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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

OBESITY RISK KNOWLEDGE, SELF-EFFICACY AND PHYSICAL ACTIVITY IN
FAMILIES OF ADOLESCENTS

by

Elaine M. Rutkowski, MSN, RN, CNS

A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

In partial fulfillment of the
requirements for the degree
DOCTOR OF PHILOSOPHY IN NURSING

April, 2008

Dissertation Committee

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Leonard D. Wiersma, D.P.E.

There were no significant relationships found between parental obesity risk knowledge and physical activity in their children, nor between parent's self efficacy and their children's physical activity. In addition there was no significant relationship between the adolescents' obesity risk knowledge and their physical activity. There was, however, a statistically significant relationship between adolescent's self efficacy and physical activity. The result of the correlation between parent's self-efficacy and their level of physical activity was not significant but approached significance ($p = .07$) and may be identified as a trend. There was a statistically significant negative correlation between parents who describe their physical activity as "vigorous" and adolescent physical activity level. There was also a statistically significant negative correlation between parents' obesity risk knowledge and "sitting time" for parents. The results of the focus group yielded results that identified a need for researchers to engage in the development of a tool to assess obesity risk knowledge in American adolescents.

A better understanding of the combination and relationships of these factors will assist nurses in examining the level of knowledge that families have regarding obesity and, in turn, assist nurses in the development of strategies to counteract this epidemic. Findings from this study will add to the body of knowledge available to assist nurses in assessing families concerned with obesity, as well as, to assist those nurses who are developing and evaluating interventions specifically in the area of childhood obesity.

DEDICATION

I dedicate this dissertation to my husband, David, from whom I received unwavering support and love during this long journey. Without your constant affection, many days would have been much more complicated and much less productive.

I also dedicate this dissertation to my children, Rachael Diane and Ryan David, from whom I received unconditional understanding and many wonderful moments of laughter. My family is my rock. I love you so much.

And to Cheryl...your courage inspired me every day...

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I also need to thank Dr. Cindy Greenberg, Dr. Paula Herberg, and Dr. Roberta Rikli. These women are the role models in my life who made it possible for me to pursue my scholarship while maintaining a career. I would not have been able to juggle the past four years of teaching and learning without the unbelievable generosity of each of you. My family and I are indebted to these members of the California State University, Fullerton, College of Health and Human Development. There are no words to adequately thank Angelina Sawitsky for her diligence in translating the data during my final semester. Finally, to my classmates; we walked through the sunshine and rain together. Godspeed for the rest of your journeys.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Childhood overweight is regarded as the most prevalent nutritional disease among US children and adolescents (Davison & Birch, 2001). Engaging families in lifestyle changes to combat this disease is so challenging that this epidemic has no end in sight (Helms, 2001). Despite comprehensive campaigns geared toward the individual, family and community concerning the risks of obesity, the number of adolescents and adults who meet the criteria for obesity continues to rise.

The issue of weight management and its co-morbid conditions for children and adolescents has been part of the healthcare agenda in the United States since the early 1960's, but the problem has continued to escalate despite ongoing attention and numerous attempts at intervention. To date, there have been no effective measures implemented to reverse this trend. A major concern facing healthcare professionals is the invention of more and more technological devices for entertainment and recreation that encourage sedentary activities in families rather than physical activity. The need to encourage a lifestyle that includes physical activity among families, especially those with adolescent aged children, continues to be an important challenge for nurses and other healthcare professionals.

Background and Significance

The epidemic of obesity, as well as its consequences in children worldwide, is well documented in the literature. It is estimated that at least 155 million children worldwide are overweight or obese (Larson & Story, 2007). The epidemic of obesity is not limited to developed countries but, during the latter part of the 20th century, this issue has become apparent in developing countries as well (Larson & Story, 2007). During the past two decades, a twofold increase has been noted in the rate of obesity among children; today, approximately 25% of children in the United States between the ages of 6 and 17 are overweight or at risk of overweight (Strauss & Pollack, 2001). Heightened rates of overweight are also noted among pre-school-aged children, particularly 4-5 year old girls (Strauss & Pollack, 2001). Additionally, research has highlighted that only 24% of girls between the ages of 12 and 21 participate in physical activity on a regular basis, with 9 and 10 year old girls following the same pattern of inactivity (Levers-Landis, Burant, Drotar, Morgan, Trapl, & Kwoh, 2003). This finding was consistent with that reported in *The Archives of Pediatric and Adolescent Medicine* that noted that children spent 75% of their day in an inactive state, and only 1.4% of their day vigorously active (Strauss, Rodzilsky, Burack, & Colin, 2001).

The single most desirous treatment of obesity is lifestyle management (Hill & Trowbridge, 1998; Swift, Glazebrook, & Macdonald, 2005). Because adolescents live in families, it therefore becomes necessary to evaluate and intervene in lifestyle management with parents as well as with children. In most families the parent is the decision maker concerning the foods that are available and the activities in which members are engaged.

The epidemic of childhood obesity has become a healthcare priority in the United States as a result of the exponential occurrence of type 2 diabetes in children. *Pediatric Annals* (2007) reported that a number of factors have been shown to contribute to the risk of type 2 diabetes. The researchers noted that obesity is unquestionably the most important risk factor for insulin resistance (Newmark & Anhalt, 2007). The American Academy of Pediatrics (2003) issued a policy statement addressing grave concerns regarding the dramatic increase in the prevalence of childhood overweight and its resultant comorbidities which are associated with significant health and financial burdens.

During his tenure as the U.S. Surgeon General, Dr. Richard Carmona addressed the incidence of obesity and its rapid growth, particularly among the nation's youth, as he described obesity as one of the most threatening and fastest growing diseases in America (UCLA Public Health, 2006). He also noted that obesity was quickly overtaking smoking as the leading cause of illness in this age group (University of Pennsylvania, 2004). Currently, 15 percent of the gross national product is spent on healthcare with nine million children already classified as obese, and Dr. Carmona predicts that this cycle will "break the bank" if the cycle is not broken soon (University of Pennsylvania, 2004).

Economist Roland Sturm examined data from Healthcare for Communities and found that obesity is associated with more chronic medical conditions than smoking or problem drinking (Rand Corporation, 2007). Compared with their normal-weight counterparts, obese individuals spend 36 % more on health care services, and 77% more on medications; the comparable numbers for current smokers are 21% and 28%, respectively, and less for problem drinkers (Rand Corporation, 2007).

Additional concerns are voiced by other healthcare professionals. In the year 2000, the percentage of overweight and obese children was 15%. This figure has quadrupled from 1963 to 1970 when the percentage was 4% in children 6 to 11 years old and 5% in adolescents 12 to 19 years old (Holcomb, 2004).

There is a pessimistic outlook among current researchers regarding the ability of our children to reverse this trajectory toward overweight and obesity (Hill & Trowbridge, 1998). The projected lack of disruption in the current trend of weight gain in children and adolescents will result in 70% being classified as obese in the year 2100 (Jakicic, personal communication, March 3, 2007). The cycle of poor eating patterns and sedentary lifestyle will not be broken unless families are aware of the consequences and risks associated with being obese and also have the ability to implement a healthy lifestyle.

It has been suggested that the chance of being overweight or obese in children persisting into adulthood is 20% at 4 years old and 70% to 80% if the child is still obese or overweight into adolescence (Holcomb, 2004). Obesity is one of the most difficult topics to discuss with children as many youth seem to have no notion that their weight is not “normal”. One contributor may be parental perspectives, in that some mothers employ euphemisms such as “thick” or “big boned” or being “large framed” to describe children who reflect growth patterns that quantify as overweight (Jain, Sherman, Chamberlin, Carter, Powers, & Whitaker, 2001). The point of reference for children is usually their family members, and this can be a major obstacle in approaching this sensitive issue with children and teens.

In a recently conducted qualitative study, researchers conducting focus groups with mothers' of obese children had difficulty recruiting participants (Styles, Meier, Sutherland, & Campbell, 2007). They described this as due to potential participants failing to recognize their children as overweight or obese. The mothers often would agree that their child may have had a weight issue, but did not see it as a serious problem (Styles et al., 2007). The researchers described one participant's encounter with a pediatrician who told the parent that her child was overweight, but the mother described the child as "very thin" (Styles et al., 2007).

There is the belief among some families that predisposition to weight is inherited, and that there are no mechanisms to alter this pattern (Jain et al., 2001). The American Academy of Pediatrics (2003) notes if one parent is obese, there is a three-fold increase for the child to become obese in adulthood; if both parents are obese, the risk is 10 times or greater. There is only a 10% chance of being obese if neither of the parents are obese (Myers & Vargas, 2000). Before age 3, parental weight is more of a risk factor for developing obesity than the child's actual weight (Myers & Vargas, 2000).

During the past 20 years, obesity among adults has risen significantly in the United States. The latest data from the National Center for Health Statistics show that 30% of U.S. adults 20 years of age and older—over 60 million people—are obese (Center for Disease Control and Prevention, 2005). This increase is not limited to adults. The percentage of young people who are overweight has more than tripled since 1980. Among children and teens aged 6–19 years, 16 % (over 9 million young people) are considered overweight (Center for Disease Control and Prevention, 2005). These increasing rates raise concerns because of their implications for Americans' health. Being

overweight or obese increases the risk of many diseases and health conditions, including the following: type 2 diabetes, hypertension, dyslipidemia (for example, high total cholesterol or high levels of triglycerides), coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, cancer and respiratory problems (Center for Disease Control and Prevention, 2005; Larson & Story, 2007).

Research has demonstrated negative psychosocial outcomes that are correlated to overweight adolescents, especially girls, such as, an increase in high school drop-out rate, and less likely to marry (Bosch, Stradmeijer & Seidell, 2004). Studies evaluating emotional and behavioral functioning have been conducted with chronically ill children and adolescents, as well as, those diagnosed with obesity (Bosch et al., 2004). Based upon the Child Behavior Checklist (CBCL, Achenbach & Edelbrock, 1991) results support prior findings that obese children had more negative social consequences than children with cancer (Bosch et al., 2004). In their recent editorial Natalie Larson and Mary Story (2007) state that adult weight status doesn't tell the whole story of the relationship between their weight and social economic status. They postulated that childhood and adolescent obesity and the stigma associated with it has a strong relationship with reductions in academic achievements and levels of income (Larson & Story, 2007).

Theoretical Frameworks

The conceptual framework for this proposed study is guided by the following theoretical perspectives: Bandura's Social Cognitive Theory; Piaget's Developmental Theory; and Bronfenbrenner's Ecological Systems Theory. A brief description of each of these perspectives will follow.

Social Cognitive Theory (Bandura)

Social Cognitive Theory analyzes developmental changes in perceived self-efficacy in terms of involvement of human agency across the life span (Bandura, 1997). It is an individual's sense of self, or efficacy, that directs their level of involvement with their environment. This ultimate management of the environment affects their developmental pathway (Bandura, 1997).

The Social Learning Theory of Bandura is also known as Self-Efficacy Theory (Bandura, 1994). Bandura's concepts are based upon a person's expectations relative to a specific course of action. It is a predictive theory in the sense that it deals with the belief that one can accomplish a specific behavior (Bastable, 2003). The main thrust of this theory states that people will more often be willing to attempt to make changes in their behaviors if they believe they have the efficacy to accomplish this behavior. Social Learning Theory is comprised of both operant conditional behaviors (reinforcement and punishment) and modeling behaviors (engaging in behavior which was observed) (Bandura, 1977). Children are conditioned to learn behaviors through both experiencing the consequences of their own behavior and through the development of expectations and consequences by observing others incurring the reinforcement/punishment for their behaviors (St. Joer, Perumean-Chaney, Sigman-Grant, Williams, & Foreyt, 2002). This conditioning results in behavioral patterns that are continuously developed and shaped over the course of the child's life. Behavioral modeling is more important during the establishment of new behaviors, while operant conditions become more relevant during the maintenance and shaping of these new behaviors. Children are more likely to learn behavioral patterns from those individuals who control the majority of the rewards and

punishments and establish the social contexts in which behaviors are learned and established (St. Joer et al., 2002) This theory is important to this study as it provides an explanation for current behavior practices and incentive for behavior change.

Developmental Theory (Piaget)

Jean Piaget (1973) developed his theory of children's learning based upon four distinctive stages of cognitive development. These periods are described as follows: 1) sensori-motor activity between 0 -2 years of age; 2) pre-operational activity during ages 2 to 7; 3) concrete operations between 7 to 11 years old; 4) formal operations which occurs from age 11 onward (Piaget, 1973; Sutherland, 1999). This study will focus on the "formal operations" stage, as participants will be at least 12 years of age. During this period of cognitive development the child is able to think logically and abstractly, and is able to reason theoretically (Silverthorn, 1999). Many changes take place in the adolescent's view of the world as a result of this new-found intellect.

It is during this changeable period of cognitive growth and dissonance that many adolescents and their families experience turmoil (Bastable, 2003). Adolescents may be caught in discomfort caused by this shift in thinking. They may encounter situations that identify themselves as children but have expectations to behave as adults. One way adolescents may combat this discomfort is to display risk-taking behaviors particularly in the area of health, often to counteract authority, or return to behaviors that previously brought them comfort (Bastable, 2003). Such behaviors often have a direct effect upon health.

This stage of development has orientation to the present for adolescents. Although they may be fully aware of the risks of certain health conditions, adolescents often choose

to ignore warnings for future complications as this is not in accord with their “present” orientation (Bastable, 2003; Bowden, Dickey, & Greenberg, 1998). During the period of adolescence, the understanding of disease and the ideas of health promotion are able to be assimilated. The adolescent may be able to identify positive health behaviors, but simultaneously reject them out of deference to peer pressure or their lack of orientation to their future health status.

This theory will inform the qualitative and quantitative areas of this study. The social structure portion of this theory provides the framework for explaining that the activity levels of the adolescents and their parents may be unequal due to parent control patterns and adolescent developmental patterns.

Ecological Systems Theory (Bronfenbrenner)

The Ecological Systems Theory (EST) considers the niche or context of experiences to behavior (Bronfenbrenner, 1979; Davison & Birch, 2001). Development occurs as a result of an individual interacting with contexts (ecological niche, i.e. family, school, society) in which he/she is embedded (Bronfenbrenner, 1979). The characteristics (gender and age) of an individual also interact with familial and social characteristics (Davison & Birch, 2001). Ecological Theory is concerned with identifying the conditions for both the individual and the environment which must be present for individual action (Bronfenbrenner, 1979; Grzywacz & Fuqua, 2000). It is important in this study to acknowledge the interactions of the adolescent as influenced mostly by their family’s environment. During this adolescent age, the ability to make determinations regarding changes in the environment is limited. This theory offers explanations to put perspective on this developmentally based dynamic.

Purpose

It is unclear whether parents have adequate knowledge regarding the risks of obesity, awareness of necessary lifestyle changes, or even the desire or capacity to engage in these lifestyle changes as a means of modeling healthy lifestyles for their adolescent-aged children. In some cases it may be the adolescent, not the parent, who has more knowledge of obesity risks and more capacity to role model healthy physical activity levels in the family.

The purpose of this study was to examine the relationships between parent physical activity, parent-adolescent obesity risk knowledge, parent-adolescent self-efficacy, and adolescent physical activity. Based upon a review of the literature parental attitudes and behavior including obesity risk knowledge, self-efficacy, and physical activity may affect adolescent physical activity. Similarly, the adolescent's obesity risk knowledge and self-efficacy may affect their physical activity. Therefore the constructs of adolescent and parental obesity risk knowledge and self efficacy, parent physical activity, and selected adolescent characteristics were examined to determine their relationship with the adolescent's physical activity

Study Aims

1. To examine obesity risk knowledge, self-efficacy, and physical activity among family dyads (adolescents and parents).
2. To describe the relationships between adolescents' obesity risk knowledge, self-efficacy, selected demographic variables (age, gender and race/ethnicity, BMI) and adolescents' physical activity.
3. To describe the relationships among adolescents' physical activity, parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy and selected demographic variables (age, gender and race/ethnicity, BMI)
4. To develop a broader understanding of the meaning of the Obesity Risk Knowledge-10 (ORK) items in this adolescent population.

Research Questions

Question 1a: What is the level of obesity risk knowledge, self-efficacy, and physical activity among family dyads (adolescents and parents)?

Question 1b: Is there a statistically significant difference between the independent variables measured in the adolescent and adult groups?

Question 2: What is the relationship of adolescent obesity risk knowledge, self-efficacy, BMI, age, gender and race/ethnicity with adolescent physical activity?

Question 3: What is the effect of the predictor variables of parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy on adolescent physical activity while controlling for BMI, age, gender and race/ethnicity?

Question 4: How well does the ORK-10 instrument measure obesity risk knowledge in this adolescent population?

Importance of the Study for Nursing

It is important for nurses to study the issues affecting or contributing to obesity in families with adolescents because obesity becomes more difficult to prevent and treat after children enter the teenage years (Robinson, 2004). The problem of obesity will become much more complicated should the future continue to reflect the current trends (Rand Corporation, 2007). Obesity is the most stigmatized disability in the United States (Waters & Baur, 2003). Children and adolescents with this problem are affected psychologically and socially with issues that lead to a decrease in self-esteem (Waters & Baur, 2003). It has been demonstrated that children with a lowered self-esteem are at a greater risk to smoke and drink alcohol (Waters & Baur, 2003). The probability of children who are obese at age 4 being obese as an adult is 20%, and this increases to 70% or higher if obesity continues into the period of adolescence (Holcomb, 2004; Myers & Vargas, 2003). Nurses must focus on children and adolescents and address issues of their health and wellbeing as a means of improving the overall population health and wellbeing (Waters & Baur, 2003).

Additionally, this topic is important for nurses to investigate as adolescent behaviors may be better predictors of disease after age 45 than adult health behaviors, therefore interventions with children and adolescents are vital to avoid future pathology as children age (Sullivan, 2000). The lifespan of the current generation of children is predicted to be less than the current generation of the adult population due to the obesity

issue (Clinton, 2005). This regressive trend has never occurred in the U.S. since it has become an industrialized nation.

Nursing will also be impacted as the rapid growth in the proportion of Americans with clinically severe obesity has enormous implications for the nation's health care system (Rand Corporation, 2007). Severely obese individuals, compared with normal weight people have twice the number of chronic health conditions (Rand Corporation, 2007). The costs associated with this comparison are 69 per cent higher for men and 60 per cent higher for women (Rand Corporation, 2007). With the current nursing shortage, the increasing numbers of potential patients with chronic healthcare needs due to obesity will further burden an over-taxed healthcare delivery system.

The rising costs of obesity will have a direct effect on the disability resources and nursing home occupancy rates in the United States. Lakdawalla and his associates (2007) from the Rand Corporation study have predicted that up to one-fifth of health care monies in America will be spent on treating the consequences of obesity should the rates continue to rise. The majority of the costs would be associated with nursing home occupancy rates and would be borne by the individual patient as the government's ability to supplement Medicare/Medicaid recipients for long-term care will be severely limited by the number of those Americans who are predicted to need this level of care in light of the current obesity trends (Rand Corporation, 2007). The steady increase in the number of obese children every year since 1975 is graphically unquestionable and should give warning that a cohort of Americans with underlying cardiovascular disease is inevitable (Feeg, 2004). The combination of these factors makes a strong case for this study as the results will assist nurses in examining the level of knowledge that families have regarding

obesity and, in turn, assist nurses in the development of strategies to counteract this epidemic.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study is to examine the relationships between parent physical activity, parent–adolescent obesity risk knowledge, parent-adolescent self-efficacy and adolescent physical activity. Much of the literature purports that the ability of children to influence their health status in the area of physical activity and weight management is limited and must be directed by their parents (Golan & Weizman, 2001). The ability of parents to be engaged as role models and authority figures in health matters of their family takes for granted that the parents are “equipped” with the knowledge, desire and capacity to fulfill these roles. No studies were found that address this dynamic between what needs to be present and what is present concerning obesity awareness in parents. This has been identified as a gap in the literature by this investigator. There is a dearth of empirical studies related to whether or not parents have the knowledge related to obesity risks or the confidence (self-efficacy) to actually manage or influence the weight and/or physical activity status of their children (Etelson, Brand, Patrick & Shirali, 2003). Considering even physicians have admitted to having limited knowledge in the area of physical activity as a prevention measure, parents are likely even less equipped to “tackle” this topic with their children (Calfas, Long, Sallis, Wooten, Pratt, & Patrick, 1996).

The variables to be included in this study will be described in this chapter. These variables have been part of multiple investigations from both nursing and related

disciplines and several of them will be described as reported in these studies. The variables to be discussed include: obesity risk knowledge; self efficacy; physical activity.

This chapter will also include a discussion of the theories that inform this study. These include the following: Bandura's Social Learning Theory; Piaget's Developmental Theory; Bronfenbrenner's Ecological Systems Theory.

Obesity Risk Knowledge

It is a well documented phenomenon that the level of obesity in the United States is on the rise. It would not be accurate to say that knowledge regarding this epidemic is couched only in the scholarly literature. There is a vast amount of information available to the public on this topic in both the popular and scientific literature, as well as in daily newspapers and all other types of media including television, radio and the internet. The cover story of U.S News & World Report for the September 10, 2007 edition was "Kids & Weight; Are Parents And Schools Behind The Rise In Childhood Obesity and Eating Disorders? What Can You Do?" The writer spins a tale of disaster regarding the obesity epidemic and the social behaviors that children are engaged in to combat being labeled as part of this problem. She says that teenage boys and girls are using cigarettes, fasting and skipping meals to control their weight (Kotz, 2007). The reporter notes that twice as many teenage girls are currently abusing diet pills than were five years ago, and since the number of teenage girls undergoing liposuction surgery is 5,000 which is three times the number who were having this done in 1998 (Kotz, 2007).

On July 8, 2007, the headline in the Orange County Register's Health & Fitness section read: "Unplug 'Generation Xbox' "(Wheeler, 2007). This reporter focused upon the parental role in assisting children to engage in lifestyles that avoid television and fast

foods. She used a clever title to draw the reader into the article that offered suggestions and encouragement to parents who find their children struggling with their weight and sedentary lifestyles.

Again, the January 30, 2008 edition of the Orange County Register's Life & Wellness (formerly Health & Fitness) section put the obesity issue as a full page issue on its front page. The headlines were "A Growing Problem: Obesity is on the Rise among Asian American Youths". This article focused on current data supporting evidence that Asian American children are the fastest growing group in overweight and obesity statistics (Chang, 2008). Even with this popular, community level exposure to the issue, the numbers of obese Americans continues to rise (Myers & Vargas, 2000). The magnitude of the problem of obesity has been described by Myers and Vargas (2000) as the single most avoidable cause of death and illness in the United States after tobacco use.

Many articles are written in the vernacular of those interested in popular current events and sporting events. One such journal, Sports Illustrated, recently included a focus on the issue of childhood obesity. Rick Reilly, a non-medical journalist, had some unusual commentary in an editorial that appeared in this weekly magazine. He wrote, "Do you realize about half the states require only a year of high school P.E. or less? Wonderful. Now we've got kids who not only can spell myocardial infarction but also will have one by their 30th birthday" (Reilly, 2003, p. 84). Even sports writers are taking time from their traditional topics and are trying to influence the American public to take notice of the epidemic of obesity.

Nearly 400 obesity related bills were introduced in state legislatures across the country in 2005-more than double the amount passed in 2003 (Tumulty, 2006). In Washington the word obesity appears in 56 bills introduced during the 2006 session of Congress which is fast catching up with the number containing the word gun (Tumulty, 2006). The question remains as to why this awareness does not translate into healthy behaviors in American families.

During his tenure, Surgeon General Richard Carmona stated that obesity is a greater threat to our country than terrorism (Tumulty, 2006). Former Arkansas Governor, Michael Huckabee has had major efforts put into place in the state during his administration as a way of encouraging his constituents to become aware and to then take the actions necessary to support and maintain healthy lifestyles. Former Governor Huckabee noted that many Americans are aware of the effects of being overweight (Tumulty, 2006). He purports that overweight issues are acknowledged, but many Americans believe that the issues do not directly affect them. Huckabee postulates that although the obesity problems aren't denied, that denial comes into play when people choose to not believe that obesity will actually affect their health (Tumulty, 2006).

The phenomenon of denial may be only part of the story when one attempts to explain how this obesity epidemic continues to escalate. One can look at the current status of smoking behaviors across cultures. A case can be made for health risk knowledge diminishing perhaps in part to complacency brought on by an over saturation of awareness information. In the situation of smoking and direct risks to human health, it is assumed that people in the "mainstream" are well aware of the dangers inherent in this practice. However, this is not the case. A Canadian study conducted in 1999 among

adults between the ages of 55 and 74 demonstrated an outcome that less than 50% of those interviewed were aware that a major cause of heart disease could be due to smoking (Frieden & Blakeman, 2005). Despite years of anti-smoking campaigns across the globe, it has been noted that knowledge regarding the risks of smoking appears to be decreasing.

In a commentary in the American Journal of Public Health (2005), the authors, Frieden & Blakeman, noted that “relatively few women are aware of gender-specific smoking health risks, including cervical cancer, osteoporosis, early menopause, miscarriage, ectopic pregnancy and infertility”. The point of their commentary was to demonstrate that there continues to be myths that people choose to believe as one of the reasons that tobacco control is undermined (Frieden & Blakeman, 2005). One investigation indicated that only 1 out of 4 (25%) of Chinese men living in China, where 90% of smokers are males, believe that smoking results in serious health problems (Frieden & Blakeman, 2005). It has also been documented that in the rural areas of the US, the knowledge concerning the risks of smoking has decreased. Of concern is the finding that in the late 1990’s smokers were less aware of the negative health risks associated with smoking than a cohort surveyed in the late 1980’s (Frieden & Blakeman, 2005). Although it is not mentioned, one should consider that lack of risk knowledge in all of the abovementioned examples may be correlated to denial and this pattern may also exist to undermine obesity awareness campaigns.

Knowledge of risks continues to be an area that is important to examine when studying health behaviors. An example of this is described in a qualitative study conducted by Janin and his colleagues (2001). The researchers conducted an investigation of low-income mothers to answer the question, “Why don’t low-income mothers worry

about their preschoolers being overweight?” The purpose was to construct a theoretical framework for how mothers perceive the problem of childhood obesity (Janin et al., 2001). The researcher’s objectives included identification of barriers existing to preventing or managing childhood obesity among these 18 mothers who participated in the focus groups (Janin et al., 2001). This research included qualitative data from the participants. One of the themes that emerged reflected low levels of knowledge. The mothers reported that they had no concerns about their child’s eating habits, including consumption of junk food, so long as they also ate “healthy foods” such as fruits and vegetables, and had a “good appetite” (Janin et al., 2001). These mothers believed that being “large” was desirable to meet cultural norms (Janin et al., 2001). They also described obesity as concerning to them only when their children have become severely compromised in mobility due to excessive weight gain (Janin et al., 2001). The authors of this study did not focus on the mothers’ limitations in obesity-risk knowledge. Rather, they were interested in potential interventions from healthcare providers that would include the aspects of parenting styles and the feeding patterns of parents, including grandparents, to address the family’s obesity issues. This study further demonstrates that lack of knowledge concerning obesity risks does indeed exist even at a time when public campaigns dedicated to education on this topic are extensive and inclusive.

A study conducted by Etelson and colleagues (2003) concurred with the findings described above that parents of overweight children consistently underestimate their children’s weight (Janin et al., 2001). This group noted that parents are not in the habit of referring to a growth chart when describing their child and may only be aware that there is an issue involving weight if there is teasing by peers (Etelson et al., 2003). This

teasing often results in social isolation which for adolescents means no friendships (Dalton, 2005). This lack of peer support often begins the cycle of making the overweight child so self conscious that their already more sedentary life becomes a lifestyle choice that they carry with them into adulthood (Dalton, 2005).

An even more recent attempt to describe a potential relationship between knowledge and healthy behavior was published in the *Journal of Pediatric Psychology* (2003). This study conducted by a group of researchers from multiple disciplines examined knowledge and the relationship it has to social support and self-efficacy as correlates of osteoporosis preventive behaviors among preadolescent females (Ievers-Landis, Burant, Drotar, Morgan, Trapl, Kwok, 2003). The aim of these investigators was to develop a model to develop and test psychosocial variables that may mediate choices for healthy lifestyle behaviors and offer prevention for osteoporosis. They noted that their study was one of the first to be conducted with pre-adolescents. Their findings were based upon a structural equation model that used Bandura's predictions of self efficacy and specific behavior relationships including knowledge and social support. These researchers studied self efficacy, knowledge and social support (parents) as mediators of the behavior of eating foods high in calcium and young females. The study applied findings from the literature that supported Bandura's theory (1997) that self-efficacy influences health behaviors and may be mediated by social support and knowledge (Ievers-Landis et al., 2003). The initial analysis of the data using a structural equation model did find a significant relationship between greater knowledge and higher self-efficacy, but upon further post hoc testing this finding was weakened (Ievers-Landis et al., 2003). The Children's Self-Efficacy Survey was altered to be specific for weight

bearing physical activity (Chronbach's alpha, $r = .90$) and used to measure children's perceived capability to engage in exercise (levers-Landis et al., 2003). This study did not support the researcher's hypothesis that knowledge would be a mediator between social support for exercise and self-efficacy for an enriched calcium diet in the participants. The investigators called for more research to construct measurement for the knowledge variable. They specifically included the need to assess knowledge of risk factors as a means to provide greater power to detect existing relationships among self-efficacy, physical activity and knowledge of osteoporosis (levers-Landis et al., 2003).

In summary, the issue of risk knowledge has emerged in numerous studies related to obesity and healthy lifestyles. These studies have included various descriptions of potential relationships among knowledge of health risks and participants' specific behaviors, or lack of behaviors, related to lifestyle choices. This information reinforces the appropriateness of this researcher's aims to include obesity risk knowledge as an independent variable in this study.

Self-Efficacy

Self efficacy is the belief that one can perform a specified behavior in a specific situation (Bandura, 1994; Bandura, 1997) as well as reflect a level of confidence that the outcomes of the behavior will produce the benefits predicted (Hofstetter, Hovell, & Sallis, 1990). Self-efficacy is commonly understood as being domain-specific, but some researchers have conceptualized a generalized sense of self-efficacy that refers to a global confidence in one's coping ability across a wide range of demanding or novel situations. General self-efficacy aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Schwarzer & Scholz, 2000). In 1977,

Bandura wrote that behavior changes were in large part due to a person's belief that they could be successful at performing behaviors. He termed this "self-efficacy" and further described the concept as one that is determined by how a person accomplishes a task amidst adversity and mounting obstacles (Bandura, 1977). In order to increase the level of self-efficacy related to a specific task, one must strengthen the belief that they have ability to accomplish this task (Canadian Fitness and Lifestyle Research Institute, 1997). Self-efficacy is not always described as a general characteristic affixed to a person's personality, but it is also used to describe specific tasks that are related to specific outcomes. In many cases individuals will have differing levels of self-efficacy depending upon the situation they face (Bandura, 1994; Strecher, McEvoy, Becker, & Rosenstock, 1986). Bandura (1994) specifically posited that efficacy is a strong influence in the areas of health functioning and in physical activities, including athletics.

Studies have found linkages with psychological factors including hardiness, optimism and self-efficacy and positive health outcomes (Grzywacz & Fuqua, 2000). This linkage has indicated that increased levels of self-efficacy results in higher health promoting behaviors, less risk taking actions, and more compliance with interventions (Grzywacz & Fuqua, 2000). Much has been written in the literature to substantiate the position that self-efficacy is one of the major mediators of health behaviors including exercise and physical activity (Hofstetter, Hovell, & Sallis, 1990). In their 1990 study, the influence of self-efficacy developed in early youth sports programs was correlated to adults' level of self-efficacy during exercise, outside of sports, by these researchers. Using Bandura's theory of self-efficacy, a scale was constructed to measure exercise self-

efficacy (Hofstetter et al., 1990). A path analysis was completed. The sample of adults included in the research was randomly selected.

This study found that early forms of structured physical activity (such as school based physical education classes) did prove to be significant with adult behaviors including smoking, exercising at work, knowledge about exercise, or the barriers to exercise (Hofstetter et al., 1990). Findings included the identification of such variables as barriers, home equipment, knowledge and models with friends and family support (Hofstetter et al., 1990). The results demonstrated that adolescents' experiences with early forms of physical activity, even informal activities (e.g. non-team sports played outside of the educational setting) that include positive feedback, positive role modeling, and positive reinforcement for expected results, will have a major impact upon their level of efficacy concerning adult types of exercise in later years (Hofstetter et al., 1990).

This same outcome was discussed in a comprehensive review of literature by Dishman who found that exercise self-efficacy was a consistent predictor of physical activity (Petosa, Suminski, & Hartz, 2003). He suggested that psychological factors are among the best predictors of exercise behavior and asserted that past experiences have a major impact upon compliance with physical activity or exercise regimes (Miller, Ogletree, Welshimer, 2002). Dishman's research concluded that positive experiences with physical activities will yield a higher rate of adherence to such activities, and that the converse is also true of negative experiences (Miller et al., 2002).

In a review of 22 studies examining the influence of self-efficacy on health related behaviors such as smoking cessation, alcohol abstinence, contraception compliance, weight reduction, a positive correlation was found between the variables of

self-efficacy and the desired behavior change (Strecher et al., 1986). These studies universally demonstrated that when levels of self-efficacy were increased the health related behaviors were positively influenced. One study in particular examined adolescents and correct use of contraception. The researchers were able to determine that by use of cognitive-behavioral interventions, these adolescents learned more and had higher confidence due to role playing and discussion, which in turn led to higher self efficacy and acquirement of the desired health behavior outcomes.

In a study conducted by levers-Landis and colleagues (2003) that identified a specific health behavior (e.g. improved nutrition by increasing calcium intake) it was demonstrated that higher levels of self-efficacy did positively influence nutritional habits as desired health behavior. Their research included post hoc testing that resulted in validation of these findings ($z = 2.02, p < .05$). The investigators were also able to support additional findings in the literature demonstrating that parents are the major source of social support for children and did indeed influence the children's health related behaviors. These investigators called for further studies to examine this developmental phenomenon that informs research studying the family influences on critical health behaviors including exercise (levers-Landis et al., 2003).

To summarize, the concept of self-efficacy has been found to be an important element when studying both adolescents and adults and the choices made concerning desirable health behaviors. This has provided confirmation that this variable is appropriate to include in this descriptive study.

Physical Activity

Discussions concerning obesity cannot be conducted without the inclusion of physical activity. Although much research and attention is paid to the consumption of calories and obesity, it is impossible to focus upon only this variable (Luepker, 1999). As an illustration, a study was conducted several decades ago that noted differences among low intake college professors and high intake lumbermen (Luepker, 1999). The lumbermen were much more lean than the college faculty. The mediating variable was the amount of physical activity each group performed. The faculty were far more sedentary than the lumbermen (Luepker, 1999).

Healthy People 2010 includes physical activity as a major objective to be improved upon from the previous decade (U.S. Department of Health and Human Services [USDHHS], 2000). This indicator has been chosen due to the health impact that physical activity makes on deaths from heart disease, development of diabetes and the reduction in blood pressure. The 2010 standards identified an adolescent goal: “vigorous physical activity that promotes cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion” (USDHHS, 2000, p. 26). For adults the 2010 standards target behaviors that, “engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day” (USDHHS, 2000, p. 26).

Despite these specific objectives for levels of physical activity, the current generation of adolescents has been described as the most sedentary in the history of the US (Hill & Trowbridge, 1998). The influx of popular electronic entertainment activities aimed at children and adolescents has been identified as a major contributor to lifestyle choices that diminish physical activities in this age group. The conveniences of modern

lifestyles have all but eradicated the need for moderate or vigorous activities associated with activities of daily living (Hill & Trowbridge, 1998). The current lifestyle of Americans negates the “old fashioned” version of physical activity among families. Baby-boomers are familiar with the changes in their current lifestyle from when they were children. They are from families where house keeping and laundry were done by the family members, and not a cleaning service. The gardening, lawn upkeep, and home maintenance were done by the individuals in the family and not by gardening services or outside contractors. The family vehicle was washed at home, and not “detailed” at a car wash business. It is highly unlikely that today’s modern conveniences will give way to the activities of the past. As a result, families are finding it necessary to make conscious efforts to balance sedentary activities with planned or scheduled effective levels of physical activity. All types of physical activity will be reported by participants during this study including, but not limited to: traditional exercise (swimming, running, walking, biking, etc.), sports (individual and group), house keeping (including chores such as dusting, washing floors, laundry, cleaning, etc.), home maintenance (including gardening, painting, washing windows, washing cars, etc.).

The recommendation has also been made for adults to accumulate somewhere in the vicinity of 10,000 steps per day. In prior research, findings support that achieving this goal for steps per day has many health benefits including lowered blood pressure and decreased body fat (Tudor-Locke & Bassett, 2004). There is discussion in the literature concerning the variations in definitions for physical activity. It is necessary to point out that in many cases the term “physical activity” is equated with the term “exercise”. This study will reflect the definition of physical activity from Armstrong and Welsman (2006)

“the term physical activity is defined as a complex set of behaviors that encompass any bodily movement produced by skeletal muscles that results in energy expenditure”.

Research suggests that the two influences of peers and parents greatly impact physical activity levels in children (Hill & Trowbridge, 1998). These researchers note that active children are usually products of active parents, and that patterns of parenting, as well as, family environment interventions may be one of the answers that future research should explore (Hill & Trowbridge). Lifestyle modification is noted to be the most effective way of controlling the epidemic of obesity (Swift, Glazebrook, & Macdonald, 2005). The impact of increased awareness of health risks often leads to health behavior changes. In a 2004 study, researchers gathered 1487 responses from surveys given to adolescents in a public high school in Massachusetts (He, Kramer, Houser, Chomitz, & Hacker, 2004). The purpose of the research was to identify adolescents who chose healthy lifestyles over risk-filled lifestyles. The researchers formulated two definitions of health using “strict” and “broad” terms to analyze such behaviors as use of drugs, level of sexual activity, and suicidality. Although inclusion of physical activity and health behavior was not part of this study, the findings can be broadly applied. Data analysis demonstrated factors that positively influenced choices in health behaviors: immigration, overall grade point average and having parents that would be upset if non-healthy behaviors were chosen (He et al., 2004). The investigators concluded that there are positive associations among school, peer and parental influence to support healthy lifestyle choices in adolescents (He et al., 2004). This supports the aspect of this current study that will examine the relationship between the adolescents and their parents in their practices of physical activity to promote a

Abstract

Obesity Risk Knowledge, Self-Efficacy and Physical Activity in Families of Adolescents

Obesity in children and adolescents continues to rise despite efforts to counter this epidemic. The steady increase of chronic diseases in children, especially type 2 diabetes, is one of the consequences. The lifestyle of families has been identified as one of the modifiable behaviors that could reverse this trend. Previous studies provide compelling evidence identifying both knowledge of risks and presence of self-efficacy as impacting the choice of families to follow healthy lifestyles that incorporate physical activity for all members. Further examination of the concepts of obesity-risk knowledge, self-efficacy and physical activity, particularly in the area of weight management, is necessary in order to combat the rising incidence of childhood obesity.

The purpose of this study was to examine the relationships between parent physical activity, parent-adolescent obesity risk knowledge, parent-adolescent self-efficacy, and adolescent physical activity. A descriptive, correlational design incorporating mixed methods was used for this study.

Ninety-four adolescent/parent dyads were recruited from eight middle schools within a single school district in Southern California. Inclusion criteria for adolescents were: able to read and speak English; be between the ages of 12 and 15; signed informed assent and have informed consent forms signed by their parents. The inclusion criteria for the parent participant were: able to read and speak English; have legal custody of adolescent participant; and sign consent form for participation.

theories as underpinnings for its conceptual framework: Bandura's Social Cognitive Theory; Piaget's Developmental Theory; and Bronfenbrenner's Ecological System's Theory.

Bandura's Social Learning Theory

Social Cognitive Theory, often referred to as Social Learning Theory, analyzes developmental changes in perceived self-efficacy in terms of involvement of human agency across the life span (Bandura, 1997). It is an individual's sense of self, or efficacy, that directs his or her level of involvement with the environment. This ultimate management of the environment affects the developmental pathway of the individual (Bandura, 1997).

The Social Learning Theory of Bandura is also known as Self-Efficacy Theory (Bandura, 1994). Bandura's concepts are based upon a person's expectations relative to a specific course of action. It is a predictive theory in the sense that it deals with the belief that one can accomplish a specific behavior (Bastable, 2003, p. 50). There are four sources of self-efficacy. The first is "mastery of experiences" where success builds a robust belief in one's personal efficacy while failure undermines it (Bandura, 1997). The second is use of vicarious experiences provided by social models. The greater the assumed similarity to the model, the more persuasive are the models' successes and failures (Bandura, 1994). The third source of self efficacy is social persuasion. People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it. Lastly, modification of self-beliefs occurs when people are able to alter their stress reactions (Bandura, 1994).

One of Bandura's (2001) principle research findings is that self-efficacy contributes to productive human functions. The main thrust of this theory states that people will more often be willing to attempt to make changes in their behaviors if they believe they have the efficacy to accomplish this behavior. Social Learning Theory is comprised of both operant conditional (reinforcement and punishment) and modeling (engaging in behavior which was observed) behaviors (Bandura, 2001). Children are conditioned to learn behaviors through both experiencing the consequences of their own behavior and through the development of expectations and consequences by observing others incurring the reinforcement/punishment for their behaviors (St. Joer, Perumean-Chaney, Sigman-Grant, Williams, & Foreyt, 2002). This conditioning results in behavioral patterns that are continuously developed and shaped over the course of the child's life. Behavioral modeling is more important during the establishment of new behaviors, while operant conditions become more relevant during the maintenance and shaping of these new behaviors. Children are more likely to learn behavioral patterns from those individuals who control the majority of the rewards and punishments and establish the social contexts in which behaviors are learned and established (St. Joer et al., 2002). This supports the need to examine parents as well as adolescents in this study.

Bandura's Self- Efficacy Theory (2001) includes the influence that modeling has on the process of changing one's behavior. He purports that by exemplification one can get people to behave altruistically, to volunteer their services, to delay or seek gratification, to show affections, to select certain foods and drinks, to choose certain kinds of apparel, to converse on particular topics, to be inquisitive or passive, to think creatively or conventionally, or to engage in other permissible courses of action. For

example, Bandura notes that the fashion and taste industries rely heavily on the social prompting power of modeling (Bandura, 2001). In another description of Bandura's work, the authors of a scale to measure self-efficacy state the following:

The construct of self-efficacy, which was introduced by Bandura, represents one core aspect of his social-cognitive theory (1). While outcome expectancies refer to the perception of the possible consequences of one's action, self-efficacy expectancies refer to personal action control or agency. A person who believes in being able to produce a desired effect can conduct a more active and self-determined life course. This "can do"-cognition mirrors a sense of control over one's environment. It reflects the belief of being able to control challenging environmental demands by means of taking adaptive action. It can be regarded as a self-confident view of one's capability to deal with certain life stressors (Schwarzer & Scholz, 2000).

The Social Cognitive Theory is also the predominant influence in the conceptual model proposed by Golan and Weizman (2001). In their studies of obese children, they hypothesize that the family unit must be led by the parents who employ the role modelling function and social learning tasks as a means of changing behaviors in their obese children. In this work, the "parenthood presence" is a central theme. This is described as parents being very involved in controlling the child's health behavior by taking responsibility and serving as an authority and role model for children that are obese (Golan & Weizman, 2001). One of the objectives of the program these researchers implemented using their model was "to promote modeling of a healthy life style (Golan, 2006). In this model, the healthy life style component included the following activities: Provide alternative leisure activities; Create opportunity for physical activity; Limit

sedentary activity. This study identified limitations which included poor recruitment. The researchers concluded that many parents seemed to project the need for change in the family on the child and that many parents were not motivated to make changes (Golan, 2006). The level of self efficacy concerning physical activity was not addressed. The level of knowledge that parents had concerning the risks that obesity entailed was also not included in their examinations. It is this researcher's view that both of these variables may impact the motivation level of parents in attempting to address and improve the physical activity levels in their families.

The issue of sedentary vs. increased physical activity in families as an effort to downsize the waist size of its members has been discussed in the literature for over two decades. In the late 1990's, researchers were noting that students in America watched television about 24 hours per week (Luepker, 1999). One group in particular "blamed" parents as setting bad examples for their children by engaging in this excessive sedentary behavior themselves, and for not participating in group activities (Luepker, 1999). Rather than including the children, parents went "jogging on their own", which is an individual sport, not one for groups or families with various abilities to perform aerobically (Luepker, 1999).

The importance of modeling behavior by parents for children was reinforced in a study that was completed in Finland (Fogelholm et al., 1999). This team of researchers used the Social Cognitive Theory to inform their findings that modeling behaviors and reinforcing positive behaviors was a significant contributor to the results of their research. The study concluded that although a positive relationship did exist between vigorous activity levels of parents and vigorous activity levels of their children, the

stronger relationship existed between the lack of physical activity in parents and in their children (Fogelholm et al., 1999), thus demonstrating the influence parents have on the lack of physical activity in their children by role modeling this lifestyle pattern within the family.

Piaget's Developmental Theory

The second theory which informs this study is the developmental theory of Jean Piaget (1896-1980). Piaget conducted his research with children to specifically study their interactions with objects in their environment rather than with other social beings. He believed that the evolution of thoughts and learning is the same for all children beginning at birth, and that each person progresses through the stages at their own pace in a gradual and orderly fashion (Bowden et al., 1998). This theory focuses on the qualitative changes of intellectual structure from birth to maturity with each structure built upon those that are acquired earlier and are less mature (Muuss, 1988).

Piaget believed that cognitive development consists of four main periods of growth that he identified "stages": Sensorimotor (birth to 2 years) is the time during infancy where infants explore their environments and attempt to coordinate sensory information with motor skills (Bastable, 2003; Piaget, 1973); Preoperational (2 to 6/7 years) includes the period when youngsters can mentally represent the environment and come to terms with symbolization (Bastable, 2003; Piaget, 1973); Concrete operations (6/7 to 11/12 years) takes place during the elementary school years and includes the ability to attend to more than one dimension at a time, conceptualize relationships, and operate on the environment (Bastable, 2003; Piaget, 1973); Formal operations (11/12 to adult) begins in adolescence and continues through adulthood, where teenagers begin to

think abstractly, and can see alternatives and criticize (Bastable, 2003; Piaget, 1973). It is during this fourth stage that Piaget described the adolescents' cognition as being capable of abstract thought and complex logical reasoning. They are able to hypothesize and apply the principles of logic to situations never encountered before (Bastable, 2003).

Piaget emphasizes the processes of assimilation, accommodation and equilibrium in the development of thinking (Muuss, 1998). Assimilation takes place when new thoughts are integrated to fit into the present intellectual organization (Muuss, 1998). Accommodation occurs as the new information garnered through assimilation causes changes to the cognitive structure (Muuss, 1998). Assimilating and accommodating environmental experiences leads to the slow, steady cognitive growth found in each of Piaget's four stages.

According to Piaget, cognitive changes take place through a life-long process of "equilibrium" (Piaget, 1973). He conceptualized that a person's brain takes in new information, and processes this against, or equalizes, that which is already known (Sutherland, 1999). Children, specifically, develop dissatisfaction with "their identified shortcomings" that are uncovered as new experiences challenge old ways of thinking. They adopt a more sophisticated mode of thought that eliminates the "shortcomings" of the old one (Silverthorn, 1999).

It is during this changeable period of cognitive growth and dissonance that many adolescents and their families experience turmoil (Bastable, 2003). Adolescents may be caught in discomfort caused by this shift in thinking. They may encounter situations that identify themselves as children but have expectations to behave as adults. One way

adolescents may combat this discomfort is to display risk-taking behaviors particularly in the area of health (Bastable, 2003).

Additionally, this stage of development has orientation to the present for adolescents. Although they may be fully aware of the risks of certain health conditions, adolescents often choose to ignore warnings for future complications as this is not in accord with their “present” orientation (Bastable, 2003; Bowden et al., 1998). During the period of adolescence, the understanding of disease and the ideas of health promotion are able to be assimilated. The adolescent may be able to identify positive health behaviors, but simultaneously reject them out of deference to peer pressure or their lack of orientation to their future health status.

Bronfenbrenner’s Ecological Systems Theory

Iri Bronfenbrenner (1917-2005) was a renowned psychologist known for developing the Ecological Systems Theory (EST) that considers the niche or context of experiences to behavior (Bronfenbrenner, 1979). This theory approaches child development within the context of the system of relationships that form his or her environment (Bronfenbrenner, 1979; Paquette & Ryan, 2001). Development occurs as a result of a child interacting with contexts (ecological niche, i.e. family, school, society) in which he/she is embedded (Bronfenbrenner, 1979; Davison & Birch, 2001). The characteristics (gender and age) of an individual also interact with familial and social characteristics (Davison & Birch, 2001). Ecological theory is concerned with identifying the conditions for both the individual and the environment which must be present for individual action (Grzywacz & Fuqua, 2000). The ecological systems theory incorporates the beliefs that health is an outcome dependent upon the quality of the fit

between the person and the environment and that there is interdependence between the social and physical environments (Bronfenbrenner, 1979; Grzywacz & Fuqua, 2000; Lundy & Janes, 2001).

Bronfenbrenner's framework includes four distinct levels or systems in which an individual exists (Corcoran, Franklin, & Bennett, 2000). These systems are open and the individual interacts with them concurrently in most situations. The following names have been affixed to each level: microsystem which includes the setting in which the individual lives (i.e. family, peers, school, neighborhood); mesosystem incorporates the relations between the microsystems (i.e. relation of family experiences to school experiences, school to church, family to peers); exosystem reflects experiences in a social setting in which an individual does not have an active role but which nevertheless influences experience in an immediate context; macrosystem includes the culture and values of an environment where an individual lives, works, etc. (Berk, 1998; Paquette & Ryan, 2001).

One application of EST describes "leverage points" for health which provide links between social environment and health. These "leverages" include: socioeconomic status and health; family and health; employment, work and health; school and health (Grzywacz & Fuqua, 2000). For the adolescent, the family is the most important link. The quality of these points directly impacts the experience of health as positive or negative. One may choose to manipulate these points to enhance the impact on health within these environments.

The Ecological Systems Theory supports the need to include both the parent and the adolescent in this study. To examine one without the other would generate an

incomplete description of adolescent families. The family is an important niche and the social interactions within this structure may impact the variables examined in this study.

Many studies have focused on the psychological elements of the childhood obesity issue, but many of the social and ecological determinants have been ignored (Goran, Reynolds & Lindquist, 1999). Ecological factors such as access to facilities or equipment for physical activity, access to safe lay areas, season, geographical location and climate have shown positive association with physical activity levels in children (Goran et al., 1999). Many studies are finding additional positive relationships in other environmental factors driven by advances in technology (Goran et al., 1999). As studies of physical activity continue to focus on the ecological influences of obesity, paradoxically, an awareness of the role of sedentary behaviors is aiding researchers to further determine the importance of physical activity in maintaining healthy body weight in children and adults (Goran et al., 1999).

Figure 1

CHAPTER III

METHODS

Purpose

The purpose of this study was to examine the relationships between parent physical activity, parent–adolescent obesity risk knowledge, parent-adolescent self-efficacy, and adolescent physical activity. Based upon a review of the literature parental attitudes and behavior including obesity risk knowledge, self-efficacy, and physical activity may affect adolescent physical activity. Similarly, the adolescent’s obesity risk knowledge and self-efficacy may affect their physical activity. Therefore the constructs of obesity risk knowledge and self efficacy for both parent and child, as well as, parent physical activity, and selected adolescent characteristics were examined to determine their relationship with the adolescent’s physical activity. This chapter presents a description of the research methodology including study aims, study design, sample and sampling, instrumentation, data collection, data analysis, and the protection of human subjects.

Study Aims

1. To examine obesity risk knowledge, self-efficacy, and physical activity among family dyads (adolescents and parents).

2. To describe the relationships between adolescents' obesity risk knowledge, self-efficacy, selected demographic variables (age, gender and race/ethnicity, BMI) and adolescents' physical activity.
3. To describe the relationships among adolescents' physical activity, parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy and selected demographic variables (age, gender and race/ethnicity, BMI)
4. To develop a broader understanding of the meaning of the ORK – 10 items in this adolescent population.

Research Design

A descriptive, correlational design incorporating mixed methods was used for this study. A descriptive design is defined as a study conducted in a naturalistic setting without attempt to modify, control, or introduce something new to the environment (Kerlinger & Lee, 2000). Descriptive designs are employed when the researcher wishes to obtain information in areas in which little previous investigation has occurred. Although the constructs of obesity risk knowledge, self-efficacy, and physical activity have been examined singularly for both adults and adolescents, an exhaustive review of the literature revealed that they have not been examined in a family dyad. The study was conducted using two phases which included:

1. The administration of a survey to assess the parent obesity risk knowledge, self-efficacy, and physical activity and adolescent obesity risk knowledge, self-efficacy and physical activity level. In addition, pedometers were worn by the adolescents for quantitative measurement of physical activity;

2. A qualitative component comprised of an adolescent focus group to gain a broader understanding of adolescent responses to the content of the ORK-10 in this adolescent population.

Sample and Setting

A purposive sample of adolescents and one of their parents were recruited from eight middle schools within a single school district in Southern California. The adolescents and their parents were deemed a sample of convenience by virtue of their interest in a school-based sports program called Students Run Los Angeles (SRLA). The SRLA program involves six months of training for middle school students who plan to complete the Los Angeles Marathon on March 2, 2008. Prior to acceptance into the program, parents were required to attend a meeting for a program orientation. It was during this meeting that the investigator was given permission to introduce the study and recruit parents for study participation.

This study included two independent variables and one dependent variable as previously described. In addition the following descriptive variables were included: race/ethnicity; gender; level of education; SES; age; BMI. Cohen's (1987) formula was applied to determine appropriate sample size. Per Cohen a moderate effect size L (R^2 of 0.13) was chosen, which is a function of power and number of independent variables at a given level of alpha. This researcher selected a power of 80, an alpha of 0.05, moderate effect size (0.13) and 8 independent variables. Based upon the formula a sample of 97 participants was needed to provide sufficient power for the study (Cohen, 1988).

Ninety-four adolescent/parent dyads were ultimately recruited for this study. This number was deemed adequate based upon the argument of Munroe (2005) that "one

should have a least 10 subjects per predictor in order to even hope for a stable prediction equation". Using Munro's formula, and the listed 9 variables multiplied by 10 subjects a sample of 90 was needed. The inclusion criteria for adolescents were: able to read and speak English; be between the ages of 12 and 15; signed informed assent; and have informed consent forms signed by their parents. The inclusion criteria for the parent participant were: able to read and speak English; have legal custody of adolescent participant; and sign a consent form for participation by themselves and their child.

Operational Definitions

Adolescent—child aged 12 to 15.

Parent-Full-time legal guardian of the adolescent (e.g. mother, father, grandmother, aunt, uncle)

Dyad- the pairing of the adolescent with his/her identified parent

Obesity Risk Knowledge- is defined as an awareness of complications to health under the conditions of obesity as measured by the ORK-10.

Self-efficacy- efficacy to perform physical activity as measured by the General Self-Efficacy Scale (GSE).

Physical Activity-engagement in behaviors that exclude sedentary activities (e.g. walking, sports, gardening, house cleaning, dancing) as measured by the International Physical Activity Questionnaire (IPAQ), PACE+ Adolescent Physical Activity Measure, and Walk 4 Life pedometers.

Data Collection Measures

Demographics

A questionnaire was used to obtain information on adolescent and parent participant's demographic data (see Appendices A and B). For the adolescent participants this included: gender; age; height; weight; ethnicity; number of household members; current grade level in school; grade point average (GPA). For the parent participants this included: gender; age; height; weight; marital status; number of years married or living with current partner; educational level; ethnicity; number of household members; work outside of home; monthly income.

Quantitative

To determine the relationships among the independent variables (knowledge of obesity risk and self efficacy) and the dependent variable (physical activity) several standardized measures described in the literature were utilized. Their description follows:

Obesity Risk Knowledge

The Obesity Risk Knowledge scale (ORK-10) is a 10 item instrument measuring knowledge regarding the health risks associated with obesity (Appendix C). The scale is designed to be self-completed with respondents being required to judge whether statements are "true" or "false" or "don't know". The following are examples of questions included: "A person with a 'beer belly' shaped stomach has an increased risk of getting diabetes"; "Obesity increases the risk of getting bowel cancer"; Obese people can expect to live as long as non-obese people"; "Obesity does not increase the risk of developing high blood pressure"; "It is better for a person's health to have fat around the

hips and thighs than around the stomach and waist". Responses are treated as dichotomous variables where "correct" responses score one point, while "incorrect" and "don't know" responses score no points. Scores on the ORK-10 scale range between zero and ten with the higher score indicating a higher level of knowledge regarding the risks of obesity. The scale items were designed using the principles of Kline and Oppenheimer (Swift et al., 2005). The obesity-related comorbidities were chosen as they met the following criteria: obesity was a significant risk factor to the condition; these conditions were common in the population sampled; these conditions added to the burden of the disease; the medical terminology used was understood by the non-medical population (Swift et al., 2005).

The reading level of 8.4 of this instrument indicated that it was suitable using the Flesch-Kincaid grade level for individuals 13 years of age and older. This reading level was reduced to 7.2 reflecting appropriateness for ages 12 and older when the term "obesity" was removed as this is considered complex vocabulary due to the number of syllables it contains. The authors of the instrument believe that this term artificially inflates the reading level (Swift et al., 2005).

Pilot testing of this instrument was completed by the researchers using an opportunistic sample of 584 adults out of a total of 1852 individuals who were invited to participate (Swift et al., 2005). These adults were from two distinct groups. One group was recruited from a setting of adults having expertise in obesity (members of the Association for the Study of Obesity). The second group was comprised of non-experts in obesity who were employed either in a retail department store or in an air freight shipping company. The authors stated that the size of this sampling "was sufficient to

detect a difference of 1.2 points between the groups on the ORK-10 scale” (Swift et al., 2005, p.3). Data analysis by the study’s authors revealed that the Cronbach’s alpha coefficient for the ORK-10 scale was .83 (Swift et al., 2005). To this investigator’s knowledge, this instrument had not been tested with adolescents. The current version tested in an adult population was used for the adolescent participants in this study. A focus group was held with nine adolescents following the collection of the quantitative data to discuss the challenges the instrument may have presented to this group of adolescents.

Self Efficacy

Self efficacy was assessed using the General Self-Efficacy Scale (GSE) developed by Matthias Jerusalem and Ralf Schwarzer in 1981 (Schwarzer & Jerusalem, 1995). The authors offer the following description: “The construct of perceived self-efficacy reflects an optimistic self-belief. This is the belief that one can perform a novel or difficult task, or cope with adversity—in various domains of human functioning” (<http://userpage.fuberlin.de/~health/engscal.htm>). Perceived self-efficacy also facilitates goal setting, effort investment, persistence in face of barriers and recovery from setbacks (<http://userpage.fuberlin.de/~health/engscal.htm>). It can be regarded as a positive resistance resource factor. The authors of this tool described the ten items designed to measure this construct as, “each item refers to successful coping and implies an internal-stable attribution of success. Perceived self-efficacy is an operative construct, i.e., it is related to subsequent behavior and, therefore, is relevant for clinical practice and behavior change” (<http://userpage.fuberlin.de/~health/engscal.htm>).

The GSE scale was created to assess a general sense of perceived self-efficacy with the aim to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events (Schwarzer & Jerusalem, 1995). It is designed for testing the general population, including adolescents, but not for children under the age of 12. The 10 item scale is scored using a 4 point likert format: (1) not true at all, (2) hardly true, (3) moderately true, (4) exactly true. The sum of the responses to all 10 items yields the final composite score with a range from 10 to 40. Mean scores can also be used. In the research described by the instrument's author's, the mean was around 2.9 (Schwarzer & Jerusalem, 1995). Reliability was tested in 23 nations and Cronbach's alphas ranged from .76 to .90, with the majority in the high .80's. The scale is unidimensional (<http://userpage.fuberlin.de/~health/engscale.htm>). "Criterion-related validity is documented in numerous correlation studies where positive coefficients were found with favorable emotions, dispositional optimism, and work satisfaction. Negative coefficients were found with depression, anxiety, stress, burnout, and health complaints" (<http://userpage.fu-berlin.de/~health/engscale.htm>).

The strength of the GSE has been supported by its broad applicability in international settings during the past twenty years. It can be self-administered, takes approximately four minutes to complete and has been shown to measure quality of life, as well as, the prediction of "adaptation after life changes" (<http://userpage.fu-berlin.de/~health/engscale.htm>).

The following questions are a sample of the 10 included in this instrument: "I can always manage to solve difficult problems if I try hard enough"; "If I am in trouble, I can

usually think of a solution”; “It is easy for me to stick to my aims and accomplish my goals”; “If someone opposes me, I can find the means and ways to get what I want”.

Physical Activity

The physical activity variable was measured by a self-report survey for parents and by two measures (e.g. self report and pedometer) for adolescent participants. This dual measurement was chosen per recommendations in the literature. Armstrong and Welsman (2006) have cautioned that discrepancies often occur between these two types of measurements in that children tend to overestimate their recall of vigorous physical activities, but underestimate their moderate physical activities. The researchers also noted that children often times do not recall moderate levels of activity because it is often unplanned, sporadic, less memorable and less quantifiable (Armstrong & Welsman, 2006). Researchers have also acknowledged that physical activity assessment in adolescents is quite complex to measure. This measurement has been made even more difficult by the diversity of methodological approaches which include self reports of the child, the parent, direct observation, motion sensors, double water labeling, etc. (Guerra, Santos, Ribeiro, Duarte, & Mota, 2003).

Despite the acknowledged limitations of using this modality, self report of physical activity is the most widely used due to low cost and easy of implementation (Armstrong & Welsman, 2006). One of the limitations of using self-reports is that their accuracy is compromised as it is difficult for some children to quantify their playing activities which is often times the largest portion of their physical activities (Armstrong & Welsman, 2006). One report in the literature included a reflection that children under 12 years of age have no recall accuracy for physical activities and are also unable to

quantify the amount of time spent on such activities (Armstrong & Welsman, 2006).

Adolescent participants in this study were between the ages of 12-15.

Adolescents

The PACE+ Adolescent Physical Activity Measure (MVPA) was developed as a screening tool for use by clinical staff to measure physical activity levels when adolescents are seeking care in primary care settings. See Appendix E. This instrument does not comprehensively assess adolescents' level of physical activity, but rather identifies adolescents who do not meet the recommended guidelines as addressed in Healthy People 2010 (Prochaska, Sallis, & Long, 2001). This measure was chosen as it was simple for adolescents to complete, and the information it generated was conducive to answering the research questions. Studies were conducted to evaluate the test-retest reliability and concurrent validity of six single item and three composite measures of physical activities. Findings informed modifications, and a best measure was then evaluated during a further study. This final study found the PACE+ measure reliable (intraclass correlation = .77) and also found it correlated significantly ($r = .40$, $p = .001$) with accelerometer data (Prochaska et al., 2001). Although brief, this instrument is practical, and assesses targeted behavior that offers clinical information to practitioners (Prochaska et al., 2001). The two questions included in this measure are: "Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?", and "Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?" Each response has a scale of 0 to 7 days. The scores for each question are added together. The total is then divided by 2. A score of less than 5

indicates that the Healthy People 2010 guideline for adolescent physical activity is not being met.

The W4L (Walk for Life) Pedometer

The most common and oldest used instrument for measuring physical activity is the pedometer (Armstrong & Welsman, 2006). History recounts that Leonardo da Vinci invented a device that he used to count steps. This is believed to be a forerunner of the modern pedometer (Armstrong & Welsman, 2006).

Pedometers sense motion and can be worn on the ankle or at the waist. They are designed to record both acceleration and deceleration of movement in one direction and their purpose is to estimate the total number of steps that an individual has taken during a certain time period (Armstrong & Welsman, 2006). These instruments are convenient for participants to wear as they are light in weight. Other benefits to their use are that they are re-usable and relatively inexpensive (Armstrong & Welsman, 2006). Waist worn pedometers have limitations as they do not reflect cycling motions and cannot be worn during water –based activities including swimming, water sports, etc. Although ankle worn devices do capture cycling activities, they are less sturdy when mounted in that position, and as a result, less desirable to be worn by children and adolescents (Armstrong & Welsman, 2006). Adolescents in this study wore waist mounted pedometers. Another limitation of the pedometer is that it is not capable of reflecting energy expenditure when physical activity includes carrying weight or engaging in activities where one must negotiate hill climbing.

One of the gaps noted in the literature is consensus among clinicians and researchers regarding the lack of parameters for number of steps for children and

adolescents. Armstrong and Welsman (2006) argue that the recommendation for adults of 10,000 steps per day may be an underestimation for children (Tudor-Locke & Bassett, 2004). They also note that to date a conversion of steps to hour of moderate physical activity has not been computed (Armstrong & Welsman, 2006).

This instrument was used to capture quantitative data to physical activity in the adolescent participants. Adults are more reliable in their recall, so this measurement was not included for them. In 2002, Walk 4 Life, Inc. created a pedometer which using average stride lengths, counts approximately 2,000 steps as equal to one mile.

Adults

The International Physical Activity Questionnaire (IPAQ) was developed to provide a set of well-developed instruments that can be used internationally to obtain comparable estimates of physical activity (IPAQ, 2001). See Appendix F. The development of an international measure for physical activity began in 1998 in Geneva. In the years between 1998-99, eight draft versions of the IPAQ were subjected to a validity and reliability evaluation in 14 countries and across 6 continents (IPAQ, 2001). The mean age of subjects in each country ranged from 25-49 years (IPAQ, 2001). Test-retest reliability was conducted by having subjects repeat the IPAQ over a 3-7 day period (IPAQ, 2001). Spearmans's Rho clustered around 0.8 indicating reliable responses between repeat administrations for all versions of the IPAQ (IPAQ, 2001). Criterion validity was determined by having subjects wear computer science application (CSA) accelerometers for 7 consecutive days (IPAQ, 2001). Criterion validity had a median rho

of about 0.30 against the CSA accelerometer for minutes of moderate, vigorous, walking, and sedentary behaviors (IPAQ, 2001).

This instrument is designed in both a short version including 4 generic items, and a long version that reflects 5 activity domains (IPAQ, 2001). This study incorporated the short version as it captured the general conditions of parental activity without being burdensome for the parents to complete. A typical question from this questionnaire follows: “During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling? Think about *only* those physical activities that you did for at least 10 minutes at a time.”

Table 1
Summary of Study Measures

Variable	Measure
OBESITY RISK KNOWLEDGE	ORK-10 Swift, Glazebrook, & McDonald (2005)..
SELF EFFICACY	GENERAL SELF-EFFICACY SCALE (GSE) Jerusalem, & Schwarzer (1992).
PHYSICAL ACTIVITY <i>Adults</i> <i>Adolescents</i>	International Physical Activity Questionnaire (IPAQ) http://www.ipaq.ki.se/IPAQ.asp?mnu_sel=EEF&pg_sel=DDE PACE+ Adolescent Physical Activity Measure (MVPA) Prochaska, J.J., Sallis, J.F., & Long, B. (2001). PEDOMETER Walk 4 Life Pedometer. Distributed by Omron Healthcare, Inc. Bannockburn, IL

Qualitative

Following the larger quantitative study, a qualitative investigation was included to examine the responses to the content of the ORK-10 in an adolescent population. A focus group of nine adolescents participated in a discussion of the ORK-10.

Data Collection Procedures

Quantitative

The purposive sample of 94 dyads for this study included adolescents between the ages of 12 and 15 who attended one of eight specifically identified middle schools in south Orange County, CA. and one of their parents. A letter of introduction of both the researcher and this study was sent to the middle school's principal and SRLA coordinator. (See Appendix I). During the orientation meeting for the SRLA program all parents and adolescents who had interest in participating in the SRLA program were invited by the program's coordinator to attend an exploratory meeting. During the meeting, this researcher was included on the agenda and given an opportunity to explain the study's purpose, aims, design, and participation parameters. The criteria to participate were also explained. Signed informed consent and assent was obtained (See Appendices J, K, L).

Next a survey packet containing the three instruments and participant profile forms was distributed. Participants self administered the surveys with the investigator present to answer study related questions. Finally the investigator collected the completed surveys. In addition adolescents were given a pedometer to be worn at the waist to measure physical activity. Pedometers were worn for three days by the adolescents.

Each participant recorded the total number of steps prior to going to sleep each of the days the pedometer was worn (see Appendix H). The pedometer logs were collected directly by: this researcher; the SRLA program coordinator who e-mailed the total to the researcher; the researcher or SRLA coordinator telephoning the participant and recording the reported number.

Studies show that adults taking about 10,000 steps a day is the target for improving health and reducing risk of chronic disease (Walk 4 Life, Inc., 2007). Most people average about 2,000 to 4,000 steps a day in routine activity (Walk 4 Life, Inc., 2007). There is no standard number of steps set for children.

Qualitative

The following procedures were implemented to conduct the focus group for this study: First nine youths randomly selected from the larger participating sample were brought together to complete the ORK-10 instrument. The participants were identified by a pre assigned number, and were instructed to not use one another's names in order to preserve anonymity during this group's electronic recording. (See Appendix G for a description of the Interview Guide for this focus group.) Following this, each of the ten items included in the ORK-10 was discussed with the youth to reflect the youth's reactions to the instrument's reading level, as well as, comprehensibility of each of the items. The children were asked to offer suggestions for the vocabulary that was incomprehensible to them. Each response was recorded in writing as well as by digital tape recorded. The results of this focus group will add to the body of knowledge available to assist nurses in assessing families concerned with obesity, as well as to assist

nurses who are developing and evaluating interventions specifically in the area of childhood obesity and measurement of obesity risks.

Data Analysis

Quantitative

Descriptive and multivariate statistics were used in this study as “an important aspect of statistical inference involves reporting the likely accuracy or degree of confidence, of the sample statistic that predicts the value of the population parameter” (Munro, 2005, p. 5). The independent variable scores of self-efficacy and obesity risk knowledge have been treated as ordinal data. “When measuring variables derived from psychosocial scales, psychological inventories, or tests of knowledge, there may be differences of opinion as to the variable’s level of measurement. Technically, these variables are ordinal in nature...” (Munro, 2005, p. 7). All data was analyzed by using the software package *Statistical Package for Social Sciences, Version 15* (SPSS, 2008).

Descriptive statistics (means, standard deviations, percentages) were employed to illustrate the characteristics of the participants. To examine the reliability of the measures used with the study participants, Cronbach’s alpha coefficients (Cohen, 1988) were generated and compared to the original coefficients as described in the literature. Inferential statistics included the use of t-tests, which is the most basic test to measure the differences between two group means (Mertler & Vannatta, 2005).

To examine the relationships among the variables, first a correlation matrix was constructed to identify the potential for multicollinearity, which can occur when there are moderate to high correlations among predictor variables. Predictor variables scrutinized

assignment among the participants in these groups, confounding variables that were controlled include: gender, race and ethnicity, SES, educational level, age, GPA, and height and weight (BMI).

Qualitative

The responses from the nine participants were recorded both by voice recorder as well as in writing and included suggestion for changes in verbiage of the ORK-10 to improve the comprehension of the instrument.

Protection of Human Subjects

The following criteria was addressed regarding the participants, both children and adults, in this study as per the Office for Human Research Protections (OHRP, 2005): risk to subjects; adequacy of protection against risks; potential benefits of the proposed research to the subjects and others; importance of the knowledge to be gained; and data and safety monitoring for clinical trials. IRB approval was obtained from the USD committee as well as from the Capistrano Unified School District.

This study is best reflected as Category 1: 45 CFR 46.404 “Research not involving greater than minimal risk to the children” (OHRP, 2005). To approve this category of research, the IRB must make the following determinations: the research presents no greater than minimal risk to the children; and adequate provisions are made for soliciting the assent of the children and the permission of their parents or guardians, as set forth in HHS (Health and Human Service) regulations at 45 CFR 46.408 (OHRP).

Risk: There was no risk to the participants in this study. There were emotional, social and knowledge assessments completed, but no negative repercussions resulted from this data collection. Should any such repercussions have arisen, participants would have been referred to local mental health providers.

Importance of the Knowledge to be Gained: The outcome of this study will inform future interventions within obesity educational programs for families of adolescents. The data collected concerning the relationships among self-efficacy, physical activity and obesity risk knowledge in families of adolescents will serve to inform interventions impacting lifestyle choices in these families .

Clinical Trials: This study was not considered a clinical trial.

Provisions for Soliciting Consent: All consents were voluntarily given by the parents of minors (ages under 18). These were received in writing. Adult participants willingly signed consents to participate. Children under the age of 18 willingly signed assents with parental approval.

CHAPTER IV

RESULTS

The purpose of this study was to examine the relationships between parent physical activity, parent-adolescent obesity risk knowledge, parent-adolescent self-efficacy and adolescent physical activity. In this chapter, a discussion of the findings is presented. First a descriptive profile of the study participants, including their scores on the independent measures of obesity risk knowledge, self-efficacy, parent physical activity and the dependent variable of adolescent physical activity are presented. Next, the results related to the specific research questions and this chapter concludes with findings from the adolescent focus group convened to examine the effectiveness of the ORK-10 instrument for measuring obesity risk knowledge in this study's adolescent population.

Sample Profile

A purposive sample of 94 family dyads, which included one adolescent and one of his/her parents, was recruited from eight middle schools within a single school district located in southern Orange County, CA from September, 2007 to December, 2007. Participants self-administered a survey containing demographic questions and standardized measures: The ORK-10 (Swift et al., 2005), General Self Efficacy Scale (GSE) (Jerusalem & Schwarzer, 1992), International Physical Activity Questionnaire (IPAQ) (IPAQ, 2005), Patient-Centered Assessment and Counseling for Exerciser Plus Nutrition (PACE+)(Prochaska et al., 2001). The adolescents also wore pedometers for three days to validate physical activity levels.

Adolescent Profile:

Adolescents provided information on the following items: gender, ethnicity, school grade level, Grade Point Average (GPA), age, height, weight, and number of family members living in the household. These descriptions are reported in Table 2. The mean age was 12.8 years ($SD = 1.0$), 53% were male, and the majority self-identified as Caucasian (75%) with 15% reporting Hispanic ethnicity. The mean BMI was 19.38 ($SD = 2.7$) with mean height of 62.58 in. and mean weight of 108.42 lbs. Household constellation ranged from 2 to 6 family members with a mean of 4.41. Division by grade level shows over two thirds (68.9%) of the participants were enrolled in the seventh (31.7%) and eighth grades (37.2%). The reported GPA on a scale of 1.0 to 4.0 was: 2.0-2.9 (10.6%); 3.0-3.9 (56%); and 4.0 (24.5%).

Table 2

Descriptive Statistics for Adolescent Sample.

	<i>N (%)</i>	<i>M (SD)</i>	<i>Range</i>
<i>Ethnicity</i>	94		
Caucasian	70(74.5)		
Hispanic	14(14.9)		
Asian	5 (5.3)		
Other	5 (5.3)		
<i>Gender</i>	94		
Male	56 (59.6)		
Female	38 (40.4)		
<i>Age</i>	94	12.8 (1.0)	11-15
<i>Weight (in pounds)</i>	94	108 (9.2)	62-180
<i>Height (in inches)</i>	94	62.6 (3.7)	50-71
<i>BMI</i>	94	19.4 (2.7)	13.6-32.9
<i># of people in household</i>	94	4.41 (.9)	2-6
<i>Grade in school</i>	93		
6th	17(18.3)		
7th	28(30.1)		
8th	35(37.6)		
9th	8 (8.6)		
10th	5 (5.4)		
<i>GPA</i>	86		
2.0-2.9	10(11.6)		
3.0-3.9	53(61.6)		
4.0 or higher	23(24.5)		

Parent Profile:

Parent information was collected for the following variables: gender, marital status, age, work outside the home, monthly income, ethnicity, weight, height, educational level, number of household members, number of years married or living with current partner. Table 3 summarizes the parent profile. Parents ranged in age from 31 to 60 years ($M = 44$ years) two thirds (66%) were female, and nearly three fourths (73.4%) identified self as Caucasian with 17% reporting Hispanic ethnicity. Respondents' mean

BMI was 24.12. The family constellation ranged from 2 to 6 with a mean of 4.40.

Ninety-one percent reported being married and the mean number of years living with a

partner was 17. The majority of the adults (66%) worked outside of the home,

approximately 80% of the sample had at least a college level education, and the reported mean of the monthly household income was \$21,664.

Table 3

Descriptive Statistics for Parent Sample

	<i>N (%)</i>	<i>M (SD)</i>	<i>Range</i>
<i>Ethnicity</i>	93		
Caucasian	69 (74.2)		
Hispanic	16 (17.2)		
Asian	6 (6.5)		
Other	2 (2.2)		
<i>Marital Status</i>	93		
Married	85(91.4)		
Single	2 (2.2)		
Divorced	5 (5.4)		
Widowed	1 (1.1)		
<i>Gender</i>	94		
Male	19 (20.2)		
Female	75 (79.8)		
<i>Age</i>	93	44.1 (5.2)	31-60
<i>Weight (in pounds)</i>	87	149.4 (36.1)	105-265
<i>Height (in inches)</i>	90	65.3 (4.0)	54-76
<i>BMI</i>	86	24.1 (4.9)	18.2-43.2
<i># of years married (or living)</i>			
<i>with current partner</i>	89	17.5 (4.9)	2-31
<i># of people in household</i>	94	4.4 (.9)	2-6
<i>Education</i>	87		
Less than high school	2 (2.3)		
High school	14 (16.1)		
College	46 (51.7)		
Post college	26 (29.9)		
<i>Work outside the home</i>	93		
Yes	31 (66.7)		
No	62 (33.3)		
<i>Household income/month (in dollars)</i>	53	21664 (46184)	1400-300000

Descriptive Findings

The survey measures used in this study were completed as self-reports by both the adolescents and the adult participants. Reliability coefficients were computed for the overall scale scores of the study sample and can be compared to the reliability results of measure's described in the literature (See Table 4).

Table 4

Reliability Coefficients for Study Measures - ORK-10, GSE, PACE+

Measure	Adolescent (Study) (Alpha)	Parent (Study) (Alpha)	Swift et al., 2005 (Alpha)	Jerusalem & Schwarzer, 1992 (Alpha)	Procheska et al., 2004 (ICC)
ORK-10	.54	.59	.83		
GSE	.83	.89		.89	
PACE+	.81				.77

Measurements

The Obesity Risk Knowledge Scale (ORK-10)

The ORK-10 scale is a 10 item instrument measuring knowledge of the health risks associated with obesity. The pilot research for this measure was conducted in the United Kingdom (UK) with an opportunistic sampling of a “non-expert group” comprised of retail and air freight workers and an “expert group” made up of members of the Association for the Study of Obesity (ASO). Scores ranged between 0 and 10 with the higher score reflecting a higher level of obesity risk knowledge (Swift et al., 2005). The

non-experts scores ranged from 0-8 with $m = 4.0$ and the experts range was 4-10 with $m = 9.0$ with a Cronbach's alpha co-efficient of .83 indicating internal consistency and reliability in the original research (Swift, et al., 2005).

The ORK-10 had not been tested to this researcher's knowledge in a population of adults or adolescents in the United States. In the study reported here, adolescent's scores had a mean of 4.69 (range of 0 to 9) . The Cronbach's alpha reliability was .53. Parent ORK-10 scores had a mean of 5.54 (range of 1 to 9), and Cronbach's alpha reliability of .59.

General Self-Efficacy Scale

The General Self-Efficacy Scale (GSE) (Jerusalem & Schwarzer, 1992) was designed for general use in adults, as well as, in adolescents. It was created to assess a general sense of perceived self-efficacy with the aim of predicting one's ability to cope with daily hassles and also with one's ability to adapt to stressful life event of all types (Jerusalem & Schwarzer, 1992). It is self-administered and responses ranked on a 4 point likert scale. The range for the scores is 10-40. The GSE is a highly validated measure with inter-rater and internal consistency reliability of .76 to .90 (Jerusalem, & Schwarzer, 1992). In this study, the Cronbach's alpha was .83 for adolescents and .89 for the parents.

PACE+ MVPA

Patient-Centered Assessment and Counseling for Exercise Plus Nutrition (The PACE+) has incorporated the 60 minute MVPA (moderate, vigorous physical activity) screening measure (Appendix E) (Prochaska et al., 2001). This measure is brief and easy to use in a clinical setting. The results have meaning to clinicians practicing in adolescent settings (Prochaska et al., 2001). The measure was found to be reliable in

reflecting levels of physical activity in adolescents when correlated to objective data collected by studies using accelerometers. Reliability (ICC = .77) and validity ($r = 0.40$) were comparable to those reported in the literature (Prochaska et al., 2001). The MPVA measure assesses adolescent's amount of moderate to vigorous physical activity for a period of 60 minutes during the past 7 days and during a "typical" week. This is self-reported by the participant. An average of these scores results in data to reflect how many days per week the adolescent reached MVPA for a 60 minute time period. The goal is to achieve this activity level for 5 or more days per week (Prochaska et al., 2001).

In this study, the results of the PACE+ MVPA indicate that 71% of these adolescent participants met the 5 day expected level of activity to meet physical activity guidelines as put forth by the National Association of Sport and Physical Education (Prochaska et al., 2001); reliability (ICC) .81 (Table 5).

Table 5 Pace+MVPA Descriptives of Adolescent Activity

	PACE+ Score	Frequency	Percent
Valid	1.50	1	1.1
	2.00	1	1.1
	2.50	1	1.1
	3.50	6	6.4
	4.00	11	11.7
	4.50	6	6.4
	5.00	14	14.9
	5.25	1	1.1
	5.50	12	12.8
	5.75	1	1.1
	6.00	14	14.9
	6.50	6	6.4
	7.00	16	17.0
	Total	90	95.7
Missing	System	4	4.3
Total		94	100.0

Pedometers

The data for those adolescents wearing pedometers for the 3 days requested by this researcher is described in Table 6. There was no statistically significant relationship between the pedometer data and the adolescent PACE+ totals.

Table 6
Pedometer Description

<i>Pedometer</i>	<i>N</i>	<i>M (SD)</i>	<i>Range</i>
Day 1	88	11562.5 (6212.8)	600-51,388
Day 2	88	11245.1 (5172.0)	1094-40,000
Day 3	86	12435.2 (6472.7)	812-50,000

International Physical Activity Questionnaire (IPAQ)

International Physical Activity Questionnaire (IPAQ) was created to measure the levels of physical activity in a population between the ages of 18 and 69. The instrument was studied in 12 countries and on 6 continents using standardized methods and protocols (IPAQ, 2001). Approximately 2,450 participants of mixed gender were included (IPAQ, 2001). The mean age was between 25 and 49 in each country. Subjects repeated the survey over a 3 to 7 day period to measure test-retest reliability. Criterion validity was measured with a CSA (Computer Science Application) accelerometer for 7 consecutive days (IPAQ, 2001). The results indicated that Spearman's Rho clustered around 0.8 measuring reliability between multiple testings. Criterion validity had a median rho of .30 vs. the CSA accelerometer for minutes of moderate, vigorous, walking, and sedentary behaviors (IPAQ, 2001). The validity of the "usual week" and "last 7 days" reference periods were similar (IPAQ, 2001).

The categories of activity levels were assigned by the IPAQ Research Committee (IPAQ, 2005) as the following:

High (Category 1) - Those who move approximately 12,500 steps per day or one hour more moderate-intensity activity over and above the basal level (5,000 steps) of activity, or vigorous-intensity activity on at least 3 days achieving a minimum total physical activity of at least 1500 MET-minutes/week or 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total physical activity of at least 3000 MET-minutes/week.

Moderate (Category 2) - Some activity, more than low active category. Also, 3 or more days of vigorous-intensity activity of at least 20 minutes per day or 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day or 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total physical activity of at least 600 MET-minutes/week.

Low-Walking (Category 3) - Not meeting any of the criteria for either of the previous categories.

Sitting Question: An additional indicator variable of time spent in sedentary activity was collected but is not included as part of any summary score of physical activity. Data on sitting is reported as median values and interquartile ranges.

In this study, the parents completed the short-form IPAQ. The results were calculated by following the instructions for both the continuous and categorical analysis of the IPAQ (IPAQ, 2005). The findings showed that 62% of the parents rated their activity level as “High” with a MET-minutes/week mean of 1960.8; “Moderate” levels were reported by 18% of the parents with a MET-minutes/week mean of 872.2 and 15 % reported “Low” or “Walking” levels of activity with a mean MET-minutes/week of 1068.7. There was a mean of 593.8 MET-minute/week reported for the “time spent sitting, excluding transportation”.

Research Questions

Inferential statistics, correlations and multiple regression techniques were applied to examine the relationships between the independent variables and the dependent variable to answer the following research questions:

Question 1a: What is the level of obesity risk knowledge, self-efficacy, and physical activity among family dyads (adolescents and parents)?

In this study obesity risk knowledge measured with the ORK-10 for adolescents was lower ($M = 4.69$, $SD = 1.63$) than the parents' obesity risk knowledge when measured with the ORK-10 ($M = 5.54$, $SD = 1.84$). Likewise, the scores for self-efficacy as measured by the GSE were lower for adolescents ($M = 3.18$, $SD = .45$) than for the parents ($M = 3.43$, $SD = .41$). The level of physical activity as measured by the PACE+ indicated that the majority of the adolescent participants were meeting the recommended level of daily vigorous daily activity ($M = 5.33$, $SD = 1.23$) (See Table 6). The number of steps taken per

day as measured with the pedometer also indicated that these adolescents were meeting recommended levels of physical activity ($M = 11,747.6$, $SD = 4945.59$) (See Table 7). The high level of activity in adolescents was consistent with parents' physical activity levels. In this study, 61.7% ($N = 58$) of parents recorded their physical activity as measured by the IPAQ at a "high" level, ($M = 1960.89$, $SD = 2164.07$), 18.1% indicated that their daily level of physical activity was "moderate" ($M = 872.28$, $SD = 1285.60$) and 14.9% measured their level of physical activity as "low" ($M = 3741.07$, $SD = 3135.43$).

Question 1b: Is there a statistically significant difference between the independent variables measured in the adolescent and adult groups?

The t-test indicated that there was a statistically significant difference in obesity risk knowledge scores ($t = 3.45$, $df = 92$, $p = .001$) and in general self-efficacy scores ($t = 4.27$, $df = 89$, $p < .001$) between the adolescent and parent groups.

Question 2: What is the relationship of adolescent obesity risk knowledge, self-efficacy, BMI, age, gender and race/ethnicity with adolescent physical activity?

A correlation matrix of both the adolescent and parent independent variables inclusive of adolescent ORK total score, parent ORK total score, adolescent GSE total score and parent GSE total score was computed (Table 7). PACE+ scores were used rather than pedometer data as there were no statistically significant findings between the dependent variables and pedometer data as the dependent variable. There were no

statistically significant relationships between the independent variables of adolescent obesity risk knowledge and the dependent variable of adolescent physical activity ($r = .15, p > .05$). However, a statistically significant positive correlation between the adolescent total General Self-Efficacy (GSE) scores and the PACE+ total score ($r = .34, p < .01$) was obtained. This statistically significant finding occurred when one of the questions from the adolescent GSE measure, “*Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?*” was positively correlated with the total adolescent GSE score ($r = .33, p < .01$). Similarly an additional question from the GSE measure, “*Over a typical or usual week, on how many days are you physically active for a total of a least 60 minutes per day?*” was positively correlated with the total GSE ($r = .32, p < .01$).

Table 7

Correlations between Independent Variables (Parent ORK-10, Adolescent ORK-10, Parent GSE, Adolescent GSE) and Adolescent Physical Activity

Independent Variable	Adolescent Physical Activity PACE+ Total <i>r</i>
Parent ORK10	-.124
Adolescent ORK10	.154
Parent GSE	.216
Adolescent GSE	.344**

Note: N= 94

** $p < .01$

To examine what adolescent predictor variable influence adolescent activity, several regression models were generated. When predictor variables are highly correlated with each other, the computations required for the regression coefficients are seriously compromised, and results tend to be unstable (Polit & Beck, 2008). In an effort to determine the extent of the independence of these variables of each other, a correlation matrix was completed. In this study multicollinearity was not considered a problem as all correlations were below .70.

A simultaneous multiple regression was generated to determine the accuracy of the IV total GSE score in predicting total PACE+ scores while controlling for adolescent gender, adolescent age and adolescent BMI. Regression results indicate the overall model significantly predicted adolescent physical activity, $R^2 = .155$, $R^2_{adj} = .110$, $F(4, 75) = 3.43$, $p < .05$). This model accounts for 16% of the variance in adolescent physical activity. A summary of regression coefficients is presented in Table 8 and indicates only one (self-efficacy) of the four variables significantly contributed to the model.

Table 8
Simultaneous Regression of Adolescent Physical Activity (PACE Total Score) on four predictors

Predictor Variable	B	Beta	Standard Error	p-Value
Adolescent's gender	-	-.147	.273	.172
Adolescent's age	.377	.170	.133	.122
Adolescent's BMI	.208	.043	.052	.696
GSE Total Score Adolescent	.020	.313*	.299	.005
Multiple R = .393 R-square = .155	Adjusted R = .110 $F(4, 75) = 3.43$, $p = .01$		* $p < .05$	

A second regression model was generated with race/ethnicity, adolescent ORK total scores, GSE score, adolescent age, BMI, and gender. Regression results indicated the overall model significantly predicted adolescent physical activity, $R^2 = .18$, $R^2_{adj} = .115$, $F(4, 75) = 2.69$, $p < .02$) (Table 9). This model accounts for 18 percent of the variance in adolescent physical activity. A summary of regression coefficients is presented in Table 9 and indicates only one (self-efficacy) of the six variables significantly contributed to the model.

Table 9

Simultaneous Regression of Adolescent Physical Activity (PACE Total Score) on six predictors: Adolescent GSE Total Score, Adolescent ORK Total Score, Adolescent race/ethnicity, Gender, Age, BMI,

Variable	B	Beta	Standard Error	p-Value
GSE Total Score Adolescent	.812	.291*	.308	.010
ORK Total Score Adolescent	.116	.142	.094	.219
Adolescent's race/ethnicity	.115	.101	.126	.363
Adolescent's gender	-.488	-.189	.286	.092
Adolescent's age	.221	.180	.136	.109
Adolescent's BMI	.038	.081	.053	.472

Multiple R = .428

R-square = .183

Adjusted R = .115

$F(6, 72) = 2.69$, $p = .02$ * $p < .05$

Question 3: To what extent do the variables of parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy

predict adolescent physical activity while controlling for BMI, age, gender and race/ethnicity?

Simultaneous multiple regression was conducted to determine the accuracy of the IVs of parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy in predicting adolescent physical activity while controlling for adolescent BMI, age, gender and race/ethnicity? Regression results indicate the overall model significantly predicted adolescent physical activity, $R^2 = .24$, $R^2_{adj} = .143$, $F(9, 67) = 2.40$, $p < .02$ (Table 10). This model accounts for 24 percent of the variance in adolescent physical activity. A summary of regression coefficients is presented in Table 10 and indicated none of the 9 variables significantly contributed to the model.

Table 10

*Simultaneous Regression of Adolescent Physical activity (PACE+) on 9 predictor variables:
Parent IPAQ Parent ORK Total Score, Adolescent Total Score ORK, Parent Total Score
GSE, Adolescent Total Score GSE,, Adolescent race/ethnicity, Gender, Age, BMI*

Variable	B	Beta	Standard Error	p-Value
IPAQ Parent	6.61	.163	.000	.209
ORK Total Parent	.092	.126	.082	.264
ORK Total Score Adolescent	.177	.214	.103	.090
GSE Total Score Parent	.613	.200	.343	.079
GSE Total Score Adolescent	.565	.200	.336	.097
Adolescent's race/ethnicity	.060	.053	.129	.640
Adolescent's gender	.462	.177	.294	.121
Adolescent's age	.196	.160	.147	.186
Adolescent's BMI	.046	.096	.054	.403

Multiple R =.494

R-square =.244

Adjusted R = .143

F (9, 67) = 2.40, $p = .02$

*Question 4: How well does the ORK-10 instrument measure obesity risk
knowledge in this adolescent population?*

A focus group of nine adolescents was held to discuss the level of comprehension in
this age group of the ORK-10. The focus group consisted of one fifteen year old female,

one fourteen year old male, two thirteen year old males, 3 twelve year old males and 2 twelve year old females. Only one of the twelve year old males had not been exposed to the initial data collection process. All parental consents and adolescent assents were completed prior to the convening of this focus group. Each participant was assigned a number that was visible to all group members. This was referenced instead of their names to maintain anonymity. The group's conversation was voice recorded and recorded in writing by an outside "observer".

Following an explanation of the purpose of the group, the participants completed the ORK-10 anonymously and individually. Having completed this process, each question was read aloud by a group member, and the adolescents offered their comments on whether they understood the question. When any participant did not understand either the vocabulary or the concept of the question, this researcher encouraged the participants to offer vocabulary or explanations that were more age appropriate and would increase their understanding of the question. The process was completed for each of the 10 items contained in the ORK-10. Specific vocabulary identified as unfamiliar by this group included the following: beer- belly; menopause; bowel cancer; South Asia and Europeans; high blood pressure; clear health benefits.

This group offered insight regarding the vocabulary used in several ORK-10 items. Although the original investigators showed evidence that the reading level (7.2) was appropriate for individuals age 12 and over (Swift et al., 2005), this researcher found that the lack of terminology reflecting the vernacular of these participants was a far greater obstacle than that of the reading level. These adolescents were unaware of many

terms contained in the questions. The adolescents identified words that, if substituted, would increase their level of comprehension of the items in the ORK-10.

The researcher explored the unfamiliar vocabulary further. Each participant was asked what he/she did not understand about each word. The term “beer belly” is not part of the vocabulary of this age group as none of these adolescents could identify the meaning of this combination of words. The comments elicited from this group included, “I thought you were asking about a beer bottle, and it’s skinny, so I didn’t understand how it fit with being fat”. Another participant stated, “If you would have said “bear belly”, I would have known you were asking about a person’s fat tummy because bears have big bellies...I didn’t know how beer fit with being fat”. Another child stated, “You should just say “fat belly” or “fat tummy”...we know what a fat belly is, but what does beer have to do with being fat?”

The term “menopause” was not understood by any of the nine participants. Several in the group stated that they thought it had to do with “ladies having babies”, but none could define this term. When asked for clarification regarding “bowel cancer”, some of the adolescents had the perception that it was meant to be “b-o-w-l cancer”...They believed the survey had a misspelled word. When this researcher described “bowel”, the participants’ immediate response was, “those are intestines...you should have said intestinal cancer, not bowel cancer”. The terms “South Asia and white Europeans were unfamiliar to the participants...they questioned the need to have an item about obesity concerning India and Pakistan when, “most of those countries are starving...why would they be part of obesity questions?” The concept of “high blood pressure” was not familiar to most of these participants. None of these children were

aware of any adult who ever discussed having “high blood pressure”. They denied ever being taught in school about this health issue. When asked about the question containing the phrase “clear health benefits”, none of the adolescents could delineate the meaning of the word “clear”. Most of these participants understood “health benefits”, but the additional term of “clear” caused confusion and led them to answer “don’t know” to this question.

It was interesting to hear the comments about the questions that were posed in the negative (e.g. “There is NO major health benefit if an obese person who gets diabetes loses weight”; “Obesity does NOT increase the risk of developing high blood pressure”). The participants suggested unanimously that these were “trick questions” because it was necessary to understand the answer was the “opposite” of what one would expect. They suggested that these questions be rewritten as positive statements (e.g. “Obesity does increase the risk of developing high blood pressure”, and “There is a major health benefit if a person with diabetes loses weight” to increase the correct response rate.)

The mean score for this group of 9 participants was $M = 6.3$ with a range of 5.0-7.0. This is a higher mean score and range scores than those of the data collected from the pool of 94 participants during the initial data collection of this study ($M = 4.6$, range = 0-9). This would most likely be attributed to this being the second time that all but one of these participants answered this survey. Discussion may have taken place about these questions among the participants following their first exposure to the ORK-10 and some of them may have recalled being told the correct answers.

Summary of Results

Quantitative Results

The demographics of the study's participants describes gender, age, ethnicity, level of education, number of household members, monthly income, adolescent's GPA, marital status, and year's living with adult partner.

The Cronbach's alpha reliability for the ORK-10 in both groups of participants was below a $>.70$, which indicates lack of consistency of responses and low reliability (Cohen, 1988). The GSE, PACE+ and IPAQ all met acceptable levels of reliability as all three instruments had Cronbach's alpha coefficients above $>.7$ (Cohen, 1988). No multicollinearity was found among the independent variables.

A correlation matrix was computed and the relationships among the independent and dependent variables were examined. It was found that in this study no relationship existed between obesity risk knowledge in parents or adolescents and the level of physical activity for adolescents. A positive relationship was found between self efficacy and level of physical activity among adolescents, and between parents' self-efficacy and parents' level of physical activity, but not between the level of self-efficacy in parents and adolescent physical activity. An inverse relationship was found between levels of vigorous physical activity in parents and adolescent levels of physical activity. An inverse relationship was found between "sitting time" and level of obesity risk knowledge in parents. Adolescent participants completed an average number of steps totaling 11,740 per day. Simultaneous regression models were examined that included the independent variables and physical activity to determine the strength of the predication that existed.

Qualitative Results

A focus group of adolescents was conducted to examine the 10 items contained in the ORK-10. It was determined that many of the questions included in this instrument were composed of terminology unfamiliar to American adolescents between the ages of 12-15.

This group offered insight into the lack of comprehension regarding the vocabulary used in several ORK-10 items. Although the original investigators showed evidence that the reading level (7.2) was appropriate for individuals age 12 and over (Swift et al., 2005), this researcher found that the lack of terminology reflecting the vernacular of these participants was a far greater obstacle than that of the reading level. These adolescents were unaware of many terms contained in the questions. The adolescents identified words that, if substituted, would increase their level of comprehension of the items in the ORK-10.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary of the Problem

The epidemic of obesity in children and adolescents has no end in sight. It has been established that for the first time since the United States was industrialized, the lifespan of our children will be shorter than their current parents' (Clinton, 2005; Larson et al., 2007).

The most recent data available for the United States indicates that the proportion of overweight and obese children is escalating at rates that far surpass predictions of past decades. The current statistics reflect that 31% of children between the ages of 2-19 are at-risk for overweight or overweight with 16% being above the 95th percentile of BMI for sex and age (Jelalian, Wember, Bungeroth, & Birmaher, 2007). This major health issue reaches far beyond the United States as a global issue with both developed and developing countries experiencing increases in their obesity rates among children (Jelalian et al., 2007). Lifestyle changes are said to be the only possible intervention that will be effective in stemming the tide of this lethal health problem.

Summary of the Purpose

The purpose of this study was to examine the relationships among knowledge of obesity risks and adolescent and parental attitudes and behaviors as they impact the family's lifestyle specifically in the area of physical activity.

Discussion of Results

Research Question 1a: What is the level of obesity risk knowledge, self-efficacy, and physical activity among family dyads (adolescents and parents)?

The parents scored higher than the adolescents in obesity risk knowledge. This was not unexpected as they have acquired more experiences that would give insight into some of the questions included in this measure. The ORK-10, although perhaps not culturally sensitive to the adult population, did not include vocabulary that was unfamiliar to the parents as it was to the adolescents. An interesting finding with this group of “non-expert” participants, adolescents and parents, was the mean for the overall scores in both groups was higher than for the “non-expert group” in the original research. This may be the result of an increase in consciousness of families in the area of south Orange County regarding childhood obesity through media, educational venues and general awareness of current health issues. This increase in consciousness may also account for the statistically significant negative finding between parents’ obesity risk knowledge and the amount of reported “sitting” time on the IPAQ ($r = -.231, p < .05$). Perhaps parents did not describe their levels of activity as “vigorous” or “moderate”, but they were able to reflect that they sat less.

Another finding was that parents and adolescents had almost identical responses when the items were evaluated for correctness. The questions with the most correct answers for the adolescent participants were: “Obesity does **not** increase the risk of developing high blood pressure” (92%); “Obese people can expect to live as long as non-obese people” (88%); “A person with a ‘beer-belly’ shaped stomach has an increased risk

of getting diabetes” (70%); “There is **no** major health benefit if an obese person who gets diabetes, loses weight” (52%). The questions with the least correct answers from the adolescent participants were: “Obesity is more of a risk to health for people from South Asia (e.g. India and Pakistan) than it is for white Europeans” (6%); “Obesity increases the risk of getting breast cancer after menopause” (17%); “An obese person who gets diabetes needs to lose at least 40% of their bodyweight for clear health benefits” (19%); “Obesity increases the risk of getting a food allergy” (35%).

It is interesting to note that the ranking of the questions, from most correctly answered to least correctly answered, results in the same questions being ranked first and second for both the adolescents and adults, and the same two questions being ranked eighth and tenth. This demonstrates that among the parent and adolescent participants in this study the content that was better known, as well as that content that was less known, were similar. A possible explanation could be that those particular known questions, were not as difficult to make “educated” guesses.

The elevated scores on the GSE for both parents and adolescents are an indication that these participants should be able to pursue challenges and call upon their own resourcefulness when confronted with challenges (Bandura, 1997). It is important to note that the GSE scores of the parents and adolescents ($M=3.4$ and $M=3.1$) were higher than those reported in participants from the international groups ($M=2.9$); (Schwarzer & Jerusalem, 1992). A commonly described challenge in many families is finding the time to be physically active due to the busy schedules of today’s parents and adolescents (Styles et al., 2007). The parents and adolescents in this study with high self-efficacy levels may be able to negotiate the logistics of their daily lives to accommodate physical

activity despite the difficulty identified in many families to find the time required to do so (Styles et al., 2007). Previous studies have supported the notion that, among youth, both confidence in skills and self-efficacy are important factors affecting physical activity levels (Luepker, 1999). This finding is consistent in this group of adolescent participants that have increased self-efficacy scores and where 71% can be described as meeting recommended activity levels as measured by the PACE+. This group has also reported having an average number of steps taken per day that is reflective of an “active” category of physical activity (Tudor-Locke & Bennett, 2004). The remaining 30% may have actually been physically less active, or they may have failed to report their step counts accurately.

The elevated GSE scores in the parent population are consistent with the findings in their children. Just as there was a positive relationship between the adolescent’s self efficacy and their physical activity level, so was there the same positive correlation between the parents’ self-efficacy and their physical activity as measured by the IPAQ ($r = .216, p < .05$). The interesting outcome of this study is that although the parent self efficacy is related to their own physical activity, it does not appear to be related to that of their children. That is to say, parent’s self-efficacy in this study does not have a relationship with the physical activity their children accumulate. This finding may be a result of these adolescent participants having role models other than parents who are impacting their self-efficacy levels. There may be teachers, coaches, siblings or other peers that are encouraging them to be more physically active.

An interesting relationship was found between the activity level described as “vigorous” in parents and the PACE+ scores of adolescents ($r = -.23^*, p = .049$). Such a

finding is consistent with that found among researchers from the School of Public Health at the University of Minnesota (Luepker, 1999). Seriously committed parents who follow exercise routines that are vigorous in nature are frequently engaged in fitness activities that involve only themselves such as running, lap swimming, gym memberships, and bicycling. Typically, these parents do not share their physical activity time with family members, especially younger age children (Luepker, 1999). They participate in their routines outside of “family time” and in essence exclude children purposefully as they may impede the intensity and duration goals of the parental activity. The researchers concluded that parents who are moderate and less “serious” are better role models because their children actually see them being physical (e.g. family bike riding, family walks, family badminton, etc.); (Luepker, 1999). These parents are more apt to include their children in their physical activities. The “seriously active” parents usually are working out early in the morning before work, on their lunch break, after work before returning home, or at night after their children go to bed. These children never benefit from a role modeling relationship which is key to the theory of self-efficacy (Bandura, 1997). The paradoxical situation of having a very fit, athletic parent and a less than adequately active child is the result of this absent of role model (Luepker, 1999).

Research Question 1b: Is there a statistically significant difference among the independent variables measured in the adolescent and adult groups?

There was a statistically significant difference between the adolescent and parent groups for both obesity risk knowledge and self efficacy.

Research Question 2: What is the relationship of adolescent obesity risk knowledge, self-efficacy, BMI, age, gender and race/ethnicity with adolescent physical activity?

There was a positive relationship between the adolescent's self efficacy and their physical activity level when controlling the variables of age, gender, BMI and race/ethnicity. This is consistent with the literature findings that described a significant relationship between self-efficacy and positive health behaviors (levers-Landis et al., 2003). A regression model was generated and the six variables taken together explained eighteen per cent of the variation in adolescent physical activity. Of the six variables, only self efficacy was a statistically significant predictor of physical activity in adolescents. No statistically significant relationships were found between the independent variable, obesity risk knowledge, and the dependent variable, level of adolescent physical activity when controlling the variables of age, gender, BMI and race/ethnicity in the adolescent population of this study. An explanation for the lack of a significant correlation may be that questions included in the ORK-10 are not reflective of the risks of obesity familiar to this study's population. Because this instrument was developed in the United Kingdom, and its validity and reliability assessed in an adult population from that nation, it may be culturally insensitive within the American population included in this study (Swift et al., 2005). Additionally, this lack of a significant correlation between adolescent's obesity risk knowledge and levels of physical activity may be attributed to the fact that the ORK-10 was developed for use in adults and had not been previously tested in an adolescent population (Swift et al., 2005).

The instrument may not be applicable to participants in this stage of development due to content beyond that cognitive ability of age group (Piaget, 1973).

The construct of self-efficacy measures “ability to perform actions that enable a person to conduct a more active and self-determined life course” (Schwarzer & Renner, 2000). Adolescents who have even the slightest interest in exploring a program to run a marathon would most likely have a high level of self-efficacy and mostly likely be interested in being physically active. This group of adolescents did reflect this positive association between these two variables.

Research Question 3: What is the effect of the predictor variables of parent physical activity, parent and adolescent obesity risk knowledge, parent and adolescent self-efficacy on adolescent physical activity while controlling for BMI, age, gender and race/ethnicity?

When the variables of adolescent obesity risk knowledge, parent obesity risk knowledge, parent self-efficacy and parent physical activity were added to the regression equation, they accounted for another six percent of the variance. The total of these nine variables explained twenty-four percent of the variance in adolescent physical activity but none of the nine variables significantly contributed to the model. Individually they explained very little of the variance. Despite the fact that there was no condition of multicollinearity, these results may indicate that these variables are not distinctly separate, and may, in fact, have a synergistic effect in this model. In other words, they

are not independently responsible for the variance, but as a group of variables, they do have an effect on the level of adolescent physical activity.

Research Question 4: How well does the ORK-10 instrument measure obesity risk knowledge in this adolescent population?

This group offered insight regarding the vocabulary used in several ORK-10 items. Although the original investigators showed evidence that the reading level (7.2) was appropriate for individuals age 12 and over (Swift et al., 2005), this researcher found that the lack of terminology reflecting the vernacular of these participants was a far greater obstacle than that of the reading level. These adolescents were unaware of many terms contained in the questions. The adolescents identified words that, if substituted, would increase their level of comprehension of the items in the ORK-10.

The findings in this study lead to skepticism regarding the usefulness of the ORK-10 in populations outside of the United Kingdom. The question answered incorrectly most often by both parents and adolescents was “obesity is more of a risk to health for people from South Asia (e.g. India and Pakistan) than it is for white Europeans” (Swift et al., 2005). The majority of participants incorrectly identified the appropriate answer. This most likely reflects unawareness on the part of the American study participants of a condition of obesity that is relevant to the British participants who participated in the construction of the ORK-10. Also, several items in the ORK-10 have been identified as incomprehensible to American adolescents living in southern California due to unfamiliar verbiage and contextual confusion.

The results described above do not negate the results in previous research supporting the relationship between knowledge and health behaviors (Janin et al., 2001). Supportive evidence in the literature has been shown for this important relationship. The outcome of this study under discussion reflects a gap in the literature surrounding the lack of instruments developed to adequately measure obesity risk knowledge in adolescents within North America (Swift et al., 2005).

Summary of Results

Quantitative

This study examined the relationships among obesity risk knowledge, self efficacy and physical activity in families of adolescents. There were no significant relationships found for parents between obesity risk knowledge and physical activity in their children, nor between parent's self efficacy and their children's physical activity. In addition there were no significant relationship between the adolescents' obesity risk knowledge and their physical activity.

There was however a statistically significant relationship between adolescent's self efficacy and physical activity and parent's self-efficacy and their level of physical activity. There was a statistically significant negative correlation between parents' who describe their physical activity as "vigorous" and the adolescent physical activity level. There was a negative correlation between parents' obesity risk knowledge and "sitting time" for parents.

Qualitative

The results of this focus group yielded results that identified a need for researchers to engage in the development of a tool to assess obesity risk knowledge in American adolescents.

Implications for Nursing Practice, Nursing Education and Future Research

Nursing Practice

Community health nurses, nurse practitioners, school nurses and clinical nurse specialists all have opportunities to interface with families. Nurses practicing in primary care settings are the first line defenders against the pandemic of childhood obesity. Americans average 2.7 medical office visits per person per year, and 60% of these visits occur in a primary care setting (Calfas et al., 1996). Physicians have the potential to play a significant role in promoting regular physical activity, but most identify several barriers to doing so (Calfas et al., 1996). Such barriers include: lack of time during the office visit; lack of reimbursement for such counseling; lack of training to counsel in such areas of preventive health; lack of perceived effectiveness in such areas of preventive health (Calfas et al., 1996). Because prevention is the focus in primary care settings, nurses have opportunities to implement promising strategies with families of adolescents (Larson & Story, 2007). Such encounters are ideal for dissemination of the findings of this study in the area of role modeling by parents for adolescents as a means of impacting behavior change. Discussions regarding the need for parental role modeling as a means of adolescents developing self- efficacy and increased confidence should be included. It

is imperative for parents to acknowledge that taking the time to exercise or be physically active with their children may have a positive outcome in increasing the activity levels of their children and reduce chronic health problems in the future. Parents' should be made aware that there is no benefit to their children for them to maintain their own fitness routines if it totally excludes their children. That is to say, fit parents do not automatically beget fit children. Children need exemplars for how to establish lifestyle routines that include physical activity and parents are in an ideal position to be the example. The patterns of physical activity and higher self-efficacy developed in adolescents will inoculate them against becoming sedentary adults (Luepker, 1999). This is a profound message that primary care nurses must share when interfacing with families of adolescents.

Nurses practicing in elementary, intermediate and high schools should advocate to maintain physical education programs within the daily curriculum. There is evidence supporting the budget cuts at the federal and state levels, as well as, inadequately trained teachers are contributing to the trend of obesity by decreasing programs addressing physical activity and fitness throughout our national educational system (Luepker, 1999). Adolescents spend the majority of their time in school based activities. This is an essential system that must contribute resources that address effective means to counter sedentary habits in adolescence (Bronfenbrenner, 1979). Physical activity on a daily basis is a vital standard of Healthy People 2010 (USDHHS, 2000) and school nurses could have a significant impact on meeting this standard through their actions to curtail educational budget cuts that remove physical education from the schools.

Nursing Education

The topic of health promotion research must be more predominant in the curriculum of nursing education programs at the Associate, Bachelor's, Master's and Doctoral levels. Courses included in nursing education need to spend more time and resources on disease prevention (e.g. obesity) rather than disease management (e.g. Type 2 Diabetes). The consequences of this obesity pandemic will directly affect the ability of nurses in the future to provide quality care to patients at the primary, secondary and tertiary levels. It has been predicted that by 2020 chronic illness will significantly affect disability rates and require more care to be delivered in nursing homes and skilled nursing facilities (Rand Corporation, 2007). With the nursing shortage predicted to continue well into the next decade, it would serve all stakeholders well to minimize obesity related illnesses as a major contributor to this increase is our nation's disability rates.

Nursing educators must help to integrate studies highlighting the implications of the current American lifestyle, especially as it affects children and adolescents, into the practice patterns of their nursing graduates. The prediction of chronically ill patients filling the acute care and rehabilitation units of healthcare systems will put more strain upon an already burdened nursing care delivery system (Rand Corporation, 2007).

The descriptions of obesity and the consequences to health due to risks from obesity are topics that are saturating nursing literature. It is imperative that nurse educators offer courses in pediatrics, nutrition, maternal/child, community health, etc. that integrate the research concerning these topics into their curriculum. Nurse educators must challenge their students to increase their own commitments to adopting healthy

lifestyles as a first step in being role models and impacting self-efficacy in the families who seek their care.

Future Research Recommendations for Changes in Methods

The participants under study would have yielded more generalizable data that could be generalized to different populations had there been more diversity in ethnicity and social-economic status. A larger sample size would yield such data. It would also be beneficial for investigators interested in replicating this study to include a control group of adolescents and parents who are not associated with this school district or with schools participating in the SRLA program. This would allow findings to be generalized to families outside of the community of this specific southern California school district. It would also remove the bias regarding level of physical activity and self efficacy inherent in using a sample associated with a training program for running a marathon.

The use of an obesity-risk measurement with good internal consistency ($r = >.7$) would strengthen the ability to measure this variable for both adults and adolescents. The ORK-10 measure should not be included in any study with American participants unless it is re-designed to meet statistical standards demonstrating that it is a valid and reliable tool for use in studies undertaken in the United States.

Recommendations for Future Studies

Future research studies on the topic of family obesity and the role of physical activity will be needed to stem the tide of the epidemic of childhood obesity. There is a gap in the literature concerning the availability of an instrument to measure the level of

knowledge that both children and adults have regarding the consequences of being overweight (Swift et al., 2005). A culturally sensitive, and developmentally appropriate instrument, needs to be constructed and validated as a means of capturing the level of awareness families have regarding the health risks of obesity. Behavior changes are the remedy for this catastrophic health issue. These changes will not be possible without the development of interventions that are effective in reducing the weight gaining lifestyles of many Americans, especially the children. The process of education will not be effective unless we know what the public does not know about obesity's risks and long term effects. Once the knowledge deficit is identified through research, intervention programs can be designed and implemented to erase said deficit.

Another gap in the literature that warrants future study concerns the relationship between obesity in children and sedentary activities such as watching television, playing electronic video games and riding electric scooters and skateboards. Bronfenbrenner (1986) has postulated that television and other media need to be included in studies of the family because it warrants investigation not so much of the behavior that it produces, but rather of the behavior that is prevented with such activities. It has been shown that the clustering of physical inactivity within a family appeared stronger than the clustering of vigorous activity (Fogelholm et al., 1999). Studies done on women have identified a lack of association between the development of obesity and physical activity and television watching (Keim, Blanton & Kretsch, 2004). Even in the most physically active women, as the level of television watching increase, so did the level of obesity (Keim et al., 2004). Adolescents have more opportunities to watch television in the current social environment of working parents, and "latch-key kids". It would be important to develop

research to measure this activity vs. television relationship in families of adolescents. This study currently undertaken did not include the variable of family “inactivity”, but such data would build a strong base for effective interventions.

It is recommended that this study be replicated with a larger familial component that would include both parents and siblings. Including these additional family members in future studies will increase the information pertinent to the family’s total physical activity level. Previous studies have confirmed that sibling and parental involvement in physical activity are strongly predictive of adolescent participation in exercise and sports programs (Luepker, 1999). There is some evidence that peers and siblings may be even more influential than parents in increasing adolescent’s level of non-sedentary activity (Goran et al., 1999). Examination of this variable would also contribute to effective intervention programs to decrease family obesity.

The importance of role modeling to children by parents has been established as an effective intervention to change behavior (Bandura, 1997; Goran et al., 1999). Studies have also shown that irrespective of a parent’s level of physical activity, the presence of their support and encouragement had a positive relationship with a child’s devotion to physical activity (Fogelholm et al., 1999). Research to determine the magnitude of the change in a family’s lifestyle when the parents and sibling’s role is expanded to include the psychological elements of support and encouragement would assist in developing interventions that could positively affect obesity trends.

It may be important for future studies to examine the effectiveness of nurse educators who teach obesity topics in their nursing curriculum. The impact of this empowerment of nurses to address obesity issues with their patients could counteract the

lack of education by the physicians. The stigma of obesity has such dire social and psychological ramifications, that addressing this topic in a public forum such as a formal classroom is often avoided in deference of being “politically” correct and caring for nursing students’ self concept.

Nurse educators must also raise their student’s consciousness regarding the desensitization of this topic. The media has flooded our nation with this topic, and just as in the anti-smoking campaigns, health care professionals may take for granted that the public is well aware of the ramifications of the obesity epidemic. There is a danger in this thinking, and nurse educators must reinforce this paradoxical occurrence to their nursing students.

In conclusion, this chapter has provided a summary of the problem and purpose of this study. The findings of the study were discussed and summarized. Also included were the implications for nursing practice and nursing education. Finally, recommendations for methodological changes for future research, as well as, recommendations for future studies have been presented.

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APPENDIX A

Demographic Data

Adolescent

Code _____

Gender: Male Female

Age: _____ Weight _____ Height _____

Ethnicity: _____

Number of people who live in your family _____

Current Grade Level in School: 6 7 8

Current GPA (Grade Point Average) 1.0-1.9 2.0-2.9 3.0-3.9 4.0 or
higher

APPENDIX B

Demographic Data

Parents

Code _____

Gender: Male Female

Age: _____ Weight _____ Height _____

Marital Status: Married Single Divorced Widowed

Number of years married (or living) with current partner _____

Education (school years completed): High School College Post College

Ethnicity _____

Number of people in household: _____

Do you work outside the home? Yes No Household Income/month:

APPENDIX C

CODE: _____

OBESITY RISK KNOWLEDGE (ORK-10)

1. A person with a "beer-belly" shaped stomach has an increased risk of getting diabetes.	True	False	Don't know
2. Obesity increases the risk of getting bowel cancer.	True	False	Don't know
3. An obese person who gets diabetes needs to lose at least 40% of their bodyweight for clear health benefits.	True	False	Don't know
4. Obese people can expect to live as long as non-obese people.	True	False	Don't know
5. Obesity increases the risk of getting breast cancer after menopause.	True	False	Don't know
6. Obesity is more of a risk to health for people from South Asia (India /Pakistan) than it is for white Europeans.	True	False	Don't know
7. There is NO major health benefit if an obese person Who gets diabetes loses weight.	True	False	Don't know
8. Obesity does NOT increase the risk of developing high blood pressure.	True	False	Don't know
9. It is better for a person's health to have fat around the hips and thighs than around the stomach and waist.	True	False	Don't know
10. Obesity increases the risk of getting a food allergy	True	False	Don't know

APPENDIX D

1. Not true at all
2. Hardly true
3. Moderately true
4. Exactly true

GENERAL SELF-EFFICACY SCALE (GSE)

1. I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2. If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
3. It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
4. I am confident that I could deal efficiently with unexpected events.	1	2	3	4
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
6. I can solve most problems if I invest in the necessary effort.	1	2	3	4
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
8. When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
9. If I am in trouble, I can usually think of a solution.	1	2	3	4
10. I can usually handle whatever comes my way.	1	2	3	4

PACE+ ADOLESCENT PHYSICAL ACTIVITY MEASURE

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time.

Physical activity can be done in sports, playing with friends, or walking to school.

Some examples of **physical activity** are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football, & surfing.

Add up all the time you spend in physical activity each day (don't include your physical education or gym class).

P1. Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?

☐ 0 days ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 days

P2 Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day?

☐ 0 days ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 days

Scoring: $(P1 + P2) / 2 < 5 \Rightarrow$ not meeting physical activity guidelines

APPENDIX F

- 1a. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling,?

Think about *only* those physical activities that you did for at least 10 minutes at a time.

_____ days per week ➡

or

☐ none

- 1b. How much time in total did you usually spend on one of those days doing vigorous physical activities?

_____ hours _____ minutes

- 2a. Again, think *only* about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ days per week ➡

or

☐ none

- 2b. How much time in total did you usually spend on one of those days doing moderate physical activities?

_____ hours _____ minutes

- 3a. During the last 7 days, on how many days did you walk for at least 10 minutes at a time? This includes walking at work and at home, walking to travel from place to place, and any other walking that you did solely for recreation, sport, exercise or leisure.

_____ days per week ➡

or

☐ none

- 3b. How much time in total did you usually spend walking on one of those days?

_____ hours _____ minutes

The last question is about the time you spent sitting on weekdays while at work, at home, while doing course work and during leisure time. This includes time spent sitting at a desk, visiting friends, reading traveling on a bus or sitting or lying down to watch television.

4. During the last 7 days, how much time in total did you usually spend *sitting* on a week day?

_____ hours _____ minutes

This is the end of questionnaire, thank you for participating.

Appendix G

Qualitative Interview Guide Obesity-Risk Knowledge Survey (ORK-10) Discussion

I want to thank you for taking the time to do this focus group today. I am interested in learning about your understanding of the consequences (results) of obesity.

Before we begin, I'd like to read and record this short statement. "You're aware that this discussion is being audio-taped and you've agreed to participate? Do you have any questions regarding the process that I can answer before we begin? "

Let me acknowledge that some of the questions may not make sense to you and let me explain what I am trying to do. I want to understand your level of understanding of the 10 questions that are asked on this survey.

Now we will review each question:

- Share your thoughts about the questions on the scale. Do they have any meaning for you? Are the words in the questions commonly used in discussions (talking) with your family, friends, and the community where you live?
- How would you answer each question: true, false or don't know? Write this down, do not give your answers out loud.
- Write down what words you do not understand
- Write down your opinions about how the questions might be improved so that other students of your same age would understand what each question is asking.

APPENDIX H
Pedometer Log
Total Number of Steps

NAME: _____

SCHOOL: _____

Day 1 _____

Day 2 _____

Day 3 _____

APPENDIX I

Informational Letter to Parent/Guardian

Dear Parent or Guardian,

You and your adolescent child are being asked to be a part of a research study that looks at how families can stay healthier and be more active. This research study is being conducted by Elaine Rutkowski, a registered nurse, as part of her doctoral dissertation at the University of San Diego, School of Nursing.

This study is not being sponsored by the Capistrano Unified School District. You and your child do not have to participate if you don't want to. Nothing about your child's schooling, grades, or anything else will change if you decide not to do this. Nothing will change in your child's involvement in the SRLA Program, either, if you decide this is not for you.

Participating takes about 20 minutes of your time to get started. There are some forms in this packet for you to fill out. If you think you might be interested, please read the form called "Parent/Guardian Consent." It will tell you the details about your and your child's participation in the study. There is also a sample permission form for your child to read, called the Adolescent Assent Form. Later on, if your child does enroll in the study, he or she be given another copy to sign. If you and your child would like to participate, please sign one copy of the "Parent/Guardian Consent" and return it with the other forms in the collection box. Be sure to keep the other copy in your files for future reference. If you'd like to talk or ask questions about the study, you can call me at (949) 495-3341 or e-mail me at emrutkowski@cox.net.

Your time and consideration are appreciated very much.

Sincerely,

Elaine Rutkowski, RN, PhD (c), CNS, PHN

APPENDIX J

PARENT/GUARDIAN CONSENT: *Quantitative****To participate in the research study:******Obesity Risk Knowledge, Self-Efficacy, Physical Activity in Families of Adolescents***

Dear Parent or Guardian,

You and your adolescent child are being asked to be a part of a research study that looks at how families can be healthier and more active. This research study is being conducted by Elaine Rutkowski, a registered nurse, as part of her doctoral dissertation at the University of San Diego, School of Nursing. This study is not being sponsored by the Capistrano Unified Schools District and your child does not have to participate if you don't want them to. Nothing about your child's schooling, grades, or anything else will change if you decide not to do this. Nothing will change in your child's involvement in the SRLA Program, either, if you decide this is not for you.

What you are being asked to do:

Fill out the enclosed forms and return them to the collection box in the SRLA classroom:

First, you'll fill out a brief questionnaire that ask you questions about things like your gender, ethnicity, household configuration, and income. This will take you about 5 minutes.

- Then, you'll fill out 3 questionnaires that ask things about how much you know about the risks of obesity, how confident you feel, and your level of physical activity. This whole process will take about 15 minutes.
- You will be notified as to the time and place of the session in which your child will participate. It is described in the next section. There is also a small chance that your child might be invited to participate in an extra activity in which a group of 8-10 kids in the study get together with the researcher for about an hour in a school classroom for a discussion. This small group discussion will focus on ways that adults can better communicate with kids about health issues like obesity, and what would be some better ways of asking kids about these issues. If your child is randomly chosen for this extra

activity, the research will contact you, and give you a special consent form for it so you can decide if that's something you and your child would like to do.

What your child is being asked to do:

- Your child will attend a session following an SRLA practice at your child's school that will last about 60 minutes. Your child will be given a permission form (called an "Assent Form") to read and sign. Your child will have 3 questionnaires to fill out which are very similar to the ones you are filling out. It might take kids a bit longer than 30 minutes to fill these out, but the researcher will be there to help them. Your child will be reminded that he or she can stop anytime they want to, or decide they just don't want to do this. There will be a restroom close by, and your child will be able to take a break and visit the restroom or relax after finishing the forms.
- At this same session, your child will receive a pedometer which measures how many steps you take and how long you are active. The researcher will show your child how to use it. The pedometer is very light weight and attaches to your child's belt or waistband with a clip. The researcher will make sure your child knows how to properly wear it and will include you in this demonstration, too, if you like. This demonstration will last about 15 minutes. Your child will receive a pedometer to keep after the study is over.
- Your child will be asked to wear the pedometer for the next 5 days while he or she is awake. It shouldn't interfere with any of his or her normal activities. It can be worn with a shirt or blouse over it, so no one will notice it.
- Your child will be asked to write down the totals from the pedometer on a special log. When the five days are completed this log will be placed in the SRLA collection box at school.

- ***Your and your child's participation in this study are:***

Voluntary. You and your child do not have to do any of this. Nothing about your child's grades, his/her schooling, or involvement in the SRLA Program will change if you choose not to do this. You and your child can decide at any time to quit.

Confidential. No names will be recorded or attached to the survey forms or data. All consent/assent forms will be stored separately from data. Only code numbers will be used on data forms. All data will be kept in a locked file cabinet for 5 years before being destroyed and only the researcher will have access to this file. The results will be

reported on a group basis, and neither your child's identity nor his or her school will ever be identified in reporting the results.

Potential Risks. If you or your child becomes tired while filling out the forms or participating in the study, you or he/she can take a break and rest. Sometimes when adults are asked things about health issues like obesity and exercise, they feel emotions like anxiety. Also, sometimes kids feel anxious when asked about these things, too. If you or your child would like to discuss these feelings, you can call the Orange County Mental Health Hotline (1-800-832-1200) and/or the California Youth Crisis Hotline number (1-800-843-5200.)

Further Information. If you would like to know more about this research study—before, during, or after your participation in it—you can call Elaine at (949) 495-3341 or e-mail her at emrutkowski@cox.net.

You can also call her professor, Dr. Cynthia Connelly, at 619-260-4548 or e-mail her at connellyc@sandiego.edu.

If you and your child would like to participate in this survey, please:

- Sign and date this form. Keep one copy of this form for your records and return the other to the researcher.
- Fill out the other 3 questionnaires in the envelope and return them to the researcher.

If you don't want to participate, please disregard these forms.

Thanks for your time and consideration.

I have read and understand this form, and consent to the research it describes to me. I have received a copy of this consent form for my records.

Signature of Parent/Guardian Participant

Date

(Printed name of Parent/Guardian Participant)

Signature of Investigator

Date

APPENDIX K

Adolescent Assent Form: Quantitative

Obesity Risk Knowledge, Self-Efficacy, Physical Activity in Families of Adolescents

My name is Elaine Rutkowski. I am a doctoral student in nursing at the Hahn School of Nursing and Health Science at the University of San Diego. I am inviting you to help me with my research project. I am studying kids that are your ages to try and find out how much you know about obesity and how much exercise you do.

The part I need your help with doing 2 things:

One is to fill out three questionnaires. A questionnaire is a survey, like on TV where they ask people what they think about stuff. It's not like a test at school. You don't need to feel embarrassed if you can't answer the questions, or just don't want to. Nobody is going to grade it. Nobody will know that it's your questionnaire, because your name will not be on it, just a number. You will be asked stuff about yourself, then asked other stuff about health topics like exercise or what happens when people are overweight. It will probably take 30 minutes to fill out all three of these forms. If you decide there are questions you don't want to answer, that is perfectly OK. You can skip them. No one will be mad at you. I will not share any information that you give me with anyone. Any papers that I collect from you will be locked up in a safe place so that no one can see them except me. At some point I may talk to other nurses and doctors at meetings and write about what I find out in magazines for doctors and nurses, but I will never use your names or the name of your school.

The second thing I am asking you to do is to wear a pedometer for three days while you're awake. It's a little device that measure how many steps you take every day and how long you were active. I will give it to you for free, and you can keep it. The pedometer you will wear is a very small box that you will put on your belt or the waistband of your pants or skirt. If you decide you don't want to wear this, or if you start to wear it and then change your mind, it is ok. No one will be mad at you.

You do not have to help me with this project. You can say "No, thank you," and it will not affect your grades at school or your participation in the Students Run LA program and no one will be mad or disappointed in you. If you do decide to work with me, you may get tired. You can take time to rest anytime or just decide to quit. You don't have to answer

any questions or give me any information that you don't want to give me. Sometimes when kids think about stuff like their weight or exercise, they get upset or anxious. If you feel that way, be sure to let your parent/guardian know. They or you can call the Orange County Mental Health Hotline at 1-800-832-1200 or the California Youth Crisis Hotline number (1-800-843-5200) anytime free.

If you have any questions about this study you can call me at home. My phone number is (949) 495-3341 and my e-mail is emrutkowski@cox.net. If you want to call my teacher, Dr. Cynthia Connelly, you can do that too. Her telephone number is (619) 260-7938 and her e-mail is connellyc@sandiego.edu.

By signing my name here, I am saying: Yes, I want to do this.

Signature of Participant

Date

Please print your name on this line.

Signature of Principal Investigator

Date

APPENDIX L

Adolescent Assent Form: Qualitative

Obesity Risk Knowledge, Self-Efficacy, Physical Activity in Families of Adolescents

My name is Elaine Rutkowski. I am a doctoral student in nursing at the University of San Diego. I am inviting you to help me with my research project. I am studying kids that are your age to try and find out how much you know about obesity and how much exercise you do.

The part I need you to help me the most with has to do with the questionnaire I'm using. A questionnaire is a list of questions, like a survey. I need to have about 10 kids meet with me in a group to talk about this questionnaire so that it will be understandable for kids your age. We will only meet one time for about one hour in a classroom at your school. I will tape record our meeting so that I don't have to write everything down that we talk about. This tape recording will not be heard by anyone but me. While we're talking, we won't use your real names. Instead, I'll call you by a code number and ask you to call the other kids by their numbers, too. That way nobody will know who was talking.

I will not share any information that you give me with anyone. Any papers that I collect from you will be locked up in a safe place so that no one can read them. At some point I may share our work with other doctors and nurses, but I will never use your names.

You do not have to help me with this project. This will not affect your grades at school or your participation in the Students Run LA program. No one will be mad or disappointed in you if you don't want to work with me in this group.

If you do participate in this group, you may get tired and want to leave for a little while to rest. That is perfectly ok. You can go to the restroom anytime you want, too. You don't have to answer any questions or give me any information that you don't want to give me. If you decide at any time during this group meeting that you want to leave the group, you may do so. No one will be mad at you for doing that.

Sometimes when kids think and talk about stuff like their weight, they get upset or anxious. If you feel that way, be sure to let your parent/guardian know. You and they can call the Orange County Mental Health Hotline at 1-800-832-1200 or the California Youth Crisis Hotline number (1-800-843-5200) anytime free.

If you have any questions about this study you can call me at home. My phone number is (949) 495-3341 and my e-mail is emrutkowski@cox.net. If you want to call my teacher, Dr. Cynthia Connelly, you can do that too. Her telephone number is (619) 260-7938 and her e-mail is connellyc@sandiego.edu.

By signing my name here, I am saying: Yes, I want to do this.

Signature of Participant

Date

Name of Participant (Printed)

Signature of Principal Investigator

Date

Capistrano Unified School District

Excellence in Education

33122 Valle Road, San Juan Capistrano, CA 92675

Telephone (949) 234-9200/FAX 489-8646

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University of San Diego,
Hahn School of Nursing
5998 Alcalá Park, San Diego, CA 92110

Dear Institutional Review Board Representative:

RE: ELAINE RUTKOWSKI, APPROVAL OF DOCTORAL STUDY

On behalf of the Capistrano Unified School District, I affirm that Elaine Rutkowski has permission and the district's consent to engage middle school students and their parents – that are participating in the Students Run Los Angeles (SRLA) program during the 2007-08 school year – to take part in her doctoral dissertation study, *"Obesity Risk Knowledge, Self-Efficacy, and Physical Activity in Families of Adolescents"*. The district requires that prior to participation; the parents of each SRLA student give written consent – a copy of which will be available for inspection prior to the administration of any data gathering instruments.

I have reviewed her proposal, and acknowledge that approximately 100 dyads of student and parents will be selected to participate in her study. Additionally, Elaine Rutkowski agrees that participants can withdraw at any time without any negative repercussions.

On behalf of the district, I acknowledge the importance of Elaine's work related to childhood obesity, and look forward to sharing the results of this study with the district's wellness committee, health services staff, middle school principals, teachers, and our staff.

Should you have any questions, you may contact me at (949) 234-9423.

Respectfully,

Jeffery Bristow
Executive Director, Risk Management & Compliance

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Capistrano Unified School District

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33122 Valle Road, San Juan Capistrano, CA 92675

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ARNOLD W. CARTER

September 14, 2007

Dr. Thomas Herrinton
IRB Administrator
University of San Diego
Office of the Provost
5998 Alcala Park,
San Diego, CA 92110

Dear Dr. Herrinton,

I am aware that Elaine Rutkowski is requesting a modification to her IRB application approved on September 5, 2007.

The principals at the middle schools have discussed the logistics of parental data collection with Ms. Rutkowski and appreciate her proposed plan modification because of the extremely busy time of year. I am also in support of the plan to collect data from consenting middle school parents at the time of the initial meeting to organize the SRLA program, rather than mailing the surveys to parents following this initial meeting, as was described in the original IRB application. All parties involved in this decision agree that the burden to the participants will be lessened with this change.

Respectfully,

Jeffery Bristow
Executive Director, Risk Management & Compliance

JB:kg