focus to date has been on authoritarian feeding styles that encompass controlling feeding practices such as limiting access to desired foods, promising a child desert if she eats her vegetables, or encouraging a child to clean his plate (Birch & Marlin, 1982; Birch Zimmerman, & Hind, 1980; Fisher & Birch, 1999a; Fisher & Birch, 1999b). These feeding practices can have unintended consequences that may result in the development of unhealthy eating practices among children. Parental attempts to control the food intake of children through these feeding practices have been shown to lessen children's responsiveness to energy density and meal size (Birch et al., 1993).

Children who were instructed to clean their plates were less responsive to energy density cues than children who were taught to focus on internal cues of hunger and fullness (Birch et al., 1987; Johnson & Birch, 1993). When parents force the child to "clean your plate," the child may learn that the amount of food remaining on the plate and not the internal physiological cues signaling hunger or satiety, is most relevant to determining how much to eat. Perhaps by shifting the emphasis from internal to external cues, controlling child feeding practices can alter children's responsiveness to hunger and satiety cues and to the energy density of the diet.

Child feeding practices that encourage children to consume a particular food increase children's dislike for that food (Birch & Marlin, 1982; Birch, Zimmerman, & Hind, 1980; Newman & Taylor, 1992). Many of the foods that parents encourage children to consume are the fruits and vegetables they would like to see consumed with greater frequency and in greater quantities. Fisher et al. (2002) indicated that parental pressure to eat fruit and vegetables discourages intake among young girls. Hertzler (1983) noted that parents' feedback to children about eating more vegetables was associated with children's preferences for fewer vegetables.

Restricting children's access to foods high in fat and sugar increased children's preferences for those foods (Fisher & Birch, 2000; Fisher & Birch, 1999b). Restricting children's access to certain foods may have undesired effect of drawing attention and increasing children's desire for those foods (Fisher & Birch, 1999b; Ritchie et al., 2005). Therefore, children may be more likely to seek and consume restricted foods when they are outside of parental control. Children may become excited when restricted foods are available, so that self-control is not exercised and eating becomes frenzied (Fisher & Birch, 1999a; Fisher & Birch, 1999b). Children may not develop the essential awareness of hunger and satiety, which enables them to regulate their own food intake (Baughcum et al., 1998; Ritchie et al., 2005). Furthermore, restriction, in

particular is also associated with overweight and weight gain in several studies (Clark et al., 2007; Faith et al., 2004; Ventura and Birch, 2008).

Another controlling child feeding practice is the promise to reward the child with food item commonly liked by children (such as sweets) if the child cleans his plate. Thus, parents use an external factor or food reward to encourage eating irrespective of the child being full rather than relying on the internal cues of hunger and satiety. Birch et al. (1987) demonstrated that rewarding children if they “cleaned their plate” resulted in less responsiveness to energy density and thereby greater caloric consumption. External rewards can also have unintended effects on the development of food preferences. When parents use food items such as dessert as a reward if the child eats her vegetables, it increases the value or liking for the dessert item and decreases the preference for the required item (vegetables) (Birch & Marlin, 1982; Birch Zimmerman, & Hind, 1980; Newman & Taylor, 1992).

Research has shown that controlling child feeding practices are associated with children’s weight status (Klesges et al., 1991). Parental control of when, what, and how much children eat may teach children to ignore their feelings of satiety, and may lead to increased levels of energy intake (Johnson & Birch, 1994), which in turn could lead to overweight (Fisher & Birch, 2000).

According to the model of Costanzo and Woody (1985), parents are most likely to control children’s behaviors when they are concerned about a child’s weight. External control in feeding results in lack of internal cues, the child eats beyond satiety which in turn is related to increased body mass (Johnson & Birch, 1994). Fisher and Birch found that young children’s weight for height predicted the degree to which mothers reported restricting their child’s intake of snack foods (Fisher & Birch, 1996). Fisher and Birch (1999a) tested and confirmed this over-control hypothesis in several studies. Spruijt-Metz et al. (2002) evaluated the relationship

between mother child-feeding practices and children's adiposity in African American and Caucasian children aged 11 years. The pressure to eat and concern for a child's weight explained 15% of the variance in the total fat mass in children.

However, the literature reveals many inconsistencies. Studies on samples representing different socioeconomic groups failed to detect a positive relationship between parental control and children's weight status (Baughcum et al., 2001; Gable & Lutz, 2000). Robinson et al. (2001), in a sample of 792 8-9-year-old children with diverse socio-economic and ethnic backgrounds also did not find a positive relationship between parental control behavior and children's weight status. A review of 16 selected studies on the relationship between restriction and weight status concludes that the findings are inconsistent across studies (Faith et al., 2004). The discrepancy between these findings may relate to the methodological differences across studies, including differences in sample size, age, subjects, and measurement of feeding practices (Faith et al., 2002; Moens, Bert, & Soetens, 2007).

A recent study that used both self-report and observation of mealtime family functioning reported that parents of 7-13 year old overweight children reported more control on their children's feeding behavior compared to parents without overweight children. However, observations at mealtime indicated that in families with an overweight child, control strategies were twice as prevalent and less parental support was displayed (Moens, Bert, & Soetens, 2007). These results are based on cross sectional studies and do not determine causality, so it is unclear whether parents' child-feeding behaviors influence children's eating habits or vice versa. Faith et al. (2004), in a longitudinal study, concluded that parental feeding styles and child BMI depends on child overweight predisposition. Among children predisposed to overweight, elevated child

weight appears to elicit restrictive feeding practices, which in turn may produce additional weight gain.

In summary, controlling child-feeding practices can have negative and unintended effects on children's food preferences. It is likely that such practices foster rather than prevent the development of childhood overweight and eating problems, although additional research is needed to confirm this point (Birch & Fisher, 1998). Satter (1986) has discussed an alternative to such controlling child-feeding practices based on her extensive clinical work. She suggested a “trust” paradigm instead of the “control” paradigm for understanding feeding practices and child weight. She suggested a division of responsibility between parent and child in which it is the parent’s responsibility to supply the child with the healthful array of foods and a supportive eating context, and it is the child’s responsibility to decide when and how much to eat. Children are innately equipped to monitor their own food intake and to determine when they are satiated (Birch & Fisher, 1995). This suggests that when parents offer a nutritious array of foods, children can serve themselves without parental coercion and interferences.

To the knowledge of researcher, limited studies have been done to specifically identify what type of feeding practices are used by Asian American or Asian Indian mothers. Studies involving South Asian (that include Asian Indians) suggests that South Asian mothers tend to use controlling feeding practices more often than Caucasians (Hackett & Hackett, 1994; Jambunathan, 2002). Furthermore, Asian Indian parents hand feed their children much longer than American parents do to ensure that they eat adequate and right foods (Londhe, 2006). Since studies focusing on Asian Indian mothers’ feeding behaviors are minimal, the next section attempts to draw general idea about parenting styles by reviewing parenting beliefs of Asian Indians.

**Parenting beliefs of Asian Indians.** Asian groups share relatively common values, beliefs, and parenting styles that originated from the philosophical principles of Confucianism. Confucian principles emphasize the importance of social order and hierarchy, loyalty, respect for and deference to older family members, obedience, and obligation to the family (Kitano & Daniels, 1995; Min, 1995). Asian American parents have been described as more hierarchical, less democratic, and more controlling than parents from other ethnic backgrounds, particularly when compared to Caucasian families (Chao & Tseng, 2002; Uba, 1994). Parenting styles among Asian parents have been variously described as “authoritarian”, “controlling”, “restrictive” and “hostile” (Steinberg, Dornbusch, & Brown, 1992; Lin & Fu, 1990).

Asian Indian parents follow an authoritarian pattern of parenting. Asian Indian parents also lay a great deal emphasis in their parenting practices on familial bonds, dependence on and loyalty to the family, obedience, religious beliefs and achievement (Kakar, 1978). Studies also stress that Asian Indian parents place a high value on academic achievement (Khatri, 1975; Rao McHale, & Pearson, 2003) and family interdependence, discourage autonomy and emphasize the importance of extended family and respect and obedience of elders (Dasgupta, 1989; Helwig & Helwig, 1980; Rao, McHale, & Pearson, 2003; Wakil, Siddique, Wakil, 1981). Asian Indian children are usually complimented and positively reinforced for behaviors such as completing chores, academic achievement, and exhibiting self-control (Kakar, 1978). Research has indicated that the Asian Indians strongly encourage their children to be reticent, dependent, not to display emotions, and to exhibit self-restraint (Kakar, 1978).

According to Asian Indian psychologists (Dasgupta, 1998; Ranganath & Ranganath, 1997), a primary difference between Asian Indian and European American cultural belief system lies in the concept of the self. Asian Indians tend to be allocentric, where the self and the family

are integral, rather than have separate concepts, as is characteristic of a Western belief system. Child-rearing practices emphasize close family bonds with parents highly involved in their children's lives. Individuals of all ages are expected to make sacrifices and to contribute to the honor and welfare of the family (Jambunathan & Counselman, 2002). By contrast, European American families tend to be nuclear. Children are generally viewed as transitional members who by adolescence and beyond are expected to individuate and pursue their own interests (Triandis et al., 1988). Compared to most Asian groups, European American parents tend to be less involved in their children's lives (Lin & Fu, 1990).

In a study of Korean American immigrants, Farver & Lee-Shin (2000) found that mothers with assimilated or integrated acculturation styles began to resemble European American families in their child-rearing styles. Likewise, in a study of Asian Indian families, Patel, Power & Bhavnagri (1996) found parents who were more acculturated, adopted relatively 'Americanized' child rearing attitudes and behaviors, and were more likely to encourage 'American characteristics in their children, than were parents who were less acculturated. Jambunathan (2002) compared parenting attitudes of Asian Indian mothers living in the US and those living in India. She found that that the Asian Indian mothers living in the US had lower inappropriate expectations and tended not to reverse roles with their children. The results also showed that the Asian Indian mothers living in India favored the use of corporal punishment more than their counterparts in the US. These results indicated that mothers living in the US had more authoritative parenting attitudes and those living in India had more authoritarian ones. She argued that Asian Indian mothers in the US with authoritarian parenting attitude may find that their children suffer under those social disabilities found in European American families who use similar parenting styles. Thus, many of the Asian Indian parents in the US adopt authoritative

parenting styles, which balance their traditional cultural expectations and values with demands of the new, majority culture.

**Parental beliefs about food and health.** Research has emphasized the role of mothers' beliefs about diet and health in determining children's diet quality. Gibson et al. (1998) showed that mothers of children aged 9-11 years considered taste to be of greatest importance in choosing what to eat for themselves, followed by consideration of health and well-being and then disease prevention. However, in choosing food for their children, mothers considered health to be the most important followed by taste and then prevention of disease. Mothers' ratings of the importance of "general health and well being" and "prevention of disease" were significantly correlated with children's diet as assessed by 3-day food diaries. Mothers with low ratings of importance of disease prevention in choosing foods for their children had children who consumed a higher percentage of fat and less fruits and fruit juice (Gibson et al., 1998). Parents who perceive that their child might develop a risk for a certain disease or who are concerned about the child's health may be more likely to promote healthy eating behaviors in children.

Contento et al. (1993) found a positive relationship between maternal health motivation and the quality of children's diet. Contento and colleagues segmented families according to the importance of beliefs about healthfulness of foods and this segmentation predicted children's diet quality. They found that the group of mothers who emphasized food selection criteria based on their own health beliefs were significantly more knowledgeable about which foods are healthful or likely to cause heart disease than their taste-oriented counterparts which, in turn, was correlated with children's dietary intake. The diets of children in health-oriented families were significantly lower in calories, total fat, saturated fat, and sucrose and higher in vitamin A and

fiber than those in taste-oriented families even when mothers' knowledge was held constant (Contento et al, 1993). A focus on health may lead parents to purchase more healthful foods and make them readily accessible in the home, which are both important determinants of children's preferences for and intake of such foods. Individual's awareness that certain health problems are related to dietary practices, and that they can be prevented by making healthy food choices at an early age may influence their behaviors. This type of knowledge may motivate a person to learn more about nutrition and adopt healthy eating behaviors.

Reimer et al. (2001) studied the relationship between child feeding strategies and stage of change for fruit and vegetable consumption in African American women with children under the age of 12 years. The Transtheoretical Model (Prochaska, Redding, & Everse, 1997) was used to identify the stages of change for fruit and vegetable consumption. Mothers who were in the later stages of change such as preparation, action, and maintenance (the mothers had made or maintained changes in consumption of fruits and vegetables) reported that they were concerned that their child should eat healthy but did not force children to eat fruits and vegetables, and used positive child feeding strategies. These mothers reported the importance of role modeling and other strategies for feeding fruits and vegetables, such as buying and keeping fruit and vegetables on hand for snacks, replacing junk foods with fruits and vegetables, adding vegetables to meals, and to provide at least one vegetable. Women in the early stages of change such as pre-contemplation and contemplation (the mothers were not interested in changing behavior or anticipating making a change or actively seeking the change) did not raise concerns about nutrition and health issues for children. According to the Transtheoretical Model, these women may have inadequate information about diet and health relationships or they may have more barriers that result in lower intake of fruits and vegetable for themselves and their children.

Parents who are aware that a particular eating behavior has health implications may presumably try to influence the corresponding aspect of child's diet by performing the desired behaviors. However, Alderson & Ogden (1999) found that mothers of 5-11 year olds were motivated by the long-term health and nutritional value in choosing foods for their children, but reported that they fed less healthy foods to their children than they ate themselves. This points toward a genuine gap between motivation and behavior and indicates a role of other factors that might impede the performance of desired behaviors by mothers. This gap between health motivation and behavior could be explained by potential constraints in performing a behavior, and hence the lack of translation of motivation into behavior (Ajzen, 1991; Armitage & Conner, 2000; Conner & Norman, 1996).

**Parental motivations and barriers to health-promoting behaviors.** To better understand the gap between health motivation and health promoting behaviors of parents, this section provides review of studies that assessed motivators and barriers in practicing parental behaviors that promote healthy eating in children. Studies determining parental motivations and barriers to health-promoting behaviors are scarce. Parents state that work schedules, cost of food, perceived inadequate time to shop, plan, and prepare nutritious meals, or a combination of these have been shown to be barriers to nutritious eating habits (Omar, Coleman, Hoerr, 2001). Hart et al. (2003) showed that parents of 7-12 year olds reported that school environment and peers were largely responsible for poor diet and lack of exercise among primary school children. However, parents were not aware about the influence of home environment on children's dietary intake and physical activity. Parents reported short-term benefits of healthy behaviors such as shiny hair, skin, and teeth, and failed to recognize the long-term health benefits of healthy eating behaviors.

Few studies have focused on parental views on home food environment and its influence on child's food choices. Cullen et al. (2000) showed that parents of 9-12 years old children representing three major ethnic groups – African American, European American and Mexican American – reported that fruits, juice and vegetables (FJV) and low-fat versions of a variety of foods were available at home but not accessible to children. Parents expected that children of this age group to prepare their own food or ask for help. Parents also reported that barriers such as lack of time on weekdays to prepare healthy meals were the reasons for not eating healthy foods at home. Campbell, Crawford, & Ball, (2006) determined parental perspectives on factors that influence child's food choices and their decision-making about food provided to their 5-6 year old children. The motivations for having family meals, as reported by parents, were: to provide opportunities for family discussion, learning about table manners, learning about proper meals, and parental modeling. The food made available to children was also seen to influence what the child ate. Yet some parents believed it was the parents' role to determine what foods were made available to the child, while others offered food on the basis of the child's taste and preference. Some of the beliefs of parents that influenced their food decisions were: children have specific food preferences, children have particular tastes, children may not eat enough if the foods they want were not available, peace at mealtime is priority, and media influence children's food choices. For feeding strategies, parents reported that using foods as a reward was a practical solution to children's food fussiness.

In summary, these studies discussed in this section suggest that parents are likely to have low behavioral control in helping their children consume a healthy diet due to the large number of perceived barriers and small number of perceived facilitators and benefits of these behaviors. It is likely that parents are aware about the importance of their feeding behaviors and health

outcomes of healthy eating patterns, but the barriers perceived by them may deter the performance of those behaviors. For example, parental beliefs that children will not eat enough if they are not served the foods they like, may affect parents' decision about which foods to purchase.

### **Project Justification**

During the past decades, US has witnessed a dramatic increase in the prevalence of overweight, which has become a major public health crisis (Ogden et al., 2010). Childhood overweight predisposes an entire generation to an increased risk of chronic diseases and disabilities and is a severe threat to the economic well being of the nation (Huang & Horlick, 2007). Overweight and obesity are associated with coronary heart disease, several types of cancers, type 2 diabetes, stroke, arthritis, breathing disorders, and psychological disorders including depression (Surgeon General's Report, 2010). In immigrant Asian Indians, prevalence of hypertension (12-20%), diabetes (6-8%), and coronary heart disease (7-14%) has been found to be higher than native rural Indians residing in India and Western populations (Singh et al., 2001). According to U.S. Bureau of Census (2010), Asian Indians make up the third largest Asian population, and is one of the fastest growing immigrant populations in the United States. By the year 2050, the number of Asian Indians living in the United States is predicted to be at two million (Bouvier & Agresta, 1985; O'Hare & Felt, 1991). It is estimated that the proportion of overweight and obesity in Asian Indians will increase with more US-born Asian Indians and longer residence in the US (Lauderdale & Rathouz, 2000).

Prevention of obesity could be the key strategy for controlling the current epidemic of obesity. Several factors have been attributed to the cause of childhood obesity epidemic (Davison

& Birch, 2001). Many researchers have emphasized that home environment and parents' behaviors have a significant impact on children's eating habits and weight status and offer a promising area for targeting childhood overweight prevention efforts (Patrick et al., 2005; Rhee, 2008; Ventura & Birch, 2008). However, little is known about the Asian Indians' home food environment and role of parents in developing children's eating habits.

There is a need to identify effective and culturally appropriate interventions due to disparities in behavioral practices based on race and ethnicity. To develop effective health and nutrition programs for this population, it is important to fill the gap in literature by understanding the child feeding behaviors of Asian Indian mothers and the factors that influence the practice of these behaviors.

This dissertation was completed in two stages. The first stage sets out to assess the child feeding behaviors of Asian Indian mothers using the theory of planned behavior. The eight child feeding behaviors assessed in this dissertation have shown to be significantly important in affecting children's eating habits and weight. The theory of planned behaviors was used a conceptual framework since it has shown potential to predict health behaviors by targeting the underlying factors that influence a particular behavior, and develop effective behavior change interventions (Armitage, 2005; Conner, Norman, & Bell, 2002; Noar & Zimmerman, 2005; Campbell et al., 2000; Rothman, 2004). Theory of planned behavior not only predicts the attitude toward a specific behavior but it also predicts non-volitional behaviors by incorporating perceptions of control over performance (perceived behavioral control) of the behavior as an additional predictor (Ajzen, 1991). Qualitative methodology was employed to explore child feeding behaviors and the underlying factors.

The second stage of this research consisted of developing and testing nutrition messages for Asian Indian mothers to help them identify appropriate behaviors in feeding their children. The findings from stage 1 about Asian Indian mothers' current practices of child feeding behaviors, behavioral beliefs, barriers, and facilitators in practicing child feeding behaviors were used to construct culturally appropriate messages.

### **Theoretical Framework for Research**

Theory of Planned Behavior (Ajzen, 1991) was used as a framework for the assessment stage as well as the message development stage. Theory of Planned Behavior (TPB) is a modified version of the Theory of Reasoned Action (Ajzen & Fishbein, 1980) and is based on the expectancy value model that addresses the problem of incomplete volitional control over behaviors (Blue, 1995). According to TPB (Figure 1-3), behavior is best predicted by intention to perform a behavior. Intention, in turn, is determined by behavioral attitude (favorable or unfavorable), subjective norm (perception of social pressures to perform or not perform the behavior), and perceived behavioral control (perception of ease or difficulty of performing the behavior). The TPB was applied to this research to understand the influence of each construct on the child feeding behaviors of Asian Indian mothers (Figure 1-4). The first construct of the TBP – 'behavioral attitude' – consisted of behavioral belief and evaluation of behavioral belief. 'Behavioral belief' was assessed by exploring mothers' beliefs about the expected nutrition outcomes of their feeding behaviors. 'Evaluation of behavioral belief' was assessed by exploring mothers' beliefs about importance of expected nutrition outcomes for children's current and future health (i.e. the value placed on nutrition outcomes). 'Subjective norm' was assessed by exploring sources of information or advice on feeding children (normative belief) and the extent

of compliance with that information or advice (motivation to comply). 'Perceived behavioral control' was assessed by exploring perceived facilitators and barriers (Control belief) that make the performance of feeding behaviors easier or more difficult for the mothers (Perceived power).

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior, 11-39.

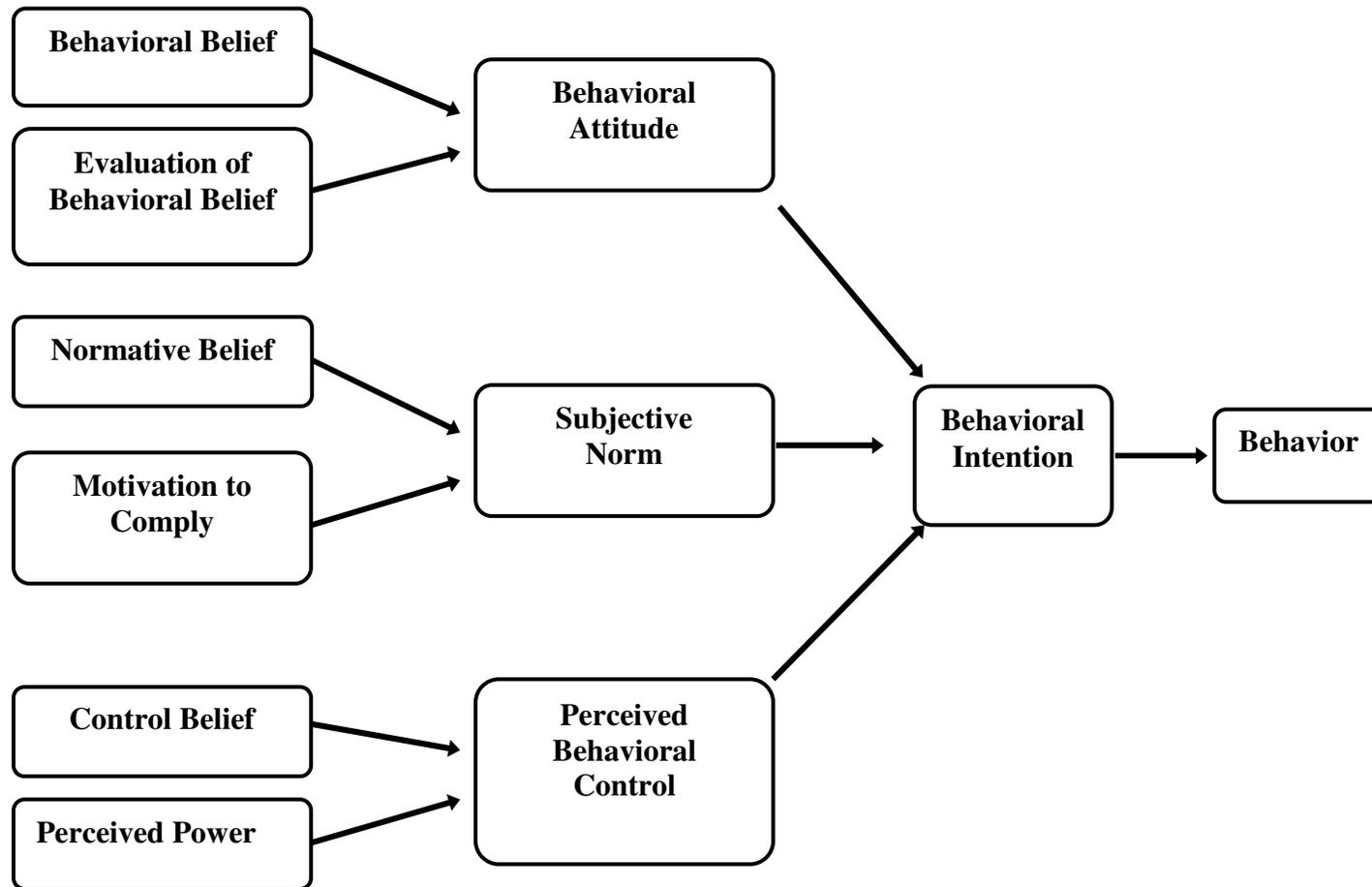


Figure 1-3. Theory of Planned Behavior

Adapted from Ajzen, I. (1985). From intentions to actions: A theory of planned behavior, 11-39.

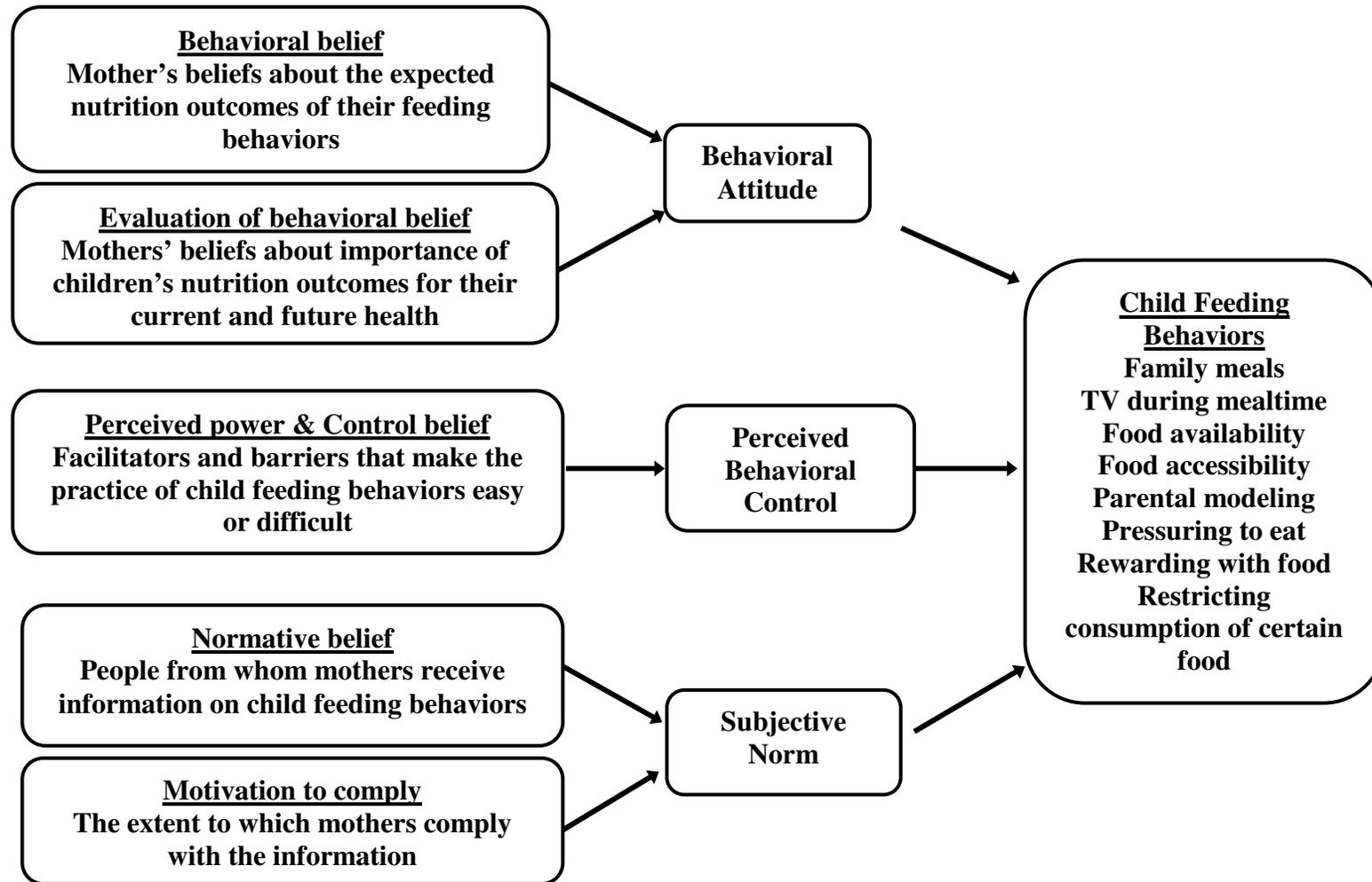


Figure 1-4. Theory of Planned Behavior Applied to Child Feeding Behaviors

The next chapters of this dissertation, written as research articles, describe methods, results, and discussion for stage one and stage two of this research. Chapter two, written as manuscript focused on five child feeding behaviors – family meals, parental modeling, pressuring to eat, offering food rewards, and allowing TV viewing while eating since these findings were different from those already reported in the literature and bring out the cultural distinctiveness of Asian Indian mothers. Findings not included in this chapter (three child feeding behaviors – availability, accessibility of healthy foods, and restricting children’s consumption of certain foods, beliefs about health and nutrition, and subjective norm) are attached as tables in Appendix F. Chapter three, written as manuscript, describes the development and testing of nutrition messages for Asian Indian mothers. Finally, chapter four provides contributions, recommendations, limitations and conclusions that can be drawn from this research.

**CHAPTER TWO:**  
**CHILD FEEDING BEHAVIORS OF ASIAN INDIAN MOTHERS**

**Abstract**

**Objective:** To understand current practice of child feeding behaviors, and underlying factors influencing these practices in Asian Indian mothers.

**Design:** Qualitative inductive design using in-depth interviews.

**Setting:** Asian Indian community and religious organizations in Michigan.

**Participants:** Twenty-seven immigrant Asian Indian mothers of children ages 5-10 years.

**Phenomena of Interest:** Feeding behaviors, beliefs about nutritional outcomes, perceived behavioral control.

**Analysis:** thematic analysis using coding and display matrices.

**Results:** Mothers were motivated by nutrition outcomes when practicing positive and negative controlling feeding behaviors. Outcomes related to preservation of Indian culture and values also influenced feeding behaviors. Pressuring to eat was often practiced despite the perception of ineffectiveness. Use of food rewards and TV to control children's food intake despite the clear understanding of undesirable nutrition outcomes was found.

**Conclusions and Implications:** Asian Indian mothers need effective child feeding strategies that are culturally appropriate. Integrating cultural beliefs in nutrition education could help support existing motivation and behavior modification.

**Key Words:** Asian Indian, feeding behaviors, culture.

## **Introduction**

The prevalence of childhood overweight is rising in all ethnic populations in the US. Several factors contribute to the development of childhood overweight. Previous research shows that parents are active in creating a child's eating environment through use of specific child feeding behaviors; these in turn influence child eating habits (Ritchie et al., 2005; Patrick & Nicklas, 2005). 'Positive child feeding behaviors' such as family meals and parental modeling of eating healthy food improve children's dietary quality (Rhee, 2008; Ventura & Birch, 2008). Eating meals as a family is linked to higher intakes of fruits, vegetables, dairy food, and vitamins and minerals (Gillman et al., 2000; Neumark-Sztainer et al., 2003; Videon & Manning, 2003). The ability of parents to model and enforce rules that encourage healthy eating has been suggested to contribute to better dietary intakes during family meals (Rhee, 2008). 'Negative child feeding behaviors' such as eating while watching TV adversely affects children's energy intake, which may lead to overweight (Francis & Birch, 2006). Negative child feeding behaviors that are also controlling, such as pressuring a child to eat or offering one food as a reward for eating another can also result in negative outcomes by disrupting a child's natural ability to self-regulate energy intake (Rhee, 2008).

The majority of the child feeding research has been conducted with white, middle class populations (Faith et al., 2004). Research has included minorities such as African Americans and Mexican Americans in low proportions, and only a few studies have focused exclusively on these groups (Clark et al., 2007). In addition, research on child feeding behaviors of recent immigrants is limited. Child feeding survey instruments are typically developed on white and well-educated populations, and therefore may measure constructs that are inappropriate for other populations, or lack constructs that are unique to other race and ethnic groups (Jain et al., 2004;

Lindsay et al., 2011). Therefore, programs for childhood overweight prevention that are based on the current body of research may not be appropriate for diverse populations.

We sought to investigate child feeding behaviors of Asian Indian immigrant mothers in the United States. Asian Indians, a subgroup of Asian Americans, are one of the largest and fastest growing Asian populations in the US (US Bureau of Census, 2010). In addition, the risk of childhood overweight for Asian Indian immigrant children is directly related to the number of years of residence in the US (Lauderdale & Rathouz, 2000; Popkin & Udry, 1998). Asian Indians are therefore an important population to study as a shift to a higher proportion of Asian Indians born in the US is likely to result in higher rates of overweight and associated health problems in Asian Indian children (Lauderdale & Rathouz, 2000).

The literature on child feeding behaviors of Asian Indian immigrant mothers is limited. Compared to whites, Asian Indian parents have been shown to hand feed their children much longer (Londhe, 2006) and use controlling feeding practices more often (Hackett & Hackett, 1994; Hinton, 2010). The reasons for these differences are not known. As such, research involving this understudied population is needed to understand the factors that drive their practice of child feeding behaviors.

The Theory of Planned Behavior (TPB; Ajzen, 1991) is a useful framework for this work as it allows for the exploration of the underlying intentions associated with various behaviors. The TPB assumes that behavioral intentions are determined by people's underlying beliefs about expected outcomes of a behavior, as well as perceived control over the particular behavior and social pressures. The theory is content-free in that it does not specify the particular beliefs or constructs. Rather, the actual beliefs must be obtained from the target group itself, using open-ended elicitation techniques (Contento, 2010).

This work seeks to explore the underlying beliefs of Asian Indian mothers associated with five behaviors that are central to the literature on child feeding. By understanding the underlying beliefs, constraints, and social pressures that are associated with these behaviors, educators may develop strategies to address these behaviors in this rapidly growing immigrant population and improve child feeding practices. A qualitative, ethnographic approach was used to allow for the emergence of themes that are most important to the study population about these behaviors. The research therefore reports on 1) current child feeding behaviors employed by Asian Indian mothers, 2) their beliefs and expectations about desirable and undesirable outcomes of feeding behaviors, 3) perceived behavioral control, or the perceived ease or difficulty in practicing feeding behaviors, and 4) perceived pressure to comply with the expectations of significant others regarding these behaviors (e.g. parents, friends, spouse).

## **Methods**

### **Study Design**

The study protocol was approved by the Institutional Review Board at Michigan State University. A purposive sample of 27 Asian Indian immigrant mothers residing in Michigan in the Detroit metropolitan area and the city of Lansing and surrounding suburbs was recruited using criterion sampling (Patton, 2002). Eligibility criteria included mothers of Asian Indian origin who had: 1) lived in the US for at least one year, 2) had at least one child between the ages 5-10 years; and 3) were the primary meal preparer. Participants were recruited from a religious center (Bharatiya Temple), Asian Indian organizations (Indian Cultural Society and India Council), and a website ([www.miindia.com](http://www.miindia.com)) for Asian Indians using fliers, emails and advertisements. Prior to the interview, informed written consent was obtained from the

participants. Face-to-face in-depth interviews were conducted by the first author (SM) from March 2009 to December 2009. Participants also completed a demographic questionnaire and the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA; Suinn et al., 1987) to measure their acculturation level. Participants received a \$25 gift card to a grocery store.

### **Interview Guide**

The interview guide used projective techniques to assess mothers' attitudes toward the five behaviors of interest. Projective techniques avoid questioning participants directly about their own behaviors. Rather, verbal or visual stimuli such as pictures or stories are used to elicit thoughts about a particular behavior (Churchill, 1995). Participants respond to the stimuli and ascribe their behavior to a third person by using the ego defense mechanism of projection, and thereby reveal their own unconscious beliefs and feelings about the situation (Churchill, 1995; Loudon & Della Bitta, 1993; Solomon, 1994). Use of projective techniques encourages participants to connect themselves with the hypothetical characters, express their perspective regarding the character's behaviors and attitudes in a non-threatening manner, and reduces the likelihood of responding with a socially desirable answer. In this study, participants were shown culturally relevant pictures and read brief narratives with culturally relevant names and situations. They were asked to interpret the behavior of Arti, an Asian Indian mother, engaging in various feeding behaviors with her child.

### **Interview Process**

Picture cards that showed each of the five feeding behaviors were presented to the participants: family meals, modeling of healthy eating, pressuring the child to eat, offering a food

reward for finishing the meal, and television viewing during meals. The cards were presented three times. The first time, information was solicited to understand current practices of the five feeding behaviors by asking open-ended questions such as “Where do you see this happening?” “How often do you think this would happen in Arti’s house?” The second time, expectations about outcomes of a behavior were explored. The participants were asked questions such as “Why is it important for Arti to do this?” “How would Arti’s behavior in this picture make a difference to what or how much the child eats?” The third time the participants were asked “Would it be easy or hard for Arti to perform the behavior?” “What makes it easy or hard for Arti to perform the behavior?” The goal was to understand perceived ease or difficulty in practicing a given behavior. Finally, a short narratives about Arti illustrating two different situations – one in favor of practicing the behavior and other making the behavior difficult to perform, were read to the participants. The end of the story was left ambiguous and the participants were asked to complete the story by expressing their thoughts about how Arti would handle this situation. This revealed participants’ decision to practice a behavior in a difficult situation. Open ended questions such as who do you talk to about child feeding, and what kind of information you receive from people about child feeding were asked to assess social pressures (subjective norm).

## **Data Analysis**

Interviews were recorded and transcribed verbatim.

**Coding.** A “start list” of codes (Miles and Huberman 1994) was developed based on the concepts of interest from the TPB. As the transcripts were reviewed, new themes emerged and the specifications of new codes were developed and added to the codebook. Upon successive

review of data, both new and start list codes were revised, and refined to fit the data until the code structure was finalized. All transcripts were coded by the first author (SM) using the final code structure. A trained second coder used the final code structure to independently code 33% of the transcripts. Inter-rater reliability of coding procedure between the coders was 0.95. All transcripts were systematically coded using QSR NVivo version 8.0 software.

**Data displays.** Coded statements from each participant transcript were extracted by theme using NVivo 8. Summary statements were developed for each transcript that captured the main ideas for each theme. In the final step a conceptually clustered matrix was developed (Miles and Huberman, 1994). A matrix listing themes along the rows and participants along the columns was prepared. Summary statements prepared in the previous step for each participant were recorded under the corresponding theme on the matrix. The authors reviewed the matrices by theme across all participants and identified patterns and trends associated with each behavior.

## **Results**

Asian Indian mothers in our sample were primarily well educated and middle- or higher-income. Over 60% of the mothers were categorized as overweight or obese based on self reported height and weight. Although the mothers had resided in the US on an average for 10 years, the mean acculturation score was low indicating that the sample was Asian Indian identified (Table 2-1).

The qualitative analysis focused on identifying emergent themes related to the mothers' beliefs about expected outcomes of each behavior, their perceptions about control over the behavior, and social pressures associated with each behavior. During the interviews, major themes emerged that pertained to the mothers' expected outcomes and behavior control, but little

information related to social pressures (or subjective norms) emerged. The following sections, therefore, describe the mothers' reports on 1) current practice of each behavior, 2) expected outcomes of practicing each behavior, and 3) the perceived ease or difficulty in practicing the behavior. Results are presented separately for positive feeding behaviors (family meals and parental modeling) and negative feeding behaviors (pressuring to eat, using food rewards, and eating while watching TV).

### **Positive Behaviors**

**Family meals.** The majority of mothers (21/27) reported having regular family meals when all family members were home. Dinner was often referenced and featured home-cooked Indian dishes.

Mothers reported two highly desirable outcomes of family meals: promoting children's consumption of healthy foods and the preservation of Indian identity. Mothers (17/27) believed that traditional Indian meals that typically include a wide variety of foods such as vegetables, rice, roti (Indian flat bread), and dal (lentils) are healthy and well balanced with important nutrients and major food groups. In addition, over half of these mothers (10/17) considered consumption of traditional Indian foods to be integral to developing and maintaining an Indian identity. One woman who felt strongly about serving her children Indian meals remarked, "*Food habits are nothing but your identity. I know many families that have separate meals for their children, but it's not good.*" Mothers therefore desired their children to be familiar with, as well as accept and consume, Indian dishes. They believed that family meals encouraged consumption of Indian foods since they could expose their children to a variety of Indian dishes, talk to them about Indian foods and nutrition, and model the consumption of Indian dishes.

Over 70% of mothers (19/27) reported that practicing family meals was difficult since cooking Indian meals was perceived to be an elaborate and time consuming process. However, they reported using several strategies to make family meals possible on a regular basis. One strategy viewed as crucial by most was meal planning and advance preparation including cutting vegetables, preparing roti dough, or soaking and boiling lentils in advance to make quick meals. *“I cut up all the vegetables the night before. So, I have everything ready the night before, like, make the roti dough. If I’m making any kind of lentil, I usually soak them the night before. So when I come home the next day, all I have to do is cook ‘em.”* Some mothers reported cooking two or three meals during weekends, partial cooking, preparing one dish such as a vegetable curry in the morning before leaving for work, following easy recipes, and preparing one-pot Indian meals such as one vegetable curry and roti instead of elaborate meals. Spouses helping with meal preparation and children helping with setting the table were also identified as making family meals easier.

**Parental modeling.** Mothers frequently discussed parental modeling in the context of family meals. The majority (14/27) stated that family meals provided a good opportunity for parents to engage in positive role modeling behaviors such as eating healthy Indian foods, avoiding negative comments about any food, trying certain foods despite their dislike, and expressing their feelings about how much they liked certain foods.

They also (14/27) believed that modeling the consumption of Indian dishes during mealtime resulted in desirable nutrition outcomes in children by creating a sense of familiarity, acceptance, and liking for those foods in children. Mothers felt that these outcomes were important given children’s exposure to western foods at school and through their peers.

A majority of mothers (22/27) reported that modeling the consumption of healthy foods was easy as they regularly ate dinner with their children and they liked and were willing to eat those foods.

## **Negative Behaviors**

**Pressuring children to eat.** The majority of mothers (16/27) reported that they frequently pressured their children to eat specific types and amounts of food. They also revealed pressuring strategies that ranged from mild to extreme. At one extreme, one mother reported *“My son always says I’ll vomit, I’ll vomit, if you give me this vegetable. I’ll vomit! I say, “Okay, I don’t care if you vomit, but you finish (your food). You have to put it (food) in the trash (anyway).... So, you eat it, and then you go and vomit..... I want them to finish their food.”*

Common pressuring strategies reported by mothers included nagging the child to finish the food, not allowing the child to leave the table unless they finish the food, threatening to take away TV or playing with friends, serving uneaten food for breakfast or the next meal, and spoon feeding to get the child to finish the meal.

Mothers reported that they (16/27) used pressuring when they were concerned that a child would not eat enough because they were not aware of their own hunger. They also felt that children were often picky and would focus on only one food in a meal while rejecting others if they were not pressured.

Mothers also showed concern that their children resisted Indian food. Almost half of those who pressured (7/16) believed that children’s exposure to American fast foods in school, as well as the spices used in Indian preparations were responsible for children’s aversions to Indian foods, *“The moment they start going to school or to daycare, that is the time they resist eating*

*Indian food. So it becomes difficult to give them Indian food. Because the moment they start eating (chicken) nuggets in school, or macaroni and cheese, they're somehow drawn towards that kind of food, because it's tastier."* Mothers reported that they used pressuring as part of an on-going power struggle over the consumption of Indian dishes.

Most mothers (21/27) believed that pressuring children to finish food on their plate was important to help children learn the value of not wasting food and to not overfill their plates. Almost all mothers who used pressuring (13/16) said that it was important to respect food for religious reasons and to show consideration for people who must struggle to feed their families. To them, it was inappropriate and disrespectful to leave any food on the plate. Said one mother, *I tell her to clean (the plate). You need to bring some values in them. They have to appreciate what people are struggling for. So you cannot just take the food and throw it in the garbage when so many people are starving for food. Because that's how we grew up. So, the same thing we are just passing on to the next generation"*.

Mothers who pressured also (13/16) reported that it was a culturally-learned behavior. *"I think it's a social mentality that has been handed from our parents. Like, you are blessed with so much food. So don't waste your food; there are children who are not getting this much..... I think this is very common, not only among Indians, basically among Asians. It's inherent for all the mothers."* The majority of the mothers (12/16) who used pressuring, however, expressed frustration that it was not effective at getting their children to eat healthfully or to eat sufficient amounts. *"It's a struggle. It's a struggle. It's hard. I don't know what else to say. It's hard because, it takes so much time and effort to get them to finish their food.....and it always feels like, daily nagging kind a thing.....Finish your food, finish your food."* Due to the perceived ineffectiveness of pressuring, almost all mothers (14/16) who used pressuring used other

controlling behaviors as well, such as rewarding children with sweets and using TV to control children's food intake.

**Rewarding with food.** Nearly half of all mothers interviewed (13/27) reported rewarding their children with food to encourage them to finish a meal or consume a specific food such as fruit or vegetables. Sweets, desserts, and snack foods were frequent rewards.

Yet, almost all mothers (24/27) cited undesirable outcomes from using food as a reward for specific eating behaviors. Mothers said that when children are offered food rewards for finishing a meal, they become more interested in the reward than the meal itself. They were also concerned that rewarding children with treats could encourage a habit of eating certain foods only when a food reward is provided. One mother said *“I think it’s not a good habit because the kid expects that if I’m finishing this, I am going to get ice cream. So, it becomes a ritual. Like, I know that mama is going give me ice cream every time I finish my lunch. So she is not interested in the lunch. “So where’s my ice cream?” I don’t think that’s a good thing to do.”* Over half of the mothers interviewed (14/27) also indicated that rewarding children for any behavior will negatively affect their development as it creates an expectation of material rewards for behavior and discourages an attitude of responsibility and obligation in children.

Despite their negative views on rewarding, all mothers (13/27) who used food rewards believed that it was easy and effective strategy to get children to finish their food and consume healthy foods, especially Indian dishes. Interestingly, most of these mothers (9/13) also reported using pressuring behaviors to encourage eating. One mother summarized, *“I think you... somehow get your way, but not make the child feel like they’re being pressurized into eating*

*something. They feel like okay, (if) I finished it, then I get my reward. At the same time, you're introducing (them) to more food, new food. And then they get into the habit of finishing it."*

**Eating while watching TV.** Another negative behavior employed by mothers was to allow children to eat while watching TV, as well as serving food or feeding them by hand in front of the TV. Despite knowledge of the ill effects of TV watching on children's food consumption, the majority of mothers (14/27) admitted to using this tactic. *"If I want him to drink milk or, eat some good food, I prefer him watching TV and eat it. Because he doesn't concentrate on what he is eating, and that way at least he's getting some good stuff."* Most mothers (8/14) using TV as a feeding strategy felt that they had lost control of their children watching TV during eating because the children were habituated to it from a very young age. *"It is difficult, because it's kind of become involuntary for children to switch on the TV. Or, take the plate and go in front of the TV and watch... Without watching something they cannot eat."*

All mothers (27) clearly understood that TV was a distraction to children while eating. Mothers explained that children unconsciously overeat because they do not pay attention to what and how much they were eating when focusing on TV. They also stated that children did not pay attention to their consumption of Indian dishes, which they might normally resist, while watching TV. As a result, mothers intentionally used this inattention to "sneak in" desired Indian foods.

Mothers had a very good understanding of the harmful effects of eating while watching TV, particularly that it might lead to overeating, and therefore expressed resignation over practicing this behavior. *"As a mother I don't prefer it. But sometimes if I have to give her some fruits ... if I turn on the TV, she'll eat the fruits and vegetables. Otherwise, she won't eat. Or*

*she'll drink the milk. I'm not very happy, but, I think she's eating (that way)."* Mothers, however, reported the use of TV to force children's food consumption because they felt that there was no other method that was as easy and effective for getting children to eat "healthy foods" that they would normally resist. One mother expressed her resignation by saying, *"I would say it's a wrong choice to put the TV on and feed them. That's wrong. But I just can't find another way to feed them."*

## **Discussion**

Although literature suggests differences in feeding behaviors among ethnic groups (Sherry et al., 2004; Ventura, Gromis, & Lohse, 2010), there is little emphasis on the role that culture plays in influencing these behaviors. In this study, the in-depth open-ended inquiry allowed for the emergence of the cultural influences on child feeding behaviors. In particular, the study found that cultural beliefs related to religion, ethnic identity, and traditional foods are strong determinants of both positive and negative feeding behaviors among immigrant Asian Indians.

First, the analysis showed the role that religious beliefs play in the practice of the negative feeding behaviors of pressuring children to eat. Food, for example, is revered in Asian culture and it is common to invoke a respect for those who do not have enough food (Yunus, 2005), even when individuals have not personally experienced food insecurity. In addition, Asian Indian Hindus consider food a gift from Annapurna Devi, mother goddess worshiped for nourishment (Arundhati, 2001), and they therefore treat it with utmost respect. Due to such religious beliefs, discarding leftover food is often regarded as unacceptable. In this study Asian Indian mothers were motivated to engage in negative feeding behaviors, such as extreme

pressuring, by these underlying cultural beliefs. It is possible that such beliefs of Asian Indian mothers may be responsible for high prevalence of controlling behaviors reported in previous studies as well (Hackett & Hackett, 1994; Hinton, 2010).

Asian Indian mothers' use of pressure to induce children to eat is of concern because it may disrupt children's ability to regulate their energy intake and increase risk of weight problems (Birch, Fisher, & Davison, 2003; Fisher & Birch, 1999; Farrow & Blissett, 2006; Galloway et al., 2006). There is little research on the outcomes of controlling child feeding behaviors on Asian children. Hinton (2010) showed that Asian Indian mothers' use of external control may impair children's regulation of energy intake. Eating disorders in South Asian girls' have been associated with their perceptions of their mothers' being over controlling (McCourt & Waller, 1995).

Second, our results found their ethnic identity was a major motivator for mothers in the practice of positive behavior of having family meals. This motivator is consistent with findings reported in the literature. First generation Asian Indians often strive to retain their cultural identity and transmit this to their children even many years after immigrating to a Western country, (Dasgupta, 1998; Patel, Power, & Bhavnagri, 1996). One of the identifying values Asian Indian immigrants retain is their preference for traditional Indian foods, even after significant adaptation to a Western environment (Wakil, Siddique, & Wakil, 1981). Our study found that consumption of Indian dishes during family meals was one way for Asian Indian mothers to remain connected to Indian culture, which they now perceived to be foreign to their children. This characteristic of Asian Indian mothers in our study is also consistent with their low acculturation scores and hence a higher tendency to hold on to their cultural values.

In addition to the cultural and religious beliefs that influence pressuring and family meals, we saw feeding behaviors were influenced by an underlying belief that traditional Indian dishes are healthy. Mothers frequently emphasized the nutritional value of traditional Indian foods and this became an important motivation to practice both positive as well as negative feeding behaviors. Research shows that feeding behaviors are usually associated with a mother's desire to improve children's nutrition outcomes (Sherry et al., 2004; Campbell, Crawford, & Hesketh, 2007). This was true for Asian Indian mothers in our study as well. However, the combination of multiple beliefs such as nutritional value of traditional food, traditional food as a part of cultural identity, and religious reverence for traditional food, contributed to the widespread practice of controlling behaviors.

Mothers appeared unsuccessful in identifying positive alternative feeding strategies to pressuring to achieve their goals in feeding their children. Mothers did not believe pressuring was very effective, and so in addition to it used one or even two negative controlling behaviors, often with resignation.

First, mothers used food rewards as a short term solution to feed Indian foods to children. This finding is consistent with the literature which indicates that food rewards are often used because they are practical solution to avoid children's food fussiness, even though mothers in this and other work recognized it as inappropriate (Campbell, Crawford, & Hesketh, 2007). These behaviors continued over time increase children's preference for the rewarded food while decreasing the preference for, and consumption of promoted food (Birch et al., 1987; Birch et al. 1982; Newman & Taylor, 1992). It's possible such behaviors of Asian Indian mothers could lead to resistance by children to eating Indian dishes leading to even more controlling feeding behaviors.

Second, the mothers in our study had developed a new, and to their belief, effective strategy of using TV to control their children's food intake. While direct control such as pressuring to eat, rewarding with food, and restricting children consumption of certain foods are commonly studied feeding practices (Rhee, 2008), this type of control using TV to circumvent children's resistance to certain foods has not been reported previously in the literature. Ogden, Reynolds, and Smith (2006) has used the term "covert control" to refer to forms of food control that cannot be detected by the child. Covert control is a more subtle and less direct approach to managing child's diet by doing things such as avoiding unhealthy restaurants or not bringing unhealthy foods into the house (Brown et al., 2008). In contrast to direct or overt control (e.g. pressuring to eat), covert control has been associated with healthier eating in children (Wardle et al., 2003; Ogden, Reynolds, & Smith., 2006; Brown et al., 2008). By contrast, discreetly controlling children's food intake using TV found in this study is a form of covert control which would be expected to have damaging outcomes on children's health . Mothers in this study were using TV viewing to distract children's attention from their food consumption, hoping to develop a preference for foods they were "sneaking" into their children. Lack of attention to eating by engaging simultaneously in other activities such as TV viewing promotes overconsumption of foods, (Francis & Birch, 2006; Bellissimo et al., 2007; Temple et al., 2007). This newly reported use of a covert control to manipulate children's intake for an intended healthy outcome may introduce another health concern of overweight.

### **Implications for Research and Practice**

Our research points to the need for nutrition professionals to become cross-culturally sensitive and competent in order to work effectively with immigrant populations. It invites

researchers to take an inquisitive approach to understand and work within the values, beliefs, and practices of people from other cultures so that culturally sensitive nutrition education could be developed.

In this population of Asian Indian mothers, nutrition education should focus on a comprehensive approach encompassing cultural values, traditional foods, and ethnic identity issues along with nutrition outcomes. Mothers' beliefs of the nutritional value of traditional Indian foods and their concern with development of ethnic identity could be used as positive motivators to maintaining and promoting positive behaviors such as family meals than focusing on nutrition benefits alone.

Addressing negative behavior such as pressuring to eat, deep-rooted within cultural and religious beliefs, is challenging and requires developing alternative feeding strategies that acknowledge and respect such beliefs rather than ignore them. For example, encouraging mothers to not overfill children's plate and serve small portions may help prevent food wastage and reduce the frequency and intensity of pressuring behavior, while preserving cultural values.

Finally, nutrition educators may focus on mothers' motivations in practicing negative controlling behaviors. Asian Indian mothers recognized the long term undesirable consequences of these behaviors, helping mothers understand their controlling behaviors could undermine the very nutrition and cultural outcomes they desire for their children may lead to receptivity to more alternate and more positive behaviors that preserve these important goals they have in feeding and raising their children.

**Table 2-1.** *Demographic Information of Participants*

<b>Demographic Characteristics</b>	
Age (years)	34.70 ± 3.440
Years in US	9.74 ± 6.85 (1-38)
Education	
Masters/PhD/Professional degree	13 (48%)
4 years degree/Bachelor's degree	14 (52%)
Employment Status	
Homemaker	11 (41%)
Graduate student	4 (15%)
Employed part-time	2 (7%)
Employed full-time	10 (37%)
Household Income (\$)	(n=25)
\$20,000 – \$40,000	4 (16%)
\$40,000 – \$60,000	2 (8%)
\$60,000 – \$80,000	6 (24%)
>\$80,000	13 (52%)
BMI (Kg/m <sup>2</sup> )	
Low (BMI<18)	1 (3.7%)
Normal (18 ≤ BMI < 25)	9 (33.3%)
Overweight (25 ≤ BMI < 30)	12 (44.4%)
Obese (BMI ≥ 30)	5 (18.5%)
Average acculturation score (1-5)	2.035 (range 1.619 – 2.857)

**CHAPTER THREE:**  
**DEVELOPING AND TESTING NUTRITION MESSAGES FOR ASIAN INDIAN**  
**MOTHERS**

**Abstract**

Asian Americans born in the US are twice as likely to be overweight compared to those born elsewhere and newly migrating. The prevalence of childhood overweight for Asian Indians will increase as more Asian Indian children are born in the US. Childhood obesity prevention efforts often focus on parent behaviors that influence children's dietary intake and weight status. Research shows that Asian Indian mothers may need nutrition education materials developed specifically for this group. The aim of this study was to develop and test nutrition messages for Asian Indian mothers addressing eight parental feeding behaviors likely to influence children's diet and weight status. Based on our previous research, nine nutrition education messages were adapted from those developed by the United States Department of Agriculture and 29 new messages were developed. These messages were tested using cognitive interviews with ten Asian Indian mothers. Mothers were receptive to 31 messages, with minor revisions made to five messages to improve clarity and increase acceptability. Two messages that received strong negative responses were deemed inappropriate for this population. Nutrition professionals working with Asian Indian families may use the final messages in education materials to help mothers develop healthy child feeding practices.

Key words: feeding behaviors, nutrition messages, Asian Indian, testing.

## Introduction

While the rates of childhood obesity have reached epidemic levels for the major ethnic groups in the US (Ogden et al., 2010), high rates have also been reported among Asian American children (Popkin & Udry, 1998; Thorpe et al., 2004). Asian Indian, a sub-group of Asian American, is a rapidly growing immigrant population in the US (US Bureau of Census, 2010). It is estimated that the proportion of overweight Asian Indian children will rise as more Asian Indian children are born and raised in the Westernized culture (Lauderdale & Rathouz, 2000), indicating a need to target obesity prevention efforts to this group.

Several factors have been suggested to contribute to the increase in childhood obesity. Research shows that parents significantly influence children's eating habits and weight status (Patrick et al., 2005; Rhee, 2008; Ventura & Birch, 2008). While creating a positive mealtime environment by having regular family meals and modeling healthy eating improves dietary intake in children (Rhee, 2008), allowing children to watch TV while eating negatively affects children's self regulation of energy intake (Francis & Birch, 2006). Making healthy food available and accessible at home can have a significant effect on children's preference for and consumption of such food (Francis & Birch, 2006). Controlling feeding practices, such as pressuring children to eat, rewarding children with food, and restricting children's consumption of certain foods can also override children's ability to self-regulate energy intake leading to eating problems and overweight status (Rhee, 2008). Given the significant impact on children's eating and weight status (Rhee, 2008; Ventura & Birch, 2008), these feeding behaviors have become a focus for interventions targeted toward parents to promote healthy eating and to prevent obesity in their children (McGarvey et al., 2004; Golan & Weizman 2001; Golan & Crow, 2004; Lindsay, 2006).

Recently, the United States Department of Agriculture (USDA) and Food and Nutrition Service (FNS) developed and tested nutrition messages to be used in Federal nutrition education programs to address low-income mothers' feeding behaviors (United States Department of Agriculture [USDA], 2008). These messages were developed based on focus group discussions with low-income Caucasian, African American, and Mexican American mothers; it is possible they may need to be adapted for use with Asian Indian mothers.

Our previous research has shown that Asian Indian mothers not only use controlling feeding practices extensively, but they also let children watch TV while eating as a means to control children's food intake (unpublished data). Some of these controlling feeding behaviors are not addressed by the USDA messages. Furthermore, Asian Indian mothers' practice of certain feeding behaviors is strongly driven by unique cultural beliefs. Our findings suggest that Asian Indian mothers lack appropriate and effective feeding strategies and may benefit from nutrition messages that are culturally sensitive and specifically targeted toward this group.

The aim of this study was to develop and test culturally appropriate nutrition education messages for Asian Indian mothers. The goal of these nutrition messages is to help Asian Indian mothers identify and practice feeding behaviors that are conducive to healthy eating, and therefore overweight prevention, in their children. This article describes the process of developing nutrition messages, provides results of testing the messages, and discusses the implications for nutrition educators working with Asian Indian mothers.

## **Methods**

A three-step approach was used to develop and test nutrition messages for Asian Indian mothers.

## **Step 1**

A formative assessment was conducted using a qualitative approach to identify the factors that influence Asian Indian mothers' practice of 8 feeding behaviors – family meals, TV viewing and eating, parental modeling, availability of foods at home, accessibility of foods at home, restricting children's consumption of certain food, rewarding children with food, and pressuring children to eat (unpublished data). Using the Theory of Planned Behavior (Ajzen, 1991) we identified beliefs, barriers, and facilitators likely to influence Asian Indian mothers' practice of each feeding behavior.

## **Step 2**

Based on our previous research, we determined that nine messages developed by the USDA with minor modifications were appropriate for testing with Asian Indian mothers as these messages reflected beliefs, barriers, and facilitators of Asian Indian mothers. USDA messages frequently used the word “veggies”, but Asian Indian mothers preferred the word “vegetables” which was substituted in these messages. Twenty nine new messages were created to address behavioral beliefs, barriers, and facilitators unique to Asian Indian mothers as well as their feeding behaviors not addressed by the USDA. This resulted in a total of 38 messages for eight feeding behaviors. Similar to the USDA messages, the new messages developed for Asian Indian mothers consisted of two types: 1) core messages and 2) supporting messages. For each feeding behavior, core messages incorporated Asian Indian mothers' behavioral beliefs (belief about an outcome of a behavior) pertaining to a given feeding behavior and provided a recommendation for an appropriate action. In this way, the core message asked the audience to take an appropriate action for a given feeding behavior and provided the incentives or reasons (benefits cited by the mothers during formative assessment) linked to the action. The supporting content

provided information to ease the barriers and enhance self-efficacy of Asian Indian mothers in practicing a given feeding behavior.

The reading level of the messages was determined using the simple measure of gobbledegook (SMOG) formula (McLaughlin, 1969). The average readability score of the messages ranged from 5<sup>th</sup> to 6<sup>th</sup> grade reading level. After the draft messages were created, they underwent review by experts in the field of health behavior change, nutrition education, and health communication, and revisions were made.

### **Step 3**

Individual interviews were conducted to determine how Asian Indian mothers understand and respond to the nutrition messages. Prior to interviews, informed written consent was obtained from participants and they also completed a demographic questionnaire and the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA; Suinn et al., 1987) to measure their acculturation level.

Interviews were conducted with ten Asian Indian immigrant mothers of children ages 5-10 years using cognitive response testing (Carbone, Campbell, Honess-Morreale, 2002). A semi-structured interview guide was used to test the following aspects of the messages – comprehensibility, agreement with the information, and feasibility of acting on the message. A concurrent verbal probing technique (Carbone, Campbell, Honess-Morreale, 2002) was used: the participant was shown one message at a time and concurrently asked questions pertaining to that message to capture her responses. The participant was asked to comprehend the meaning of the message by summarizing the message in her own words. Next, she was asked to express words and phrases that would make the message clearer and easier to understand. The participant was then asked how much she agreed with and trusted the information. Finally, feasibility was

determined by asking the participant if it would be easy or hard for her to follow the recommendations provided in the message. When testing different ideas in core messages for a given feeding behavior, participants were asked to rank the messages based on their preferences.

The interviews lasted an average of fifty minutes. The sample size was determined by saturation of responses, i.e. the point at which no new responses were obtained. Response saturation was obtained after conducting 8 interviews; however, 2 additional interviews were conducted to ensure saturation had been reached.

The interviews were audio-recorded and notes were taken during the interview. The audio recordings of participants' responses and written notes were qualitatively analyzed to identify common themes and similar responses for each of the three aspects of a given message. Based on the responses from cognitive interviews, the messages were left unchanged, revised to address the issues of ambiguities and disagreements, or deemed inappropriate for this target group.

This study was approved by the Institutional Review Board at Michigan State University. Participants were provided with a \$20 gift card as reimbursement for their participation.

## **Results**

The average acculturation score was 2.05 (from a possible score of 1 to 5) and ranged from 1.38 to 2.85, reflecting a high Asian identification of the participants. The mean age of participants was 35.8 years (range 29 to 42 years) and the average number of years they had lived in the US was 10 years (range 2 to 39 years). Participants were highly educated, with 60% having a graduate or a professional degree and 40% having a bachelor's degree. About 40% of the participants were employed full time and 30% were homemakers. Others were either

employed part time (10%) or were students (20%). Annual household income was higher than \$60,000 for 90% of the participants.

The 38 tested messages are presented for each feeding behavior categorized into three groups: mealtime environment (Table 3-1), availability and accessibility of healthy food at home (Table 3-2), and controlling child-feeding behaviors (Table 3-3). Core messages (C) are listed first, followed by supporting messages (S). Out of 38 total messages, 31 messages (6 from USDA) received consistent positive reactions (one message received mixed responses) and were retained without any modifications. We determined five messages (1 from USDA) needed minor revisions to address the issues of ambiguity and agreement. These revisions were made based on comments provided by the mothers. Two messages (both from USDA) were deemed inappropriate due to poor acceptability of these messages with this target audience.

## **Mealtime Environment**

**Family meals (Fm).** Although, all core messages addressing the importance of family meals were well accepted (Table 3-1), the message “when you eat together, your kids can see and get to know the foods your family enjoys” (FmC1) was most preferred among all core messages. The mothers liked the idea of exposing children and making them familiar with family foods incorporated in this message. The first two supporting messages (FmS1 and FmS2) were well received by mothers. However, they felt that the supporting message “Family meals are possible when everybody is in it together” (FmS3) was ambiguous. They needed more information on how “kids can be great help” in making family meals possible. This message was revised by adding tasks mothers suggested were safe for children to perform and would get

them involved in making family meals. The mothers felt that the message “Do some tasks a day before” (FmS4) lacked clarity since it did not specifically mention that the recommendation applies to meal preparation. Revisions were made to clarify this message as well.

**TV viewing while eating (Tv).** All core and supporting messages about not letting children watch TV while eating (Table 3-1) received strong and consistent positive reactions from the mothers. When asked about their preference for core messages, the message “Your kids will pay attention to what and how much they eat” (TvC1) was preferred by most mothers over the message that stressed kids will like the taste of food (TvC2).

**Parental modeling of healthy eating (Mo).** Although all three core messages for modeling healthy eating behaviors (Table 3-1) were well accepted, the message “Want your kids to eat new foods?” (MoC1) suggesting parental modeling to encourage children to eat new foods was most preferred among the three core messages. The supporting message (MoS1) suggesting the effects of making negative comments and showing dislike for a particular food on children was very appealing since almost every mother had experienced instances where parents’ negative comments about a food had adversely influenced children’s liking for that food. Although all supporting messages (MoS1, MoS2, and MoS3) were well received by mothers, the message suggesting that ‘if food likes and dislikes are counter balanced by both parents, parental modeling could still be practiced’ (MoS3) was ambiguous to some mothers. The mothers were initially unsure to who the message was referring (e.g. child or mother). This was clarified with a revision.

## **Availability and Accessibility of Food at Home**

**Availability of healthy food at home (Av).** Although mothers agreed with both core messages recommending making healthy food available at home (Table 3-2), they liked and preferred the first message that phrased the outcome as a question: “Want your kids to eat healthy foods?” (AvC1) versus directly stating the outcome: “When kids are home, they will choose and eat from what’s available” (AvC2). Core message 3 (AvC3) was also well accepted by mothers. The mothers felt that the availability of “unhealthy” or “junk” food at home was a major barrier to children’s consumption of healthy food. However, some mothers expressed reluctance to completely avoid bringing less healthy food home. They noted that despite the presence of healthy food, children were more likely to prefer and choose the less healthy foods that were available. Therefore, these mothers reported a lower preference for the latter message ‘Keep lots of healthy foods...when kids are home, they choose and eat from what’s available’ (AvC2). This section does not contain supporting messages addressing this barrier since availability of less healthy food was also strongly related to restricting children’s consumption of such foods. This issue was addressed in the section pertaining to restriction of foods.

**Accessibility of healthy food at home (Ac).** While both core messages (AcC1 and AcC2) addressing accessibility of fruits and vegetables (Table 3-2) were well accepted, mothers had a stronger preference for “Keep fruits and vegetable where your kids can see them” (AcC2). However, they also felt that fruits and vegetables could be kept in places other than the refrigerator such as the table or kitchen counter, where children can easily see them. This message was revised accordingly. The supporting message “Kids love to dip fresh vegetables in

low-fat ranch dressing (AcS1) received mixed responses. Some mothers agreed with the message, while others didn't find the use of dip appropriate to their family. The message was retained without any modification for those to whom it was suited. A few mothers shared strong opinions about not keeping fruits and vegetables in cut form in response to the message "Store cut fruits and vegetables in sealed plastic bags....." (AcS2). These mothers felt that when fruits and vegetables are cut they start losing freshness and important nutrients.

### **Controlling Child-Feeding Behaviors**

**Restricting consumption of certain foods (Re).** In previous interviews, Asian Indian mothers described alternatives to restricting children's consumption of certain foods. They were divided in their beliefs – some mothers preferred to not buy foods they considered unhealthy (ReC1), while others felt it was appropriate to have small amounts of these foods at home for children to consume them in limited amounts (ReC2). When testing both these ideas in two different messages (Table 3-3), the mothers showed a strong preference for either one or the other message. This suggested that both the messages be kept as a part of nutrition education. The supporting messages suggesting availability of healthy snacks for children to choose from (ReS1) and buying healthier versions of snacks (ReS2), intended to address the barrier of availability of unhealthy food, were also well accepted by all mothers.

**Offering food rewards for finishing meal (Rw).** The core messages about not using food as a reward for encouraging children to finish their meal (Table 3-3) were well received by the mothers, with higher preference given to the message "Reward with praise, not food"

(RwC1) versus the message “Reward your kids with things other than food” (RwC2). Some mothers who were already rewarding their children with sweets for eating or finishing other foods felt that it would be hard for them to follow these recommendations. However, when testing the supporting content that provided ideas of using alternatives to food rewards, the mothers felt that it was feasible for them to follow the recommendations and were motivated to try the ideas provided in supporting messages (RwS1 and RwS2).

**Pressuring to eat (Pr).** The core messages addressing pressuring to eat tested the concept of “division of responsibility” (Table 3-3) – offering a variety of healthy food choices and letting children choose ‘what’ and ‘how much’ to eat, in two different messages (PrC1 and PrC2), both adapted from the USDA messages. Most mothers showed a strong and consistent disagreement with the idea of offering variety and allowing children to choose what and how much to eat. The mothers expressed concern that they did not trust their children to eat enough if they were allowed to decide how much to eat. The mothers strongly felt that it was their responsibility to decide how much their child would eat. The mothers also felt that it was not always possible for them to provide a variety of foods to their children for each meal. Even when a variety of foods were offered, the mothers felt that children should eat at least a small amount from all the varieties. As a result of lack of receptivity to this concept, these messages were deemed inappropriate for Asian Indian mothers.

One of the supporting messages tested the idea of ‘letting children serve themselves in small amounts’ (PrS2) (taken from USDA) and “allowing for a second helping” tied to the concept of “helping children learn not to waste food”. This message was intended to reduce the pressuring behaviors of mothers by advising them to serve small portions of food. The mothers

connected very well to this message. Our previous work found that wasting food is a major concern of Asian Indian mothers when feeding their children resulting in pressuring children to eat; this may have resulted in the receptivity to smaller portions as a way to address the concern on wastage. Although the mothers were receptive to the idea of controlling portion size to avoid food wastage, some mothers disagreed with letting children serve themselves (PrS2). Asian Indian foods are mostly in the form of curry. Mothers felt that the children will make a mess if allowed to serve themselves. Some mothers also expressed fear of children hurting themselves if the food was too hot. This message was revised accordingly.

### **Discussion**

This study developed core and supporting messages for Asian Indian mothers related to eight key feeding behaviors. Our study addressed some feeding behaviors that were not included in the USDA messages. For example, watching TV while eating and rewarding with food were brought up in focus groups conducted by the USDA (USDA, 2008; White et al., 2011). However, messages were not developed to address these issues. Given the extent of TV viewing while eating in Asian Indian children and its harmful effects on children's energy regulation and weight problems (Francis & Birch, 2006), five messages related to TV watching and eating were developed specifically for Asian Indian mothers. Although addressed by the USDA (White et al., 2011), all messages related to family meals were specifically developed for Asian Indian mothers considering their distinct beliefs about the benefits of family meals and meal preparations related to Asian Indian foods (unpublished data).

Nine out of 38 messages pertaining to food availability, food accessibility, parental modeling, and pressuring children to eat were adapted from the USDA messages. The majority

of these messages used or adapted from the USDA were well accepted by Asian Indian mothers. Acceptance of these messages by low-income mothers of different ethnic groups as well as high income Asian Indian mothers indicates that despite cultural differences, common beliefs and opinions exist regarding child feeding. However, there were differences in the views by these Asian Indian mothers about a few messages that were driven by strong cultural beliefs. For example, USDA's message to control portion size suggests letting children serve themselves. While, this message was well accepted by low-income mothers (White et al, 2011), Asian Indian mothers did not agree with letting their children serve themselves due to the fear of children making a mess during mealtime. Previous research has shown that Asian parents continue to spoon feed their children until they are old enough to eat neatly and efficiently by themselves to prevent messy mealtimes and cleaning up after meals (Yunus, 2005). Another message aimed at enhancing children's likelihood to choose fruits and vegetables that are accessible by serving them with low-fat ranch dressing (AcS1) was well accepted by low income mothers (USDA, 2008). However, our study found that half the mothers shared positive responses about this message since they liked the idea of providing "low-fat" ranch, which was perceived to be healthy. The half of the mothers disagreed with message since they considered salad dressings and dips as traditional American foods and did not feel a need to have these foods in their homes. Asian Indian mothers may currently not be receptive to introducing western foods into their traditional Indian diet due to low acculturation. However, dietary patterns of immigrants change with acculturation resulting in incorporation of more western foods (Satia-Abouta, 2003). Such information could thus be helpful to mothers who are likely to incorporate American foods in their diet to do so in a healthy manner.

A few mothers did not believe in cutting fruits and vegetables in advance to preserve freshness and important nutrients. Although these issues emerged with very few mothers, it is still a barrier nutrition educators should consider with this population. Alternatively, educators could provide Asian Indian mothers with additional information on how to safely store cut fruits and vegetables for few days in a refrigerator without losing nutrients. To help mothers encourage children's consumption of fruits and vegetables, the mothers could also be advised to provide fruits and vegetables that do not require cutting (e.g. banana, grapes, plums, baby carrots etc.) accessible to children.

Similar to the responses obtained from low-income mothers (White et al, 2011), Asian Indian mothers showed strong and consistent disagreement with the messages that incorporated the concept of 'division of responsibility'. Several researchers suggest using this concept in nutrition education and interventions targeted at mothers to help them reduce mother-child conflicts over eating while giving some control to both parents and children (Satter, 1987; Dietz & Stern 1999; Sherry et al., 2004). However, responses from this study, and the study conducted by White et al. (2011) suggest that mothers may not be receptive to this idea as presented. Another explanation of this concept is needed before mothers understand the application of this concept. Alternatively, strategies may be used to reduce controlling feeding practices. One concept, used in this study and well received by the mothers, is to link mothers' behavior (e.g. serving small portion of food) to their cultural beliefs (helping children avoid food wastage) as the main purpose of behavior.

## **Conclusions and Implications for Practitioners**

Testing of these messages demonstrated that the majority of the messages are culturally appropriate for Asian Indian mothers in terms of language, informational content, and feasibility of acting on the message. Other messages were revised to be suitable; only a few messages were so poorly received that they would not be acceptable in nutrition education for this group. Our final set of messages may be incorporated into nutrition education materials for Asian Indian population to encourage Asian Indian mothers to practice feeding behaviors that are conducive to healthy eating and overweight prevention in their children.

Since there are very limited health and nutrition interventions for the Asian Indian population, integrating these messages into existing programs is challenging. Identifying potential communication channels that allow reaching a large number of Asian Indian mothers is crucial for disseminating these messages. Common sites often targeted and considered by Asian Indian mothers include schools and physician's offices. Targeting such venues located in areas with high density of Asian Indian populations could be useful in delivering nutrition education. Other channels unique to this group, such as Asian Indian organizations and clubs, religious centers, Asian Indian grocery stores, and websites for Asian Indians were also identified during interviews with mothers. Several religious, cultural and social events and gatherings for parents and children organized by these organizations draw together a large number of Asian Indians and could be appropriate settings to provide nutrition information.

**Table 3-1. Nutrition Messages Related to Mealtime Environment**

Message number <sup>a</sup>	Message	Participants' response
<b>Behavior Fm: Family Meals</b>		
FmC1	When you eat together, your kids can see and get to know the foods your family enjoys.	Well accepted
FmC2	Eat together. Your kids will learn to eat the foods your family enjoys.	Well accepted
FmC3	Family meals are a great time to talk to your child about health and nutrition.	Well accepted
FmS1	You may not be able to eat together every day. Try to eat dinner together on weekdays or breakfast and lunch during weekends.	Well accepted
FmS2	Involve kids in making meals. Allow your kids to wash fruits and vegetables, mix ingredients, and open packages. Kids like to eat foods they help prepare.	Well accepted
FmS3	<i>Original:</i> Family meals are possible when everybody is in it together. Your spouse and kids can be a great help. <i>Revised:</i> Sometimes family meals are possible when your spouse and kids help. Kids can help with some tasks like setting the table, picking up dishes, and tossing salad.	Needed Revision <sup>b</sup>
FmS4	<i>Original:</i> Do some tasks a day before. Wash and cut vegetables. Have roti dough ready in fridge. Soak lentils the night before or use a slow cooker. <i>Revised:</i> Save some time during making a meal by doing some tasks a day before. Have roti dough ready in fridge. Soak lentils the night before or use a slow cooker.	Needed Revision
<b>Behavior Tv: TV Viewing and Eating</b>		
TvC1	Turn off the TV! Your kids will pay more attention to what and how much they eat.	Well accepted
TvC2	Turn off the TV! When your kids focus on food, they learn to like the taste of food.	Well accepted
TvS1	Set rules of not watching TV during mealtime or snack time in your family when the kids are young. This way, it does not become a habit.	Well accepted
TvS2	Be good role models. Avoid watching TV during mealtime or snack time.	Well accepted
TvS3	Kids like to watch TV while eating when they are eating alone. Try to eat meals and snacks with your kids.	Well accepted

Table 3-1 (cont'd)

<b>Behavior Mo: Parental Modeling of Healthy Eating</b>		
MoC1	Want your kids to eat <u>new foods</u> ? Eat them yourself and your kids will want to try them too.	Well accepted
MoC2	Kids learn from watching you. Make sure you and your spouse eat fruits and vegetables and your kids will too. [Adapted from USDA] <sup>c</sup>	Well accepted
MoC3	When you enjoy a particular food, it shows your child that it is okay to try the food.	Well accepted
MoS1	Showing your dislike or making negative comments about a food in front of your child, teaches the child that the food is not good.	Well accepted
MoS2	It's normal for kids to be picky eaters. Help them increase the type of fruits and vegetables they like by being a good role model. [Adapted from USDA]	Well accepted
MoS3	<i>Original:</i> Do not like a specific fruit or vegetable? Your kids could still have a good role model if your spouse enjoys that food. <i>Revised:</i> If one parent does not like a specific fruit or vegetable, your kids could still have a good role model when the other parent enjoys that food.	Needed Revision

<sup>a</sup>The first two alphabets of message number represent the feeding behavior. The third alphabet represents core (C) or supporting (S) message, followed by a number to distinguish more than one message within the same section.

<sup>b</sup> Revisions made to the original message based on the responses from the participants to address ambiguity and disagreements.

<sup>c</sup> Already existing USDA message (White et al, 2011) that reflected beliefs, barriers, or facilitators reported by Asian Indian mothers in the previous formative assessment has been modified by either adding new sentences or words to the part of the message.

**Table 3-2. Nutrition Messages Related to Food Availability and Accessibility at Home**

Message number <sup>a</sup>	Message	Participants' response
<b>Behavior Av: Making Healthy Food Available at Home<sup>b</sup></b>		
AvC1	Want your kids to eat healthy foods? Make sure you bring fruits and vegetables home.	Well accepted
AvC2	Keep lots of healthy foods at home. When your kids are at home, they will choose and eat from what's available.	Well accepted
AvC3	Let your kids be “produce pickers”. Allow them to pick fruits and vegetables at the store. They will love to eat the foods they picked. [Adapted from USDA] <sup>c</sup>	Well accepted
<b>Behavior Ac: Making Healthy Food Accessible</b>		
AcC1	Want your kids to reach for a healthy snack? Make sure they can see cut fruits and vegetables when they open the refrigerator. [Adapted from USDA]	Well accepted
AcC2	<i>Original:</i> Keep fruits and vegetables where your kids can see them. Keep cut fruits and vegetables in clear plastic bags or boxes on a low shelf in the fridge. <i>Revised:</i> Keep cut fruits and vegetables where your kids can see them. Keep them in clear plastic bags or boxes on a low shelf in the fridge, or in a bowl on a table or kitchen counter.	Needed Revision <sup>d</sup>
AcC3	When your kids come home hungry, have healthy foods such as fruits and vegetables ready-to-eat. [Adapted from USDA]	Well accepted
AcS1	Kids love to dip fresh vegetables in low-fat ranch dressing. Store cut vegetables near their favorite dip on a low shelf in the fridge. [Adapted from USDA].	Well accepted
AcS2	Store cut fruits and vegetables in sealed plastic bags or airtight plastic boxes to keep them fresh.	Well accepted

<sup>a</sup>The first two alphabets of message number represent the feeding behavior. The third alphabet represents core (C) or supporting (S) message, followed by a number to distinguish more than one message within the same section.

<sup>b</sup>This section does not contain supporting message as the barriers in this section are addressed in ‘Behavior Re: Restricting children’s consumption of certain foods’ due to a strong relationship between availability of food and restriction of food”.

<sup>c</sup>Already existing USDA message (White et al, 2011) that reflected beliefs, barriers, or facilitators reported by Asian Indian mothers in the previous formative assessment has been modified by either adding new sentences or words to the part of the message.

Table 3-2 (cont'd)

<sup>d</sup>Revisions made to the original message based on the responses from the participants to address ambiguity and disagreements.

**Table 3-3.** *Nutrition Messages Related to Controlling Child Feeding Behaviors*

Message number <sup>a</sup>	Message	Participants' response
<b>Behavior Re: Restricting Consumption of Certain Food</b>		
ReC1	Having junk foods that the kids are not allowed to eat makes the food more tempting. Instead, make healthy snacks available for your kids.	Well accepted
ReC2	Concerned about children eating too much unhealthy food? Try to buy such foods in small amounts only.	Well accepted
ReS1	Stack your pantry with healthy snacks such as cereal bars, nuts, and dry fruits for the kids to choose from.	Well accepted
ReS2	Buy healthier snacks such as baked instead of fried chips or oatmeal instead of chocolate chip cookies.	Well accepted
<b>Behavior Rw: Rewarding with Food</b>		
RwC1	<b>Reward with praise, not food.</b> Teach your child all foods are good by praising them for trying new foods.	Well accepted
RwC2	<b>Reward your kids with things other than food.</b> When you promise a sweet or dessert for finishing the food, your child thinks that sweets or desserts are better than other foods.	Well accepted
RwS1	Let your kids earn points or stickers towards something they value instead of offering sweets or desserts.	Well accepted
RwS2	Instead of dessert, offer to do activities with your child such as reading a story book, doing a coloring activity, or letting your child choose a special outing.	Well accepted

Table 3-3 (cont'd)

<b>Behavior Pr: Pressuring to Eat</b>		
PrC1	<b>Patience works better than pressure.</b> Offer choices and a variety of healthy foods. Let your kids choose <u>what to</u> eat. Kids enjoy a food when eating is their own choice. [Adapted from USDA] <sup>b</sup>	Inappropriate
PrC2	<b>Patience works better than pressure.</b> Offer choices and a variety of healthy foods. Let your kids choose <u>how much to</u> eat. Kids will eat the right amount when eating is their own choice. [Adapted from USDA]	Inappropriate
PrS1	<b>Sometimes new foods take time.</b> Kids do not always like new foods right away. Offer one new food at a time. Offer new food many times. Tell them to taste at first and be patient with them. [Adapted from USDA]	Well accepted
PrS2	<i>Original:</i> <b>Help your kids learn not to waste food.</b> Let your kids serve themselves at mealtime. Teach them to take small amounts at first. Tell them they can have more if they are still hungry. [Adapted from USDA] <i>Revised:</i> <b>Help your kids learn not to waste food.</b> Serve them small amounts at first. Tell them they can have more if they are still hungry. [Adapted from USDA]	Needed Revision <sup>c</sup>

<sup>a</sup>The first two alphabets of message number represent the feeding behavior. The third alphabet represents core (C) or supporting (S) message, followed by a number to distinguish more than one message within the same section.

<sup>b</sup>Already existing USDA message (White et al, 2011) that reflected beliefs, barriers, or facilitators reported by Asian Indian mothers in the previous formative assessment has been modified by either adding new sentences or words to the part of the message.

<sup>c</sup>Revisions made to the original message based on the responses from the participants to address ambiguity and disagreements.

## **CHAPTER FOUR:**

### **CONTRIBUTIONS, RECOMMENDATIONS, LIMITATIONS, AND CONCLUSIONS**

#### **Contributions**

This study was conducted in two stages to achieve the following objectives: 1) Assess the underlying factors that influence Asian Indian mothers' practice of child feeding behaviors using the Theory of Planned Behavior. 2) Develop and test culturally appropriate nutrition messages for Asian Indian mothers to promote feeding behaviors conducive to healthy eating and obesity prevention in children.

The findings from stage one provided a thorough understanding of how Asian Indian mothers feed their children by assessing their beliefs about expected outcomes, barriers, and facilitators in practicing feeding behaviors (Chapter 2). This research addresses the gap in existing literature about the type of child feeding behaviors used by Asian Indian mothers and the motivations that drive these behaviors. The study highlights the role of unique beliefs and values integral to Asian Indian culture that influenced the practice of child feeding behaviors. Such information is valuable when designing effective nutrition education for Asian Indian population. Furthermore, it explains why certain controlling feeding behaviors were frequently practiced to encourage healthy eating in children despite the known adverse nutritional outcomes and how that could be addressed in education programs.

Elucidating the depth and detailed information needed to understand the Asian Indian mothers' practice of feeding behaviors was possible due to the qualitative nature of the study. Qualitative methodology was chosen as a suitable approach for this research as it allows target audiences' beliefs, values, attitudes, knowledge related to the behaviors to emerge, such that we

might develop appropriate education, which was ideal given the second objective of this study. In addition, the use of projective technique provided the respondents an opportunity to explain and share their experiences, attitudes, and perceptions. This provided a greater depth of understanding about why certain opinions were held and behaviors performed.

Formative research is critical for developing understandable and persuasive health messages (Fishbein & Cappella, 2006; Jemmott et al., 1995; Kreuter & Haughton, 2006; Myrick, 1998; Witte, Meyer, & Martell, 2001). Formative research conducted using the Theory of Planned Behavior provided an excellent framework for developing nutrition messages which were culturally appropriate and well received by Asian Indian mothers. The Theory of Planned Behavior has a tremendous potential of informing behavior change interventions (Armitage & Conner, 2002; Hardeman et al., 2002; Rutter, 2000). For this research, it helped identify existing messages developed by the USDA that could be used with Asian Indian mothers and also guided the development of new messages most needed by Asian Indian mothers.

Finally, testing of message was a vital step of this research to gauge the target audience's reactions and responses to the developed messages, and draw valid conclusions about its effectiveness prior to its implementation in educational programs (Chapter 3). Testing of the nutrition messages for Asian Indian mothers not only allowed us to understand how these messages were received by the target but also allowed revision to some of the messages so that they were best accepted by the target audience. It also helped identify certain cultural beliefs related to food freshness and dietary acculturation that needed to be addressed while using messages in nutrition education.

## **Recommendations for Future Research**

The feeding behaviors assessed in this dissertation have shown to be associated with children's eating habits and weight status (Rhee, 2008). However, these findings come from research studying primarily Caucasians, African Americans, and Mexican Americans.

Quantitative research with larger sample size is needed to understand the associations between feeding behaviors and children's eating and weight outcomes in Asian Indians. Research has shown ethnic disparities in use of controlling feeding practices (Faith et al., 2003; Ventura, Gromis, & Lohse, 2010). Future research should focus on understanding what kind of controlling feeding practices (grounded in cultural beliefs) are used by Asian Indian mothers and how those affect children's attitude toward foods and their self-regulation of energy intake. This study would be a guiding framework for developing assessment tools to conduct future quantitative studies with Asian Indian population.

Controlling feeding practices have been linked to maternal concern of child's weight (May et al., 2007; Crouch, O'Dea, & Battisti, 2007). Almost all the mothers in this study perceived their child as "normal weight" (results not reported), and mothers were well aware that unhealthy eating could lead to obesity and associated health problems (results not reported). However, this study did not assess Asian Indian mothers concerns of children's current and future weight nor did it measure children's current weight. As research has reported a mismatch between childhood overweight and maternal concern (Kaiser et al., 1999; Jain et al., 2001), future studies should assess Asian Indian mothers concern of child's weight and its relationship to child's actual weight and child feeding practices adopted by these mothers.

Robinson et al. (2001) noted that parental report of overweight, a risk factor found to predict future overweight in their children (Whitaker et al., 1997), was associated with exerting

significantly less control over their children's intake. Due to the qualitative nature and small sample size of this study, it was not possible to determine associations between mothers' weight and feeding practices. The majority of the mothers in this study were classified as overweight (18.5%) or obese (44.4%). Therefore, it becomes important to not only determine the prevalence of obesity of Asian Indian mothers in the US, but also to understand if mothers' weight status influences their practice of feeding behaviors and children's weight.

Finally, the goal of nutrition messages is to help Asian Indian mothers adopt and practice appropriate feeding behaviors. Future studies should assess the effects of nutrition messages (developed and tested in this study) on Asian Indian mothers' behavioral change or adoption of feeding behaviors and how it affects children's eating habits.

### **Strengths and Limitations**

One of the greatest strength of this study was the use of projective technique to conduct in-depth interviews. When the participants were asked to reflect upon the pictures and stories of a hypothetical character of Asian Indian mother, they readily associated themselves with the character and were able to answer in a non-threatening manner. Likewise, the interviewer being an Asian Indian herself also increased the trust level of participants to share their views about Indian cultural beliefs associated with their feeding behaviors.

There were several limitations to this study. Asian Indian mothers in this study were highly educated and had a high annual household income suggesting that they belonged to a high socio-economic status (SES). Although the demographic characteristics of Asian Indian mothers in this study were consistent with those reported by the US Bureau of Census 2000, this could be a potential limitation of the study. Since the release of last data by the US bureau of Census,

migration influx of Asian Indians in the last 12 years could have resulted in changes in the demographic characteristics. The findings of this study should be applied with caution to Asian Indian families belonging to a different SES.

This study looked at the child feeding behaviors of first generation Asian Indian mothers, which explains the low acculturation score as the mothers may not have assimilated or integrated into 'western culture'. Most Asian Indian mothers in this study identified themselves as "bicultural" in behavioral competency and as "Indian" in cultural values. This is consistent with results from previous literature explaining that the behavioral aspects of a new culture are acquired more rapidly than the values of a new culture by immigrant population (Inman, 1999). In addition, Asian Indians tend to retain their cultural values even many years after their immigration (Dasgupta, 1998). However, this is a limitation since it is not known if behavioral and cultural beliefs about child feeding in second or third generation Asian Indian mothers concur with the beliefs of first generation Asian Indian mothers. Future research should focus on second and third generation Asian Indian mothers to identify difference and similarities in behavioral and cultural beliefs related to child feeding.

Due to the scope of this research, it focused on children in a limited age group (5-10 years, or elementary school aged). Although children in this age group develop some degree of independence in terms of eating, parents are still the primary people responsible for feeding their children. Furthermore, a set pattern of eating habit is also fairly well established by this age. Our findings revealed that mothers were using TV to control children's food intake when they were younger suggesting that Asian Indian mothers struggle with feeding their children using appropriate strategies when children are very young. This could be considered as a potential limitation of this study. Further research is needed to examine the feeding behaviors of Asian

Indian mothers with young children so that interventions can be made available to mothers before their struggle with child feeding begins.

Use of triangulation methods in qualitative study could improve the validity and reliability of research or evaluations of findings (Mathison, 1988). One of the limitations of this study is that it used one method (mono-method bias) for data collection. Examining parent-child interaction during meal using observations could have provided additional information such as the extent of pressure used by the mothers and child's response to it.

### **Conclusions**

This is the first study to assess a variety of child feeding behaviors of Asian Indian mothers. The findings from stage 1 of this study clearly indicated a need to develop and implement culturally appropriate nutrition education interventions for Asian Indian families to promote healthy eating in children. Although, this study has certain limitations, it provides important information, which will help develop and conduct future quantitative research with Asian Indian population in the context of child feeding. Finally, messages developed in this study will contribute to obesity prevention efforts in Asian Indian children when used in nutrition interventions.

## **APPENDICES**

## **Appendix A: Interview Guide for Research Stage 1**

### **Interviewer:**

Before I begin the interview I would like you to know that there are no right or wrong answers to any questions. I am interested in your thoughts about the household activities related to feeding your family.

### **Activity # 1 – Cards**

#### **Expected outcomes of feeding behaviors**

### **Interviewer:**

I have a stack of 8 cards with pictures on it. The cards show different household activities related to feeding your family. We will go through all the cards one at a time and I will ask you questions related to each card.

Tell me what do you think is happening in the picture?

When and where do you see this happening?

What do you think about this activity?

Probes: What makes it important for a mother to do this?  
Does it make any difference to what the child eats? How?

Controlling feeding behaviors – Probes: What might make a mother do this? Does it make any difference to what the child eats? How  
Is this is a good thing to do? Why would you say so?

#### **Perceived behavioral control**

### **Interviewer:**

Would it be hard or easy for a mother to do this?  
Feeding styles: is it easy or hard for a mother to not do this?

Probes: What makes it easy or hard for her to do this? What would make it easier for her to do this?

### **Activity # 2 - Stories**

#### **Perceived behavioral control**

### **Interviewer:**

Now I will read you short stories about Arti. After I read each one, I will ask you some questions. I would like to remind you that there are no right or wrong answers to this. I am interested in your thoughts.

Arti is a mother of two children, Anu who is 8 years old and Sonu who is 6 years old. She lives in Michigan and works full time.

***Family meals***

After Arti comes home from work its already dinner-time. She has a lot to do before and after dinner. Arti would like to have her family sit together and have dinner.

***TV watching during meals***

When the kids sit for dinner they like to watch their favorite show on TV while they are eating. Arti is not sure if this is a good idea.

***Food availability***

Arti is shopping for foods. Her kids like cookies and sweets but she also wants them to eat more fruits and vegetables and she also want something that she can cook very fast for meals.

***Food accessibility***

Arti is not sure that keeping healthy foods easy to reach and ready-to-eat for children will help children eat them more. She thinks that if her children want those foods, they will ask for help. For her 8 year old, she thinks that her child is old enough to get it on her own.

***Parental modeling***

Arti and her kids are having a meal. Arti has heard that she should set a good eating example for her children but she doesn't like fruits and vegetable and she thinks that it doesn't matter to her children what she eats.

***Pressure***

Arti and her children are having a meal. Arti wants her children to eat enough food. When she serves food, she wants her children to eat all the food in the plate. Her children always leave food on the plate after meal.

***Food rewards***

Arti and her children are having a meal. Arti wants her children to eat meals that she has cooked. But her children won't eat them and instead they ask for dessert first.

***Restriction***

Arti has bought some foods like cakes and cookies for her family. Her kids like them a lot but she doesn't want her kids to eat too much of these foods. Her kids are asking for it.

**Questions:** What do you think Arti would do in this situation? Why do you say so?  
What advice would you give to Arti about the situation? Why?

**Activity # 3 – Stories**

**Evaluation of behavioral belief**

**Interviewer:**

Now I will read two stories. One is about “Gupta” family and the other one is about “Mathur” family. After I read them I will ask you some questions on eating habits of children and health outcomes (Read the stories twice for each part if needed).

**Story 1**

**Gupta family** includes Mr & Mrs. Gupta and their children (6 and 8 years old). The whole family sits down for dinner every day. Their meal most of the times includes vegetables, fruits, fruit juice, milk and whole grain foods. The mother always keeps fruits, milk and other healthy foods handy for her children to eat.

**Story 2**

**Mathur family** includes Mr. & Mrs. Mathur and their children (6 and 8 years old). Most of the times they have chips, pop, cookies and other food items at home. The mother tells the children not to eat too much of these foods, but the children do not always listen to her.

**Questions:** What would be the eating habits of the children from Gupta & Mathur family like?

Probes: Would eating habits of the children from Gupta & Mathur family be different? How?

What do you think about the health of children from Gupta & Mathur family?

Probes: Would the health of the children in Gupta family be different from the children in

Mathur family? How? Would their health be different when they grow up, how? Have you heard about any health conditions due to unhealthy eating habits? How do you see the role of parents in Gupta & Mathur family to prevent these health conditions in the future?

**Subjective Norm****Questions**

Has anyone given you advice/information about eating and feeding children related to the household activities we just discussed? What do they tell you?

Probes: Doctor, family, relatives, and friends.

What do you think about their advice?

Probe: Do you usually follow the advice? Why or why not?

\*\*If you were to receive information on how to feed children and improve their eating habits, where would you like to get that information from?

Probes: doctor, local organizations, religious centers, and schools.

## Appendix B: Demographic Form

Please provide the following information

1. Age \_\_\_\_\_(years)
2. Age when arrived in the US \_\_\_\_\_ (years)
3. Have you lived in a country other than India or US? (This does not include trip or visit to India or other country)
  - Yes\*\*      \*\*Answer the following question if the answer in Q3 is yes
  - No              Specify which country\_\_\_\_\_?
  - For how long you lived there\_\_\_\_\_?
4. What is your race? (Check all that apply)
  - Asian/Asian American
  - Caucasian
  - African American
  - American Indian
  - Other \_\_\_\_\_
5. What is your ethnicity  
Hispanic or Latino (please check yes or no)
  - Yes
  - No
6. Which one best describes your religious affiliation?
  - Hindu
  - Muslim
  - Christian
  - Jain
  - Sikh
  - Not religious
  - Other \_\_\_\_\_ (please specify)
7. What languages do you speak at home \_\_\_\_\_?
8. What state of India are you from \_\_\_\_\_?
9. What is your marital status?
  - Married
  - Not married/separated/divorced
10. Mark the highest level of your formal education and specify the country you got your education
  - Have not completed high school \_\_\_\_\_

- Received high school diploma or GED \_\_\_\_\_
- Some college or technical school \_\_\_\_\_
- 4-year degree/Bachelor's degree \_\_\_\_\_
- Masters/Ph.D./Professional degree \_\_\_\_\_

11. Mark the highest level of your spouse's formal education and specify the country he got his education

- Have not completed high school \_\_\_\_\_
- Received high school diploma or GED \_\_\_\_\_
- Some college or technical school \_\_\_\_\_
- 4-year degree/Bachelor's degree \_\_\_\_\_
- Masters/Ph.D./Professional degree \_\_\_\_\_

12. Which one best describes your employment status?

- Student
- Homemaker
- Not employed
- Employed part time
- Employed full time
- Retired
- Other

13. Which one best describes your spouse's employment status?

- Student
- Homemaker
- Not employed
- Employed part time
- Employed full time
- Retired
- Other

14. What is your annual household income?

- Less than \$20,000
- \$20,000 – \$40,000
- \$40,000 – \$60,000
- \$60,000 – \$80,000
- \$80,000 – \$100,000
- \$More than \$100,000

15. Type of housing

- Own house
- Rental house
- University apartments
- Other apartments
- Other (specify) \_\_\_\_\_

16. Please provide information on all children ages 5-10 years in the household.

Age (Years)	Gender (Male/Female)	Height (Inches)	Weight (Lbs)	I think my child is _____? (Select one)
				<input type="checkbox"/> Underweight <input type="checkbox"/> Normal weight <input type="checkbox"/> Overweight
				<input type="checkbox"/> Underweight <input type="checkbox"/> Normal weight <input type="checkbox"/> Overweight
				<input type="checkbox"/> Underweight <input type="checkbox"/> Normal weight <input type="checkbox"/> Overweight
				<input type="checkbox"/> Underweight <input type="checkbox"/> Normal weight <input type="checkbox"/> Overweight

17. Please provide the following information on all the other members in the household

	Age (years)	Gender (male or female)	Relationship
1.			
2.			
3.			
4.			
5.			

18. Do you have a family history of any of the following health conditions?

- Heart disease
- Blood pressure
- Cancer
- Diabetes
- Other (specify)\_\_\_\_\_

19. Your Height \_\_\_\_\_ and Weight \_\_\_\_\_ lbs

20. Does your child have food allergies?

- Yes
- No

## Appendix C: Interview Picture Cards for Stage 1



**Figure 2-1. Family meal** (For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation)



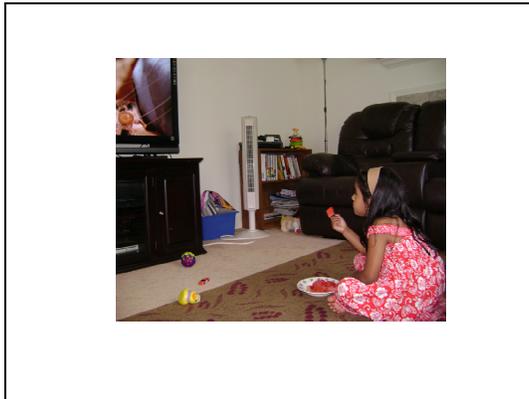
**Figure 2-2. Parental modeling**



**Figure 2-3. Making healthy foods available**



**Figure 2-4. Making healthy foods accessible**



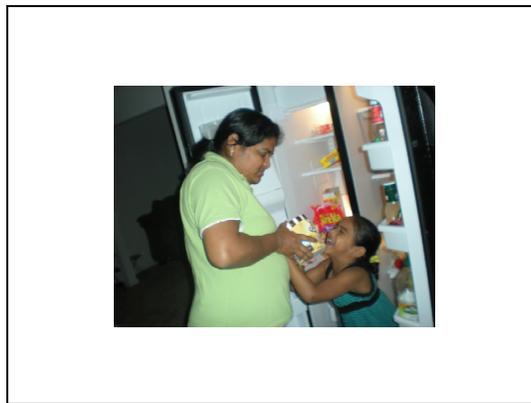
**Figure 2-5. TV viewing and eating**



**Figure 2-6. Pressuring children to eat**



**Figure 2-7. Offering food rewards**



**Figure 2-8. Restricting children's consumption of certain foods**

## Appendix D: Suinn-Lew Asian Self-identity Acculturation Scale (SL-ASIA)

**INSTRUCTIONS:** The following questions are to collect information about your past background as well as more recent behaviors related to your cultural identity. **Choose the one answer which best describes you.**

1. What language can you speak?
  1. Indian only (for example, Hindi, Marathi, Gujarati, Tamil, etc.)
  2. Mostly Indian, some English
  3. Indian and English about equally well (bilingual)
  4. Mostly English, some Indian
  5. Only English
  
2. What language do you prefer?
  1. Indian only (for example, Hindi, Marathi, Gujarati, Tamil, etc.)
  2. Mostly Indian, some English
  3. Indian and English about equally well (bilingual)
  4. Mostly English, some Indian
  5. Only English
  
3. How do you identify yourself?
  1. Indian
  2. Asian
  3. Asian American
  4. Indian-American
  5. American
  
4. Which identification does (did) your mother use?
  1. Indian
  2. Asian
  3. Asian American
  4. Indian-American
  5. American
  
5. Which identification does (did) your father use?
  1. Indian
  2. Asian
  3. Asian American
  4. Indian-American
  5. American

6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?
  1. Almost exclusively Indians, Indian-Americans
  2. Mostly Indians, Indian-Americans
  3. About equally Indian groups and Anglo groups
  4. Mostly Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  
7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?
  1. Almost exclusively Indians, Indian-Americans
  2. Mostly Indians, Indian-Americans
  3. About equally Indian groups and Anglo groups
  4. Mostly Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  
8. Whom do you now associate within the community?
  1. Almost exclusively Indians, Indian-Americans
  2. Mostly Indians, Indian-Americans
  3. About equally Indian groups and Anglo groups
  4. Mostly Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  
9. If you could pick, whom would you prefer to associate within the community?
  1. Almost exclusively Indians, Indian-Americans
  2. Mostly Indians, Indian-Americans
  3. About equally Indian groups and Anglo groups
  4. Mostly Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Indian ethnic groups
  
10. What is your music preference?
  1. Only Indian music (for example, Hindi, Marathi, Gujarati, Tamil, etc.)
  2. Mostly Indian
  3. Equally Indian and English
  4. Mostly English
  5. English only
  
11. What is your movie preference?

1. Indian-language movies only
  2. Indian-language movies mostly
  3. Equally Indian/English English-language movies
  4. Mostly English-language movies only
  5. English-language movies only
12. What generation are you? (circle the generation that best applies to you)
1. 1st Generation = I was born in India or country other than U.S.
  2. 2nd Generation = I was born in U.S., either parent was born in India or country other than U.S.
  3. 3rd Generation = I was born in U.S., both parents were born in U.S, and all grandparents born in India or country other than U.S.
  4. 4th Generation = I was born in U.S., both parents were born in U.S, and at least one grandparent born in India or country other than U.S. and one grandparent born in U.S.
  5. 5th Generation = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.
  6. Don't know what generation best fits since I lack some information.
13. Where were you raised?
1. In India only
  2. Mostly in India, some in U.S.
  3. Equally in India and U.S.
  4. Mostly in U.S., some in India
  5. In U.S. only
14. What contact have you had with India?
1. Raised one year or more in India
  2. Lived for less than one year in India
  3. Occasional visits to India
  4. Occasional communications (letters, phone calls, etc.) with people in India
  5. No exposure or communications with people in India
15. What is your food preference at home?
1. Exclusively Indian food
  2. Mostly Indian food, some American
  3. About equally Indian and American
  4. Mostly American food
  5. Exclusively American food
16. What is your food preference in restaurants?

1. Exclusively Indian food
2. Mostly Indian food, some American
3. About equally Indian and American
4. Mostly American food
5. Exclusively American food

17. Do you

1. Write only an Indian language?
2. Write an Indian language better than English?
3. Write both Indian and English equally well?
4. Write English better than an Indian language?
5. Write only English?

18. Do you

1. Read only an Indian language?
2. Read an Indian language better than English?
3. Read both Indian and English equally well?
4. Read English better than an Indian language?
5. Read only English?

19. If you consider yourself a member of the Indian group (Indian, Indian-American, etc., whatever term you prefer), how much pride do you have in this group?

1. Extremely proud
2. Moderately proud
3. Little pride
4. No pride but do not feel negative toward group
5. No pride but do feel negative toward group

20. How would you rate yourself?

1. Very Indian
2. Mostly Indian
3. Bicultural
4. Mostly Westernized
5. Very Westernized

21. Do you participate in Indian occasions, holidays, traditions, etc.?

1. Nearly all
2. Most of them
3. Some of them
4. A few of them

5. None at all

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

1	2	3	4	5
(do not believe)				(strongly believe in Indian values)

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

1	2	3	4	5
(do not believe)				(strongly believe in Indian values)

24. Rate yourself on how well you fit when with other Indians:

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

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

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

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

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

## Appendix E: Coding structure

**Table 2-2: Coding Structure and Code Definitions**

Theme	Code	Definition	Rule of application	Example
<u>Feeding behavior (FB)</u> <i>(For this code also include intentions or mothers' advice to other mothers about performing/n of performing specific feeding behavior)</i>	FB	Comments or description of mothers' actual performance or intentions to perform a FB	References given to: Mothers' comments/description of how a particular FB is performed at her or others' home or her intentions to practice a particular FB in future (e.g. giving advice to other mothers)	
Family meal	FBP1	Mothers' comments/description of how meals (lunch, school lunches, dinner, breakfast, snacks) are set up at home (or outside)	References given to description of: <ol style="list-style-type: none"> <li>1. Family meals: meals (lunch, dinner, breakfast, snacks) eaten at home or outside together as a family</li> <li>2. Meals (lunch, dinner, breakfast, snacks) eaten individually at home or outside (school, office, etc.)</li> <li>3. Planning and preparation of above mentioned meals, timings of meals, foods eaten or offered during meals etc.</li> </ol>	"We all eat meals at different times these days. My daughter comes from school at 4:00 she eats her dinner. And then my husband comes sometimes late, sometimes early. And, I don't wait for him for dinner."

Table 2-2 (cont'd)

TV viewing and eating	FBN1	Mothers' comments or description of feeding child/ren, child/ren eating in front of TV, or rules for watching TV while eating	References given to: 1. Child/ren's habits or behavior of eating snacks or meals while watching TV 2. Mothers' behavior of letting/not letting the child eat or feeding the child in front of TV 3. Rules for watching TV while eating	"Most of his snacks that he eats, he does this, he sits and watches his cartoons, and he's having a snack."
Modeling of eating behaviors	FBP2	Mothers' comments or description of people's behavior of eating foods in front of the children to set an example Mothers' behavior of involving children in food preparation	References given to: 1. Persons (mother, father, sibling, peers etc.) behavior of eating healthy or non-healthy foods and setting an example for children 2. Mothers' behaviors of involving children in food preparation	"I don't like broccoli, I never ever used to eat broccoli at all. And now that I want my son to eat, I eat it."
Availability of healthy foods at home	FBP3	Mothers' comments/description of foods available at home	References to: Mothers' behavior of purchasing/bringing foods at home and making them available to children <i>Examples to look for:</i> What foods are made available, how the foods are made available (e.g. frequency of grocery shopping, preparing list, mother's or family members' food choices etc.), etc.	"I go grocery shopping, uh, and then I have the fruit and vegetables in the fridge."

Table 2-2 (cont'd)

<p>Accessibility of foods</p>	<p>FBP4</p>	<p>Mothers' comments/description of keeping the foods accessible to children</p>	<p>References given to: Mothers' behavior of keeping the foods in manner;</p> <ol style="list-style-type: none"> <li>1. That is easy for the children to reach or see, and ready to be eaten</li> <li>2. Not accessible to children</li> </ol> <p><i>Example to look for:</i> Cutting, peeling, chopping, washing the fruits, cleaning, putting in bowl/table etc.</p>	<p>"Something like a watermelon or grapes, I, I make sure it's cut. Uh, grapes I make sure it's washed, and then keep."</p>
<p>Pressure/forcing/encouraging children to eat</p>	<p>FBN2</p>	<p>Mothers' comments or description of behaviors such as forcing, threatening or pressuring the child to eat or finish the meal</p>	<p>References given to:</p> <ol style="list-style-type: none"> <li>1. Mothers' behavior or strategies used to force, threaten, or pressure the child to eat or finish the meal.</li> <li>2. Child's reaction and responses to this behavior</li> </ol> <p><i>Examples to look for:</i> Power struggle between the mother and child, depriving privileges, tell the child to eat specific foods from the plate (e.g. vegetables), spoon feed the child, etc.</p>	<p>"My thing is I force, and I...do this, clean your plate."</p>

Table 2-2 (cont'd)

Offering food rewards	FBN3	Mothers' behavior of offering or giving food/not offering food rewards to children for finishing meals or chores	References given to: Mothers' behavior of giving or offering or not offering food rewards to children for finishing meals or doing chores	"When the kid is not ready to go to school, you give the 2 M&M's which will, help them to do that chore."
Restricting certain foods	FBN4	Comments or description of mothers' behavior of restricting/not restricting children's consumption of certain foods	References given to: 1. Mothers' behavior of restricting/not restricting foods; 1. Foods that are restricted to children 2. Manner and situations in which the foods are restricted <i>Examples to look for:</i> Rules & timing when the foods are restricted, Manner of food restriction (e.g. hiding), religious restrictions etc. 2. Child's reaction and responses to this behavior	"But sometimes, if they open the fridge and they see it, they might get tempted. But still we have the rules that, it should be only on Saturdays."
<b><u>Importance of Feeding Behaviors for Eating habits</u></b>	<b>ImpE</b>	<b>Mothers' perception of advantages/disadvantages of practicing positive &amp; negative FBs for short term and long term eating habits of children</b>	<b>References given to: Advantages/disadvantages of practicing positive &amp; negative FBs for short-term and long-term eating habits of children</b>	

Table 2-2 (cont'd)

Family meal	ImpEP1	Mothers thoughts on benefits of family meals for the family and children's eating habits	<p>References given to:</p> <ol style="list-style-type: none"> <li>1. Benefits/lack of benefits of family meals for the family members</li> <li>2. Benefits/lack of benefits of family meals for children's eating habits</li> </ol> <p><i>Examples to look for:</i> Family conversation, family bonding, spending time with family etc.</p> <p><i>Examples to look for:</i> Opportunities for modeling healthy eating habits, monitoring child's food intake, children eating homemade/nutritious foods, etc.</p>	<p>“He tells me about his day, his friends in his school. So it's a special bonding time for me.”</p> <p>“When I'm sitting with him and eating my meal with him that I make sure he, he's not just drinking juice or, or water all the time, and ignoring his food.”</p>
TV viewing and eating	ImpEN1	Mothers' thoughts on the harmful effects of watching TV while eating on children's eating habits	<p>References given to: Detrimental effects of watching TV while eating in relation to child's eating habits</p> <p><i>Examples to look for:</i> Control over portion size, lack of awareness in eating etc.</p>	<p>“He probably eats less, I would think, because he's distracted by watching TV.”</p>

Table 2-2 (cont'd)

Modeling of eating behaviors	ImpEP2	Mothers' thought on favorable or unfavorable effects of modeling of eating behaviors by parents, siblings, and peers on children's eating habits	References given to: The favorable or unfavorable effect of modeling of eating behaviors (healthy/non-healthy) by parents, siblings, and peers on children's eating habits Favorable or unfavorable effects of involving kids in meal preparation <i>Examples to look for:</i> Children's likeliness to eat modeled foods, children requesting/asking for foods eaten by peers etc.	"Yeah, I think so, because we have to be role models for our children. We cannot say something and then not do it. So if we eat healthy, the kids may learn to eat the same food and..."
Availability of healthy foods at home	ImpEP3	Mothers thoughts on influence of any foods available at home, involving children in grocery shopping on children's food consumption	References given to: 1. Advantages or disadvantages of availability/presence of any food items at home for children's food choices or food intake 2. Advantages/disadvantages of involving kids in grocery shopping	" If you have, all the, like the fruits and vegetables, if you have it ready in your house, then, you know, it's easier to offer that to your child. If you don't have, have that in the house, then it's like, okay, I don't have this, but I Have chips; do you want chips?"
Accessibility of foods	ImpEP4	Mothers' thoughts on influence of foods that are easy to reach/ready to eat on children's eating habits	References given to: Children's likeliness to eat the foods that are prepared or placed in a manner that is visible, easy to reach/ready to eat <i>Examples to look for:</i> Children's likeliness to eat accessible foods from the fridge, pantry, etc.	"Like for example fruits, like you know if I cut it and put it in the, uh, table, definitely she eats."

Table 2-2 (cont'd)

Pressure/forcing children to eat	ImpEN2	Mothers comments/description of Advantages or disadvantages of forcing the child to clean the plate/finish the meal	References given to: Benefits or disadvantages (perceived by mothers), related to child's eating habit, of forcing the child to clean the plate/finish the meal <i>Examples to look for:</i> Amount eaten, proper nutrition, child throwing up, create dislike for the food, weight of child, etc.	“So to make sure that they're getting enough nutrition and enough of everything that's there on the plate, it's important for them the mother to make sure that they finish what's on the plate.”
Offering food rewards	ImpEN3	Advantages or disadvantages , perceived by mothers, of rewarding children with foods	References given to: Benefits or disadvantages, related to child's eating habits, of offering food rewards to children <i>Examples to look for:</i> Children habituated to food rewards, rewarded foods become comfort food, etc.	“I feel like it becomes a comfort food. Where, if he gets stressed out, then you're gonna reach out for that as a reward to yourself, saying I've had a bad day, so I can treat myself with that.”
Restricting certain foods	ImpEN4	Advantages or disadvantages , perceived by mothers, of restricting children from consuming certain foods at home and outside	References given to: Benefits or disadvantages, related to child's eating habits, of restricting children from consuming certain foods at home and outside <i>Examples to look for:</i> Control overeating of certain foods, weight concerns, children eating when outside parental control, etc.	“Because I think sugar, it, we should limit it, the dessert. It's not like you can eat all, how much quantity you want to eat...”

Table 2-2 (cont'd)

<p><b><u>Importance of Eating Habits for Health</u></b></p>	<p>ImpH</p>	<p>Mothers' opinion about advantages/disadvantages of children's current eating habits for children's short-term and long-term health</p>	<p>References given to: Advantages/disadvantages of children's current eating habits for short-term and long-term health of children <i>Examples to look for:</i> Health in general, eating habits later in life, disease prevention (e.g. diabetes, heart disease, and cancer), prevention of overweight, healthy teeth, bones, skin, etc.</p>	<p>"They will grow up to, you know, kind of obese and, will, plus, they do not appreciate any healthy habits. And, you know, kind of slows them down in everything that they do..."</p>
<p><b><u>Healthy and balanced foods/diet</u></b></p>	<p>Hlt</p>	<p><b>Mothers' opinions about healthy foods and balanced diet</b></p>		
<p><b><u>Healthy Foods</u></b></p>	<p>HltF</p>	<p>Mothers opinions and perceptions about healthy foods and healthy diet</p>	<p>References given by mothers about or mothers' own idea, conception and classification of <i>Examples to look for:</i></p> <ul style="list-style-type: none"> <li>• Foods that are healthy or not healthy (e.g. junk foods, fast foods etc.)</li> </ul>	<p>"So, I think, I don't know whether there are studies or something like that, but I feel like, more you eat frozen or pre—you know, preservatives in foods, you know, this is not healthy for you."</p>

Table 2-2 (cont'd)

<u>Balanced diet</u>	HltB	Mothers opinions and perceptions about balanced meals	Mothers' references about healthy and balanced meals/diet <i>Examples to look for:</i> <ul style="list-style-type: none"> <li>• Inclusion of fruits and vegetables in diet</li> <li>• Inclusion of non-healthy food items in diet</li> <li>• Inclusion of non-healthy foods along with healthy food items to make a balanced diet</li> </ul>	“Like pop and all, we don’t encourage her to ask, but once in a while when she goes for a party or something, then she has it, which is okay for us. Like, you know, it’s just once in a while. Yeah, so kind of, you have to balance.”
<u>Physical activity</u>	ActP	Mothers opinions about physical activity	Mothers' references about; <ul style="list-style-type: none"> <li>• The importance of physical activity for health</li> <li>• Family members performance of physical activity</li> <li>• Lack of physical activity in children – video games, computer, etc.</li> </ul>	To get them more involved in different physical activities. Like, my son, we have him in... tennis, swimming, you name it. Everything that I can control, I’ve done it.
<u>Perceived Behavioral Control - Barriers</u>	PbcB	Mothers' perception of things/situations that pose a barrier to the performance of positive FBs and facilitate/promote the performance of negative FBs	References given to: Situations or things that make it difficult for the mothers to perform positive FBs and things or situations that make it easy to perform negative FBs	

Table 2-2 (cont'd)

Family meal	PbcBP1	Mothers' perception of things or situations that pose a barrier to having family meals	References given to: Situations or things that make it difficult for the mother to cook and have a family sit together for meal <i>Examples to look for:</i> Work schedule of parents, children, presence of younger child/ren requiring special attention or hampering mother's meal time etc.	But... she (mother) has to put some efforts though. Yeah. Especially in my home, each one eats different food. The kid, the food has to be mashed, and, the food has to be hidden. And... and the kid doesn't sit till the end of the meal, so when I take my meal, I have to come on in. So what I do is... I give the meal to the kid, feed it. After I feed them..... Then I sit for my meal with my husband
TV viewing and eating	PbcBN1	Mothers' perception of things or situations that facilitate them to feed/ let the child eat while watching TV	Reference given to: Situations or things that make it easy for the mother to feed/let the child eat while watching TV <i>Examples to look for:</i> Child's habits, ease of feeding children, child and mother's schedule, etc.	Because, you know, then you can get all your other stuff done. So it's definitely easy.
Modeling of eating behaviors	PbcBP2	Mothers' perception of things or situations that pose a barrier for mother/father to model healthy eating behaviors	References given to: Situations or things that make it difficult for the mother/father to eat and enjoy healthy foods in front of children <i>Examples to look for:</i> Dislikes of mother/father, support from spouse, peer influence, etc.	"It was very tough. Because I still don't like it and I have to eat it, so it's really tough."

Table 2-2 (cont'd)

<p>Availability of foods at home</p>	<p>PbcBP3</p>	<p>Mothers' perception of things or situations that pose a barrier to purchase/bring healthy foods at home and make children to eat those foods</p>	<p>References given to: Things or situations that make it difficult to;</p> <ol style="list-style-type: none"> <li>1. Purchase/bring healthy foods at home</li> <li>2. Make children eat foods brought at home</li> </ol> <p><i>Examples to look for:</i> Weather, cost of foods, likes and dislike of parents and children, etc.</p>	<p>Bringing it is not hard part, but feeding them is a hard part. So, I like to try, you know, new things with my kids, you know, eat pear, or try papaya, and they hate papaya actually. So, feeding them is a hard part. Sometimes they don't like to try new foods.</p>
<p>Accessibility of foods</p>	<p>PbcBP4</p>	<p>Mothers' perception of things or situations that poses a barrier in making healthy foods easy to reach and ready to eat</p>	<p>References given to: Things or situations that make it difficult for;</p> <ol style="list-style-type: none"> <li>1. Mother to make healthy foods easy to reach (e.g. cutting, cleaning, peeling F/V) and ready to eat</li> <li>2. Children to eat accessible foods</li> </ol> <p><i>Examples to look for:</i> Likes/dislikes of children, etc.</p>	<p>"I read this thing like, if you keep the foods cut, there's an oxidation process, because you cut it with knife. And, when oxidation happens, it can ruin the taste of food and, you know, it also, you know, makes some chemicals which is not, you know, good for you. So I never, you know, cut fruits and put them in shelf."</p>

Table 2-2 (cont'd)

<p>Pressure/forcing children to eat</p>	<p>PbcBN2</p>	<p>Situations or things that persuade a mother to force the child to eat</p>	<p>References given to:            Characteristics/behavior of the child in relation to eating, religious/cultural reasons, or other situations perceived by the mother that causes a mother to force the child to eat/finish the meal  <i>Examples to look for:</i>            Picky eater, appetite, food dislike of child, food wastage, playful mood of the child, cultural reasons (respecting food), etc.</p>	<p>“And she says my tummy is full mama, if it’s rice. Then after 10 minutes, I see her opening the fridge and eating cereal. So, that kind of a thing.”</p>
<p>Offering food rewards</p>	<p>PbcBN3</p>	<p>Situations that persuade a mother to offer food rewards to children</p>	<p>References given to:            Characteristics of the child, or other situations perceived by the mother that causes a mother to reward the child with food  <i>Examples to look for:</i>            Getting the child eat main meal, getting chores done from children, weight of the child, etc.</p>	<p>“Yeah, it’s good, because kids are excited, and they feel recognized for what they have done.”</p>

Table 2-2 (cont'd)

<p>Restricting certain foods</p>	<p>PbcBN4</p>	<p>Things or situations that persuade a mother to restrict children's consumption of certain foods at home and outside</p>	<p>References given to: Characteristics of the child (personality), religious/cultural reasons, or other things/situations perceived by the mother that causes a mother to restrict children's consumption of certain foods at home and outside <i>Examples to look for:</i> Religious restrictions, availability to (exposure to) foods at home and outside, timings (e.g. right before meal) etc.</p>	<p>"I... especially scream at her. Suppose I'm making elaborate dinner, waiting that I'll serve them at 5:00 or 6:00. And then she opens the fridge and tries to eat her cereal, or nuggets. I'll literally scream at her, saying, you know you stop it because, I worked hard to prepare the food..." "They'll question their parent how come I'm not allowed to eat a chicken sandwich, how come I'm not allowed to eat, uh, sausage or bacon, or whatever, and they give 'em this thing about religion, you know."</p>
<p><u>Perceived Behavioral Control – Facilitators</u></p>	<p>PbcF</p>	<p><b>Mothers' perception of things/situations that facilitates the performance of positive FBs and provide a alternative to the performance of negative FBs</b></p>	<p><b>References given to: Situations or things that make it easy for the mothers to perform positive FBs &amp; things or situations that make it difficult to perform negative FBs</b></p>	

Table 2-2 (cont'd)

Family meal	PbcFP1	Mothers' perception of things that facilitate having family meals	References to: Situations or things that make it easy for the mother to cook and have a family sit together for meal <i>Examples to look for:</i> Pre-planning and preparations, schedule, assistance from family members etc.	"Depends on how much a spouse helps out in the house and stuff."
TV viewing and eating	PbcFN1	Mothers' perception of things or situations that allow to avoid TV viewing while eating or feeding the child	Reference given to: Situations or things that allow the mothers to avoid TV viewing while eating or feeding the child <i>Examples to look for:</i> Mealtime rules, video recording the favorite show etc.	"She (mother) should say the TV, once you are done with the food, they can watch the TV. She has to make the dinnertime little early, so, and she has to insist that after dinner she has to... mm, they can see TV. So that way they can finish their dinner and then see the TV."
Modeling of eating behaviors	PbcFP2	Mothers' perception of things or situations that facilitate the mother/father to model healthy eating behaviors	References given to: Situations or things that make it easy for the mother/father to eat and enjoy healthy foods in front of children <i>Examples to look for:</i> Diet (vegetarianism) or likes of mother/father, etc.	"I think because I'm vegetarian, so we've never had meat in our house, so our main diet is vegetables and fruits. So, I don't think anything has changed, after my, my son was born or anything, it just continued the same, and he's eating what we are eating."

Table 2-2 (cont'd)

Availability of healthy foods at home	PbcFP3	Mothers' perception of things or situations that facilitate purchasing/bringing healthy foods at home and getting children to eat those foods	References given to: Things or situations that make it easy to; 1. Purchase/bring healthy foods at home 2. Make children eat foods brought at home <i>Examples to look for:</i> Likes and dislike of parents and children, sneaking vegetables, etc.	“Like the, I’ll go through Meijer’s and Kroger’s paper before I go and buy anything. and if, if it’s a time crunch thing where I can’t go—like let’s say Kroger has milk on sale, but, Meyer’s has everything else, has more, whoever has the most stuff that I want, I go there.”
Accessibility of foods	PbcFP4	Mothers' perception of things or situations that facilitate making healthy foods easily accessible to children	References given to: Things or situations that make it easy for the mother to make healthy foods easy to reach (e.g. cutting, cleaning, peeling F/V) and ready to eat	“Yeah, again that’s, that’s easy to. It’s just the way I arrange my fridge, and moment I come, I cut and chop and wash everything and keep it in the fridge, so that’s not extra efforts to do. It was part of my routine even before then, so, it’s easy”

Table 2-2 (cont'd)

<p>Pressure/forcing children to eat</p>	<p>PbcFN2</p>	<p>Things or situations that allow the mother to avoid forcing the child to eat</p>	<p>References given to:                  Things or situations that provide a mother with an alternative to forcing the child to eat                  Mothers' behavior of feeding the child using strategies other than forcing, threatening, or pressuring.  <i>Examples to look for:</i>                  Sneaking vegetables, menu planning, appropriate portion size, praise the child or food, offer food choices, making the food interesting, reasoning with the child (e.g. nutrition talk) etc.</p>	<p>“We just give her a little bit. She wants more of something, and we give her a little bit, and I always tell her you can take more, there is plenty more. So you can have seconds. And if she needs it, she asks for it, and we serve her more.”                  “Or even if she doesn't like it, because she's so enthusiastic because we are eating it, and then we, we praise her, oh wow, you really liked it? And she's like yeah. So, I think it's probably in the flow of the dinner, that she actually finishes everything on her plate.”</p>
<p>Offering food rewards</p>	<p>PbcFN3</p>	<p>Things or situations that allow the mother to avoid offering food rewards to children</p>	<p>References given to:                  Characteristics of the child, things/situations that provide a mother with an alternative to offering food rewards to the child  <i>Examples to look for:</i>                  Offering non-food rewards, child interested in other rewards, etc.</p>	<p>“I think rewards should be more... you know, praise, appreciation, or maybe some good stickers, or maybe some, you know, a small trip to somewhere. But not with food.”</p>

Table 2-2 (cont'd)

Restricting certain foods	PbcFN4	Things or situations that allow the mother to avoid restricting children's consumption of certain foods at home and outside	References given to: Things or situations that provide a mother with an alternative to restrict children's consumption of certain foods at home and outside <i>Examples to look for:</i> Not purchasing the foods, purchasing healthier options of junk foods, etc.	"First of all, if she doesn't, like these foods, she should not buy them."
<b><u>Responsibility</u></b>	<b>Res</b>	<b>Mothers comments or description of responsibility of developing eating habits in children</b>		
Parent Responsibility	ResP	Mothers comments or description of parent responsibility of developing eating habits in children	References given to: The role and responsibility of parents in developing (healthy/non-healthy) eating habits in children	"Definitely a very important role, because, they are the one who provide the food, and, setting an example, and getting the kids to have a healthy food habit."
School Responsibility	ResS	Mothers comments or description of role and responsibility of school in developing children's eating habits	References given to: Role and responsibility of school and influence of school food environment in developing children's food choices, food attitudes, and eating habits	"When she went, she told me mom I want baby carrots, how, because the school which told her, which told her. Where did you eat baby carrots? And maybe friends house. But she told mama I had in school, with the Ranch dip. So, that's also affects"

Table 2-2 (cont'd)

<u><b>Health condition</b></u>	ConH	Mothers comments or description of health conditions of self and others	<b>References given to:</b> <b>1. Health conditions of self and others (family members and relatives) as a result of genetics (family history) and eating habits</b> <b>2. Changes in attitudes of mother as a result of these health conditions in their eating habits</b> <b>3. Changes in mothers FB as a result of these health conditions</b>	<p>“Um, I purchase bread, and I always go for wheat bread. I don’t like white, because, uh, especially my husband has a BP, so the doctor has said no white food. So now I’m trying to using less of potatoes too, because it has lot of carbs. You don’t have to eat lot of white.”</p>
<u><b>Advice or information on feeding children</b></u>	InfS	Mothers’ comments/description of information & sources of information about feeding children	<b>References given to:</b> The information about feeding (food, nutrition, recipes, etc.) children and sources from where the information is obtained (irrespective of the accuracy of information) <b>Examples</b> <ul style="list-style-type: none"> <li>• Friends</li> <li>• Relatives</li> <li>• Doctors</li> <li>• Internet sources</li> <li>• Other</li> </ul>	<p>“... mostly Indian, so, you know, my parents like, especially when they were growing up, my daughter, when she was like kid and all that, at certain age I should give her this, I shouldn’t give her that. All those information came from my parents, not from any other sources.”</p>
<u><b>Compliance with Information</b></u>	infC	Mothers’ compliance with the information they obtain about feeding their children	<b>References given to:</b> Mothers’ comments and description of whether and how much they comply with the information obtained from others about feeding their children	<p>“You know, that’s its not possible to just copy everything, because, one says something, another one says. So you just have to go into a general, uh, you know, uh, on a general view, okay, this is good.”</p>

Table 2-2 (cont'd)

<p><b><u>Validity of Information</u></b></p>	<p>InfV</p>	<p>Mothers comments about the validity and suitability of the information on feeding children</p>	<p>References given to: The validity and suitability of the information they already received or would like to receive about feeding children <i>Examples to look for:</i></p> <ul style="list-style-type: none"> <li>• Research based information</li> <li>• Cultural appropriateness</li> </ul>	<p>“The researchers can do a great job in saying that you have to go by this family. Then, even if the parents were in doubt to whether should they follow it, or maybe I can do it, they might be convinced with that saying that okay, this helped so many people”</p>
<p><b><u>Potential sources of Educational messages</u></b></p>	<p>InfP</p>	<p>Mothers’ comments/description of potential sources where the mothers would like to receive information on feeding children</p>	<p>References given to: Potential sources where the mothers think are appropriate to obtain the information and the reasons why these places are appropriate</p>	<p>“I think rather than all these places, your child’s pediatric, you know. That would be the first place, because, you know, we do follow through, like as a mother, like whenever I go for a visit, whatever information I get, I just follow through that very seriously.”</p>
<p><b><u>Intrinsic motivation factors</u></b></p>	<p>IntM</p>	<p>Intrinsic motivational factors that influence the attitude of mothers toward feeding behaviors</p>	<p>Mothers comments/description of intrinsic factors that shape their feeding behaviors <i>Examples to look for:</i></p> <ol style="list-style-type: none"> <li>1. Indian cultural values and attitude regarding food and parenting</li> <li>2. Mothers own experiences as a child, and with other children in family</li> </ol>	<p>Rule of exclusion: this does not include likes and dislikes of mother</p>

Table 2-2 (cont'd)

<p><b><u>Indian Foods</u></b></p>	<p>IndF</p>	<p>Comments/description of mothers' or children's attitude toward Indian foods</p>	<p>Mothers' or children's attitude toward Indian foods  <i>Examples to look for:</i>            1. General outlook of Indian foods in terms of nutrition and culture            2. Kids eating/not eating, likes/dislikes of Indian foods            3. Mothers' wanting children to eat Indian foods            4. Indian foods for family lunch</p>	<p>"In our country dal is definitely because that's a main source of proteins for us. Especially for the vegetarians. And they are so healthy. So I think you should have dhal things. That's important."            "Yeah. Believe it or not, my daughter is now 10. I used to feed her, till she was 9, she was my only child and she used never used to eat any Indian food. Like I used to get so scared that she's not eating any healthy food."</p>
<p><b><u>Gender differences</u></b></p>	<p>GenD</p>	<p>Differences in children's eating habits, behaviors, or attitude due to gender</p>	<p>References given to: Comments or description of differences in children's eating habits, food behaviors, or attitude toward foods due to gender</p>	

## Appendix F: Additional Themes from Stage 1

**Table 2-3:** Themes for Availability, Accessibility and Restricting Consumption of Certain Foods

Theoretical concepts	Themes for family meals
	<b>Themes for making healthy foods available</b>
Behavior	Some bought only healthy foods (fruit, vegetables, and meat if the family is non-vegetarian); do not buy any “junk foods”. Some bought healthy as well as “junk foods” in moderation or in limited quantities. Do not prefer frozen foods, canned foods, and cut fruits and vegetables.
Behavioral belief	Conveniently allows mother to cook and offer foods available at home. Provides exposure and familiarizes children to new and variety of foods. Makes children more likely to eat foods.
Barriers	Availability of unhealthy foods distracts children from eating healthy foods.
Facilitators	Easy availability of variety and quality of healthy foods at grocery store. Easy accessibility to grocery stores.
	<b>Themes for making healthy foods accessible</b>
Behavior	Strategies to make foods accessible include <ul style="list-style-type: none"> <li>○ Manner: washing grapes, cutting fruits</li> <li>○ Location: front section of the fridge, in front of the kids, in a bowl on the table</li> </ul> Fruits not kept accessible but are cut and provided immediately when children ask or when the mother feels like. Children are asked to grab the foods from the fridge when they want.
Behavioral belief	Children are more likely to eat foods when are accessible. Easy for mothers to offer if the foods are ready-to-eat.
Barriers	Children are distracted by the availability of unhealthy foods. Picky eaters do not reach for healthy accessible foods. Children are not allowed to get foods from the refrigerator due to the fear of causing a mess. Cutting fruits and vegetables causes loss of freshness and appeal.
Facilitators	Buying pre-cut fruits from the store, help from the spouse, and making a routine of cutting fruits immediately after they are brought home.
	<b>Themes for Restricting children’s consumption of certain foods</b>

Table 2-3 (cont'd)

Behavior	<p>Some mothers do not restrict children's consumption of junk foods and children allowed to eat in limited quantities and at specific times.</p> <p>Some mothers restrict children's consumption of junk foods in a very firm, strict and non-yielding manner.</p> <p>Food restriction strategies used:</p> <ul style="list-style-type: none"> <li>○ Not bringing unhealthy foods at home</li> <li>○ If available at home, hiding the foods or keeping them out of child's reach</li> <li>○ Letting children eat them at specific times and not all times</li> </ul>
Behavioral belief	<p>Ensure that children do not eat unhealthy food.</p> <p>Control portion size of "junk foods".</p> <p>Control consumption of sugar and fat as it leads to obesity, tooth decay, stomach problems such as constipation.</p>
Barriers	<p>Availability and accessibility of unhealthy food at home tempts children for such food.</p> <p>Children have high preference and liking for "junk foods".</p>
Facilitators	<p>Buying healthy versions of snack foods such as oatmeal instead of chocolate chip cookies, or baked instead of fried chips.</p>

**Table 2-4:** *Themes for Evaluation of Behavioral Beliefs and Subjective Norm*

<b>Theoretical concepts</b>	<b>Themes for family meals</b>
	<b>Themes for making healthy foods available</b>
Beliefs about nutrition and health	<p>Long-term health conditions resulting from unhealthy eating habits include: obesity, diabetes, high blood pressure, high cholesterol, heart diseases, cancer.</p> <p>Healthy eating habits can reduce the genetic risk of health conditions such as diabetes and heart disease.</p> <p>Eating more fruits and vegetables can prevent chronic diseases such as cancer.</p> <p>Short-term health conditions resulting from unhealthy eating habits include – lack of stamina and strength, attention span, falling sick frequently, infections, dental health, stomach problems such as constipation, and weak eyesight.</p>
Normative belief	<p>Mothers received information from doctors, pediatricians or dietician. Most mother also mentioned having pediatrician, doctors, or dieticians being Indian origin. Some of these doctors were also their friends.</p> <p>Most mothers also went to the internet for information such as healthy recipes for kids, blogs of other mothers on the internet about feeding their children.</p> <p>Family members (parents and in-laws) provided information on how to feed vegetables to the kids, share their experience about child feeding, what foods to feed to children, prepare food in a manner child likes.</p> <p>Mothers discussed with their friends about child feeding, shared tips about feeding healthy foods to kids and recipes.</p>
Motivation to comply	<p>Advice from parents (especially mother) considered valuable.</p> <p>Advice from the doctors, nutritionists, and pediatrician was taken very seriously by the mothers and followed upon.</p> <p>In some cases advice from the friends was taken and followed upon if it worked for the child.</p>

## Appendix G: Interview Guide for Research Stage 2

### **Interviewer:**

Before I begin the interview I would like you to know that there is no right or wrong answers to any questions. I am interested in your thoughts about nutrition messages related to feeding your child and family.

For this interview, I will show you some messages. We will go through each message one at a time and I will ask you questioned related to each message. Your thoughts will help us improve these messages.

(The mothers will be shown each message and then asked the below questions for each message)

### **Questions:**

#### **Comprehensibility**

What do you think this message is asking you to do?

What does this term mean “\_\_\_\_\_”?

What are the things in this message that are confusing/unclear to you?

How can we make these things clear?

What other word or phrase would you suggest to make it clear?

*Probe:* Can you tell me in your own words what does this message mean?

#### **Credibility and agreement**

Tell me how do you feel about the information provided in the message?

How much do you agree with/believe the information?

*Probes:* What do you think about the accuracy of the information? Do you believe mothers like you will get the benefits if they do what is asked in this message? Why/Why not? Do you think this information is meant for you? How

#### **Feasibility**

How is this information useful to you?

Does this seem possible for you to do? How?

*Probes:* Do you think you can use this information in feeding your children? How? Do you see yourself following these recommendations? How (or why not)?

## Appendix H: Frequency Sheets for Message Development

**Table 3-4.** *Frequency Sheet for Family Meals*

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Opportunity to model	11	Full time work commitments resulting in to tiredness, lack of time, too much responsibility of cooking on one person	13	Help from spouse in cooking and cleaning	10
Exposure and introduction to new and variety of foods	6	Time conflicts: Children eating at different time, graduate student commitment, father coming late	9	Cooking some foods in morning, on weekends, or day before	10
Monitor child's food consumption (type and amount)	5	Presence of younger child at home require separate feeding, food arguments, and disagreements	7	Following easy and simple recipes	8
Opportunity for parents to talk about health and nutrition	4	Elaborate preparation of Indian meals require more time	3	Help from children in setting up table, cleaning etc.	5
Overall, children motivated to eat healthy foods	3			Cutting vegetables on weekends or night before	9
				Soaking or boiling lentils in advance	5
				Having ready-made roties	4

Table 3-4 (cont'd)

				Preparing roti dough in advance	4
				Using frozen pre-cut vegetables	3

**Table 3-5. Frequency Sheet for Parental Modeling**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Children copy both healthy and non-healthy eating habits of parents	21	Food dislike and eating habits of parents	6	Parents like for fruits and vegetables, and openness to try new fruits and vegetables	8
Children are motivated and encouraged to try and eat new foods	8	Child's dislike of food	4	Not showing dislike and eating a few bites in front of children	7
Gives a sense of familiarity and safety toward food and makes food more acceptable	4	Lack of support from spouse	2	Balance of likes and dislike between parents	5
Parents negative comments about foods makes children not eat those foods	3	Religious restrictions	3	Cooking or preparing foods that taste better	5
Modeling as a strategy to expose to and encourage eating of new foods	2			Vegetarianism and health consciousness	5

**Table 3-6. Frequency Sheet for Food Availability**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Conveniently allows mother to cook and offer foods	14	Picky eater child does not like the foods	4	Easy availability of variety and quality foods at grocery store	7
Provides exposure and familiarizes children to new and variety of foods	8	Presence of unhealthy foods at home causes distraction to eating healthy foods	2	Easy accessibility of grocery store	4
Availability of unhealthy foods makes children more likely to eat those foods	10	Spouse bringing unhealthy foods that causes distraction	2	Foods not very expensive	5
		Dislike of parents for certain foods	3	Involving children in grocery shopping exposes children to variety of foods, letting them pick fruits and veggies makes them more likely to eat those foods	5
		Weather conditions makes shopping difficult and affects availability of quality foods	3	Substituting expensive fruits with cheaper ones	2

Table 3-6 (cont'd)

		Some fruits are expensive	3	Shopping based on ongoing sales or deals	2
				Buying colorful, attractive, and clean fruits	2
				Preparing food in interesting and creative manner	2

**Table 3-7. Frequency Sheet for Food Accessibility**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Makes children more likely to eat and makes them independent in their decision	20	Children distracted by the presence of unhealthy foods at home	12	Routine for the mother to cut fruits and veggies after grocery shopping	4
Easily offer the foods when the child is hungry without losing time and patience	4	Children do not reach for healthy options because they do not like it	8	Buying pre-cut fruits from grocery store	3
Does not make any difference as it depends on the taste of the child	5	Children will not pick healthy foods, they have to be told to eat healthy foods	11	Help from spouse in cutting fruits	3
		Children not allowed to access the refrigerator to avoid mess	7	Dip is helpful	2
		Some fruits are cumbersome to cut and spoil if not eaten soon	3		
		Fruits cut for a long time lose freshness and appeal	8		
		Lack of time, help, and motivation to cut fruits	3		

**Table 3-8. Frequency Sheet for TV Viewing while Eating**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
TV causes distraction resulting in overeating	16	Allows mother to feed any food in more quantity without child's knowledge	12	Parents having meals with children, and conversation during meal-family meals	4
No control over what and how much they are eating	5	Habit of watching TV is an uncontrolled phenomenon for children	12	Mealtime rules - Let children watch TV before of after meal	4
Do not realize what foods they are eating	9	Snack time or meal time is the only time for children to watch TV	8	Recording favorite show	2
Do not savor and relish the taste of foods	6	Meal time only time for the parents to watch TV	6	Arrangement of the house such that does not permit TV viewing during mealtime (e.g. TV not viewable from dining table)	3
TV distraction slows down foods consumption resulting in under eating	14	Letting child watch TV allows the mother to complete chores & have some time to herself	4		
Tooth decay and improper chewing of foods	4	Peer modeling	4		
No interaction with family members	2	Lack of family interaction	2		

**Table 3-9. Frequency Sheet for Pressuring Children to Eat**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Ensures children eat vegetables, enough of all foods, and get good nutrition	10	Food is scared and it is culturally inappropriate to waste food	18	Giving small portions and allow for second helping	14
Develops good health as a result of above	3	Inculcating cultural values of not wasting food and teaching good manners of eating	8	Give appropriate portion size	3
Child learns to know his appetite	5	Children do not like home cooked or Indian foods and prefer other foods (e.g. fast foods)	10	Offering variety and letting child decide, offer one foods that the child likes	4
Ensures that child eats enough and does not get hungry after a while	4	Children eat enough and not become hungry after a while	5	Not letting children snack before mealtime	3
Encourages overeating	3	Children do not know they are hungry and need to eat more	4	Introduce new foods slowly and in small amounts	3
Child develops aversion to forced foods and does not eat when outside parental control	4	Playing is priority for children	4	Allow the child to become familiar with the food by letting them taste several times	2

Table 3-9 (cont'd)

Child may choke or throw up	4			Praising the child for trying and giving rationales	6
				Reducing the amount of spice in food preparation	2
				Twisting child's favorite food by adding veggies	2

**Table 3-10.** *Frequency Sheet for Using Food as Rewards*

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Children become habituated to rewarded foods	11	Helps children eat the main meal without forcing	6	Providing alternative rewards such as reading story books, buying books, coloring activity	4
Children will be more interested in rewarded food and not the main meal	9	Helps the mother get things done without working hard	3	Taking children out to games, playground, park, zoo, picnic	5
Rewarded foods fall into the category of unhealthy foods and can result in unhealthy eating habits and overweight	4	Helps child gain weight	2	Praising the child, show love, and affection	3
Increased liking for rewarded food	3	Children feel recognized and appreciated	3	Stickers or points	2
Children are encouraged to eat healthy foods, finish main meal, develop good eating habits	6			Letting children watch TV or play with toys or computer	4
In general, results in expectant nature of child in general	2				

**Table 3-11. Frequency Sheet for Restricting Consumption of Certain Food**

<b>Behavioral Belief</b>	<b>Frequency</b>	<b>Barriers</b>	<b>Frequency</b>	<b>Facilitators</b>	<b>Frequency</b>
Control the portion size of unhealthy foods	9	Availability and accessibility of unhealthy foods tempts children for such foods at home	7	Buying limited quantities of junk foods and in predetermined portion size	12
Ensure that children do not eat unhealthy foods at all	3	Children have strong liking for junk foods	3	Not buying junk foods at all	12
Prevent consumption of fat and sugar and thereby other health problems including overweight	16	Religious restrictions	2	Setting a snack time routine and when the child is allowed to eat snacks	4
Prevent consumption of junk foods before meal time	2			Buying healthier versions of snack foods	3
Children resist more if they are restricted (including religious restrictions)	3				

## **BIBLIOGRAPHY**

## BIBLIOGRAPHY

- Addressi, E., Galloway, A. T., Visalberghi, E., & Birch, L. L. (2005). Specific social influences on the acceptance of novel foods in 2-5-year-old children. *Appetite*, 45, 264-271.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhland & J. Beckman (Ed.), *Action-control: from cognitions to behavior* (pp. 11-39). Heidelberg: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organ Behav Hum Decis Process*, 50, 179–211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Alderson, T., & Ogden, J. (1999). What do mothers feed their children and why? *Health Education Research*, 14(6), 717-727.
- Allison, D. B., Zannolli, R., & Narayan, K. V. (1999). The direct health care costs of obesity in the United States. *American Journal of Public Health*, 89, 1194-9.
- Anand, S., Yusuf, S., Vuksan, V., Devanesen, S., Teo, K., Montague, P., Kelemen, L., Yi, C., Lonn, E., Gerstein, H., Hefele, R., & McQueen, M. (2000). Differences in risk factors, atherosclerosis, and cardiovascular disease between ethnic groups in Canada: the Study of health Assessment and Risk in Ethnic groups (SHARE). *Lancet*, 356, 279 –284.
- Anderson, R. E., Crespo, C. J., Bartlett, S. J., Cheskin, L. J., & Pratt, M. (1998). Relationship of physical activity and television watching with body weight and level of fatness among children. *Journal of the American Medical Association*, 179, 938–942.
- Anliker, A., Laus, M. J., Samonds, K. W., & Beal, V. (1992). Mothers' reports of their three year old children's control over foods and involvement in food related activities. *Journal of Nutrition Education*, 24(7), 285–291.
- Armitage, C. J. (2005). Can the theory of planned behaviour predict the maintenance of physical activity? *Health Psychology*, 24, 235–245.
- Armitage, C. J., & Conner, M. (2002). Reducing fat intake: Interventions based on the theory of planned behaviour. In D. Rutter & L. Quine (Eds.), *Changing health behaviour: Intervention and research with social cognition models*. (pp. 87-104): Buckingham, UK: Open University Press.
- Arundhati, P. (2001). Annapurna: A bunch of flowers of Indian culture. Retrieved from [http://books.google.com/books?id=cfK2LoH\\_j54C&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](http://books.google.com/books?id=cfK2LoH_j54C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

- Auld, G., Boushey, C., Bock, M., Bruhn, C., Gable, K., Gustafson, D., et al. (2002). Perspectives on intake of calcium-rich foods among Asian, Hispanic, and White preadolescent and adolescent females. *J Nutr Educ Behav*, 34, 242-251.
- Bandura, A. (1971). Analysis of modeling processes. In A. Bandura (Ed.), *Psychological modeling: Conflicting theories*. Chicago: Aldine-Atherton.
- Baranowski, T., Cullen, K.W., & Baranowski, J. (1999). Psychological correlates of dietary intake: advancing dietary intervention. *Annu Rev Nutr*, 19, 17-40.
- Baranowski, T., Domel, S., Gould, R., Baranowski, J., Leonard, S., Treiber, F., & Mullis R. (1993). Increasing fruit and vegetable consumption among 4<sup>th</sup> and 5<sup>th</sup> grade students: results from focus group using reciprocal determinism. *Journal of Nutrition Education*, 25, 114-120.
- Barnes, J.S., & Bennett, C.E. (2002, February). The Asian population: 2000. Census 2002 Brief. Washington, DC: U.S. Department of Commerce, U.S. Census Bureau.
- Basu, A. (2010). Forecasting distribution of body mass index in the United States: Is there more room for growth? *Medical Decision Making*, 30(3), E1-E11.
- Baughcum, A. E., Burlow, K. A., Deeks, C. M., Powers, S. W., & Whitaker, R. C. (1998). Maternal feeding practices and childhood obesity: a focus group study of low-income mothers. *Arch Pediatr Adol Med*, 152, 1010-1014.
- Baughcum, A. E., Powers, S. W., Johnson, S. B., Chamberlin, L. A., Deeks, C. M., Jain, A., & Whitaker, R. C. (2001). Maternal feeding practices and beliefs and their relationships to overweight in early childhood. *J Dev Behav Pediatr*, 22(6), 391-408.
- Baumrind, D. (1971). *Current patterns of parental authority. Developmental Psychology Monograph*, 4(1, Pt. 2), 1-103.
- Bellissimo, N., Pencharz, P.B., Thomas, S.G., & Anderson, H. (2007). Effect of Television Viewing at Mealtime on Food Intake After a Glucose Preload in Boys. *Pediatric Research*, 61(6), 745-749.
- Birch, L. (1992). Children's preferences for high-fat foods. *Nutr Rev*. 1992, 50(9), 249-55.
- Birch, L. L. (1987). The acquisition of food acceptance patterns in children. In R. A. Boakers, D. A. Popplewell & M. J. Burton (Eds.), *Eating habits: Food, physiology and learned behavior*. (pp. 107-130). Chichester, England: Wiley.
- Birch, L. L., & Fisher, J. O. (1995). Appetite and eating behavior in children. In G. E. Gaull (Eds.), *The pediatric clinics of North America: Pediatric nutrition* (pp. 931-953). Philadelphia, PA: Saunders.
- Birch, L. L., & Fisher, J. O. (1998). Development of eating behaviors among children and adolescents. *Pediatrics*, 101(3), 539-549.

- Birch, L. L., & Marlin, D. W. (1982). I don't like it; I never tried it: effects of exposure to food on two-year-old children's food preferences. *Appetite*, 4, 353-360.
- Birch, L. L., Birch, D., Marlin, W., & Kramer, L. (1982). Effects of instrumental consumption on children's food preference. *Appetite*, 3, 125-34.
- Birch, L. L., Fisher, J. O., & Davison, K. K. (2003). Learning to overeat: Maternal use of restrictive feeding practices promotes girls' eating in the absence of hunger. *American Journal of Clinical Nutrition*, 78(2), 215–220.
- Birch, L. L., Johnson, S.L., Jones, M. B., & Peters, J. C. (1993). Effects of a non-energy fat substitute on children's energy and macronutrient intake. *Am. J. Clin. Nutr*, 58, 326-333.
- Birch, L. L., McPhee, L. B. Shoba, C., Steinberg, L., & Krehbiel, R. (1987). "Clean up your plate": Effects of child feeding practices on the conditioning of meal size. *Learn Moti*, 18, 301-17.
- Birch, L. L., Zimmerman, S., & Hind, H. (1980). The influence of social-affective context on preschoolers' food preferences. *Child Dev*, 51, 856-861.
- Blue, C. L., (1995). The predictive capacity of the Theory of Reasoned Action and the Theory of Planned Behavior in exercise research: An integrated literature review. *Res Nurs Health*, 18, 105–121.
- Borzekowski, D. L., & Robinson, T. N. (2001). The 30-second effect: an experimental revealing the impact of television commercials on food preferences of preschoolers. *J. Am. Diet. Assoc*, 101, 42-46.
- Boutelle, K. N., Birnbaum, A. S., Lytle, L. A., Murray, D. M., & Story, M. (2003). Associations between perceived family meal environment and parent intake of fruit, vegetables, and fat. *J Nutr Educ Behav*, 35, 24-29.
- Boutelle, K. N., Fulkerson, J. A., Neumark-Sztainer, D., Story, M., & French, S. A. (2006). Fast food for family meals: relationships with parent and adolescent food intake, home food availability and weight status. *Public Health Nutrition*, 10(1), 16–23.
- Bouvier, L. F., & Agresta, A. J. (1985). *The fastest growing minority*. *American Demographics*, 7, 31-33.
- Bronfenbrenner, U., & Morris, P. A. (1988). The ecology of human developmental processes. In W. Damon & N. Eisenberg (Ed.), *The handbook of child psychology* (pp. 993-1027). John Wiley & Sons: New York.
- Brown, K.A., Ogden, J., Vögele, C., & Gibson, E.L. (2008). The role of parental control practices in explaining children's diet and BMI. *Appetite*, 50, 252–259.
- Brown, R., & Ogden, J. (2004). Children's eating attitudes and behaviour: A study of the modeling and control theories of parental influence. *Health Educ Res*, 19, 261-71.

- Campbell, K. J., Crawford, D. A., & Ball, A. (2006). Family food environment and dietary behaviors likely to promote fatness in 5-6 year-old children. *International Journal of Obesity*, 30, 1272–1280.
- Campbell, K. J., Crawford, D. A., & Hesketh, K. D. (2007). Australian parents' views on their 5-6-year-old children's food choices. *Health Promotion International*, 22(1), 11-18.
- Campbell, K., Crawford, D., Jackson, M., Cashel, K., Worsley, A., Gibbson, K., & Birch, L. (2002). Family food environment of 5-6-year-old-children: does socioeconomic status make difference? *Asia Pacific J Clin Nutr*, 11, S553-S561.
- Campbell, M., Fitzpatrick, R., Haines, A., Kinmonth, A. L., Sandercock, P., Spiegelhalter, D. et al. (2000). Framework for design and evaluation of complex interventions to improve health. *British Medical Journal*, 321, 694–696.
- Cappuccio, F., Cook, D., Atkinson, R., & Strazzullo, P. (1997). Prevalence, detection, and management of cardiovascular risk factors in different ethnic groups in south London. *Heart*, 78, 555–63.
- Cappuccio, F., Oakeshott, P., Strazzullo, P., & Kerry, S. (2002). Application of Framingham risk estimates to ethnic minorities in United Kingdom and implications for primary prevention of heart disease in general practice: cross-sectional population based study. *BMJ*, 325, 1271.
- Carbone, E., Campbell, M. & Honess-Morreale, L. (2002). Use of cognitive interview techniques in the development of nutrition surveys and interactive nutrition messages for low-income populations. *J Am Diet Assoc*, 102, 690-696.
- Casey, R., & Rozin, P. (1989). Changing children's food preferences: Parent opinions. *Appetite*, 12, 171–182.
- Chao, R., & Tseng, V (2002). Parenting of Asians. In M.H. Bornstein (Ed.), *Handbook of parenting: Vol. 4. Social conditions and applied parenting* (2nd ed., pp. 59-93). Mahwah, NJ: Lawrence Erlbaum.
- Churchill, G. A. (1995). *Marketing Research: Methodological Foundations* (6th ed.). Orlando, FL: Dryden Press.
- Clark, H. R., Goyder, E., Bissell, P., Blank, L., & Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *Journal of Public Health*, 29, 132–141.
- Cluskey, M., Edlefsen, M., Olson, B., Reicks, M., Auld, G., Bock, M. A, Boushey, C. J., Bruhn, C., Goldberg, D., Misner, S., Wang, C., & Zaghoul, S. (2008). At-home and Away-from-home Eating Patterns Influencing Preadolescents' Intake of Calcium-rich Food as Perceived by Asian, Hispanic and Non- Hispanic White Parents. *J Nutr Educ Behav*, 40, 72-79.

- Conner, M., & Norman, P. (Eds.) (1996). *Predicting health behaviour*. Buckingham: Open University Press.
- Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology, 21*, 194–201.
- Contento, I. R. (2011) *Nutrition Education: Linking Research, Theory, and Practice* (2nd ed.). Sudbury, MA: Jones and Bartlett Publishers.
- Contento, I., Basch, C., et al. (1993). Relationship of mothers' food choice criteria to food intake of preschool children: Identification of family subgroups. *Health Education and Behavior, 20*, 243–259.
- Coon, K. A., Goldberg, J., Rogers, B. L., & Tucker, K. L. (2001). Relationships between use of television during meals and children's food consumption patterns. *Pediatrics, 107*, E7.
- Costanzo, P. R., & Woody, E. Z. (1985). Domain-specific parenting styles and their impact on child's development of particular deviance: the example of obesity proneness. *British Journal of Social and Clinical Psychology, 3*, 425–445.
- Cousins, J. H., Power, T. G., & Olvera-Ezzell, N. (1993). Mexican-American mothers' socialization strategies: Effects of education, acculturation, and health locus of control. *Journal of Experimental Child Psychology, 55*, 258–276.
- Crouch, P., O'Dea, J. A., & Battisti, R. (2007). Child feeding practices and perceptions of childhood overweight and childhood obesity risk among mothers of preschool children. *Nutrition & Dietetics, 64*, 151-158.
- Cullen, K. W., Baranowski, T., Owens, E., Marsh, T., Rittenberry, L., & de Moor, C. (2003). Availability, accessibility, and preferences for fruit, 100% fruit juice, and vegetables influence children's dietary behavior. *Health Education Behavior, 30*, 615-626.
- Cullen, K., Baranowski, T., Rittenberry, L., & Olivera, N. (2000). Social-environmental influences on children's diet: results from focus groups with African-, European- and Mexican-American children and their parents. *Health Education Research, 15*, 581-590.
- Cutting, T. M., Fisher, J. O., Grimm Thomas, K., & Birch, L. L. (1999). Like mother, like daughter: familial patterns of overweight are mediated by mothers' dietary inhibition. *Am J Clin Nutr, 69*, 608-613.
- Darling, N., & Steinberg, I. (1993). Parenting style as context: an integrative model. *Psychological Bulletin, 113*(3), 487-496.
- Das, A. K., & Kemp, S.F. (1997). Between two worlds: Counseling South Asian immigrants. *Journal of Multicultural Counseling and Development, 25*, 23-34.
- Dasgupta, S. D. (1998). Gender roles and cultural continuity in the Asian Indian immigrant community in the U.S. *Sex Roles, 38*, 953–973.

- Dasgupta, S. S. (1989). *On the Trail of an Uncertain Dream: Indian Immigrant Experience in America*. New York, NY: AMS Press.
- Davison, K. K., & Birch, L. L. (2001). Childhood overweight: a contextual model and recommendations for future research. *Obes Rev*, 2(3), 159-171.
- Dietz, W. H., & Stern, L. (1999). *American Academy of Pediatrics Guide to Your Child's Nutrition*. New York: Villard Books.
- Dowse, G. K., Gareeboo, H., Zimmet, P. Z., Alberti, K. G., Tuomilehto, J., Fareed, D., et al. (1990). High prevalence of NIDDM and impaired glucose tolerance in Indian, Creole, and Chinese Mauritians. Mauritius Noncommunicable Disease Study Group. *Diabetes*, 39(3), 390-396.
- Enas, E. A., Garg, A., Davidson, M. A., Nair, V. M., Huet, B. A., & Yusuf, S. (1996). Coronary heart disease and its risk factors in first-generation immigrant Asian Indians to the United States. *Indian Heart J*, 48, 343-53.
- Eppright, E., Fox, H., Fryer, B., Lamkin, G., & Vivian, V. (1970). Nutrition knowledge and attitudes of mothers—The north central regional study of diets of preschool children. *Journal of Home Economics*, 62(5), 327-332.
- Epstein, L. H., McCurley, J., Wing, R., & Valoski, A. (1990). Five-year follow-up of family-based treatment for childhood obesity. *J consult Clin Psychol*, 58, 661-664.
- Epstein, L. H., Roemmich, J. N., Robinson, J. L., Paluch, R. A., Winiewicz, D. D., Fuerch, J. H., & Robinson, T. N. (2008). A Randomized Trial of the Effects of Reducing Television Viewing and Computer Use on Body Mass Index in Young Children. *Arch Pediatr Adolesc Med*, 162(3), 239-245.
- Epstein, L., Valoski, A., Wing, R., & McCurley, J. (1990). Ten-year follow-up of behavior, family based treatment of obese children. *JAMA*, 264, 2519-2523.
- Faith, M. S., Scanlon, K. S., Birch, L. L., Francis, L. A., & Sherry, B. (2004). Parent-child feeding strategies and their relationships to child eating and weight status. *Obesity Research*, 12, 1711-1722.
- Faith, M. S., Tepper, B. J., Hoffman, D. J., & Pietrobelli, A. (2002). Genetic and environmental influences on childhood obesity. *Clinical Family Practices*, 4, 277-294.
- Farrow, C., & Blissett, J. (2006). Breast-feeding, maternal feeding practices and mealtime negativity at one year. *Appetite*, 46, 49-56.
- Farver, J., & Lee-Shin, Y. (2000). Acculturation and Korean-American Children's Social and Play Behavior. *Social Development*, 9(3), 316-336.
- Fernandez, M., & William, L. (1986). Asian Indians in the United States: Economic, Educational and family profile from the 1980 census. In R. H. Brown & G. V. Coelho (Eds.),

- Tradition and transformation: Asian Indians in America* (pp. 149-180). Williamsburg, VA: College of William and Mary.
- Finkelstein, E. A., Fiebelkorn, I. C., & Wang, G. (2003). National medical spending attributable to overweight and obesity: How much, and who's paying? *Health Affairs*, W3, 219–226.
- Fishbein, M., & Cappella, J. N. (2006). The role of theory in developing effective health communications. *Journal of Communication*, 56, S1–S17.
- Fisher, J. O., & Birch, L. L. (1996). Maternal restriction of young girls' food access is related to intake of those foods in an unrestricted setting. *FASEB J*, 10, A225.
- Fisher, J. O., & Birch, L. L. (1999a). Restricting access to foods and children's eating. *Appetite*, 32, 405-419.
- Fisher, J. O., & Birch, L. L. (1999b). Restricting access to palatable foods affects children's behavioral response, food selection, and intake. *American Journal of Clinical Nutrition*, 69, 1264–1272.
- Fisher, J. O., & Birch, L. L. (2000). Parents' restrictive feeding practices are associated with young girls' negative self-evaluation of eating. *J Am Diet Assoc*, 100, 1341-1346.
- Fisher, J. O., Mitchell, D. C., Smiciklas-Wright, H., & Birch, L. L. (2002). Parental influences on young girls' fruit and vegetable, micronutrient, and fat intakes. *J Am Diet Assoc*, 102, 58-64.
- Fontaine, K. R., Redden, D. T., Wang, C., Westfall, A. O., & Allison, D. B. (2003). Years of life lost due to obesity. *JAMA*, 289, 187-193.
- Francis, L. A., & Birch, L. L. (2006). Does Eating during Television Viewing Affect Preschool Children's Intake. *Journal of American Dietetic Association*, 106, 598-600.
- Francis, L. A., Lee, Y., & Birch, L. L. (2003). Parental weight status and girls' television viewing, snacking and body mass indexes. *Obes Res*, 11, 143-151.
- Frisbie, W. P., & Cho, Y., (2001). Hummer, R. A. Immigration and the health of Asian and Pacific Islander adults in the U.S. *Am J Epidemiol*, 153(4), 372–380.
- Gable, S., & Lutz, S. (2000). Household, parent and child contributions to childhood obesity. *Family Relations*, 49, 293-300.
- Galloway, A. T., Fiorito, L. M., Francis, L. A., & Birch, L. L. (2006). 'Finish your soup': counterproductive effects of pressuring children to eat on intake and affect. *Appetite*, 46(3), 318–323.
- Gibson, E. L., Wardle, J., & Watts, C. J. (1999). Fruit and vegetable consumption, nutritional knowledge and beliefs in mothers and children. *Appetite*, 31, 205-228.

- Gillespie, A. H., & Achterberg, C. L. (1989). Comparison of family interaction patterns related to food and nutrition. *J Am Diet Assoc*, 89, 509-512.
- Gillman, M. W., Rifas-Shiman, S. L., & Frazier, A. L. (2000). Family dinner and diet quality among older children and adolescents. *Arch Family Med*, 9, 235-240.
- Golan, M., & Crow, S. (2004). Targeting parents exclusively in the treatment of childhood obesity: long term results. *Obes Res*, 12, 357-361.
- Golan, M., & Weizman, A. (2001). Familial approach to the treatment of childhood obesity: conceptual model. *J Nutr Educ*, 33(2), 102–107.
- Golan, M., Weizman, A., Apter, A., & Fainaru, M. (1998). Parents as the exclusive agents of change in the treatment of childhood obesity. *Am J Clin Nutr*, 67, 1130-1135.
- Gordon-Larson, P., Harris, K. M., Ward, D. S., & Popkin, B. M. (2003). Acculturation and overweight-related behaviors among Hispanic immigrants to the US: the National Longitudinal Study of Adolescent Health. *Soc Sci Med*, 57, 2023–2034.
- Gupta, S. P. (1976). Changes in food habits of Asian Indians in the US: a case study. *Sociology and Social Research*, 60, 87-99.
- Hackett, L., & Hackett, R. J. (1994). Child-rearing practices and psychiatric disorders in Gujarati and British children, *British Journal of Social Work*, 24, 191-202.
- Hall, A., & Brown, L. B. (1982). A comparison of the attitudes of young anorexia nervosa patients and non patients with those of their mothers. *British Journal of Psychology*, 56, 39–48.
- Hardeman, W., Johnston, M., Johnston, D.W., Bonetti, B., Wareham, N.J. and Kinmonth, A.L. (2002) Application of the Theory of Planned Behaviour in behaviour change interventions: a systematic review. *Psychology and Health*, 17, 123–158.
- Harper, L. V., & Sanders, K. M. (1975). The effects of adults' eating on young children's acceptance of unfamiliar foods. *J Exp Child Psychol*, 20, 206-214.
- Hart, K. H., Herriot, A., Bishop, J. A, & Truby, H. (2003). Promoting healthy diet and exercise patterns amongst primary school children: a qualitative investigation of parental perspectives. *Journal of Human Nutrition Diet*, 16(2), 89-96.
- Helwig, A. W., & Helwig, U. M. (1980). *An immigrant success story: East Indians in America*. Philadelphia: University of Philadelphia press.
- Hendy, H. M., & Raudenbush, B. (2000). Effectiveness of teacher modeling to encourage food acceptance in preschool children. *Appetite*, 34, 61-76.

- Heptinstall, E., Puckering, C., Skuse, D., Start, K., Zur-Szpiro, S., & Dowdney, L. (1987). Nutrition and mealtime behavior in families of growth-retarded children. *Human Nutrition and Applied Nutrition*, 41, 309-402.
- Hertzler, A. A. (1983). Children's food patterns--a review. II. Family and group behavior. *J Am Diet Assoc*, 83, 555-560.
- Hill, J. O., & Peters, J. C. (1998). Environmental contributions to the obesity epidemic. *Science*, 280, 1371-1374.
- Hinton, L. K. (2008). *A cross cultural examination of parenting styles and feeding practices*. (Doctoral dissertation). University of Texas Southwestern Medical Center, Texas.
- Huang, T., & Horlick, M. (2007). Trends in childhood obesity research: A brief analysis of NIH supported efforts. *Journal of Law, Medicine and Ethics*, 35, 148-153.
- Hughes, S., Anderson, C., Power, T., Micheli, N., Jaramillo, S., & Nicklas, T. (2006). Measuring feeding in low-income African-American and Hispanic parents. *Appetite*, 46, 215-223.
- Hughes, S., Power, T., Fisher, J., Mueller, S., & Nicklas, T. (2005). Revisiting a neglected construct: parenting styles in a child-feeding context. *Appetite*, 44, 83-92.
- Iannotti, R. J., O'Brien, R. W., & Spillman, D. M. (1994). Parental and peer influences on food consumption of preschool African-American children. *Perceptual and Motor Skills*, 79(2), 747-752.
- Inman, A., G, Constantine, M.,G., & Ladany N. (1999). Cultural value conflict: An examination of Asian Indian women's bicultural experience. In D.S. Sandhu (Ed.). *Asian and Pacific Islander Americans: Issues and concerns for counseling and psychotherapy* (pp. 31-41). Commack, NY: Nova Science Publishers.
- Jain, A., Sherman, S. N., Chamberlin, L. A., & Whitaker, R. C. (2004). Mothers misunderstand questions on a feeding questionnaire. *Appetite*, 42(3), 249-254.
- Jain, A., Sherman, S., Chamberlain, L., Carter, Y., Powers, S., & Whitaker, R. (2001). Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics*, 107, 1138-46.
- Jambunathan, S., & Counselman, K. P. (2002). Parenting attitudes of Asian Indian mothers living in the United States and India. *Early Child Development and Care*, 172, 657-662.
- Jemmott, L. S., Catan, V., Nyamathi, A. M., & Anastasia, J. (1995). African American and HIV-risk reduction issues. In A. O'Learn & L. S. Jemmott (Eds.), *Women at risk: Issues in the primary prevention of AIDS* (pp. 131-157). New York: Plenum Press.
- Jha, P., Enas, E., & Yusuf, S. (1993). Coronary artery disease in Asian Indians: prevalence and risk factors. *Asian Am Pac Isl J Health*, 1, 163-175.

- Johnson, S. L., & Birch LL. (1994). Parents' and children's adiposity and eating style. *Pediatrics*, 94, 653-661.
- Johnson, S., & Birch, L. (1993). Parenting style and regulation of food intake in children. *Abstracts of the biennial meeting for the society for research in children development*. Chicago, IL: University of Chicago Press.
- Jonnalagadda, S. S., & Diwan, S. (2002). Nutrient intake of first generation Gujarati Asian-Indian immigrants in the U.S. *J Am Coll Nutr*, 21(5), 372-380.
- Jonnalagadda, S. S., Diwan, S., & Cohen, D. L. (2005). U.S. Food Guide Pyramid food group intake by Asian-Indian immigrants in the U.S. *J Nutr Health Aging*, 9(4), 226-231.
- Kaiser, L. L., Martinez, N. A., & Harwood, J. O., & Garcia, L. C. (1999). Child feeding strategies in low-income Latin households: focus group observations. *J Am Diet Assoc*, 99, 601-3.
- Kakar, S. (1978). *The inner worlds: A psycho-analytic study of childhood and society in India*. New Delhi: Oxford University Press.
- Karim, N., Bloch, D. S., Falciglia, G., & Murthy, L. (1986). Modification of food consumption patterns reported by people from India living in Cincinnati, Ohio. *Ecol Food Nutr*, 19, 11-18.
- Katzmarzyk, P. T., & Janssen, I. (2004). The economic costs associated with physical inactivity and obesity in Canada: An update. *Can J Appl Physiol*, 29, 90-115.
- Khairullah, D. Z., & Khairullah, Z. Y. (1999). Behavioural Acculturation and Demographic Characteristics of Asian-Indian Immigrants in the United States of America. *International Journal of Sociology and Social Policy*, 19, 57-80.
- Khatri, A. A. (1975). The adaptive extended family in India today. *The Journal of marriage and family*, 37(3), 633-643.
- Kim, E. J., Kim, K. S., Lee, T. H., & Kim, D. Y. (1976). The incidence of diabetes mellitus in urban and rural populations in Korea. In S. Baba, Y. Goto & I. Fukui (Eds.), *Diabetes mellitus in Asia. Ecological aspects of epidemiology, complications and treatment* (pp. 41-44). Amsterdam, The Netherlands: Excerpta Medica.
- Kitano, H. L., & Daniels, R. (1995). *Asian Americans: Emerging minorities*. Englewood Cliffs, NJ: Prentice Hall.
- Klesges, R. C., Stein, R. J., Eck, L.H., Isbell, T.R., & Klesges, L. M. (1991). Parental influence on food selection in young children and its relationships to childhood obesity. *Am J Clin Nutr*, 53, 859-864.
- Kreuter, M. W., & Haughton, L. T. (2006). Integrating culture into health information for African American women. *American Behavioral Scientist*, 49, 794-811.

- Kuczmarski, R. J., Ogden, C.L., Guo, S. S. et al. (2002). 2000 CDC growth charts for United States: methods and development. *Vital Health Stat 11*, 246, 1-190.
- Kurian, G., & Ghosh, R. (1983). Child rearing in transition in Indian immigrant families in Canada. In G. Kurian & R. P. Srivastava (Eds.), *Overseas Indians: A study in adaptation* (pp. 128-140). New Delhi, India: Vikas.
- Landman, J., & Cruickshank, J. K. (2001). A review of ethnicity, health and nutrition-related diseases in relation to migration in the United Kingdom. *Public Health Nutr*, 4, 647-57.
- Larson, N. I., Neumark-Sztainer, D., Hannan P.J., & Story, M. (2007). Family Meals during Adolescence Are Associated with Higher Diet Quality and Healthful Meal Patterns during Young Adulthood. *Journal of the American Dietetic Association*, 107, 9, 1502-1510.
- Lauderdale, D. S., & Rathouz, P. J. (2000). Body mass index in a US national sample of Asian Americans: effects of nativity, years since immigration and socioeconomic status. *Int J Obes Relat Metab Disord*, 24, 1188-1194.
- Leonard-Spark, P. J. & Saran, P. (1980). The Indian immigrant in America. A demographic profile. In E. James & P. Saran (Eds.), *The new ethnics: Asian Indians in the U.S.* (pp. 136-162). New York, NY: Praeger.
- Lin, C-Y. C., & Fu, V. R. (1990). A comparison of childrearing practices among Chinese, immigrant Chinese and Caucasian American parents. *Child Development*, 61, 429-433.
- Lindsay, A. C., Sussner, K. M., Kim, J., & Gortmaker, S. (2006). The role of parents in preventing childhood obesity. *Future Child*, 16, 169-186.
- Lindsay, A. C., Sussner, K.M., Greaney, M., Wang, M.L., Davis, R., & Peterson, K.E. (2011). Using Qualitative Methods to Design a Culturally Appropriate Child Feeding Questionnaire for Low-Income, Latina Mothers. *Matern Child Health*, 16(4), 860-6.
- Logue, A. W., Logue, C. M., Uzzo, R. G., McCarty, M. J., & Smith, M. E. (1988). Food Preferences in Families. *Appetite*, 10, 169-80.
- Londhe, R. (2006). *Decisions about child rearing practices: A study of Asian Indian parents in the U.S.* (Doctoral Dissertation). Retrieved from <http://digitalcommons.uconn.edu/dissertations/AAI3217038>. (AAI3217038).
- Loudon, D. L., & Della Bitta, A. J. (1993). *Consumer Behavior: Concepts and Applications*. New York: McGraw-Hill.
- Maccoby, E., & Martin, J. (1983). Socialization in the context of the family: parent child interaction. In P.H. Mussen (Eds.), *Handbook of child psychology* (pp. 1-10). New York, NY: Wiley.

- Mamun, A. A., Lawlor, D.A., O'Callaghan, M.J., Williams, G. M, & Najman, J. M. (2005). Positive Maternal Attitude to the Family Eating Together Decreases the Risk of Adolescent Overweight. *Obesity Research*, 13(8), 1422-1430.
- Manson, J. E., & Bassuk, S. S. (2003). Obesity in the United States. A fresh look at its high toll. *JAMA*, 289, 229-30.
- Marquis, M., & Shatenstein, B. (2005). Food choice motives and the importance of family meals among immigrant mothers. *Can J Diet Practice Res*, 66, 77-82.
- Matheson, D. M., Killen, J. D., Wang, Y., Varady, A., & Robinson, T. N. (2004). Children's food consumption during television viewing. *American Journal of Clinical Nutrition*, 79(6), 1088-1094.
- Mathison, S. (1988). Why triangulate? *Educational Researcher*, 17(2), 13-17.
- May, A. L., Donohue, M., Scanlon, K. S., Herry, B., Dalenius, K., Faulkner, P., & Birch, L. L. (2007). Child-feeding strategies are associated with maternal concern about children becoming overweight, but not children's weight status. *J Am Diet Assoc*, 107, 1167-1174.
- McCourt, J., & Waller, G. (1995). Developmental role of perceived parental control in the eating psychopathology of Asian and Caucasian schoolgirls. *International Journal of Eating Disorders*, 17, 277-282.
- McGarvey, E., Keller, A., Forrester, M., Williams, E., Seward, D., & Suttle, D. E. (2004) Feasibility and Benefits of a Parent-Focused Preschool Child Obesity Intervention. *American Journal of Public Health*, 94 (9), 1490-1495.
- McKeigue, P. M., Miller, G. J., & Marmot, M. G. (1989). Coronary heart disease in South Asians overseas - a review. *J Clin Epidemiol*, 42, 597-609.
- McKeigue, P. M., Shah, B., & Marmot, M. G. (1991). Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *Lancet*, 337, 382 -386.
- McLaughlin, G. H. (1969). SMOG grading: a new readability formula. *Journal of Reading*, 12:639-646.
- Mehta, R., & Belk, R. W. (1991). Artifacts, identity and transition: Favorite possessions of Indians and Indian immigrants to the United States. *Journal of Consumer Research*, 17, 398-411.
- Middelkoop, B. J., Kesarlal-Sadhoeram, S. M., Ramsaransing, G. N., & Struben, H. W. (1999). Diabetes mellitus among South Asian inhabitants of The Hague: High prevalence and an age-specific socioeconomic gradient. *Int J Epidemiol*, 28, 1119-23.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage publication.

- Min, P. G. (1995). *Asian Americans: Contemporary trends and issues*. Thousand Oaks, CA: Sage Publications.
- Misra, A. (2003). Revisions of cutoffs of body mass index to define overweight and obesity are needed for the Asian-ethnic groups. *International Journal of Obesity*, 27, 1294–1296.
- Moens, E., Braet, C., & Soetens, B. (2007). Observation of family functioning at mealtime: a comparison between families of children with and without overweight. *Journal of Pediatric Psychology*, 32(1), 52-63.
- Mulatti, L. (1995). Families in India: Beliefs and realities. *Journal of Comparative Family Studies*, Special Issue: *Families in Asia: Beliefs and Realities*, 26, 11–25.
- Must, A., & Strauss, R. S. (1999). Risks and consequences of childhood and adolescent obesity. *Int J Obes Relat Metab Disord*, 23, S2-S11.
- Myrick, R. (1998). In search of cultural sensitivity and inclusiveness: Communication strategies used in rural HIV prevention campaigns designed for African Americans. *Health Communication*, 10, 65–85.
- Negy, C., & Woods, D. J. (1992). The importance of acculturation in understanding research with Hispanic Americans. *Hisp J of Behav Sci*, 14(2), 224-247.
- Neumark-Stzainer, D., Hannan, P. J., Story, M., Croll, J., & Perry, C. (2003). Family meal patterns: associations with sociodemographic characteristics and improved dietary intake among adolescents. *J Am Diet Assoc*, 103, 317-322.
- Neumark-Sztainer, D. (2006). Eating Among Teens: Do Family Mealtimes Make a Difference for Adolescents' Nutrition? *New Directions for Child and Adolescent Development*, 111, 91-105.
- Neumark-Sztainer, D., Larson, N. I., Fulkerson, J. A., Eisenberg, M. E., & Story, M. (2010). Family meals and adolescents: what have we learned from Project EAT (Eating Among Teens)? *Public Health Nutrition*, 13, 1113-1121.
- Neumark-Sztainer, D., Story, M., Perry, C., & Casey, M. (1999). Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. *J Am Diet Assoc*, 99, 929-934.
- Newman, J., & Taylor, A. (1992). Effect of a means-end contingency on young children's food preferences. *J Exp Child Psychol*, 53, 200-216.
- Noar, S.M., & Zimmerman, R.S. (2005). Health behavior theory and cumulative knowledge regarding health behaviors: Are we moving in the right direction? *Health Education Research*, 20, 275–290.

- O'Dea, J. A. (2003). Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents. *J Am Diet Assoc*, 103, 497-510.
- O'Hare, W. P., & Felt, J. C. (1991). *Asian Americans: America's fastest growing minority group*. Washington, D.C.: Population Reference Bureau.
- Ogden, C. L., Carroll, M. D., & Flegal, K. M. (2008). High Body Mass Index for Age Among US Children and Adolescents, 2003–2006. *JAMA*, 299, 2401–2405.
- Ogden, C. L., Carroll, M. D., Curtin, L. R., Lamb, M. M., & Flegal, K. M. (2010). Prevalence of High Body Mass Index in US Children and Adolescents, 2007–2008. *JAMA*, 303, 242–249.
- Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA*, 295, 1549-1555.
- Ogden, J., Reynolds, R., & Smith, A. (2006). Expanding the concept of parental control: a role for overt and covert control in children's snacking behaviour? *Appetite*, 47(1), 100-106.
- Omar, M. A., Coleman, G., & Hoerr, S. (2001). Healthy Eating for Rural Low-Income Toddlers: Caregivers' Perceptions. *Journal of Community Health Nursing*, 18(2), 93-106(114).
- Pan, Y. L., Dixon, Z., Himburg, S., & Huffman, F. (1999). Asian students' change their eating patterns after living in the United States. *J Am Diet Assoc*, 99, 54-57.
- Patel, N., Power, T., & Bhavnagri, N. (1996). Socialization values and practices of Indian immigrant parents: correlates of modernity and acculturation. *Child Development*, 67, 302-313.
- Patel, S., Unwin, N., Bhopal, R., et al. (1999). A comparison of proxy measures of abdominal obesity in Chinese, European, and South Asian adults. *Diabet Med*, 16, 853–860.
- Patrick, H., & Nicklas, T. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of American College of Nutrition*, 24 (2), 83-92.
- Patrick, H., Nicklas, T., Hughes, S., & Morales, M. (2005). The benefits of authoritative feeding style: caregiver feeding styles and children's food consumption patterns. *Appetite*, 44, 243-249.
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Perry, M. A., & Furukawa, M. J. (1980). Modeling methods. In F. Kanfer & A. Goldstein (Ed.), *Helping people change: A textbook of methods* (pp. 131-171). New York, NY: Pergamon Press.

- Pike, K. M., & Rodin, J. (1991). Mothers, daughters, and disordered eating. *J Abnorm Psychol*, 100, 198-204.
- Pliner, P. (1992). The effects of mere exposure on liking for edible substances. *Appetite*, 3, 283–290.
- Pliner, P., & Pelchat, M. (1991). Neophobia in humans and the special status of foods of animal origin. *Appetite*, 16, 205–218.
- Pliner, P., & Pelchat, M. L. (1986). Similarities in food preferences between children and their siblings and parents. *Appetite*, 7(4), 333-42.
- Popkin, B., & Udry, R. (1998). Adolescent obesity increases significantly in the second and third generation U.S. immigrants: The National Longitudinal Study of Adolescent Health. *The Journal of Nutrition*, 128, 701-706.
- Prochaska, J. O., Redding, C. A., & Evers, K. E. (1997). The transtheoretical model and stages of change. In K. Glanz, R. M. Lewis & B. K. Rimer (Ed.), *Health Behavior and Health Education: Theory, Research and Practice* (pp. 60-84). San Francisco, CA: Jossey-Bass.
- Raj, S. (1999). Dietary habits of Asian Indians in relation to length of residence in the United States. *J Am Diet Assoc*, 99(9), 1106-1108.
- Ramachandran, A., Dharmaraj, D., Snehlatha, C., & Viswanathan, M. Prevalence of glucose intolerance in Asian-Indians: urban-rural difference and significance of upper body adiposity. *Diabetes Care*, 15, 1348-55.
- Ranganath, V. M., & Ranganath, V. K. (1997). Asian Indian children. In G. Johnson- Powell & Y. Yamamoto (Ed.), *Transcultural Child Development* (pp. 103–125). New York, NY: Wiley.
- Rao, N., McHale, J. P., & Pearson, E. (2003). Links between socialization goals and child rearing practices in Chinese and Indian mothers. *Infant and Child Development*, 12, 475-492.
- Reilly, J., Methven, E., McDowell, Z., Hacking, B., Alexander, D., Stewart, L., & Kelnar, C. (2003). Health consequences of obesity. *Arch Dis Child*, 88(9), 748–752.
- Reimer, K., Smith, C., Reicks, M., Henry, H., Thomas, R., & Atwell, J. (2003). Child feeding strategies of African American women according to stage of change for fruit and vegetable consumption. *Public Health Nutrition*, 7(4), 505-512.
- Reinaerts, E., de Nooijer, J., Candel, M., & de Vries, N. (2007). Explaining school children's fruit and vegetable consumption: The contributions of availability, accessibility, exposure, parental consumption and habit in addition to psychosocial factors. *Appetite*, 48, 248-58.

- Reynolds, K., Hinton, A. W., Shewchuk, R., & Hickey, C. A. (1999). Social cognitive model of fruit and vegetable consumption in elementary school children. *Journal of Nutrition Education*, 31, 23-30.
- Rhee, K. (2008). Childhood overweight and relationship between parent behaviors, parenting styles, and family functioning. *The ANNALS of the American Academy of Political and Social Sciences*, 615(11), 12-37.
- Ritchie, L., Welk, G., Styne, D., Gerstein, D., & Crawford, P. (2005). Family environment and pediatric overweight: What is a parent to do? *Journal of the American Dietetic Association*, 105(5), 70-79.
- Robert, S. (2008, August 13). In a Generation, Minorities May Be the U.S. Majority. The New York Times. Retrieved from <http://www.nytimes.com/2008/08/14/washington/14census.html>
- Robinson, T. N., & Killen, J. (2001). Obesity prevention for children and adolescents. In J. Thompson & L. Smolak (Ed.), *Body image, eating disorders and obesity in youth: assessment, prevention and treatment*. Washington, DC: American Psychological Association.
- Robinson, T. N., Kiernan, M., Matheson, D. M., & Haydel, F. K. (2001). Is Parental Control over Children's Eating Associated with Childhood Obesity? Results from a Population-Based Sample of Third Graders. *Obesity Research*, 9, 306-312.
- Rosenthal, T., & Bandura, A. (1979). Psychological modeling: theory and practice. In S. Garfield & A. Bergen (Ed.), *Handbook of Psychotherapy and behavior change* (pp. 621-658). New York, NY: Wiley.
- Ross, A. D. (1967). *The Hindu family in the urban setting*. Toronto: The University of Toronto Press.
- Rothman, A.J. (2004). Is there nothing more practical than a good theory? Why innovations and advances in health behavior change will arise if interventions are more theory-friendly. *International Journal of Behavioral Nutrition and Physical Activity*, 1, 11.
- Rutter, D. (2000) Attendance and reattendance for breast cancer screening: a prospective 3-year test of the Theory of Planned Behaviour. *British Journal of Health Psychology*, 5, 1-13.
- Sam, D. L., Berry, J. W. (1995). Acculturative stress among young immigrants in Norway. *Scand J Psychol*, 36(1), 10-24.
- Saran, P. (1985). *The Asian Indian experience in the United States*. Cambridge, MA: Schenkman Press.
- Satia, J. A., Patterson, R. E., Kristal, A. R., Hislop, T. G., Yasui, Y., & Taylor, V. M. (2001). Development of dietary acculturation scales among Chinese Americans and Chinese Canadians. *J Am Diet Assoc*, 101, 548-553.

- Satia-Abouta J. Dietary acculturation: Definition, process, assessment, and implications. *International Journal of Human Ecology*. 2003;4(1):71- 86.
- Satter, E. M. (1987). *How to Get Your Kid to Eat. But Not Too Much*. Palo Alto, CA: Bull Publishing.
- Satter, E.M. (1986). The feeding relationship. *J Am Diet Assoc*, 86, 352-356.
- Seagren, J., & Terry, K. (1991). WIC females' parents' behavior and attitudes towards their children's food intake – relationship to their children's relative weight. *J. Nutr. Educ*, 23, 223-30.
- Segal, U. (1991). Cultural variables in Asian Indian families. *Families in Society*, 72, 233–241.
- Sharma, M. (2006). Developing effective health education interventions for preventing obesity in South Asian Americans. *California Journal of Health Promotion*, 4 (1), 119-128.
- Sherry, B., McDivitt, J., Birch, L. L., Cook, F. H., Sanders, S., Prish, J. L., Francis, L. A., & Scalon, K.S. (2004). Attitudes, practices, and concerns about child feeding and child weight status among socioeconomically diverse White, Hispanic, and African-American Mothers. *J Am. Diet. Assoc*, 104, 215-221.
- Sheth, M. (1995). Asian Indian Americans. In P. Gap Min (Ed.), *Asian Americans: Contemporary trends and issues* (pp. 169-198). Thousand Oaks, CA: Sage.
- Singh, R. B., Tomlinson, B., Thomas, G. N., & Sharma, R. (2001). Coronary artery disease and coronary risk factors: The South Asian paradox. *Journal of Nutritional and Environmental Medicine*, 11, 43-51.
- Sodowsky, G. & Lai, E. (1997). Asian immigrant variables and structural models of cross cultural distress. In A. Booth, A. C. Crouter, N. Landale, (Eds.), *Immigration and the family: Research and policy on U.S. immigrants* (pp. 211-234). Mahwah, NJ: Erlbaum.
- Solomon, M. R. (1994). *Consumer behaviour. Buying, having and being*. (2nd ed.). Boston: Allyn & Bacon.
- Spruijt-Metz, D., Lindquist, C. H., Birch, L. L., Fisher, J. O., & Goran, M. I. (2002) Relation between mothers' child-feeding practices and children's adiposity. *Am J Clin Nutr*, 75, 581–586.
- Srivastava, R. (2002). South Asia's governments exhorted to focus on CVD. *Lancet*, 359, 858.
- Stanek, K., Abbott, D., & Cramer, S. (1990). Diet quality and the eating environment of preschool children, *Journal of the American Dietetic Association*, 90(11), 1582–1584.
- Steinberg, L., Dornbusch, S., & Brown, B. B. (1992). Ethnic differences in adolescent achievement: An ecological perspective. *American Psychologist*, 47:723–729.

- Suinn, R. M., Rikard-Figueroa, K., Lew, S., & Vigil, P. (1987). The Suinn-Lew Asian Self-Identity Acculturation Scale: An initial report. *Educational and Psychological Measurement*, 47, 401–407.
- Taras, H. L., Sallis, J. f., Patterson, T. L., Nader, P. H., & Nelson, J. A. (1989). Television's influence on children's diet and physical activity. *J. Diet. Behav. Pediatr*, 10, 176-180.
- Temple, J. L., Giacomelli, A. M., Kent, K. M., Roemmich, J. N., & Epstein, L. H. (2007). Television watching increases motivated responding for food and energy intake in children. *American Journal of Clinical Nutrition*, 85(2), 355-361.
- Thorpe, L. E., List, D. G., Marx, T., May, L., Helgerson, S. D., & Frieden, T. R. (2004). Childhood Obesity in New York City Elementary School Students. *American Journal of Public Health*, 94(9), 1496-1500.
- Tibbs, T., Haire-Joshu, D. et al. (1990). The relationship between parental modeling, eating patterns, and dietary intake among African-American parents. *J Am Diet Assoc*, 101, 535-541.
- Tremblay, M. S., Inman, J. W., & Willms, J. D. (2000). Relationships between physical activity, self esteem, and academic achievements in ten- and eleven-year-old children. *Pediatr Exer Sci*, 11, 312-23.
- Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross cultural perspectives on self-group relationships. *Journal of Personality and Social Psychology*, 54, 323–338.
- U.S. Bureau of Census. (2012). The Asian population: 2010. Retrieved from <http://www.census.gov/prod/cen2010/briefs/c2010br-11.pdf>.
- U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (November 2010). *Healthy People 2020: Improving the Health of Americans*. Retrieved from <http://www.healthypeople.gov/>
- U.S. Department of Health and Human Services. (2010). *The Surgeon General's Vision for a Healthy and Fit Nation*. Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General.
- Uba, L. (1994). *Asian Americans: Personality patterns, identity, and mental health*. New York: Guilford Press.
- United States Department of Agriculture. (2008). *Maximizing the message: Helping moms and kids make healthier food choices*. Retrieved from <http://www.fns.usda.gov/fns/corenutritionmessages/Files/Guidebook.pdf>
- Ventura, A. K., Gromis, J. C., & Lohse, B. (2010). Feeding practices and styles used by a diverse sample of low-income parents of preschool-age children. *J Nutr Educ*, 42(4), 242-249.

- Ventura, A., & Birch, L. (2008). Does parenting affect children's eating and weight status? *International Journal of Behavioral Nutrition and Physical Activity*, 5(15), 1-12.
- Videon, T. M., & Manning, C. K. (2003). Influences on adolescent eating patterns: the importance of family meals. *J Adolesc Health*, 32, 365-373.
- Wahlqvist, M. L. (2002). Asian migration to Australia: food and health consequences. *Asia Pacific J Clin Nutr*, 11: S562-S568.
- Wakil, S., Siddique, C., & Wakil, F. (1981). Between two cultures: A study in the socialization of children of immigrants. *Journal of Marriage and the Family*, 43, 929-940.
- Wardle, J., Herrera, M. L., Cooke, L., & Gibson, E. L. (2003). Modifying children's food preferences: The effects of exposure and reward on acceptance of an unfamiliar vegetable. *Eur J Clin Nutr*, 57, 341-48.
- Wee, C. C. (2004). Obesity among U.S. immigrant subgroups by duration of residence. *JAMA*, 292, 2860-2867.
- Whitaker, R. C., Wright, J. A., Pepe, M. S., Seidel, K. D. & Dietz, W. H. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *N Engl J Med*, 337(13), 869-873.
- White, A.H., Wilson, J. F., Burns, A., Blum-Kemelor, D., Singh A., Race, P. O., Soto, V., & Lockett, L. F. (2011). Use of Qualitative Research to Inform Development of Nutrition Messages for Low-income Mothers of Preschool Children. *Journal of Nutrition Education and Behavior*, 43, 19-27.
- Wiecha J. L., Peterson, K. E, Ludwig, D. S., Kim, J. K., Sobol, A. & Gortmaker, S. L. (2006). When children eat what they watch: Impact of television viewing on dietary intake in youth. *Arch Pediatr Adolesc*, 160, 436-442.
- Williams, R. (1988). *Religions of immigrants from Indian and Pakistan*. NY: Cambridge University Press.
- Witte, K., Meyer, G., & Martell, D. (2001). *Effective health risk messages: A step-by-step guide*. Thousand Oaks, CA: Sage.
- Woodward, D. R., Cumming, F. J., Ball, P. J., Williams, C., Hornsby, H., & Boon, J. A. (1997). Does television affect teenagers' food choices? *Journal of Human Nutrition and Dietetics*, 10, 229-35.
- Yunus, S. M. (2005). Child care practices in three Asian countries. *International Journal of early childhood*, 37 (1), 39-55.