

Perceived Parental Support and Self-efficacy for Avoiding Sedentary Behaviors and Overweight Status among School Children

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Abstract Overweight in childhood is a serious public health concern. Approximately 31% of 6-19-year-old children in the United States are obese, overweight or at risk of overweight. The sample (N=721) consisted of students between the ages of 9-14 years of age enrolled in grades 4th-8th in Leon and Gadsden Counties, Florida. Using a multinomial regression model, analyses revealed that students with increased perceived self-efficacy were approximately 1.4 times more likely to be overweight than their counterparts, and those who lived in Gadsden County were 1.7 times more likely to be overweight. Those enrolled in the free/reduced lunch program were 7% less likely to be overweight than their counterparts. The purpose of this study was to explore the relationship of weight with sedentary behavior, self-efficacy in sedentary behavior avoidance, perceived parental support and socio-environmental factors among African American children. The study findings contradict much of the literature in terms of perceptions about the relationship of perceived self-efficacy and behavior and underscore the need for additional research to better understand possible differences between African American and White children.

Keywords Childhood Obesity, Self-efficacy, Sedentary Behavior; School children, Health Disparities, Parental Support, Florida

1. Introduction

The prevalence of childhood obesity and overweight is increasing rapidly.¹ Since 1980, obesity prevalence among children and adolescents has almost tripled². These trends have affected all major racial and ethnic groups, regions of

the country and socioeconomic strata, but the largest increases in obesity occurring among racial/ethnic minority groups³. Groups disproportionately affected include African Americans, Hispanics, American Indians and low-income adolescents⁴. These trends in obesity are concerning because children who are obese after the age of six are 50 percent more likely to be obese as adults, regardless of parental obesity status⁵. Among children who were overweight at ages 10-15, 80 percent were obese at age 25⁶. The prevalence of obesity among children ages 6-11 years increased from 6.5 percent in 1980 to 19.6 percent in 2008; among adolescents ages 12-19 it increased from five percent to 18.1 percent.⁷ Among girls, the prevalence of overweight and obesity increased from 27.4% in 1980 to 32.4% in 2008, and among boys from 28.9% to 34.8%⁸.

The Institute of Medicine (IOM) Standing Committee on Childhood Obesity Prevention recommended a separate IOM committee review of factors related to overweight and obesity from birth to age five, with a focus on nutrition, sedentary behavior, and policy recommendations on obesity prevention^{3,9}. The Standing Committee also identified that over the past 20 years Americans reduced their physical activity and increased the amount of time they spend in sedentary pursuits; only 42 percent of children between the ages of 6 and 11 exercise for an hour or more a day for five or more days per week¹⁰. Among adolescents between ages of 12 and 19, approximately eight percent exercise¹⁰. According to Centers for Disease Control and Prevention (CDC) review of 50 studies, physical activity is important for more than overall health: it also improves students' academic performance, including grades and standardized test scores¹².

Social and physical environment is also important, as researchers have found that children's perceptions of safety going to and from school was associated with physical

activity levels¹². Moreover, children and adolescents living in neighborhoods with more green space were less likely to be overweight than those living environments with less green space.¹³ Minority children were more likely to reside in neighborhoods with safety issues and limited recreational opportunities^{14, 22, 23, 13}. Treatment and prevention of childhood obesity requires multidisciplinary approaches with clear understanding of social, environmental, behavioral and psychological factors¹⁴. Home and school environmental factors can discourage physical activity by being technology focused which promotes sedentary behaviors¹⁰. Fewer than one in five high school students meet the current recommendations of 60 minutes of daily physical activity^{6, 10}. Further, researchers estimate that adolescents now spend more than seven hours per day of screen time: watching television, DVDs, movies, using a computer or a mobile device like a cell phone or MP3 player.²²

Parental support and children's self-efficacy in sedentary behavior avoidance are also related likely to be related to obesity as both factors have significant roles in promoting physical activity and preventing sedentary behavior.^{14, 15, 16}

According to the National Survey of Children's Health in Florida, 33.1 percent of children between 10-17 years of age are overweight or obese: higher than the national average (30.6 percent). The prevalence rate of overweight and obesity is more than two out of five for Florida children who are poor (43.1 percent), on public health insurance (40.8 percent), or black non-Hispanic (45.3 percent)²⁴.

Self-efficacy, described as a person's evaluation of his or her ability to overcome salient barriers (e.g. lack of parental support) for a given behavior (e.g. avoiding sedentary life-style) or one's ability to perform determines whether behavior will be initiated, how much effort will be expended, and whether the effort will be sustained²⁹, is one of the primary constructs of Social Cognitive Theory. Self-efficacy has received considerable empirical scrutiny for its mediating role in the development of physical activity behaviors in particular^{31,32} and predicting other health behaviors. However, nearly no study has examined self-efficacy in African American children related to avoiding sedentary behaviors and its relationship with childhood obesity or overweight

Though self-efficacy is measured in many areas, few studies have examined self-efficacy in relation to adaptive behaviors in adolescents. Sedentary behavior was found to be more prevalent among African American children compared to their white counterparts²⁵. Perceived parental supports and its relationship with development of self-efficacy in children for avoiding of sedentary behavior is not clearly understood. Some research has found inconsistent associations between self-efficacy and quality

of life for ethnic adolescents. Suldo and Shaffer state that the domain specific self-efficacy during adolescences is related to numerous psychosocial adjustments indicators²⁶. However, few studies have examined the relationship between social factors and obesity²⁷. According to researchers, a multilevel approach incorporating individual, interpersonal, and structural factors to understand the causes of obesity must be employed²⁸.

The purpose of this study was to explore the associations between childhood weight and child's self-efficacy in sedentary behavior avoidance, parental support, sedentary behaviors, and other selected socio-environmental factors among African American children. This study hypothesized that perceived parental support influences adolescent self-efficacy in sedentary behavior avoidance, and would be inversely associated with child's BMI. This study also explored the relationship among self-efficacy and self-reported sedentary behavior, and hypothesized that there would be an association between perceived parental supports, self-efficacy, self-reported sedentary behavior avoidance and overweight as reported body mass index (BMI) percentile.

2. Materials and Methods

Data for this study was collected in classroom-administered surveys in selected public schools, in Gadsden and Leon Counties in North West Florida an urban and rural population respectively.

After receiving permission from County School Boards, a meeting was held to each school to receive consent from their principals. The schools sent home a consent form with an opt-out choice, meaning if the parent did not want their child to participate they returned the form with the child. This allowed the parents to have contact information for the researcher and FAMU Institutional Review Board that approved the study. Students completed the self-administered questionnaire at school, supervised by the principal investigator during March -April 2009. A scripted introduction to the survey was read, and the researcher was available for questions. The researcher then read aloud each question, and the corresponding answer choices. Children followed along and marked their answers on the questionnaire. The height and weight of each participating child were measured at school in a private area, by the researcher using a Taylor Body Fat Analysis and Scale (used in weight only mode). Students were not allowed to see their weights, but were given their heights, to remove any stigma or undue emotional stress about weight.

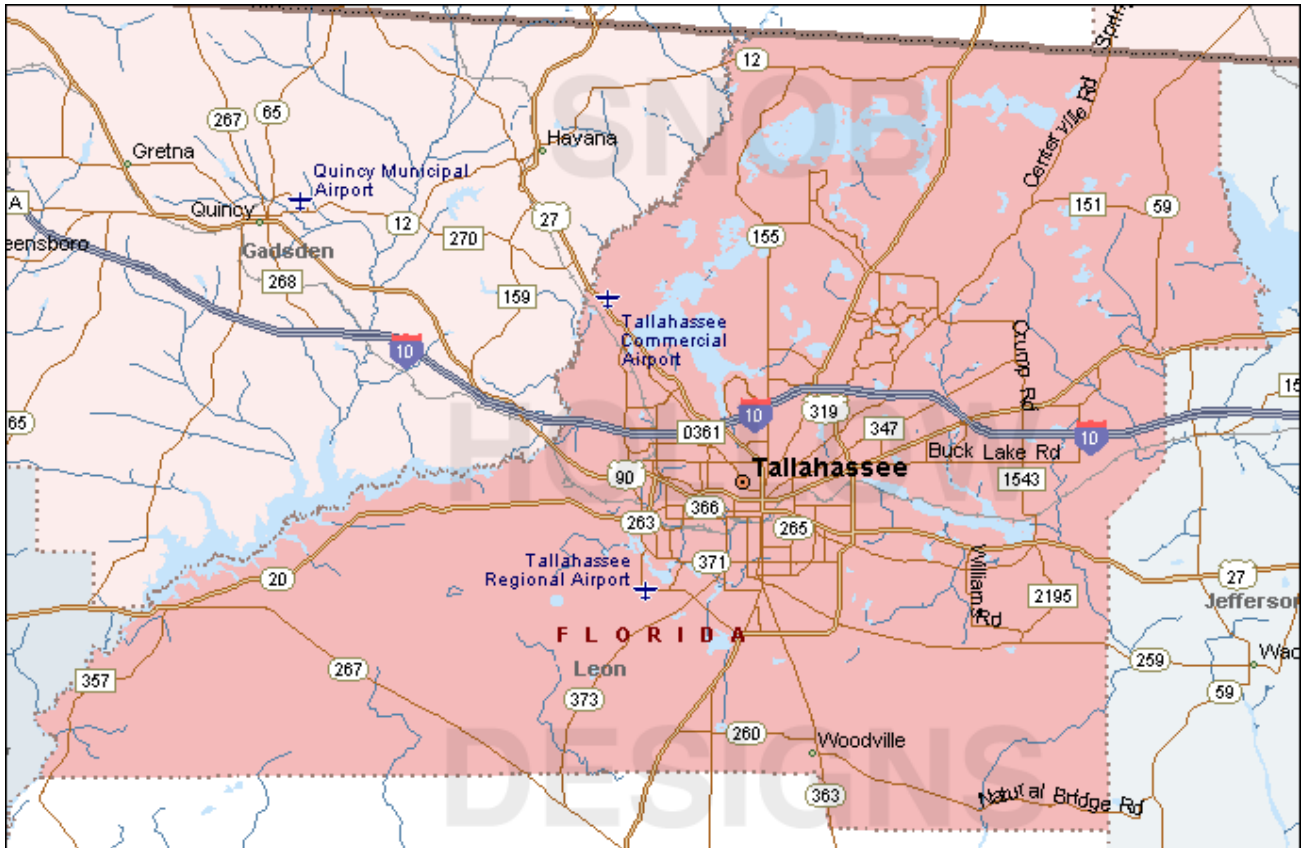


Figure 1. Map of Study Area

The sample (N=721) consisted of students between the ages of 9-14 years of age enrolled in grades 4th-8th Leon and Gadsden County, Florida. This age group was selected because previous research suggests that physical activity levels drop precipitously in those 13-18 years of age¹².

2.1. Instrument

A 50-item question was developed and pilot tested based on several existing instruments. Demographic information of the children was placed at the first part of the survey. The second part of the questionnaire assessed perceptions of parental supports in addressing avoidance of sedentary behaviors, the third part dealt with measures of self-efficacy for avoiding sedentary behaviors, and the fourth half of the survey measured self-reported behaviors that elaborate avoidance of sedentary life-style.

To measure the children's self-efficacy, a modified version of the generalized self-efficacy scale developed by Schwarzer and colleagues³³, and the Patient-centered Assessment and Counseling for Exercise (PACE) scale by Norman et al.³⁴ were employed to measure self-efficacy in children to avoid sedentary behaviors. The reliability of these measures has been established, with high internal consistency, and appropriate concordance with other measures of physical activity and dietary behaviors in elementary school children³⁵. Norman (2004) found a reliability and internal consistency of 0.81. Another

instrument, the Weight Efficacy Life-style (WEL) Questionnaire, is a 20-item instrument that consists of 5 situational factors: negative emotions, availability, social pressure, physical discomfort and positive activities. The WEL was developed by Clark and colleagues (1991) and was used as a guideline for the present study as well³⁶. The present study questionnaire items were tailored based on the cultural appropriateness and acceptance for this study population.

Perceived parental support was assessed by an instrument with a five-point Likert scale, with responses that ranged from 1 (strongly disagree) to 5 (strongly agree). In this questionnaire, several dimensions of parental supports (encouragement, providing access, direct or indirect facilitation, etc.) were measured, as those relate to avoidance of sedentary behaviors. Children's self-reported actual behaviors/time use (for avoiding sedentary life-style) were measured by asking questions developed based on Adolescents Risk Behavior Survey (YRBS), Florida Department of Health -Adolescents Physical Activity and Nutrition (YPAN) survey and a study done by Sharma³⁷. These questions were modified depending on the cultural appropriateness and sensitivity of the question. The questionnaire was then piloted in a sample of 10 adolescents for readability before administering the final survey for data collection.

The dependent variable for this study was the children's Body Mass Index (BMI) for age and gender. The

independent variables included: home Environment defined as perceived parental supports (access and availability of equipment and activities, modeling and encouragement), self-efficacy in avoiding sedentary behavior; self-reported sedentary behaviors, and demographics.

2.2. Data Analysis

The data was analyzed using SPSS 17.0 using two steps. First, descriptive statistics were performed. Second, inferential statistics and hypothesis testing were performed. Confirmatory factor analyses were conducted to measure the construct validity of scales in the instrument. Reliability coefficients were assessed to measure the internal consistency of the instrument. Pearson correlation coefficients were calculated to determine the strength of relationship between each variable. Cross-tabulation and chi-square tests were performed as preliminary bivariate analysis. A logistic regression test was used to determine the main effects for each variable and the interaction effect of the combined variables on step count totals, BMI, parental support, and self-efficacy values.

3. Results

Table 1 describes the demographic characteristics of the participants. Of the 721 students in the study; approximately 59% of the sample was from Leon County and 49.8 % were from Gadsden County. Nearly 46% were male and 54.1% female. The mean age was 11.95 (Std. dev. = 1.52 yrs). Of the survey respondents 69.3% of the participants were non-Hispanic African American. Approximately 14% of participants self-identified as Hispanic, of which 37.6% were female. The majority of the study participants indicated that English was the primary language spoken at home (89%).

Table 1. Demographics of participants and other variables

VARIABLE	N	%
Age	717	
≤9 yrs	37	5.2
10-11 yrs	248	34.6
12-13 yrs	299	41.7
≥14 yrs	133	18.5
Grade	720	
4 th	188	26.1
5 th	132	18.3
6 th	81	11.3
7 th	223	31.0
8 th /other	96	13.3

Race/Ethnicity	721	
White	72	10.0
Black	500	69.3
Hispanic	102	14.1
Other	47	6.5
Lunch Program	696	
Enrolled	508	73.7
Not-enrolled	181	26.3
Gender	697	
Male	320	45.9
Female	377	54.1
County	721	
Leon	362	50.2
Gadsden	359	49.8
Language spoken at home	721	
English	641	88.9
Spanish	69	9.6
Other	11	1.5
Weight description	680	
Underweight	68	10.0
About right	410	60.3
Slightly Over	176	25.9
Very Over	26	3.8
Transportation to School	717	
Walk	71	9.9
Bike	5	0.7
Bus	389	54.3
Parents dropped off	252	35.1
Transportation from School	717	
Walk	84	11.7
Bike	4	0.6
Bus	439	61.2
Parents picked up	190	26.5
BMI category	687	
≤84 th (underweight & normal)	346	50.4
85 th (overweight)	145	21.1
95 th (obese)	196	28.5

Table 2. Body Mass Index percentile among participants

	N	BMI Percentile				Total
		Underweight (< 5 th %ile)	Normal (5 th %ile)	At Risk (≥85 th %ile)	Overweight (≥95 th %ile)	
			Range: 5-84.99	Range: 85-94.99		
Leon Males	179	2.2%	55.3%	20.1%	22.3%	100%
Leon Females	179	.6%	45.3%	27.4%	26.8%	100%
Gadsden Males	141	.7%	49.6%	17.0%	32.6%	100%
Gadsden Females	198	.0%	45.5%	18.2%	36.4%	100%
TOTALS	697	.9%	48.8%	20.8%	29.6%	100%

3.1. Body Mass Index Distributions

Approximately 50% of the sample was overweight (> 85th percentile) or obese (>95th percentile). When categorized into three levels, 20.1% of the study sample was overweight, and 31.9% were obese. As calculated using the CDC BMI for age and gender calculator, the rate of obesity among Leon and Gadsden adolescents is high, with 45% of the total sample being at overweight (85th percentile) and 26% of the total sample were obese (95th percentile). Approximately 39% of males were overweight and 24% were obese, respectively; in turn, 50% of females were overweight with 27% being obese. In Leon County, 41% of the overall sample was overweight and 21% were obese, compared to 48% of the Gadsden overall sample found to be overweight and 31% obese.

Table 1 describes the demographic characteristics of the participants. When analyzed by gender, the BMI distribution was as follows: 45.6% of females were normal; 22.5% and 31.8% were overweight and obese, respectively. For males, 54.4% were normal, 18.8% were overweight and 26.9% were obese. BMI distribution by race/ethnicity was as follows: 20.8% of whites were overweight and 27.8% were obese. For African Americans, the distribution was 18.8% overweight and 31.2% obese. Among Hispanics, 29.4% were overweight and 34.3% were obese.

Of those students who indicated that they participated in the lunch program, approximately 29.5% were obese and 21.1% were overweight, and of those not on the program some 37.6% were obese and 19.9% were overweight.

3.2. Environment

Participants were asked to identify how they traveled to and from school. Approximately 10% walked to school, with a majority either riding the bus (54.3%) and being dropped off by a parent or guardian (35.1%). When asked to identify their most frequent mode of transportation home from school in a separate question, 11.7% walked, 61.2% rode the bus and 26.5% were picked up from school or after-school program.

To help triangulate SES, the following two questions were asked: participation in the free/reduced lunch program (73.7%) and residence in affordable housing (55.3%).

3.3. Weight Perceptions

When asked to describe their weight (N=680), 10% of study participants self-identified as being under weight, 60.3% thought of themselves as just about the right weight, another 25.9% of adolescents saw themselves as slightly overweight and 3.8% saw themselves as very overweight. This is a potentially important indicator of distortion in self-perception because nearly 50% of the adolescents had BMIs at or above the 85th percentile for their age and gender.

3.4. Sedentary Behaviors

In this study participants were surveyed about the type of video game/electronic toys in their home. Sixty-seven percent (67.2%) of participants indicated they had access to Nintendo, Xbox and/or play station (categorized as a sedentary game type) and 24.6% had access to Wii or interactive game access. Some 72% of the participants surveyed had a computer, cell phone and/or an MP3.

3.5. Perceived Parental Support

Perceived parental support (PS) and Self-Efficacy (SE) for avoiding sedentary behavior were positively correlated (r=0.56, p=0.000). Self-efficacy and social factors (SF) were positively correlated (r=0.31, p=0.000). Parental support and social factors were also positively correlated (r=0.50, p=0.000). Time Use (TU) and Self-efficacy (SE) were negatively correlated (r= -0.21, p=0.000) and time use and social factors were also weakly correlated (r=0.12, p=0.000).

Social factors in this study include home environment (e.g. role modeling, socio-economic status (SES), etc.). Parental Support in this study includes reinforcement of dietary and physical activity, availability and accessibility, etc. Time Use in this study included how participants utilized their time after school e.g. physical activity, sedentary activities,

and sleeping.

Table 3. Basic Descriptive Statistics and Cronbach's Alpha

Variable	<i>N</i>	<i>M</i>	α
Self Efficacy	12	2.90	0.89
Perceived Parental Support	17	2.81	0.91
Time Use Tech* (Self reported behaviors)	5	2.45	0.68
Social Factors (home environment)	7	2.44	0.53
Total Subscale	47		0.89

*Only items that were technology based were included in this variable.

The multi-nominal logistic regression (MLR) with the reference category being normal showed: BMI at or above the 85th percentile (overweight) was for the Time Use Tech (TU) subscale with a crude odds ratio of 0.91 (p-value=0.030; CI=0.84-0.99), however the adjusted odds ratio of 0.94 (p-value= 0.201; CI=0.86-1.03) did not show significance. These findings indicate that those study participants who had

increased sedentary behavior were 9% less likely to be overweight compared to their normal weight counterparts. Further, SF was significant with a crude odds ratio of 0.69 (p-value=0.035; CI=0.49-0.98) and an adjusted odds ratio of 0.71 (p-value= 0.134; CI=0.46-1.11). Approximately 7% of those participants who indicated low social factors were less likely to be overweight compared to their counterparts.

For those with a BMI at or above the 95th percentile (obese) the MLR showed: self-efficacy was moderately significant with an adjusted odds ratio of 1.40 (p-value =0.045; CI = 1.01-1.94) and a crude odds ratio of 1.11 (p-value=0.388; CI=0.88-1.41). Participants who had increased perceived self-efficacy were found to be 1.4 times more likely to be overweight than their counterparts. County of residence was also significant with an adjusted odds ratio of 1.68 (p-value = 0.022; CI=1.08-2.61) and a crude odds ratio of 1.72 (p-value=0.002; CI=1.23-2.42). Those who lived in Gadsden County were 1.7 times more likely to be overweight than their normal counterparts.

Table 4. Multinomial regression Model

VARIABLE	<i>BMI at risk(85th %ile) vs BMI normal</i>		<i>BMI over(95th %ile) vs BMI normal</i>	
	<i>Crude OR (95%CI)</i>	<i>Adjusted OR (95%CI)</i>	<i>Crude OR (95%CI)</i>	<i>Adjusted OR (95%CI)</i>
Subscales				
<i>Perceived parental support (PS)</i>	0.93(0.72-1.21)	0.95(0.65-1.39)	0.92(0.74-1.15)	0.97(0.69-1.36)
<i>Self-efficacy (SE)</i>	1.19 (0.89-1.57)	1.25 (0.87-1.80)	1.11(0.88-1.41)	1.40 (1.01-1.94)*
<i>Time Use (TU)</i>	0.91 (0.84-0.99)*	0.94(0.86-1.03)	1.02(0.95-1.10)	1.02(0.94-1.11)
Social Factors (SF)	0.69 (0.49-0.98)*	0.71(0.46-1.11)	0.93(0.69-1.27)	0.79(0.53-1.18)
Lunch Program				
<i>Enrolled</i>	0.91 (0.58-1.44)	0.82(0.50-1.35)	0.68 (0.46-0.99)*	0.61(0.39-0.93)*
<i>Not-enrolled</i>	1.00	1.00	1.00	1.00
Gender				
<i>Male</i>	1.00	1.00	1.00	1.00
<i>Female</i>	1.43 (0.97-2.12)	1.43 (0.94-2.19)	1.41(1.00-2.00)*	1.39 (1.00-2.04)
County				
Leon	1.00	1.00	1.00	1.00
Gadsden	0.81(.55-1.20)	0.77(0.47-1.25)	1.72 (1.23-2.42)*	1.68(1.08-2.61)*

NOTE: This table only contains variables that had statistically significant findings to preserve space. Full table is available via request.

Sex (gender) was also significant at the 95th percentile with an adjusted odds ratio of 1.39 (p-value = 0.91; CI=0.95-2.04) and a crude odds ratio of 1.41 (p-value=0.052; CI=1.00-2.00). Finally, lunch program enrollment was significant with an adjusted odds ratio of 0.61 (p-value=0.022; CI=0.39-0.93) and a crude odds ratio of 0.68 (p-value=0.046; CI=0.46-0.99). The model correctly predicted 50.7% of the cases, and was a significant model with a likelihood ratio of p-value of 0.038. However with a Cox and Snell of 0.081; Nagelkerke of 0.092. Tables outlining the crude and adjusted odds ratios for the multinomial regression variables by category are located in Table 4.

4. Discussion

To date, the poor predictiveness of theoretical concepts for understanding the levels of influence on healthy behavior participation among children is of substantial concern. It is not clear whether the concepts have not been appropriately applied; they are too cognitive to capture the behaviors of children, or the measures are too unreliable³⁹. Further research with self-efficacy and children should emphasize decisions in the eating and physical activity events over which children exert the most control, and thereby, the cognitive variables could be expected to be predictive. Younger children may not exercise much control over their diet or physical activity, thus the emerging research on family focused behavioral research⁴⁰. Perhaps environmental variables [e.g., parenting or availability] offer the most promise with younger children⁴¹.

The findings of this study imply that males were 1.4 times more likely than females to be overweight/obese. Those participants who had increased perceived self-efficacy were approximately 1.4 times more likely to be overweight than their counterparts, and those who lived in Gadsden County were 1.7 times more likely to be overweight. Finally, that those enrolled in the free/reduced lunch program were 7% less likely to be overweight than their normal counterparts.

The study findings also highlight the importance of possible differences among African American children and White children in perceived self-efficacy, as well as difference among urban and rural overweight.

4.1. Limitations

There are several limitations to this study, including limited generalizability to only those communities similar to Gadsden and Leon County, Florida. However, the study population included a rural and urban county, which adds to the usability of this dissertation data. Data was collected using a cross sectional survey, with self-reported information from adolescents ages 9-13, and the survey was administered at different times to students in different school environments which may influence the result. The survey questions were read out loud to participants and student's

ability to comprehend and respond to the questions may have varied, therefore it may affect the study systematically. Finally, there was slight overlap in the survey time use Likert scale, therefore categories were collapsed. This caused a slight change in odds ratios and associations, but did not affect the associations much.

As more information becomes available, and research is translated into policy and services, children's unique needs must be addressed with messages that are easily distinguished and integrated into their daily lives. Study findings suggest that public health interventions should be multifaceted: including knowledge and skills training, and emphasizing the importance of preventing chronic diseases by addressing psycho-social factors.

5. Conclusion

The findings of this study do not correspond with those of existing research. However, because the instrument used in this study was newly developed and is a better assessment tool for self-efficacy, the finding of increased self-efficacy in overweight participants, may indicate that overweight children are not able to adequately adjust their avoidance of sedentary activities such as computer time, and video game use to decrease their BMI, yet are confident of their capability to be active. Because there is some interaction in the model, further research on the possible mediating and moderating effects of perceived parental support and social factors on self-efficacy should be done in the future.

These findings imply that further research with a sample that is predominantly minority need to be conducted. Given the lack of association with self-efficacy, another theoretical model may offer a better fit, including a larger focus on cultural and environmental variables.

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