

Planning Phase of a Population-Specific Healthy Lifestyle Program

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Abstract

Childhood overweight and obesity in the United States are significant health problems that have a negative impact on a child's physical and psychological well-being and that generate an extra financial burden for those affected due to health care costs. The current evidence-base for treatment of childhood overweight and obesity recommends a moderate- to high-intensity healthy lifestyle program of physical activity, healthy diet, and behavioral modification. The purpose of this descriptive, multi-method inquiry was to identify the perceived barriers to a healthy lifestyle for a population of elementary school students, ages 6 to 13 years, as the basis for the development of a school-based, population-specific healthy lifestyle program. Quantitative findings included a significantly higher level ($p = .04$) of perceived barriers to physical activity by age category in terms of social factors. Post hoc analyses revealed that 11- to 13-year old students had higher perceived barriers related to social factors compared to 9- to 10-year olds ($p = .03$). Perceived barriers to physical activity related to body-related factors were also significantly higher ($p = .02$) for students living in a single-parent household as compared to those students living in a dual-parent household. Additionally, single- versus dual-parent household status was found to be a significant predictor ($OR = 2.68$, $CI [1.004, 7.134]$) of total perceived barriers to physical activity, with students living in a single-parent household reporting a higher level of perceived barriers as compared to those living in a dual-parent household. Qualitative findings revealed that the overarching perceived barriers in terms of physical activity were related to knowledge and barriers to healthy diet were related to access.

Background and Significance

Recent statistics indicate that more than 23 million children and adolescents are overweight or obese in the United States (U.S.) (Centers for Disease Control and Prevention [CDC], 2008). According to the CDC (2009), this means that approximately one-fifth of American children are overweight or obese. The fairly rapid and consistent rise in the problem has been termed an epidemic in the childhood population (Klish, 2011). The prevalence of childhood overweight and obesity continues to rise in the U. S., is strongly linked to adult overweight and obesity, and predisposes children to numerous overweight- and obesity-related medical problems, decreased quality of life, poor academic performance, disability, and premature death. There is recent evidence to suggest that this generation may be the first to experience a shorter lifespan than their parents (Daniels, 2006). In addition, the health care costs associated with being overweight or obese have a significant impact on state and national health care expenditures in the U.S. (Finkelstein, Fiebelkorn, & Wang, 2003, 2004).

The causes for the rise in overweight and obese children in this country are multiple and complex. Among common theories of causation are the increase in the number of full-time working mothers with less time and energy for cooking, ease of access to fast food, introduction of cable television with increased time watching television and less time spent in unstructured outdoor play, and the lack of physical education requirements in schools (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004; Brown, Broom, Nicholson, & Bittman, 2010; Landhuis, Poulton, Welch, & Hancox, 2008; Nelson, Gordon-Larsen, North, & Adair, 2006; Veugelers & Fitzgerald, 2005). While not exhaustive, each of the listed causative theories exhibits a plausible explanation to the problem of overweight and obesity in the childhood population.

The reasons for lack of widespread success in treating the epidemic of childhood overweight and obesity are equally as complex. Being overweight or obese is a complicated and

multi-faceted problem, likely the result of multiple issues including individual behavior and choice, family and cultural norms, and environmental influences. The complexity of these multiple issues, or social and environmental determinants of health of a population, may represent some of the reasons behind lack of success in treatment at the population level, as well as gaps in the treatment evidence-base, as each population possesses its own unique and complicated set of health-determining factors. Most notably, the gaps in the research-generated evidence include lack of evidence on well-defined, population-specific methods for creating an effective and sustainable non-pharmacologic (behavioral) weight loss program for children.

To date, certain non-pharmacologic efforts directed at combating overweight and obesity have been effective in individuals, but behavioral efforts that are effective at the population level remain elusive (Birch & Ventura, 2009; Dehghan, Akhtar-Danesh, & Merchant, 2005; Ebbeling, Pawlak, & Ludwig, 2002). While it is clear that increased physical activity and decreased caloric intake are conducive to weight loss (Katz, 2011), this general knowledge has done little to improve the overweight and obesity rates in children in the U.S. Current evidence-based research suggests that behavioral interventions may hold some promise, but does not describe in significant detail what population-specific behavioral interventions should be implemented to improve childhood overweight and obesity rates (U.S. Preventative Services Task Force, 2010; Whitlock, O'Connor, Williams, Beil, & Lutz, 2010). The dearth of conclusive evidence related to successful, non-pharmacologic weight loss in children may be linked to the vast variability in daily environments of the children in question. Daily living environments, manifested as social and environmental determinants of health, have a significant impact on the sustainability of any type of health intervention, including attempts at weight loss. Access to positive support

systems, safe physical environments for play, and healthy foods are crucial to a daily living environment that could support sustainable healthy weights in children.

The strongest evidence related to combating childhood overweight and obesity to date includes implementation of a moderate-to-high intensity healthy lifestyle program with three key components including physical activity, healthy diet, and behavioral modification (U.S. Preventative Services Task Force, 2010). There is also research that suggests that a population-specific approach to health care interventions is imperative to successful treatment (Carter, Goto, Schuldberg, & Wolff, 2007; Crawford, Storry, Wang, Ritchie, & Sabry, 2001; Glover et al, 2011; Grow et al., 2010). This finding could reasonably be attributed to the fact that a targeted approach to treatment addresses some of the complexities of life inherent in specific populations. Current investigation also indicates that school-based interventions hold some promise in effectively curbing childhood overweight and obesity rates (Zenzen & Kridli, 2009). This is likely due to the fact that children spend 6 to 7 hours per day in the school setting, allowing for consistent application and reinforcement of weight-related lifestyle interventions. What is also known is that parental involvement and a community-based approach are important to intervention effectiveness (Findholt, 2007; Wofford, 2008). This type of inclusive approach provides the support system that children need to lose weight and maintain a healthy lifestyle.

Data clearly suggest that childhood overweight and obesity have risen to epidemic proportions in the U.S. and that effective measures must be taken to improve the current and future health of our nation. The enormity and the negative impact of the problem, the complexity of the issue, and the current relevant evidence-base warrant the need for exploration of the effectiveness of a school-based, population-specific healthy lifestyle program that is

planned, developed, and implemented with parental involvement and community support as an intervention to help curb childhood overweight and obesity.

There was determined to be a need for such a program at an inner-city elementary school in Jackson, Mississippi. The student population of the school numbered approximately 362 children and was comprised of 100% African-American students who were enrolled in grades Pre-K through 5th Grade. The students ranged in age from 3 to 13 years, and there were approximately equal numbers of boys and girls who attended the school. Most notably, there were recent data indicating an overweight and obesity rate among its students that exceeded district and statewide as well as national rates of childhood overweight and obesity. A first step in addressing the complex problems of childhood overweight and obesity at the elementary school involved determining the perceived barriers to a healthy lifestyle encountered by the students who attended the school. Some of the healthy lifestyle barriers were already known. While there were regularly scheduled times for physical activity, actual engagement in physical activity frequently depended upon the weather, as the majority of the play equipment was located outside. Additionally, the school lost one of its two Physical Education teachers two years ago due to a drop in student census, creating an extra work burden on the remaining Physical Education teacher. Several small programs were in place to address healthy diet concerns, but those would lose funding in the near future. Although student-access vending machines have been removed from the school, potato chips were still available for sale in the lunch line and were frequently a first choice of the students. School administrators, teachers, and parents had expressed concern over these issues and a desire and willingness to work with school-based health center health care professionals in addressing the problem.

Review of the Literature

Scope of the Problem in Mississippi

The incidence and prevalence of childhood obesity is especially alarming in the state of Mississippi. In 2006, the Child and Youth Prevalence of Overweight Survey (CAYPOS) published a rate of overweight and obesity of close to 40 % in elementary and middle school-aged children who attend public schools in Mississippi (Kolbo et al., 2006). This statistic ranks the state of Mississippi highest in the nation for cases of childhood overweight and obesity (The Child and Adolescent Health Measurement Initiative, 2009). Additionally, the U.S. Department of Health and Human Services (2007) has declared the state's school-aged children's overweight and obesity rates to be approximately seven and a half times the national health goal for 2010. The 2009 data from the Healthy Students Act of 2007 policy evaluation show a 35.8% overweight and obesity rate of school-aged children in Mississippi's District V, home to the state capital of Jackson (Southward et al., 2009). As recently as Spring of 2011, a school-based health clinic chart review of students' height and weight with subsequent Body Mass Index (BMI) calculation and use of the CDC's gender-specific and age-specific BMI charts conducted by this author revealed an overweight and obesity rate of over 45% among participants at the elementary school of interest.

Sequelae and Financial Impact of Overweight and Obesity

Childhood overweight and obesity lead to many health-related conditions including cardiovascular disease, diabetes, sleep apnea, arthritis, certain types of cancer, and self-esteem issues. Some of these health-related outcomes, such as hypertension, diabetes, sleep apnea, and self-esteem issues, are more prevalent at an earlier age than ever before (Daniels, 2006). Additionally, an overweight child has an 80 % chance of becoming an overweight or obese adult (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). For these overweight or obese children, the

onset of adulthood heralds an even greater risk of developing multiple comorbidities (e.g., hypertension, diabetes, sleep apnea, arthritis, cancer, and self-esteem issues). Whether a person develops overweight or obesity-related conditions in childhood or upon reaching adulthood, the comorbidities in question frequently lead to decreased quality of life, disability, and increased mortality.

Being overweight or obese may also have a significant impact on a child's psychological health (Daniels, 2006). According to research conducted by Young-Hyman et al., (2006), heavier children experience a greater degree of psychological and mental distress than do children with a healthy weight. In addition, children with excess weight tend to perform more poorly in school. Taras and Potts-Datema (2005) found that children who were overweight or obese had poorer academic performance as compared with their healthy weight counterparts.

An additional cause for concern stems from a report published on the consequences of childhood overweight and obesity (Daniels, 2006). Study findings clearly suggest that this generation of children may be the first to experience a shorter lifespan than their parents. This generational decrease in life expectancy is linked to the vast number of children who are overweight or obese and the associated health risks.

The financial impact of childhood overweight and obesity is evident in the form of health care costs incurred as a direct or indirect result of overweight or obesity. In 1998, the estimated cost of obesity and its complications made up 9.1 % of the United States total yearly medical expenditure, and the Medicaid expense for the same period was 3 billion dollars for childhood obesity and its sequelae alone (Finkelstein et al., 2003). In addition, a study of healthcare expenditures related to childhood obesity showed that, on average, a child with diagnosed obesity had yearly medical expenses of 172 dollars greater than a child with a healthy weight

(Hampl, Carroll, Simon, & Sharma, 2007). Specific to the state of Mississippi, it is estimated that between the years of 1998 and 2000 obesity created 757 million dollars in medical expenditures (Finkelstein et al., 2004).

Current Evidence-Base for Treatment of Childhood Overweight and Obesity

Though not specific in detail, relevant evidence-based research guidelines reveal that current best practice in terms of non-pharmacologic intervention is to enroll overweight and obese children in a moderate-to-high intensity healthy lifestyle program (U.S. Preventative Services Task Force, 2010). These programs should include components that address physical activity, healthy diet, and behavioral modification and should involve interaction between child and health professionals for greater than 25 hours over a six-month period.

Recent investigations into treatment of childhood overweight and obesity advise that a population-specific approach will be more likely to provide successful results. Current studies on diet and physical activity among ethnic populations indicate that successful health promotion interventions involve consideration of population-specific needs (Carter et al., 2007; Glover et al., 2011). In addition, contemporary research on childhood obesity suggests that risk for the problem may be related to the population in which one lives, signifying a call for a focus on the needs of a specific population in order to effectively address risk reduction (Crawford et al., 2001; Grow et al., 2010).

A recent integrative research review revealed that schools may be highly effective implementation sites for healthy lifestyle programs that combat childhood overweight and obesity (Zenzen & Kridli, 2009). There is also recent evidence that school-based interventional programs may help prevent (Foster et al., 2008), as well as decrease the prevalence (Kriemler et al., 2010) of obesity in school children. There is additional evidence to suggest that school-based

approaches help improve diet quality (Williamson et al., 2007) and levels of physical activity (Boyle-Holmes et al., 2010; Williamson et al., 2007).

Between the months of August and May, school-aged children in the state of Mississippi spend over one-third of their waking hours at school, providing school-based health care providers with the opportunity to assist at-risk populations. This makes the school-based health center a practical and effective site for assessments and interventions focused on children at risk for or experiencing overweight and obesity. Health care providers working synergistically with school personnel to promote a healthy lifestyle program are in a unique position to positively impact both the health status, as well as the academic status of children. Studies indicate that children with a healthy weight miss fewer days from school and are able to learn more effectively (Geier et al., 2007; Hollar et al, 2010; Taras & Potts-Datema, 2005). Additionally, while it is already known that physical activity promotes energy balance and healthy weight, research indicates that physical activity also promotes effective learning (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010; Hollar et al., 2010). Healthy nutritional status has also been linked to healthy weight, as well as higher academic performance (Florence, Asbridge, & Veugelers, 2008). Further, an additional benefit to having healthier, more well-educated students enrolled in a particular school includes continued federal and state school funding as a result of increased average daily attendance and improved standardized test scores (No Child Left Behind, 2002).

A systematic review of childhood obesity prevention studies by Wofford (2008) found parental involvement to be crucial to effective strategies that promote healthy weight in children. Further studies (Dietz & Gortmaker, 2001; Pyle et al., 2006) suggest that parental support is imperative for school-based interventional program success. Researchers also suggest that

parental self-efficacy is needed to enhance programs targeted at preventing and controlling childhood obesity (McGarvey et al., 2006) _

Current research also suggests that the use of a community-based approach to combat childhood obesity may provide invaluable insights into the specific needs of a community, thereby allowing for development of more effective interventions (Findholt, 2007). A community-based pilot program to prevent childhood obesity was found to be both highly effective in reducing the rate of excessive weight gain in program participants, as well as being economically feasible (McAuley et al., 2010). An additional study by Roux et al. (2008), found that community-based physical activity interventions were effective in reducing incidence of disease and were also highly cost effective. Finally, Slater et al. (2010) found that communities that possessed built environments that promoted physical activity resulted in higher rates of youth physical activity. _

Problem Statement

Overweight and obesity in the childhood population are significant problems in the U.S., especially in the state of Mississippi, including a specific elementary school in Jackson. To date, no effective secondary prevention interventions based on the existing relevant evidence and addressing population-specific barriers related to physical activity and healthy diet had been explored or implemented at this site. The purpose of this inquiry was to identify perceived barriers to a healthy lifestyle in terms of physical activity and healthy diet for the students at this school in an effort to develop and implement a school-based, population-specific healthy lifestyle program with the inclusion of parental involvement and community support.

Definition of Terms

Foundational concepts specific to this inquiry were conceptual definitions. They were as follows:

Definitions

1. Student referred to any child currently enrolled at the elementary school of interest.
2. School personnel were defined as anyone employed by Jackson Public School System and working at the elementary school of interest.
3. Parent referred to anyone who had legal guardianship of a child in this inquiry.
4. Community leader was defined as any person with an interest in the surrounding community and who currently served, or who wanted to serve, as an advocate for the community.
5. Community referred to the geographic area surrounding the elementary school of interest, as well as the people who lived there. The community population included students, school personnel, parents, and community leaders, as well as other residents.
6. Weight status referred to a student's weight based on a gender-specific and age-specific growth chart that categorized a child's weight as normal weight, overweight, or obese (Ogden & Flegal, 2010).

Theoretical Framework

Pender's Health Promotion Model provided a solid theoretical foundation for the processes and goals of the proposed population-specific healthy lifestyle program (Pender, Murdaugh, & Parsons, 2002) (see Figure 1). Of particular relevance to this program's planning, development, and implementation, were the Model's basic assumptions that humans are complex beings who are in constant interaction with, and are therefore shaped by, their environment; and that health professionals may be part of that environment and therefore shape and influence

human beings. Additionally, Pender proposes via the Health Promotion Model that perceived barriers can have a negative effect on commitment to a behavior; that persons are more likely to engage in a behavior if they have positive role modeling and support; that families, peers, and health care providers are important sources of support for promoting a given behavior; and that situational or environmental influences affect commitment to and engagement in a given behavior (Pender et al., 2002).

Determination of perceived barriers via administration of barriers scales and conduction of focus group discussions related to perceived barriers will enable health care professionals to develop a healthy lifestyle program tailored to help overcome those barriers for this specific patient population. Use of a school-based approach with significant input from school personnel, parents, and community leaders, will lead to a comprehensive set of information with which to develop the healthy lifestyle program. Parental involvement and community support will also provide the positive role modeling and support the children need for success. Thus, the focus of this inquiry was to uncover the perceived barriers to action in terms of physical activity and healthy diet in order to guide development and implementation of a program to help facilitate a commitment to a plan of action and health promoting behavior.

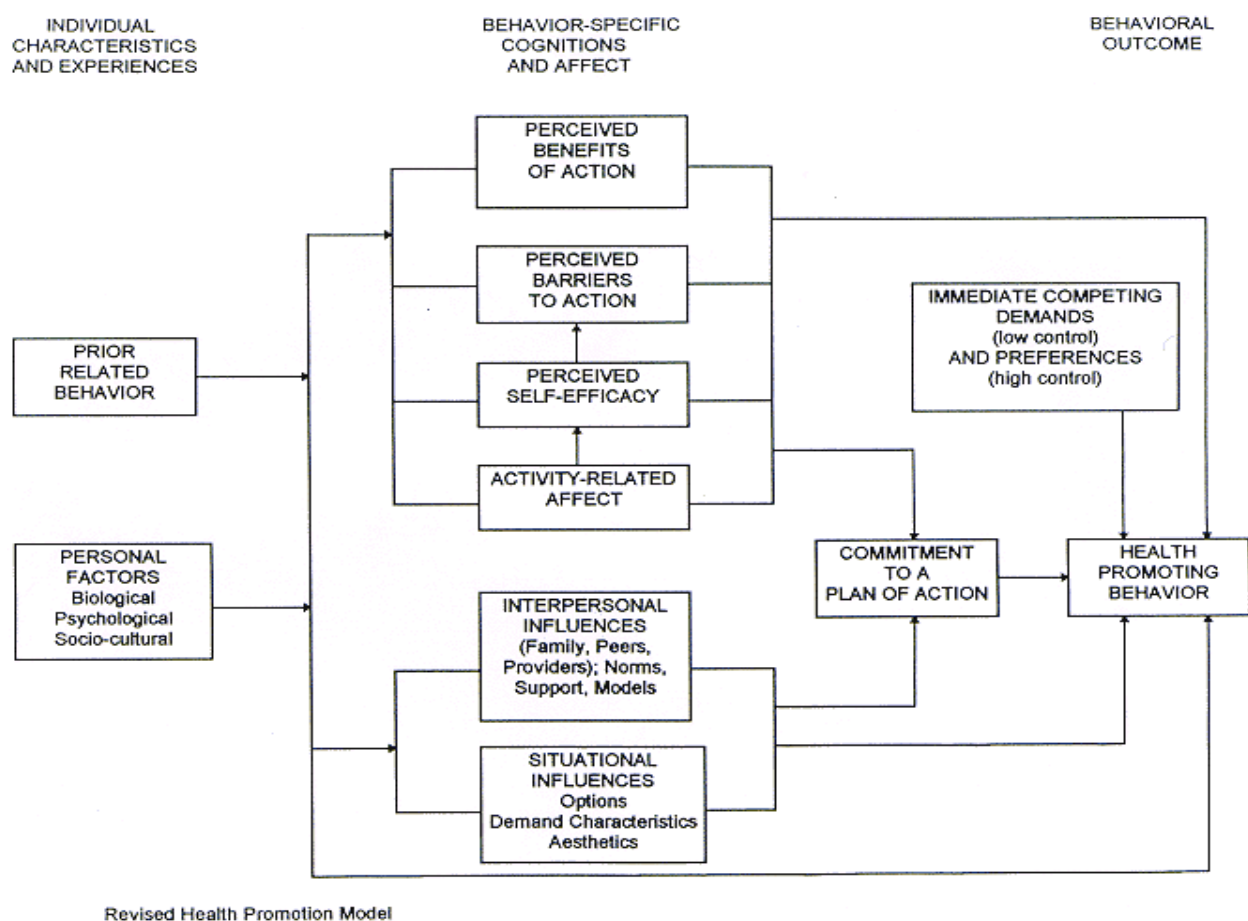


Figure 1. Pender's Health Promotion Model.

Inquiry Objective/Aim

The primary inquiry objective was to uncover the perceived barriers to a healthy lifestyle in terms of physical activity and healthy diet for a specific group of elementary school students.

This objective was achieved by answering the question: What are the barriers to a healthy lifestyle in terms of physical activity and healthy diet for children ages 6 to 13 as perceived by a specific group of elementary school students, school personnel, parents, and community leaders?

The ultimate aim of the inquiry is to utilize the inquiry findings to develop and implement a school-based, population-specific healthy lifestyle program with the inclusion of parental involvement and community support.

Design

To decrease the prevalence of childhood overweight and obesity at a specific elementary school in Jackson, Mississippi, the planning, development, and implementation of a school-based, population-specific healthy lifestyle program was proposed. The planning phase, which was the focus of this inquiry, was conducted using a descriptive, multi-method design to obtain sufficient insight into the perceived barriers to physical activity and healthy diets of the population of interest.

Method

Preliminary Data

After removing all identifiers, a retrospective chart audit was performed in the Spring of 2011 at the elementary school's school-based health center. The audit of 143 charts revealed an overweight and obesity rate among student participants of 45.5%. Alpha was set at 0.05 for all statistical tests. Chi-square analysis revealed no significant difference in weight status based on gender ($\chi^2[1, N = 138] = .35, p = .55$), but did reveal a significant difference in weight status based on age category ($\chi^2[2, N = 138] = 8.08, p = .02$). Upon further analysis of the relationship between age category and weight status using binary logistic regression (see Table 1), age category was found to be a significant predictor ($p = .03$) of weight status while controlling for

gender. More specifically, it was found that there was a significant decrease in odds ($p = .01$) of being overweight or obese for students 3 to 5 years old compared to those students 9 to 13 years of age, while holding gender constant. However, there was no significant difference ($p = .86$) in risk of being overweight or obese for students 6 to 8 years of age as compared to those students 9 to 13 years of age while controlling for gender. Additionally, binary logistic regression revealed no significant gender differences ($p = .90$) in terms of risk while controlling for age.

Table 1

Adjusted Odds Ratios for Weight Status Among Elementary School Students by Selected Characteristics, Grades Pre-K through 5th, Mississippi 2009-2010

Characteristic	Overweight or Obese		
	Odds ratio	95% CI	p-value
Gender			
Male	.96	.47-1.93	.90
Female	1.00	referent	
Patient's Age Group			.03
3-5	.23	.08-.71	.01
6-8	.94	.45-1.95	.86
9-13	1.00	referent	

Participants for Current Inquiry

Administration of the Barriers to Physical Activity Scale (Zabinski, Saelens, Stein, Hayden-Ware, & Wilfley, 2003) (Appendix A) and the Pediatric Barriers to a Healthy Diet Scale (Janicke, Storch, Novoa, Silverstein, & Samyn, 2007) (Appendix B) to individual students and focus group discussions comprised of teachers, administrators, parents, and community leaders helped to elucidate student barriers at the individual, social, and environmental levels.

Quantitative data were collected from a population ($N = 260$) comprised of students in Grades 1st through 5th attending the elementary school of interest. Students in Grades Pre-K and

Kindergarten were not included in this inquiry due to their lack of ability to read. No further inclusion or exclusion criteria were established for this portion of the inquiry.

Qualitative data were collected via 3 separate focus groups of 5 to 8 people. One group included teachers and school administrators, one included students' parents, and one included community leaders. Focus group participants were selected on a volunteer basis with guidance and recommendation of potential participants from school personnel as needed and via snowball sampling.

Human Research Protection

The Instructional Leader (Principal) at the elementary school of interest and the Executive Director of Accountability and Research in the Jackson Public School System approved access to conduct the study (Appendices C and D).

This inquiry was also submitted for review to the Institutional Review Board (IRB) of the University of Mississippi Medical Center (UMMC) and received approval (Appendix E). Due to the de-identified nature of the data to be collected from the minor children participants, it was requested that the UMMC IRB grant this investigator a waiver of written informed consent for this portion of the inquiry. This waiver was granted and completion of the self-administered surveys served as indication of parents' consent and children's assent.

Focus group participants were given a detailed informational letter (Appendix F) describing the nature of the meetings and subsequent use of the information gathered. Attendance at the focus group sessions served as indication of consent for this portion of the inquiry.

Self-administered surveys were identified by a unique numerical identifier only with no link to individual names or individual participants. Quantitative data were stored in an electronic

data set format. Participants in the audiotaped focus group discussions were identified by pseudonym only. Participants were instructed not to discuss dialogue specifics or who participated outside of the focus group session. Qualitative data were stored on original audiotape devices and in a Microsoft Word® document. All alphanumeric data were stored on a password protected desktop computer and additional hard drive in the investigator's locked office. Inquiry participants' completed self-administered surveys and audiotapes were kept in a locked file cabinet in a locked office. Upon completion of all phases of this inquiry and upon reaching the UMMC IRB requirement for maintenance of inquiry data, all data will be destroyed.

Self-Administered Surveys

Instrument reliability and validity.

Administration of the Barriers to Physical Activity Scale (Zabinski et al., 2003) and the Pediatric Barriers to a Healthy Diet Scale (Janicke et al., 2007) to the individual elementary school students served to elucidate perceived barriers at the individual, social, and environmental levels. Upon careful review of scale items, both scales exhibited face validity. In a pilot study, the Barriers to Physical Activity Scale was administered to a group of 84 overweight children ages 8 to 16, either attending a summer fitness camp or being treated at a university-based weight loss clinic, in order to gain an understanding of the factors preventing physical activity among study participants (Zabinski et al., 2003). Items for the Barriers to Physical Activity Scale were generated based on a previous study exploring barriers to physical activity for high school students, where scale items were subjected to factor analysis as a means of establishing construct validity (Allison, Dwyer, & Makin, 1999). For the instrument development study related to the Barriers to Physical Activity Scale, Cronbach's alpha was used to establish internal consistency, with items within each of five barrier types (Body-related, Convenience, Resources,

Social, and Fitness) revealing a reliability coefficient of > 0.70 , with the exception of items measuring convenience ($\alpha = 0.58$).

The developers of the Pediatric Barriers to a Healthy Diet Scale (Janicke et al., 2007) implemented a pilot test of the scale to establish content validity. The sample for this pilot test included 171 overweight and obese children ages 8 to 17 who were patients at one of two university-based medical clinics specializing in the treatment of comorbid conditions related to childhood obesity. Exploratory factor analysis was used to establish construct validity. In addition, the two established barriers factors (Access and Desire) were only moderately correlated, exhibiting adequate independence between factors. Internal consistency was established using Cronbach's alpha for the Access and Desire factors and for total scores, all with reliability coefficients of > 0.70 . Good convergent validity for this scale was established with measures of depressive symptoms, measures of social support, and measures of barriers to physical activity using Pearson product-moment correlations. Of note, is that convergent validity for the Pediatric Barriers to a Healthy Diet Scale and measures of barriers to physical activity was established using the same Barriers to Physical Activity Scale listed above and used in this inquiry, with a correlation of 0.37 ($p < .001$) (Zabinski et al., 2003; Janicke et al., 2007).

Instrumentation.

Quantitative data were collected via survey responses. A letter explaining the inquiry (Appendix G), a demographic survey (Appendix H), the Barriers to Physical Activity Scale (Zabinski et al., 2003), and the Pediatric Barriers to a Healthy Diet Scale (Janicke et al., 2007) were sent home from school with currently enrolled 1st- through 5th-grade elementary school students attending the school of interest in the Fall of 2011. The Barriers to Physical Activity Scale was used to measure the student's total level of perceived barriers to engaging in physical

activity (Total Barriers score, range = 21-105), as well as levels along five sub-scale scores (Body-related, range = 3-15, Convenience, range = 3-15, Resources, range = 5-25, Social, range = 5-25, & Fitness, range = 5-25). The Pediatric Barriers to a Healthy Diet Scale was used to measure the student's total level of perceived barriers to a healthy diet (Total Barriers score, range = 17-85), as well as levels along two sub-scale scores (Access, range = 8-40 & Desire, range = 9-45). For both scales, higher scores (Total Barriers scores and sub-scale scores) indicated a higher level of perceived barriers. Total Barriers scores for both scales were initially divided at the Total Barriers score midpoints by this investigator to create "high" and "low" total barriers score categories for the purposes of statistical analysis (binary logistic regression). The sample Total Barriers scores median for both scales was also used as a categorical "high/low" cutpoint for the purposes of conducting binary logistic regression with the same independent variables.

Procedure.

The self-administered surveys were completed voluntarily by each student with the assistance of a parent as needed. The completed surveys were returned in-person by the student, parent, or legal guardian in a sealed envelope (provided) to the elementary school administrative office personnel within two weeks of receipt. A reminder flyer (Appendix I) was sent home with all students in Grades 1 through 5 one week after the initial distribution of the self-administered surveys. Students returning the completed surveys within the prescribed timeframe received a Tiger Paw award (pseudo-currency used in the school store to buy treats). The office personnel then delivered the sealed envelopes to the investigator, who also worked in the school clinic. In this way, the clinic and school office staff did not develop conscious or unconscious associations between data and participants. No personal identifiers were requested, however a numerical

identifier was assigned by this investigator to each demographic survey and matching barriers scales for the purposes of data entry and analysis.

Focus Groups

Discussion dependability and credibility.

Focus group discussions comprised of teachers, administrators, parents, and community leaders helped to determine perceived barriers for children at the individual, social, and environmental levels. One group included teachers and school administrators. A second group included students' parents, and the third group was comprised of community leaders. Clustering focus group participants in this manner was designed to allow for more comfortable and open dialogue among peers. Focus groups were initiated and guided using a semi-structured script to provide for consistency among groups (Appendix J). Issues of data dependability and credibility were addressed by maintenance of a detailed data collection journal, audiotaping the discussions, and clarification-seeking from participants during focus group discussions (and afterward as much as possible), respectively (Mertens, 2009).

Procedure.

Focus groups consisting of school personnel, parents, and community leaders were convened on school property and sessions were conducted on three separate occasions to determine healthy lifestyle barriers in the community and to foster parental involvement and community support. Potential initial focus group participants were identified with the help of school personnel (teachers, administrators, and staff) as likely having interest in the inquiry and useful insight, with subsequent participant identification occurring via snowball technique. A letter explaining the inquiry was given to potential focus group participants approximately 1 to 1 ½ weeks prior to each session, with focus group session attendance signifying consent. A

demographic survey (Appendix K) was given to each participant for completion at the beginning of each focus group discussion. Each focus group included 5 to 8 members and each session lasted approximately 30 to 60 minutes. This investigator facilitated the focus groups using specific questions through a semi-structured script while also allowing for free-thinking and brainstorming by participants. Focus group members were asked for permission to record the sessions and two digital tape recorders were used to ensure accurate capture of information. This investigator also took notes during the sessions to provide back-up information should it be needed to clarify information from the taped recordings. The recordings were subsequently transcribed verbatim and analyzed for content. Participants were identified by pseudonym only in all transcripts and reports.

Data Analysis

Missing data for all quantitative data analysis was addressed via the default setting provided by SPSS. Initial visual inspection of data revealed minimal and acceptable amounts of missing data, allowing for use of the default settings.

Demographic surveys for student respondents were examined using descriptive statistics. Descriptive statistics were used to examine overall item totals as well as age- and gender-specific item totals with respect to grade level, number of people in the household, single- versus dual-parent household status, household income, method of transportation to and from school, and number of school-prepared meals consumed at school per school day. Data were entered into an electronic data set and subsequent analysis was conducted using SPSS (PASW, 2009) statistical software.

Barriers scales were scored (Total Barriers scores and sub-scale scores) for each student and examined using descriptive statistics. Age- and gender-specific descriptive statistics were

also calculated. Cronbach's alpha was calculated for both scales to establish internal consistency for this inquiry. One-way ANOVA was utilized to determine if there was a significant difference in barriers scores (dependent variable) based on the independent categorical variables of age category (6-8, 9-10, 11-13), gender, single- versus dual-parent/guardian household status, and household income (<\$5,000, \$5,001-\$15,000, \$15,001-\$25,000, \$25,001-\$35,000, \$35,001-\$45,000, \$45,001-\$55,000, >\$55,000). Desired power was set at 0.8, effect size was estimated at between 0.3 and 0.5, and a desired alpha was set at <0.05. Binary logistic regression was initially used to further determine if categorized ("high" [64-105 for the Barriers to Physical Activity Scale, 52-85 for the Pediatric Barriers to a Healthy Diet Scale] versus "low" [21-63 for the Barriers to Physical Activity Scale, 17-51 for the Pediatric Barriers to a Healthy Diet Scale]) Total Barriers scores (dependent variable) could be predicted by the independent categorical variables of age category, gender, single- versus dual-parent/guardian household status, and household income. A sample Total Barriers scores median "high/low" cutpoint of 30 for both scales was also utilized for data analysis with binary logistic regression ("high" [31-105 for the Barriers to Physical Activity Scale, 31-85 for the Pediatric Barriers to a Healthy Diet Scale] versus "low" [21-30 for the Barriers to Physical Activity Scale, 17-30 for the Pediatric Barriers to a Healthy Diet Scale]) and the same independent variables. Data were initially entered into an electronic data set and subsequent analysis was conducted using SPSS (PASW, 2009) statistical software.

Focus group demographic data were examined using descriptive statistics. Discussion results were examined for dialogue content that indicated school personnel, parent, and community leaders' perceived healthy lifestyle barriers for children at the school. One group included teachers and school administrators. A second group was made-up of students' parents.

The third group was comprised of community leaders. Examination of dialogue subject matter by this investigator was conducted via summative content analysis, a form of qualitative analysis which starts with the counting of content elements and then examines latent meanings (Hsieh & Shannon, 2005), to gain an understanding of the participants' perceived barriers to physical activity and healthy diet for the students attending the school of interest.

Results/Findings

Self-Administered Surveys

A total of 260 sets of self-administered surveys were distributed to potential inquiry respondents in Grades 1 through 5 in the Fall of 2011. A total of 118 sets of surveys were returned with several sets ($n = 8$) having insufficient completion of data to be included in analysis, resulting in a sample of 110 for a response rate of 42%.

Demographic surveys (see Table 2).

The highest percentage of respondents was between the ages of 8 and 10 (60.9%) (see Figure 2) and the majority of respondents were enrolled in Grades 2 through 4 (62.7%). Most of the student respondents were in an age-appropriate grade with only 1 nine-year-old still enrolled in the 2nd Grade and 2 ten-year-old students enrolled in the 3rd Grade. Of the final sample, 53 were males (48.2%) and 57 were females (51.8%). The sample was comprised of 100% African-American students. The majority of respondents (73.4%) resided in households comprised of 3 to 5 persons. Both male and female students tended most often to live in a 3- to 4-person household. Most students (73.6%) lived in a single parent household and this remained true across all ages and across gender (males = 69.8%, females = 77.2%). Total annual household income for most respondents (72.1%) was \$15,000 or less, whether male (66%) or female (42%). Most students who participated in the inquiry (88.2%) rode in a car, bus, or van to and from

school with only 11.8% walking to and from school. Males (84.9%) and females (91.2%) alike tended to ride in a vehicle to and from school far more than walking. The majority of respondents (66.4%) ate 2 meals per day at school. One-hundred percent of male students ate at least one school meal per day and 98.2% of female students ate at least one school meal per day.

Table 2

Descriptive Statistics for Self-Administered Survey Respondents (n = 110)

	Frequency	Percentage
Age Category		
6-8	56	51
9-10	42	38
11-13	12	11

<hr/>		
Gender		
Male	53	48
Female	57	52
<hr/>		
Grade		
1	19	17
2	24	22
3	20	18
4	25	23
5	22	20
<hr/>		
# of people in household		
2	9	8
3	27	25
4	28	26
5	25	23
6	8	7
7	6	6
8	5	5
11	1	1
<hr/>		

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Table 2, cont'd

Descriptive Statistics for Self-Administered Survey Respondents (n = 110)

<hr/>		
<hr/>		
	Frequency	Percentage
<hr/>		

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28

of parents/
guardians
in household

1	81	74
2	29	26

Annual
household income

< \$5,000	38	37
5,000-15,000	37	36
15,001-25,000	13	13
25,001-35,000	10	10
35,001-45,000	5	5
45,001-55,000	1	1

Transportation
to and from school

Walk	13	12
Ride bus/van	47	43
Ride in a car	50	46

of school meals
eaten

0	1	1
1	35	33
2	71	66

Note. All percentages are approximate.

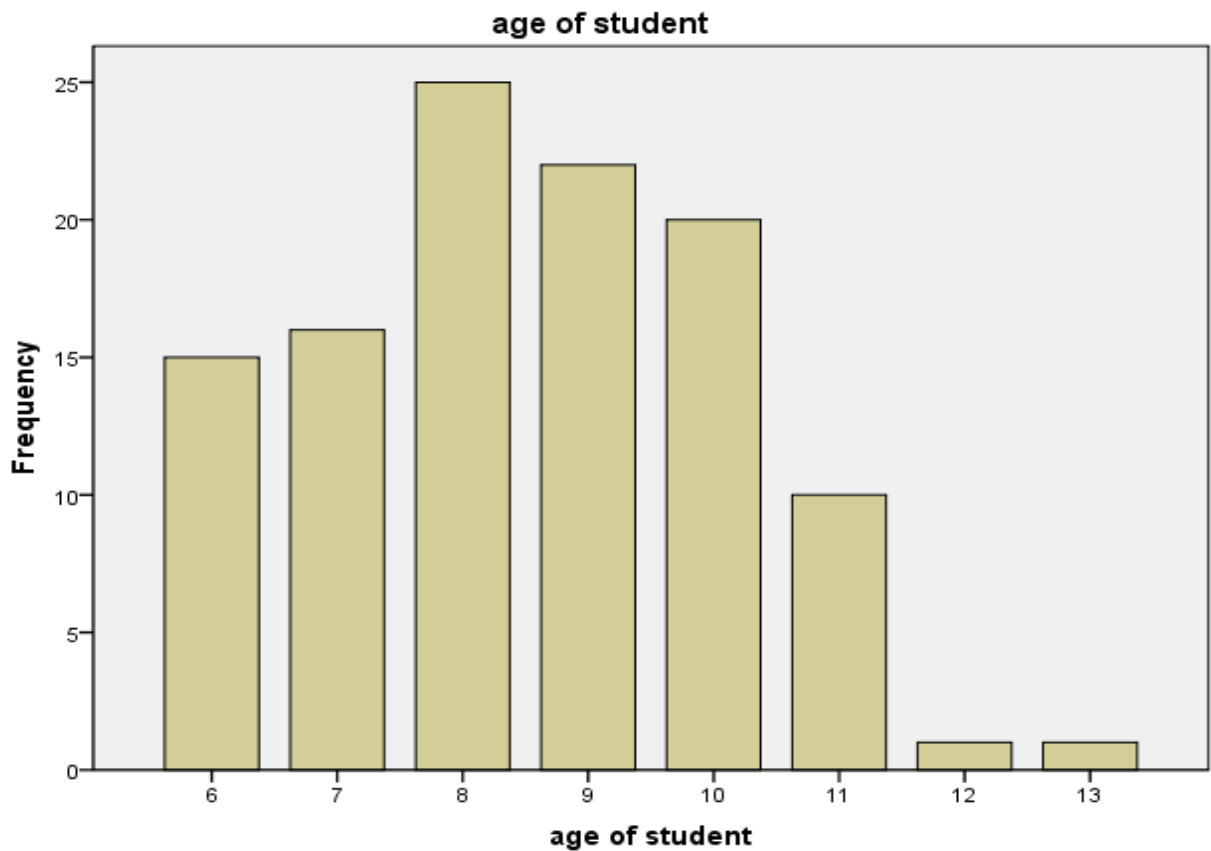


Figure 2. Age of students in the inquiry.

Barriers scales.

Internal consistency was established for both barriers scales for this inquiry using Cronbach's alpha. For the Barriers to Physical Activity Scale (Zabinski et al., 2003), a high level of internal consistency ($\alpha = .90$) was indicated for this specific sample. The same was true for each of the sub-scales, with the exception of Convenience: Body-related ($\alpha = .77$), Convenience ($\alpha = .35$), Resources ($\alpha = .88$), Social ($\alpha = .78$), and Fitness ($\alpha = .72$). Internal consistencies for the Pediatric Barriers to a Healthy Diet Scale (Janicke et al., 2007) ($\alpha = .88$) and subscales (Access [$\alpha = .80$] and Desire [$\alpha = .81$]) were adequate as well.

It was further determined that the sample size achieved for the analysis of variance (ANOVA) portion of the inquiry analysis was adequate to meet the criteria for the desired power (0.8) based on an estimated effect size ($f = 0.3$ to 0.5) and alpha set at 0.05 . According to Cohen (1988), the largest sample size needed for any of the relevant statistical analyses specific to this inquiry ($f = 0.4$) would be $n = 91$. In addition, an alpha of < 0.05 was set for all statistical analyses.

The mean Total Barriers Score for the Barriers to Physical Activity Scale was 33.58 ($SD = 12.06$, range = $21-66$), with a higher score indicating a higher level of perceived barriers. The mean sub-scale scores for the Barriers to Physical Activity Scale were as follows: Body-related ($M = 4.68$, $SD = 2.55$, range = $3-15$), Convenience ($M = 5.74$, $SD = 2.29$, range = $3-11$), Resources ($M = 9.17$, $SD = 4.76$, range = $5-25$), Social ($M = 7.98$, $SD = 3.59$, range = $5-20$), and Fitness ($M = 6.71$, $SD = 2.57$, range = $5-16$) (see Table 3).

Table 3

Mean Total and Sub-scale Scores for Barriers to Physical Activity Scale

Scores	<i>M (SD)</i>
Total Barriers Score	33.58 (12.06)
Body-related Sub-scale Score	4.68 (2.55)
Convenience Sub-scale Score	5.74 (2.29)
Resources Sub-scale Score	9.17 (4.76)
Social Sub-scale Score	7.98 (3.59)
Fitness Sub-scale Score	6.71 (2.57)

The mean Total Barriers Score for the Pediatric Barriers to a Healthy Diet Scale was 30.09 ($SD = 10.05$, range = 17-49), with a higher score indicating a higher level of perceived barriers). The mean sub-scale scores for the Pediatric Barriers to a Healthy Diet Scale were as follows: Access ($M = 14.80$, $SD = 5.20$, range = 8-26) and Desire ($M = 16.31$, $SD = 5.74$, range = 9-29) (see Table 4).

Table 4

Mean Total and Sub-scale Scores for Pediatric Barriers to a Healthy Diet Scale

Scores	$M (SD)$
Total Barriers Score	30.09 (10.05)
Access Sub-scale Score	14.80 (5.20)
Desire Sub-scale Score	16.31 (5.74)

Mean total barriers scores and sub-scale scores by age category were also tabulated for both scales. The 6- to 8-year-olds averaged 34.96 ($SD = 12.55$) on the Barriers to Physical Activity Scale Total Barriers score and 29.24 ($SD = 10.56$) on the Pediatric Barriers to a Healthy Diet Scale Total Barriers score. The 9- to 10-year-old students averaged 30.33 ($SD = 9.78$) on the Barriers to Physical Activity Scale Total Barriers score and 30.06 ($SD = 9.70$) on the Pediatric Barriers to a Healthy Diet Scale Total Barriers score. Finally, the 11- to 13-year-olds

had a mean of 39.86 ($SD = 15.80$) on the Barriers to Physical Activity Scale Total Barriers score and a mean of 33.73 ($SD = 8.97$) on the Pediatric Barriers to a Healthy Diet Scale Total Barriers score (see Tables 5 and 6 for complete results).

Table 5

Mean Total and Sub-scale Scores by Age Category for Barriers to Physical Activity Scale

Scores	<i>n</i>	<i>M (SD)</i>
6-8-year-olds	56	
Total Barriers Score		34.96 (12.55)
Body-related Sub-scale score		4.47 (2.27)
Convenience Sub-scale score		6.14 (2.36)
Resources sub-scale score		9.62 (4.65)
Social Sub-scale score		8.42 (3.64)
Fitness Sub-scale score		6.92 (2.65)
9-10-year-olds	42	
Total Barriers Score		30.33 (9.78)
Body-related Sub-scale score		4.36 (2.03)
Convenience Sub-scale score		5.13 (1.99)
Resources sub-scale score		7.88 (3.74)
Social Sub-scale score		6.87 (2.83)
Fitness Sub-scale score		6.24 (2.37)
11-13-year-olds	12	
Total Barriers Score		39.86 (15.80)
Body-related Sub-scale score		6.82 (4.26)
Convenience Sub-scale score		6.25 (2.82)
Resources sub-scale score		12.00 (6.96)
Social Sub-scale score		10.22 (4.87)
Fitness Sub-scale score		7.36 (2.84)

Table 6

Mean Total and Sub-scale Scores by Age Category for Pediatric Barriers to a Healthy Diet Scale

Scores	<i>n</i>	<i>M (SD)</i>
6-8-year olds	56	
Total score		29.24 (10.56)
Access sub-scale score		14.30 (5.62)
Desire sub-scale score		15.63 (5.66)
9-10-year-olds	42	
Total score		30.06 (9.70)
Access sub-scale score		13.79 (4.88)
Desire sub-scale score		16.63 (5.99)
11-13-year-olds	12	
Total score		33.73 (8.97)
Access sub-scale score		15.00 (4.58)
Desire sub-scale score		18.08 (5.14)

In terms of scores analysis by gender, male respondents averaged a Total Barriers to Physical Activity score of 31.41 ($SD = 10.20$) and a Total Pediatric Barriers to a Healthy Diet score of 29.96 ($SD = 9.62$). For female student respondents, the average Barriers to Physical Activity Total Barriers score was 35.86 ($SD = 13.48$) and for the Pediatric Barriers to a Healthy Diet Scale, the female students averaged a Total Barriers score of 30.21 ($SD = 10.54$) (see Tables 7 and 8 for complete results).

Table 7

Mean Total and Sub-scale Scores by Gender for Barriers to Physical Activity Scale

Scores	<i>n</i>	<i>M (SD)</i>
Male	53	
Total score		31.41 (10.20)
Body-related sub-scale score		4.47 (2.14)
Convenience sub-scale score		5.65 (2.35)
Resources sub-scale score		8.46 (4.10)
Social sub-scale score		7.82 (3.25)
Fitness sub-scale score		6.28 (1.99)
Female	57	
Total score		35.86 (13.48)
Body-related sub-scale score		4.88 (2.90)
Convenience sub-scale score		5.83 (2.24)
Resources sub-scale score		9.85 (5.27)
Social sub-scale score		8.15 (3.94)
Fitness sub-scale score		7.14 (3.00)

Table 8

Mean Total and Sub-scale Scores by Gender for Pediatric Barriers to a Healthy Diet Scale

Scores	<i>n</i>	<i>M (SD)</i>
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Male	53	
Total score		29.96 (9.62)
Access		14.06 (5.15)
Desire		16.33 (5.53)
Female	57	
Total score		30.21 (10.54)
Access		14.29 (5.29)
Desire		16.29 (5.97)

A total of 4 one-way ANOVA's was conducted to determine if there was a statistically significant difference in Total Barriers scores and sub-scale scores for both scales based on the independent variables of age category, gender, single- versus dual-parent/guardian household status, and household income.

Age category.

For the independent variable of age category, Levene's Test for Homogeneity of Variance was met for the Barriers to Physical Activity Total Barriers score ($F = 1.18, p = .31$), Convenience sub-scale score ($F = 1.59, p = .21$), Fitness sub-scale score ($F = 2.08, p = .13$), the Pediatric Barriers to a Healthy Diet Total Barriers Score ($F = .94, p = .40$), Access sub-scale score ($F = .54, p = .60$) and Desire sub-scale score ($F = .57, p = .57$). For the scores for which Levene's Test for Homogeneity was not met for the age category groups (Body-related sub-scale score, Resources sub-scale score, and Social sub-scale score), Welch's Robust Test of Equality of Means was applied.

There was no statistically significant difference in barriers scores among age categories as determined by one-way ANOVA for the Barriers to Physical Activity Scale Total Barriers score ($F(2,83) = 2.53, p = .09$), for the Convenience sub-scale score ($F(2,94) = 2.43, p = .09$), for the

Fitness sub-scale score ($F(2,97) = 1.18, p = .31$), for the Pediatric Barriers to a Healthy Diet

Scale Total Barriers score ($F(2,90) = .88, p = .42$), for the Access sub-scale score ($F(2,97) = .25,$

$p = .78$), and for the Desire sub-scale score ($F(2,96) = .98, p = .38$). Using the Welch test as a

Robust Test of Equality of Means, there was found to be no statistically significant difference

among age categories for the Body-related sub-scale score ($F(2,100) = 4.67, p = .21$) or for the

Resources sub-scale score ($F(2,99) = 3.66, p = .07$). Based on the Welch's Robust Test of

Equality of Means, there was found to be a statistically significant difference among age

categories for the Social sub-scale score ($F(2,94) = 4.22, p = .04, r = .29$), with post-hoc testing

revealing that the Social sub-scale scores were statistically significantly higher for 11- to 13-

year-old students ($M = 10.22 \pm 4.87, 95\% \text{ CI } [6.48, 13.96]$), as compared to 9 to 10 year-old

students ($M = 6.87 \pm 2.83, 95\% \text{ CI } [5.94, 7.80]$), $p = .03$. There were no statistically significant

differences in the Social sub-scale scores between the age categories of 6 to 8 ($M = 8.42 \pm 3.64,$

$95\% \text{ CI } [7.38, 9.46]$) and 9 to 10 ($p = .12$) or between the age categories of 6 to 8 and 11 to 13 (p

$= .47$). These results are supported via further analysis using the Kruskal-Wallis test with a post

hoc Mann-Whitney U test (with Bonferroni correction) to correct for violations in normal

distribution. This further analysis revealed that there was a significant difference in the Social

sub-scale score based on age ($\chi^2[2, N = 97] = 7.83, p = .02$), with the 11- to 13-year-old students

scoring significantly higher on the sub-scale score than 9- to 10-year-old students ($U = 92.00, z =$

$-2.24, p = .03, r = -.33$). None of the other scores for either scale revealed significant differences

in means based on age category based on Kruskal-Wallis analysis: Total Barriers to Physical

Activity score ($\chi^2[2, N = 86] = 2.96, p = .23$), Body-related sub-scale score ($\chi^2[2, N = 103] = 4.21,$

$p = .12$), Convenience sub-scale score ($\chi^2[2, N = 97] = 4.30, p = .12$), Resources sub-scale score

($\chi^2[2, N = 102] = 4.29, p = .12$), Fitness sub-scale score ($\chi^2[2, N = 100] = 2.19, p = .34$), Total

Pediatric Barriers to a Healthy Diet score ($\chi^2[2, N = 93] = 2.13, p = .34$), Access sub-scale score ($\chi^2[2, N = 100] = .55, p = .76$), and Desire sub-scale score ($\chi^2[2, N = 99] = 1.79, p = .41$).

Gender.

For the independent variable of gender, Levene's Test of Homogeneity of Variance was met for the Convenience sub-scale score ($F = .76, p = .39$), the Resources sub-scale score ($F = 3.51, p = .06$), the Social sub-scale score ($F = 1.53, p = .22$), the Pediatric Barriers to a Healthy Diet Scale Total Barriers score ($F = .23, p = .63$), the Access sub-scale score ($F = .00, p = 1.00$), and for the Desire sub-scale score ($F = 1.23, p = .27$). For the scores for which Levene's Test for Homogeneity was not met for the gender groups (Barriers to Physical Activity Scale Total Barriers Score, Body-related sub-scale score, and Fitness sub-scale score), the Welch's Robust Test of Equality of Means was applied.

There was no statistically significant difference in barriers scores between male and female students as determined by one-way ANOVA for the Convenience sub-scale score ($F(1,95) = .15, p = .70$), the Resources sub-scale score ($F(1,100) = 2.19, p = .14$), the Social sub-scale score ($F(1,95) = .20, p = .65$), the Pediatric Barriers to a Healthy Diet Scale Total Barriers Score ($F(1,91) = .02, p = .90$), the Access sub-scale score ($F(1,98) = .05, p = .83$), and the Desire sub-scale score ($F(1,97) = .00, p = .97$). Welch's Robust Test of Equality of Means also failed to reveal a statistically significant difference in barriers scores between male and female students for the Barriers to Physical Activity Scale Total Barriers Score ($F(1,84) = 2.99, p = .09$), the Body-related sub-scale score ($F(1,101) = .68, p = .41$), and the Fitness sub-scale score ($F(1,98) = 2.85, p = .10$).

Single- versus dual-parent/guardian household.

Levene's Test of Homogeneity of Variance was met for the independent variable of single- versus dual parent/guardian household status for the following barriers scores : Barriers to Physical Activity Scale Total Barriers score ($F = 2.52, p = .12$), the Convenience sub-scale score ($F = 1.86, p = .18$), the Resources sub-scale score ($F = .05, p = .83$), the Fitness sub-scale score ($F = .65, p = .42$), the Pediatric Barriers to a Healthy Diet Scale Total Barriers score ($F = .01, p = .94$), the Access sub-scale score ($F = 1.17, p = .28$), and the Desire sub-scale score ($F = .23, p = .63$). For the scores for which the independent variable groups did not meet the Test of Homogeneity of Variance (Body-related sub-scale score and Fitness sub-scale score), Welch's Robust Test of Equality of Means was applied.

There was no statistically significant difference between the single-parent/guardian household and the dual-parent/guardian household groups as determined by one-way ANOVA for the Barriers to Physical Activity Scale Total Barriers Score ($F(1,84) = 1.34, p = .25$), the Convenience sub-scale score ($F(1,95) = 1.34, p = .25$), the Resources sub-scale score ($F(1,100) = .05, p = .83$), the Fitness sub-scale score ($F(1,98) = .96, p = .33$), the Access sub-scale score ($F(1,98) = .02, p = .89$), and the Desire sub-scale score ($F(1,97) = .00, p = .99$). Welch's Robust Test for Equality of Means revealed no statistically significant difference in the parent-status groups for the Social sub-scale score ($F(1,95) = 1.48, p = .17$), but did reveal a statistically significant difference in the groups for the Body-related sub-scale score ($F(1,101) = 1.34, p = .02$) with students living in a single-parent household scoring higher on the sub-scale (4.96 ± 2.77 , 95% CI [4.32, 5.60], $r = .18$) than those living in a dual-parent household (3.93 ± 1.65 , 95% CI [3.29, 4.57]).

Household income.

In terms of the independent variable of household income, Levene's Test of Homogeneity of Variance was met for the Barriers to Physical Activity Scale Total Barriers score ($F = 1.58, p = .19$), the Convenience sub-scale score ($F = 1.79, p = .14$), the Resources sub-scale score ($F = 1.26, p = .29$), the Social sub-scale score ($F = 1.92, p = .11$), the Pediatric Barriers to a Healthy Diet Scale Total Barriers score ($F = .13, p = .97$), the Access sub-scale score ($F = .11, p = .98$), and the Desire sub-scale score ($F = .67, p = .62$). The household income groups did not meet the Test of Homogeneity of Variance for the Body-related sub-scale score and the Fitness sub-scale score. The Welch's Robust Tests of Equality of Means was not applied to these scores due to the fact that at least one group had the sum of case weights less than or equal to 1.

One-way ANOVA was used to analyze those scores where the household income groups met the Test of Homogeneity of Variance and none were found to be statistically significant among household income groups: Barriers to Physical Activity Scale Total Barriers score ($F(5,75) = 1.10, p = .37$), Convenience sub-scale score ($F(5,86) = .34, p = .89$), Resources sub-scale score ($F(5,91) = 1.07, p = .38$), Social sub-scale score ($F(5,86) = .84, p = .53$), Pediatric Barriers to a Healthy Diet Scale Total Barriers score ($F(5,82) = .51, p = .77$), Access sub-scale score ($F(5,89) = .63, p = .68$), and Desire sub-scale score ($F(5,87) = 1.35, p = .25$). Further analysis via Kruskal-Wallis testing to correct for violations of homogeneity of variance and normal distribution revealed no significant differences among any of the mean scores for either of the scales based on household income: Total Barriers to Physical Activity score ($\chi^2[5, N = 81] = 4.83, p = .44$), Body-related sub-scale score ($\chi^2[5, N = 98] = 7.56, p = .18$), Convenience sub-scale score ($\chi^2[5, N = 92] = 1.71, p = .89$), Resources sub-scale score ($\chi^2[5, N = 97] = 7.15, p = .21$), Social sub-scale score ($\chi^2[5, N = 92] = 3.72, p = .59$), Fitness sub-scale score ($\chi^2[5, N = 95] = 6.49, p = .26$), Total Pediatric Barriers to a Healthy Diet score ($\chi^2[5, N = 88] = 2.47, p = .78$),

Access sub-scale score ($\chi^2[5, N = 95] = 3.29, p = .66$), and Desire sub-scale score ($\chi^2[5, N = 93] = 6.64, p = .25$).

Further analysis was conducted using binary logistic regression to determine if the independent variables of age category, gender, single-versus dual-parent/guardian household status and/or household income were statistically significant factors in predicting whether or not students scored “high” or “low” on the Total Barriers scores for both scales.

For the Barriers to Physical Activity Scale using the initial Total Barriers score midpoint as the cutpoint, the model ultimately turned out not to be a reliable one for the four independent variables of interest due to several factors, including incomplete information for the independent variables of single- versus dual-parent/guardian household status and household income. Using the median Barriers to Physical Activity Scale Total Barriers score of 30 for this sample as the “low” cutpoint, however, revealed that single- versus dual-parent/guardian household status was a significant predictor of “high” versus “low” Total Barriers scores. (The independent variables of age category and household income were removed from the model due to violations of linearity and incomplete information, respectively.) Students living in a single-parent household had a statistically significantly higher odds ($\beta = .98 (.50)$, $OR = 2.68$, $CI [1.004, 7.134]$) of scoring on the “high” end of the total barriers score spectrum ($R^2 = .06$, $df = 1$) indicating a higher level of perceived barriers to physical activity as compared to those students living in a dual-parent household. The remaining independent variable of gender proved *not* to be significant predictor of “high” versus “low” total barriers scores for this scale at the sample median cutpoint.

For the Pediatric Barriers to a Healthy Diet Scale, none of the respondents scored in the “high” category based on the Total Barriers score midpoint cutpoint, so binary logistic regression

was not initially run based on this categorization to determine predictability of “high” versus “low” Total Barriers scores based on the independent variables of age category, gender, single-versus dual-parent/guardian household status, and household income. Additionally, using the sample median total barriers score of 30 as the “low” category cutpoint, none of the independent variables of interest that met statistical analysis assumptions (age category, gender, and single-versus dual-parent household status) proved to be significant predictors of “high” versus “low” total barriers scores for this group of students.

Focus Groups

Results of the three separate focus groups were analyzed using descriptive statistics and summative content analysis.

Demographic surveys.

Of the 20 total focus group participants, the average age was 39.8. All but one participant were female. The majority of participants were black (80%), with the remainder being white. In terms of education, 35% ($n = 7$) had completed some college, 35% ($n = 7$) had completed college, 25% ($n = 5$) had received a Masters Degree, 5% ($n = 1$) had achieved a doctoral degree. Annual average income for participants was as follows: \$5,000-\$15,000 (35%), \$15,001-\$25,000 (15%), \$25,001-\$35,000 (10%), \$35,001-\$45,000 (10%), \$45,001-\$55,000 (5%), and greater than \$55,000 (25%). Most participants owned a car (90%).

Focus group discussions.

The first group of 8 participants was comprised of school personnel, including administrators, teachers, and staff. The session lasted approximately 60 minutes. The second group was comprised of students’ parents. There were 5 participants in this group and the

discussion continued for about 30 minutes. The third and final focus group, made up of seven community leaders, lasted for 40 minutes.

Summative content analysis of comments generated by all three focus groups revealed three categories of information for both the barriers to physical activity for the students of interest as well as for the barriers to healthy diet. Comments related to barriers to physical activity could best be categorized into the following groups: resources (e.g., equipment, human resources, and time), interest (e.g., respect [for PE instructors], attention, and desire), and knowledge (e.g., general knowledge, alternatives, and parental support). Comments related to barriers to healthy diet could best be categorized into the following groups: access (e.g., school and home), desire (e.g., personal preference [taste]), and knowledge (e.g., general knowledge, parental support, and teacher support).

Aggregate analysis of focus group discussions revealed a total of 116 comments related to barriers to physical activity for the students at the elementary school of interest. Forty-two percent ($n = 49$) of those comments were related to knowledge barriers. They included comments such as, “I think our problem, as we would solve it today, is awareness, and when we become aware, we can do better.” Thirty-five percent ($n = 41$) of comments related to physical activity barriers concerned resources. They included comments such as, “For one, we don’t have the playground equipment and a gym. There are so many things that we could do, but we are limited to doing because of the space, the weather most of the time, or a gym with the equipment in it to make them physically active.” An additional 22% ($n = 26$) of comments was related to interest and included comments like, “With [Coach] here the children have more respect. They listen to him, he catches their attention...He holds their attention.”

In terms of barriers to healthy diet, a total of 329 comments were received from participants across all three groups. Forty-seven percent ($n = 155$) of the remarks was related to access, and included comments such as, “Sometimes they [cafeteria personnel] run out of food and they only give the kids toast or cheese toast. They don’t have a good back-up supply if they run out of something.” Thirty-six percent ($n = 118$) of comments were related to knowledge and included comments like, “I think that the biggest thing is awareness, it’s the biggest thing.” A final 17% ($n = 56$) were related to desire and included remarks such as, “They would eat chicken nuggets every day.”

Analysis of the school personnel focus group discussion revealed a total of 35 comments related to barriers to physical activity for students attending the elementary school of interest. Forty-nine percent ($n = 17$) of comments concerning barriers to physical activity made by school personnel involved resources. Interest factors made up 40% ($n = 14$) of comments, and 11% ($n = 4$) of remarks were related to knowledge. In terms of barriers to healthy diet, school personnel offered comments related to access (55%, $n = 69$), knowledge (26%, $n = 32$), and desire (19%, $n = 24$) from a total of 125 comments.

Analysis of the students’ parents focus group discussion revealed a total of 12 comments related to barriers to physical activity. Sixty-seven percent ($n = 8$) were related to resources, while the remainder (33%, $n = 4$) were related to knowledge. In terms of barriers to a healthy diet, students’ parents offered a total of 44 comments categorized as follows: access (75%, $n = 33$), desire (23%, $n = 10$), and knowledge (2%, $n = 1$).

Analysis of the final focus group of community leaders revealed a total comment number of 69 when it came to barriers to physical activity for the students attending the school in question. Fifty-nine percent ($n = 41$) of those comments were related to knowledge, 23% ($n =$

16) were related to resources, and 17% ($n = 12$) were related to interest. When it came to barriers to healthy diet, these participants mentioned knowledge 53% ($n = 85$) of the time, followed by access (33%, $n = 53$), and desire (14%, $n = 22$), from a total of 160 comments.

Summary

Findings of note include the fact that most student respondents were between the ages of 8 and 10 and that there were an approximately even number of male and female respondents. All respondents were African-American. Most student respondents were enrolled in Grades 2 through 4 at the time of data collection and the majority of respondents lived in a household of 3 to 5 people. Most lived in a single-parent household and lived in a household with an annual income of \$15,000 or less. The majority of respondents traveled in some type of vehicle as their mode of transport to and from school and most of the student respondents consumed at least one school-prepared meal per school day.

The overall mean Total Barriers score for the Barriers to Physical Activity Scale fell on the low end of the range at 33.58 (high of 105), indicating an overall lower level of perceived barriers to physical activity for student respondents in this inquiry. The Barriers to Physical Activity Scale sub-scale scores followed suit, with all means falling on the lower end of the spectrum for each sub-scale range, indicating an overall lower level of perceived barriers to physical activity in terms of body-related factors, convenience factors, resource factors, social factors, and fitness factors for this sample. The overall mean for the Pediatric Barriers to a Healthy Diet Scale Total Barriers score was 30.09, placing it at the lower end of the scale range as well (high of 85). The same was true for both sub-scale scores for this particular scale. The scores for the Pediatric Barriers to a Healthy Diet Scale and sub-scales also indicate an overall lower level of perceived barriers to a healthy diet, including those factors that dealt with access

and desire, among this sample. In terms of gender, females had higher mean scores for both

Total Barriers Scale scores and for all sub-scale scores with the exception of the Desire sub-scale score for the Pediatric Barriers to a Healthy Diet Scale.

Upon one-way ANOVA analysis, statistically significant differences in barriers scores were found in relation to the Social sub-scale score based on age category and in relation to the Body-related sub-scale score based on single- versus dual-parent household status. The 11- to 13-year-old student respondents were found to have statistically significantly higher scores than the 9- to 10-year olds on the Social sub-scale score of the Barriers to Physical Activity Scale. This finding was supported by a subsequent Kruskal-Wallis and post hoc Mann-Whitney U test. The student respondents living in a single-parent household scored statistically significantly higher on the Body-related sub-scale score of the Barriers to Physical Activity Scale as compared to those living in a dual-parent household. The independent variables of interest proved not to be a good fit for the binary logistic model for the Barriers to Physical Activity Scale when the Total Barriers score midpoint was used as the categorical cutpoint. This was not the case, however, when the sample Total Barriers score median of 30 was used to categorize the total barriers scores as “high” or “low.” Results using this lower cutpoint revealed single-versus dual-parent household status to be a significant predictor of “high” versus “low” total barriers scores for this scale, with students living in single-parent households being more likely to report higher Total Barriers scores. None of the sample members scored “high” on the Pediatric Barriers to a Healthy Diet Scale when using the midpoint Total Barriers score as the categorical cutpoint, negating the need for barriers score prediction for this scale at that level of measurement. In addition, none of the independent variables that met relevant statistical assumptions proved to be

significant predictors when using the sample Total Barriers score median of 30 as the “low” cutpoint for the Total Barriers score for this scale.

Focus group participants were, for the most part, young to middle-aged black women with some amount of college education. Participants had a largely lower- to middle-class income and most owned some form of transportation.

Aggregate focus group analysis across all three groups revealed knowledge to be the most often mentioned category in terms of significant barriers to physical activity for the students attending the elementary school of interest, followed by closely by resources and then interest. Related to barriers to healthy diet, focus group participants commented most often on access as a significant barrier for the students attending the elementary school of interest, followed by knowledge and desire.

School personnel mentioned resources most often as an important barrier to physical activity for the students attending the school of interest, followed by interest and knowledge. In terms of barriers to healthy diet, they mentioned access most often, followed by knowledge and desire.

Students’ parents commented on resources most often as a barrier to physical activity for students, followed closely by knowledge. They commented on access, followed by desire and then knowledge in terms of barriers to healthy diet.

Community leaders mentioned knowledge most often as a barrier to physical activity for the students of interest, followed by resources and interest. In terms of healthy diet, knowledge was mentioned most often, followed by access and desire.

Discussion

The student sample members represented in this inquiry are unique in many respects, but generally reflect the populous of the area and the general patient population of interest. (This will be important as current students move on to middle school and new students from the same area are enrolled in the elementary school of interest.) Student sample members, for the most part, lived in an average-sized household with a single parent and a household income of less than \$15,000 per year. Most also rode in a motorized vehicle to and from school and consumed at least one school-prepared meal per day during the academic week. This particular student sample differs, however, from known previous studies using the same surveys where all recruited respondents were overweight or obese and ranged in age from 8 to 17 (Janicke et al., 2007; Zabinski et al., 2003). For this study, we included students ages 6 to 13 who were normal weight for age, as well as those who were overweight or obese.

Focus group participants, likewise, represent those likely to be key stakeholders in surrounding area schools and other child-focused organizations. Most were young to middle-aged black women with some form of college education. Most reported a lower- to middle-class income and owning some form of transportation.

Contrary to expectations, the overall picture of Total Barriers scores and sub-scale scores for both barriers scales indicated perception of barriers among students to be on the low end of the measurement range in terms of physical activity as well as healthy diet. However, these results are not unlike previous studies in which these scales were used for a sample including a similar age group (mean Total Barriers scores were on the low end of the range for both the Barriers to Physical Activity Scale as well as the Pediatric Barriers to a Healthy Diet Scale) (Janicke et al., 2007; Zabinski et al., 2003). An additional study using a different perceived barriers to physical activity scale, also revealed a relatively low mean level of

perceived barriers (Allison et al., 1999). Perhaps for this particular inquiry this finding was due to the fact that survey (scale) questions were difficult in some instances to interpret and resulted in inaccurate responses or possibly there were fewer barriers in existence than anticipated by this investigator.

Also of note is the fact that there were no significant differences in Total Barriers scores for either scale based on age category, gender, single- versus dual-parent household status, or household income. This finding of lack of overall differences based on the independent variables of interest is contrary to previous studies on barriers to a healthy diet among a similar age group (Janicke et al., 2007) where a significant relationship *was* found between perceived barriers and age, such that as age increased so did total barriers scores, indicating a higher degree of perceived barriers. This finding, as far as gender and barriers to physical activity is concerned, is also contrary to a study that showed that females reported significantly higher perceived barriers to physical activity than did males (Allison et al., 1999). Additional research also revealed that females tend to get less physical activity than males, indicating a higher level of barriers to physical activity for females (Sallis, Zakarian, Hovell, & Hofstetter, 1996). Consistent with current inquiry findings, however, are findings from a previously mentioned study (Janicke et al., 2007) which revealed no significant relationship between total barriers scores and gender or family income.

In terms of age, the lack of Total Barriers scores differences for this inquiry may be explained by the fact that student respondents were all of a relatively young age and unable to fully appreciate the full extent of existing barriers, or it may be explained by the existence of fewer actual barriers than perceived by this investigator. In addition, more differences may have come to light based on age had this investigator examined the data by individual age or by

different age categories. Another consideration may be that students of this overall age group may have had difficulty understanding some or all of the questions asked via the surveys (scales). The lack of differences in barriers perception based on gender may be explained by the fact that students of both genders came from largely similar backgrounds and were distributed fairly evenly across the spectrum in terms of age, grade level in school, number of people in their households, number of parents in the household, household income, mode of transportation to and from school, and number of school-provided meals eaten per academic day.

In terms of single- versus dual-parent household status, the lack of significant differences in total barriers scores for this independent variable for both scales may be partially explained by the fact that the majority of students for this sample lived in a single-parent household. It may also be that the single parents of interest had learned to compensate adequately for the lack of two parents in the home, thereby eliminating some barriers. This finding, however, is inconsistent with research indicating that parents perceive stress and time constraints to be significant barriers to promoting physical activity for their children (McCarron et al., 2010). It is reasonable to expect that single parents may experience higher levels of stress and time constraints, thereby preventing them from engaging in physical activity promotion with their children. This expectation seemed not to be the case for this particular sample, based on the overall low level of reported barriers by students in a single-parent household.

Household income proved not to have a significant influence on reported total barriers for either scale as well. This same finding was reflected in a previously mentioned study (Janicke et al., 2007) where no significant relationship was found between total barriers scores on the Pediatric Barriers to a Healthy Diet Scale and family income. For this inquiry, perhaps this was

due to the fact that the majority of students lived in homes with an annual household income of \$15,000 or less, creating a homogeneous group in terms of income.

Not surprising, however, was the statistically significant finding that the 11- to 13-year-old students perceived greater barriers to the social aspects of physical activity as compared to the 9- to 10-year-olds. The social sub-scale of the Barriers to Physical Activity Scale addressed factors such as: lack of a physical activity partner, friends not liking physical activity, being teased during exercise or sports, being chosen last for teams, and lack of a physical activity partner at the same skill level. The developmental stage that many 11- to 13-year-olds find themselves in, identity versus role confusion (Maier, 1969), sees great importance placed on successful ventures and social interactions. Thus, the social aspects of any situation become paramount to children of this age group and they will likely shy away from situations that create social discomfort. This finding is consistent with previous research by Janicke and colleagues (2007) who found more perceived barriers with increasing age.

A second statistically significant finding was that students from a single-parent household perceived greater barriers to the body-related aspects of physical activity. The body-related sub-scale of the Barriers to Physical Activity Scale addressed factors such as: being self-conscious during activities and being self-conscious about one's body during physical activity. Perhaps this is accounted for by the lack of at least one parent, usually the father, in the home. Fathers may serve as effective promoters of self-esteem when the father-child relationship is healthy and consistent (Howard, Lefever, Borkowski, & Whitman, 2006). Lack of a consistent presence in the home may lead to a greater level of insecurity and lack of self-confidence in one's body. The finding that single- versus dual-parent household status was a significant predictor of "high" versus "low" total barriers scores at the sample Total Barriers score median cutpoint, with

students in a single-parent household having greater odds of scoring on the high end of the total barriers score was not unexpected in light of the fact that there were statistically significant differences for the Social sub-scale scores based on the same independent variable. This finding is also consistent with research that indicates that parental support is an influential component in promoting healthy weight in children (Epstein, Myers, Raynor, & Saelens, 1998; McGarvey et al., 2006; Wofford, 2008). With one less parent readily available, support levels likely decline.

Of little surprise to this investigator was the fact that focus group findings revealed the greatest perceived barrier to physical activity for students to be knowledge, while the greatest perceived barrier to a healthy diet was access. These findings are consistent with previous research indicating that knowledge of physical activity and access to healthy foods pose significant barriers to engaging in physical activity and eating a healthy diet (McCarron et al., 2010). Many students attending the school of interest for this inquiry had little knowledge of how to participate in organized or spontaneous play outside of the academic day, and this academic year marked the initial introduction of a formal organized play curriculum at the school. In addition, access to healthy foods with which to constitute a healthy diet was a visible problem. The first affordable grocery store within walking distance was erected within the past year, but prior to that there were no nearby outlets for affordable healthy foods. Significant strides have been made in the make-up of food offerings in the school cafeteria, but unhealthy choices are still available and are often the preferred choices of the students attending the school. School personnel expressed lack of resources as the chief barrier to physical activity for students attending the school. This was not unexpected, as school personnel are uniquely aware of resources available to students during the school day as well as having moderate knowledge about home resources for some students. In terms of healthy diet, school personnel deemed

access as the key barrier for students. This is consistent with the overall analysis results for all groups, likely for similar reasons. Students' parents indicated that resources were the most significant barrier to physical activity and access was the most significant barrier to healthy diet, again for reasons consistent with those listed above in terms of overall analysis. Lastly, community leaders, indicated knowledge as the key barrier to both physical activity and healthy diet. This may be considered consistent with a leadership point of view regarding knowledge as a starting point for positive change.

Limitations

This inquiry has limitations to consider before drawing conclusions and making recommendations. Limitations for this inquiry exist in terms of sample, instrumentation, methodological, and design issues.

The student sample did not include the younger students (Pre-K and K) at the school of interest. Their perceptions and thoughts were not captured, limiting the breadth of data obtained and possibly the application of the resultant information to that portion of the population. Another consideration is that younger students in the sample may lack the life experience to accurately perceive barriers in their lives, skewing the scores falsely downward. In terms of the older students, the sample was flawed by the fact that there was only one 12-year-old respondent and one 13-year-old respondent, limiting one's confidence that their lone perceptions could be applied to the remainder of students of that age group at the school in question. Further sample limitations include focus group composition. One of the focus groups (students' parents) had only 5 members, potentially limiting the stimulation of conversation and generation of ideas as compared with the other larger groups. Additionally, males were under-represented in the focus groups, limiting the male perspective in terms of barriers to physical activity and healthy diet.

In terms of instrumentation, some of the younger portion of the student sample who were included in the quantitative data collection via self-administered surveys seemed to have difficulty addressing some of the items on the surveys. This leads one to consider if the answers to the questions of interest were an accurate measure of perceptions based on comprehension (or lack thereof) or if the parents had undue influence on certain answers. An additional concern is the inability to compare sub-scale to sub-scale scores with ease as there are differing possible scoring ranges for each subscale. In addition, perhaps the scales used were inadequate to capture all of the information desired for program planning and development based on wording, language nuances, style considerations, and other factors.

A methodological factor to consider in interpreting results includes the fact that this investigator was and is in a position of caring for stakeholders' health. This factor may have led to some degree of trying to please the investigator, skewing the results.

A further limitation might have been the manner in which the age categories were grouped. Had a two-group age categorization been implemented as opposed to a three-group categorization, significant differences might have arisen based on age category.

Conclusions

Several conclusions may be drawn from inquiry findings. While overall barriers scores indicate a lower level of perceived barriers than expected for this population and most differences based on the independent variables of interest were not significant, it may be concluded that the 11- to 13-year-old students experienced greater barriers in terms of the social aspects of physical activity as compared to the 9- to 10-year-old students (based on post hoc testing) and that students living in a single-parent household experienced greater barriers in terms of the body-related aspects of physical activity as compared to those students living in a

dual-parent household. In addition, students living in a single-parent household had significantly higher odds of experiencing greater overall barriers to physical activity than did students living in a dual-parent household. It may also be concluded that knowledge was a significant barrier to physical activity for the students attending the school of interest and that access was a significant barrier to achieving a healthy diet.

Implications for Practice/Recommendations

Findings from this inquiry can be utilized along with significant input from school personnel, parents, and community leaders to guide development and implementation of various school-based, population-specific healthy lifestyle program components. An initial step at this point includes developing program components geared toward the population of interest and founded on the findings of the inquiry.

Based on inquiry findings, development of the population-specific healthy lifestyle program might be most effective if the overarching concepts focus on educational components to address the knowledge-level among stakeholders (students, school personnel, parents, and community leaders) in terms of physical activity and to focus on improving access to a healthy array of foods in the school setting in terms of healthy diet. Delivery of educational components related to physical activity might include regularly held classroom and playground educational sessions. The sessions would be interactive and include classes geared toward the students as well as the adult stakeholders. Numerous evidence-based physical activity curricula are in existence and available for use in guiding the sessions in a consistent and age-appropriate manner. In terms of addressing access to healthy dietary choices, an initial meeting with the cafeteria manager would be a foundational step toward making improvements in school day food preparation and choices. Some currently successful improvements have been made in state

schools, including special ovens that replace traditional fryers and core recipes that have been changed to incorporate more healthy ingredients for preparation. These improvements might well be emulated at the school of interest. An additional component might include seeking grant funding to continue the practice of supplying fresh fruits to the students for mid-morning and early afternoon snacks.

Special consideration would likely need to be focused on groups of students at higher risk for experiencing barriers. A targeted approach might be beneficial for those groups who reported experiencing a higher risk for certain barriers in terms of age as related to barriers to physical activity. Special focus would need to be paid to addressing the social aspects of physical activity for the 11- to 13-year old students. This specialized focus might include physical activity sessions that focus on joint activities for age-related peer groups as well as encouraging school personnel, parents, and community leaders to become an active part of the students' physical activity regime. Additional focus would need to be on some non-competitive, all-inclusive fun outlets for physical activity. An additional demographic group to target would be the students living in a single-parent household. A focus on eliminating overall (total) barriers as well as a more specific focus on the body-related aspects of physical activity would likely be beneficial for students living in single-parent household. This might include ensuring regularly scheduled after-school physical activity sessions for students to participate in while their single parents are still at work, as well as sessions that address self-esteem issues in terms of one's body. These tailored sessions could incorporate various forms of physical activity that are consistent with certain body types, thereby improving successful physical activity and boosting self-esteem.

It is proposed that inquiry findings and potential healthy lifestyle program component ideas be introduced to the students, school personnel, parents, and community leaders at a PTA

Meeting. Volunteer stakeholders would then be invited to form a committee to discuss program findings and clearly define the needed healthy lifestyle program components. From there, it is proposed that this investigator engage personnel from the Mississippi Department of Education Office of Healthy Schools as well as other interested parties to seek grant funding opportunities to finance the defined healthy lifestyle program components. Upon receipt of grant funding, it is then proposed that this investigator, along with students, school personnel, parents, and community leaders implement healthy lifestyle components. Program evaluation will be designed to meet the needs of all key stakeholders—students, school personnel, parents, community leaders, and grant-funders.

Recommendations for further inquiry include the use of an interviewer-administered survey process to provide adequate comprehension of scale items and inclusion of a focus group comprised of students to provide richer insight into the thoughts of younger stakeholders. Future exploration of motivators for physical activity and healthy diet would add depth to program planning as well. In addition, conducting a barriers scales' individual item analysis to determine more specific areas of concern as well as examination of the relationship between additional independent variables and barriers scores might be of benefit. Of interest to program developers might also be the relationship between the students' method of transport to school and barriers scores as well as between the number of school-prepared meals consumed by students on a daily basis and barriers scores.

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Appendix A

Barriers to Physical Activity:

Circle the answer that best answers the following question: How often do the following things prevent you from getting physical activity?

	None	Rarely	Sometimes	Often	Very Often
1. Self conscious about my looks when I do Activities	A	B	C	D	E

2. Lack of interest in physical activity	A	B	C	D	E
3. Lack of time	A	B	C	D	E
4. I do not have anyone to do physical activities with me	A	B	C	D	E
5. Lack of equipment	A	B	C	D	E
6. Lack of skills	A	B	C	D	E
7. Lack of knowledge on how to do physical Activities	A	B	C	D	E
8. Lack of convenient place to do physical Activities	A	B	C	D	E
9. I am too overweight	A	B	C	D	E
10. My friends don't like to do physical activity	A	B	C	D	E
11. My friends tease me during exercise or sports	A	B	C	D	E
12. I'm chosen last for teams	A	B	C	D	E
13. The weather is too bad	A	B	C	D	E
14. Homework	A	B	C	D	E
15. Self conscious about my body when I do physical activity	A	B	C	D	E
16. I do not want people to see my body when I do physical activity	A	B	C	D	E
17. I do not have anyone at my skill level to do physical activity with me	A	B	C	D	E
18. I do not like the way my body feels when I do physical activity	A	B	C	D	E
19. Physical activity is too hard	A	B	C	D	E
20. Being active makes me physically Uncomfortable	A	B	C	D	E
21. Physical activity is too much work	A	B	C	D	E

Barriers to Physical Activity Scale sub-scale items (based on barriers types):

Body-related:

- Self-conscious about my looks when I do activities
- Self-conscious about my body when I do physical activity
- I do not want people to see my body when I do physical activity

Convenience:

- Lack of time
- The weather is too bad
- Homework

Resources:

- Lack of interest in physical activity
- Lack of equipment

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Lack of skills
Lack of knowledge on how to do physical activities
Lack of convenient place to do physical activities

Social:

I do not have anyone to do physical activities with me
My friends don't like to do physical activity
My friends tease me during exercise or sports
I'm chosen last for teams
I do not have anyone at my skill level to do physical activity with me

Fitness:

I am too overweight
I do not like the way my body feels when I do physical activity
Physical activity is too hard
Being active makes me physically uncomfortable
Physical activity is too much work

Instructions for scoring:

Student responses were given based on a 5-point scale with 1 being never and 5 being very often. Scores were tabulated by adding numerical response equivalents for a Total Barriers score as well as for sub-scale scores. Higher scores indicated a higher level of perceived barriers.

Appendix B

Barriers to a Healthy Diet:

Circle the answer that best answers the question: How often do the following things prevent you from eating healthy foods?

	Stron gly Disag ree	Disag ree	Somew hat Agree	Agr ee	Stron gly Agre e
AVAILABILITY/KNOWLEDGE					
1. Healthy foods choices are not available in School	1	2	3	4	5
2. Healthy food choices are not available at Home	1	2	3	4	5
3. It costs too much to buy healthy foods at the store, cafeteria, or	1	2	3	4	5

restaurant					
4. I don't know what foods are healthy foods that I should eat	1	2	3	4	5
5. I don't know how to cook/bake/prepare healthy foods	1	2	3	4	5
SUPPORT					
6. No one else in my family eats healthy Foods	1	2	3	4	5
7. My friends do not eat healthy foods	1	2	3	4	5
8. No one encourages me to eat healthy Foods	1	2	3	4	5
9. Eating healthy foods is not cool	1	2	3	4	5
10. Adults get on my case about how I should eat healthy foods	1	2	3	4	5
INTEREST					
11. I don't care about eating healthy foods	1	2	3	4	5
12. I don't have time to worry about eating healthy or unhealthy foods	1	2	3	4	5
13. Healthy foods do not fill me up	1	2	3	4	5
TASTE/APPEARANCE					
14. I do not enjoy the taste of fruits	1	2	3	4	5
15. I do not enjoy the taste of healthy foods	1	2	3	4	5
16. I just really enjoy the taste of unhealthy Foods	1	2	3	4	5
17. Healthy foods do not look good	1	2	3	4	5

Pediatric Barriers to a Healthy Diet Scale sub-scale items (based on barriers factors):

Access:

Healthy food choices are not available in school

Healthy food choices are not available at home

It costs too much to buy healthy foods at the store, cafeteria, or restaurant

I don't know what foods are healthy foods that I should eat

I don't know how to cook/bake/prepare healthy foods

No one else in my family eats healthy foods

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My friends do not eat healthy foods
No one encourages me to eat healthy foods

Desire:

Eating healthy foods is not cool
Adults get on my case about how I should eat healthy foods
I don't care about eating healthy foods
I don't have time to worry about eating healthy or unhealthy foods
Healthy foods do not fill me up
I do not enjoy the taste of fruits
I do not enjoy the taste of healthy foods
I just really enjoy the taste of unhealthy foods
Healthy foods do not look good

Instructions for scoring:

Student responses were given based on a 5-point scale with 1 being strongly disagree and 5 being strongly agree. Scores were tabulated by adding numerical response equivalents for a Total Barriers score as well as for sub-scale scores. Higher scores indicated a higher level of perceived barriers.

Willie C. Johnson, Ph.D.
Executive Director III
Accountability & Research



Phone 601-960-8850
Facsimile 601-960-8849
Email wjohnson@jackson.k12.ms.us
www.jackson.k12.ms.us

October 3, 2011

Mary (Molly) Moore
204 Bay Park Drive
Brandon, MS 39047

Dear Ms. Moore:

The Jackson Public School District's Research Review Committee has approved your request to conduct your study "**Planning Phase of a Population-Specific Lifestyle Program**". Please ensure that all information pertaining to individuals identity and facilities used in the research remain anonymous. This letter certifies that your study will be conducted during the **2011-2012** school year. If you should need further assistance, please do not hesitate to contact our office. Best wishes with your research.

Sincerely,

Willie C. Johnson
Executive Director III

Appendix E**UNIVERSITY OF MISSISSIPPI MEDICAL CENTER**

2500 North State Street

Jackson, Mississippi 39216-4505

Institutional Review Board DHHS FWA #00003630

Telephone (601) 984-2815 IORG #0000043

Facsimile (601) 984-2961 IRB 1 Registration #00000061

IRB 2 Registration #00005033

Approval Notice**Initial Application**

11/02/2011

Marcia Rachel,

School of Nursing

University Of Mississippi Medical Center

2500 North State Street

Jackson, MS 392164505

RE: IRB File #2011-0213

Planning Phase of a Population-Specific Healthy Lifestyle Program

Your Initial Application was reviewed and approved by the Expedited Review process on 11/02/2011.

You may begin this research.

Please note the following information about your approved research protocol:

Protocol Approval Period: 11/02/2011 - 10/31/2012

Approved Enrollment #: 300

Participant Population: K-12 Students

Parent/Teacher/Caregiver

Performance Sites: Johnson Elementary School Based Health Clinic

Expedited Review Category(ies): (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b) (2) and (b)(3). This listing refers only to research that is not exempt.);

Documents / Materials:**Type Description Version # Date**

Letter of co-operation/support
for non-UMC site

Letter of Support from Jackson Public Schools 1 10/10/2011

Letter of co-operation/support
for non-UMC site

Letter of Support from Johnson Elementary School
Instructional Leader

1 10/10/2011

Letters Informational Letter for Students and Parents 1 10/10/2011

Other Material Demographic Survey--Students 1 10/10/2011

PLANNING PHASE

Other Material Barriers to Physical Activity Scale 1 10/10/2011
 Other Material Pediatric Barriers to a Healthy Diet Scale 1 10/10/2011
 Letters Reminder Letter to Students 1 10/10/2011
 Letters Informational Letter for Focus Group Participants 1 10/11/2011
 Other Material Demographic Survey--Focus Group Participants 1 10/13/2011
 Other Material Semi-Structured Script for Focus Groups 1 10/10/2011
 Document ProtocolV1.docx 1 10/11/2011

Review History:

Date Type Decision

11/02/2011 Expedited Review Approved

Please remember to:

- Use the IRB file number (2011-0213) on all documents or correspondence with the IRB concerning your research protocol.

- Review and comply with all requirements on the enclosure, UMMC Investigator Responsibilities,

Protection of Human Research Participants.

The IRB has the prerogative and authority to ask additional questions, request further information, require

additional revisions, and monitor the conduct of your research and the consent process.

Please note, if this study involves an intervention (whether or not it involves a drug or device) you (or the

"responsible party") must register the study before enrollment begins and report results within 12 months

of study closure through Clinicaltrials.gov <http://www.clinicaltrials.gov/>. Penalties for responsible parties

who fail to register applicable clinical studies are significant and include civil monetary penalties and, for

federally-funded studies, withholding or recovery of grant funds. For additional information please go to

<http://irb.umc.edu/GuidanceInfo/ClinTrialRegistry.htm>.

We wish you the best as you conduct your research. If you have questions or need additional information,

please contact the Human Research Office at (601) 984-2815.

IRB 1

Enclosure(s): (1) Investigator Responsibilities, Protection of Human Research Participants

cc: Sharon Lobert, Ph.D.

Office of Integrity and Compliance

UMMC Investigator Responsibilities

Protection of Human Research Participants

The IRB reviews research to ensure that the federal regulations for protecting human research participants outlined in UMMC policy, the Department of Health and Human Services (DHHS) regulations (45 CFR 46) and the Food and Drug Administration (FDA) regulations (21 CFR Parts 50 & 56), as well as other requirements, are met. The University of Mississippi Medical Center's Federalwide Assurance (FWA), FWA# 00003630, awarded by the Office for Human Research Protections (OHRP) at DHHS, is a written pledge to follow federal guidelines for protecting human research participants in accordance with the principles of the Belmont Report.

All investigators must read both the Belmont Report and the UMMC FWA to understand their responsibilities in conducting research involving human participants. Both documents are available on the Human Research Office webpage, <http://irb.umc.edu/>, and in hard copy by request from the Human Research Office. Some of the responsibilities investigators have when conducting research involving human participants are listed below.

1. Conducting the Research: You are responsible for making sure that the research is conducted according to the IRB approved research protocol. **You are also responsible for the actions of the study's co-investigators and research staff.**
2. Participant Enrollment: You may not recruit or enroll participants prior to the IRB approval date or after the expiration date of IRB approval. All recruitment materials for any form of distribution or media use must be approved by the IRB prior to their use. If you need to recruit more participants than was noted in your IRB approval letter, you must submit an amendment requesting an increase in the number of participants.
3. Informed Consent: Informed consent is a process that begins with the initial contact and ends at some point after the study is complete. You are responsible for the conduct of the consent process, ensuring that effective informed consent is obtained and documented using **only** the IRB-approved and stamped consent document(s), and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Whoever is presenting the consent document to the potential participant and conducting the consent discussion must have all pertinent information at hand, be knowledgeable about the study and the disease or condition involved, if any, and have the ability and experience to answer questions regarding the study and any treatment involved. Please give all participants a signed copy of each consent or assent document they sign, and keep the originals in your secured research files for at least six (6) years. When appropriate, you should place a copy of the consent document in the participant's medical record.
4. Continuing Review: The IRB must review and approve all IRB-approved research protocols at intervals appropriate to the degree of risk, but not less than once per year. **There is no grace period.** Prior to the date on which IRB approval of the research expires, the IRB will send you three reminders to submit a Continuing Review, 90, 60 and 30 days prior to expiration. Although reminders are sent, **it is ultimately your responsibility to submit the renewal in a timely fashion to ensure that a lapse in IRB approval does not occur.** If IRB approval of your research lapses, you must stop new participant enrollment, and contact the IRB immediately.
5. Amendments and Revisions: If you wish to amend or change any aspect of your research, including research design, interventions or procedures, number of participants, participant population, consent document, instruments, surveys or recruitment and retention material, you must submit the amendment or revisions to the IRB for review with a Request for Change. **You may not initiate** any amendments or changes to your research without first obtaining IRB review and written approval. The **only exception** is when the change is necessary to eliminate apparent immediate hazard to participants. In that case the IRB should be immediately informed of this necessity, but the change may be implemented before obtaining IRB approval.
6. Unanticipated Events: All adverse events that are unanticipated (**unanticipated means that the event is serious, unexpected, related or possibly related to participation in the study and places participants at greater risk of harm than previously recognized**) and serious

protocol deviations, must be reported to the IRB **within ten (10) business days** of discovery. The only exception to this policy is death - **the death of a UMMC research participant must be reported within 48 hours of discovery**. Reportable events should be submitted to the IRB with the Adverse Event/Unanticipated Problem Report form.

Events that do not meet the definition of an unanticipated problem involving risk to participants or others, including research related injury occurring at a UMMC performance site or to a UMMC study participant, participant complaints, problems, minor protocol deviations and non-compliance with the IRB's requirements for protecting human research participants should be reported as follows: Minor deviations and problems should be submitted at the time of continuing review, as instructed on the form. All other events should be reported in writing via letter or email to the IRB with sufficient detail to allow the reviewer to understand the problem and any actions taken to prevent it from happening again.

7. Research Record Keeping: At a minimum, you must keep the following research related records in a secure location for at least six years: the IRB approved research protocol and all amendments; all versions of the investigator's brochure; all informed consent documents; all recruiting materials; all renewal applications; all adverse or unanticipated event reports; all correspondence to and from the IRB; and all raw data.

8. Reports to FDA and Sponsor: When you submit the required annual report to the FDA or you submit required reports to your sponsor, you **must** provide a copy of that report to the IRB. You may submit the report with your IRB continuing review application.

9. Provision of Emergency Medical Care: When a physician provides emergency medical care to a participant without prior IRB review and approval, to the extent permitted by law, such activities will not be recognized as research and the data cannot be used in support of the research.

10. Final Reports: When you have completed the study, (no further participant enrollment, interactions, interventions or data analysis) or stopped work on it, you must submit a Final Report to the IRB using the Final Report form.

11. On-Site Evaluations, FDA Inspections, or Audits: If you are notified that your research will be reviewed or audited by the FDA, OHRP, the sponsor, any other external agency, or any internal group, you **must** inform the IRB immediately and submit all audit reports received as a result of the audit to the IRB.

If you have questions or need assistance, please contact the Human Research Office at 601 984-2815.

Appendix F
Johnson Health Center
A Division of University of Mississippi Medical Center
School of Nursing
1339 Oak Park Drive
Jackson, Mississippi 39213

Dear _____:

I am one of the nurses at Johnson Health Center. I work for the School of Nursing at the University of Mississippi Medical Center. I am also a student there. I am doing a research study and I want to talk to people about overweight and obesity at Johnson Elementary School. I would like to learn about school and neighborhood plans that could be done to help lower overweight and obesity in the students at Johnson.

The University of Mississippi Medical Center Institutional Review Board has approved this research study. The Board is a group of people who look at research studies to make sure that the people who take part in the plans are taken care of. No risks or direct benefits are known with this study.

You are asked to be in these talks because you are a teacher, administrator, staff member, parent, or neighborhood leader for Johnson Elementary. If you choose to be a part of the talks, you will come to a meeting to give us your ideas on ways that could help the students to exercise and eat better. Each meeting should last about 1 and 1/2 hours and will be recorded on audiotape to prevent loss of information. Taking part in this meeting is your choice. You may choose not to take part or to leave the meeting at any time. If you are a parent, your child will be taken care of at the clinic as usual. The results of the study may be published and the ideas from the meetings may be used to plan on ways to improve exercise and healthy eating for the students at Johnson Elementary. Your name will not be used.

If you have questions about the plan, please call me at (601) 713-1642 or Dr. Marcia Rachel at (601) 984-6200.

Coming to the meeting on _____(date) at _____(time) _____(place) will be your agreement to participate and to be audiotaped.

**Thank you,
Molly Moore, School Nurse**

Appendix G
Johnson Health Center
A Division of University of Mississippi Medical Center
School of Nursing
1339 Oak Park Drive
Jackson, Mississippi 39213

Dear Parent or Legal Guardian:

I am one of the nurses at Johnson Health Center. I work for the School of Nursing at the University of Mississippi Medical Center and I am a student there. I am working on a research study that could help lower overweight and obesity in the students at Johnson Elementary School. I would like to give out a set of questions to the students at Johnson. The questions will ask them about things that keep them from doing exercise and eating healthy foods.

The University of Mississippi Medical Center Institutional Review Board has approved this research study. The Board is a group of people who look at research studies to make sure that the people who take part in the research studies are taken care of. No risks or direct benefits are known with this study.

I am asking your child to answer the set of questions because he or she goes to Johnson and is in Grade 1 through 5. Answering the set of questions is yours and your child's choice. As the parent or legal guardian of a student at Johnson, we would like you to help your child answer the set of questions if they need help. The answers will give us information about the students who go to Johnson and the things that may keep them from doing exercise and eating healthy foods. The set of questions should take about 30 minutes to fill-out. Once the questions are answered, please bring them to the front office of the school in the envelope given to you. Please turn them in by two weeks after you get them. Returning the filled-out set of questions means that you and your child are agreeing to be a part of the study. If you or your child decide not to fill out the questions, your child's care at the clinic will not be affected. The results of the study may be published and the answers to the sets of questions may be used plan on ways to improve exercise and healthy eating for the students at Johnson. The sets of questions will have numbers on them in case the pages are separated, but the number is not connected to your child's name. Your child's name will not be used and will not be known to me or anyone else.

If you have any questions about the plan, please call me at (601) 713-1642 or Dr. Marcia Rachel at (601) 984-6200.

**Thank you,
Molly Moore, School Nurse**

Appendix H

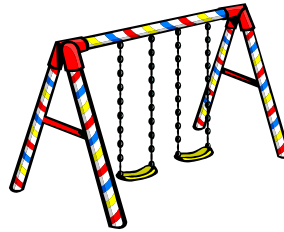
Demographic Survey:

Please answer all questions about your child who attends Johnson Elementary School.

- 1. Age of student _____**
- 2. Gender of student (male or female) _____**
- 3. Race of student (black, white, or other) _____**
- 4. Grade in school _____**
- 5. How many total people live in your household? _____**
- 6. One-parent/guardian household _____ Two-parent/guardian household _____ (check one please)**
- 7. Total household income level per year: (check one please)**
less than \$5,000 _____ \$5,000-15,000 _____ \$15,001-25,000 _____
\$25,001-35,000 _____ \$35,001-45,000 _____ \$45,001-55,000 _____ greater than \$55,000 _____
- 8. How do you (student) get to and from school? (check one please)**
____ Walk
____ Ride Bus/Van
____ Ride in a Car
- 9. How many school-prepared meals do you eat at school per school day?**

Appendix I

Have you turned in your child's surveys



yet?

School Nurse Molly Moore would like to use the survey results to help plan ways to promote physical activity and healthy diets for the students at Johnson!

If you would like to be a part of the study, please do not forget to return the surveys within one week!



Appendix J

Semi-Structured Script for Focus Groups:

1. Tell me what things keep the students at Johnson Elementary School from doing regular physical activity.

2. Tell me what things keep the students at Johnson Elementary School from eating healthy foods.

Appendix K

Demographic Survey:

Please answer all questions.

1. Age _____
2. Gender (male or female) _____
3. Race (black, white, or other) _____
4. Highest level of education: (check one please)
completed grade school _____ some high school _____
completed high school _____ some college _____
completed college _____ Masters degree _____ Doctoral degree _____
5. Total household income level per year: (check one please)
less than \$5,000 _____ \$5,000-15,000 _____ \$15,001-25,000 _____
\$25,001-35,000 _____ \$35,001-45,000 _____ \$45,001-55,000 _____ greater than
\$55,000 _____

6. Do you own a car? (yes or no)_____