

5-2015

Associations between family functioning and adolescent health behaviors

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FAMILY FUNCTION AND ADOLESCENT HEALTH BEHAVIOR

Associations between family functioning and adolescent health behaviors

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Abstract

Background: The obesity epidemic has been a concern across the globe, affecting about 20% of adolescents in the U.S. Physical activity and nutrition-related behaviors that develop during adolescence carry through into adulthood. Adolescents' perceptions of how their family functions may be associated with health behaviors, including physical activity and diet.

Objective: To determine whether there is an association between perceived family functioning and adolescent health behaviors among a national sample of adolescents aged 11 to 16 who participated in the 2009-2010 Health Behaviors of School-Aged Children survey.

Methods: Participants reported on demographics and measures of family function, which included satisfaction with family relationships (very satisfied, satisfied, not satisfied) and mother/father knowledge of daily life (knowledge of friends, money spending; and time spent during free time, at night, and after school). In addition, adolescents reported on levels of physical activity and frequency of fruit and vegetable consumption. A series of analysis of covariance (ANCOVA) models were constructed to examine the associations between the measures of family function and health behaviors, controlling for socioeconomic status, race/ethnicity, and age. Separate models were conducted for males and females.

Results: Participants (n=12,624) were racially diverse (52% white, 20% African American, 27% other) and 26% identified as Hispanic/Latino. Sixty-five percent of participants reported being satisfied with family relationships, 34% reported that their mothers were very knowledgeable of their daily life, while 21% reported that their fathers were very knowledgeable. Results of the ANCOVAs determined that all three family function measures were associated with physical activity, fruit and vegetable consumption. Individuals who reported greater satisfaction with their family relationships and whose mother and/or father were more knowledgeable about their lives were more physically active and consumed more fruits and vegetables ($p < 0.05$).

Conclusion: Study results suggest that family functioning may be a significant factor in determining adolescent healthful behavior. Family function may be helpful when understanding the process of adolescent development and internalization of health behaviors. Further research may include family-centered interventions to increase positive family function.

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Introduction

Adolescence is a compelling age group to study because it is a time when individuals are learning to habituate lifelong health behaviors [1]. An argument can be made for the importance of studying family functioning for its influence on forming internalized behaviors and attitudes towards physical activity (PA) and nutrition in the adolescent [2]. Stronger family ties due to effective communication and trusting relationships between parents and children have the ability to further strengthen adolescents' adoption of behaviors. The purpose of the present study is to investigate the associations between family functioning as perceived by adolescent and health behaviors categorized by PA, and fruit, vegetable, fast food, sweets, and sugary beverage consumption. It is hypothesized that more favorable reports of family functioning will have a positive affect on PA, fruit and vegetable consumption, and an inverse affect on fast food, sweets, and sugary beverage consumption.

Literature Review

Health behaviors of children and adolescents

Research on health trends has recently shown troubling behavioral patterns among children and adolescents in the U.S. More than a third of adults and about 20% of children and adolescents (ages 2-19) are overweight or obese, although these rates have begun to level off as of 2003 [3]. Dietary patterns among school-aged children have begun incorporating more fast food, sugar sweetened beverages, and prepared foods high in fat [4]. Less than half of American adolescents are participating in regular PA and most are not meeting recommendations for at least 60 minutes of moderate-to-vigorous PA 7 days a week [5]. Children and adolescents' PA tends

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to decrease as they grow older, a decline that negatively impacts health later in adulthood, putting them at risk for hypertension, osteoporosis, cardiovascular disease, certain types of cancer, psychological disorders, and all cause premature mortality [6]. Combined, health behaviors such as a lack of PA and unhealthful eating patterns, such as overeating and consumption of a high sugar and fat diet, comprise a lifestyle that is conducive to a range of weight- and psychological-related health problems [7, 8]. These behaviors are established primarily in the household starting at an early age, and throughout adolescence [1]. Adolescence is a period in the lifespan when attitudes and awareness towards healthy lifestyle choices become more developed through observation and adopting of environmental cues, primarily brought about within the household [9]. Contributing to environmental cues, the way in which a family interacts together, or functions, may be an indicator of the likelihood of adolescents establishing healthful PA and dietary behaviors. Understanding family functioning can lead to a different social view on adolescent health outcomes.

Family functioning

How the family functions as a system may affect adolescents' attitudes towards and practices of being PA, consuming a healthful diet. Family functioning refers to the system in which all members of the family interact, forming a dynamic relationship in which values and behaviors are constantly being shaped [10, 11]. Family functioning differs from parenting style (commonly involving styles such as authoritative, authoritarian, neglectful, or permissive) as parenting commonly refers to a one-way interaction between parents and their children where the parent is the enforcer of the preferred values and behaviors [12]. Family functioning also differs from family structure, which refers to the parental make up the household such as dual parenting,

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inclusion of step-parents, single parent, or other adult as parental figure [10, 13]. Identifying parenting style and family structure gives way for a more inclusive method of identifying relationships amongst family members, in which all of these components contribute to the family dynamic. Family functioning embodies parts of parental socialization and the family structure, however there is a stronger focus on all members of the household working as a system to encourage and habituate behaviors. This notion provides a more complex insight as to how the family unit may be involved in the formation and maintenance of health behaviors [9].

Two theoretical models contribute to the understanding of how family functioning impacts health behaviors. First, the Family Socialization Model guides the understanding that knowledge and values are gained by interacting with and experiencing the family's expected behaviors. Often, constructs such as parental modeling, parental encouragement, and parental support of their child catalyze adolescents' health choices [10]. This model has a bidirectional structure with parents as the primary providers of moral expectations and behaviors, yet the child is able to influence the context in which the parents are providing guided learning. Without the working interaction between both parent and child, the parent would strictly be the enforcer. Parenting style plays a role in the family socialization process by setting the parent up to be a supportive model for the child. This is important when the child is learning to establish lifestyle values and patterns and must be practiced in a safe environment [14].

Family Systems Theory embodies the interconnectedness amongst family members [11] and the importance of the system in which all members of the household shape one another's behaviors [15]. Adolescents learn by being involved in a family context in which behaviors are modeled and encouraged, however, the Family Systems Theory extend the learning process to all family members. This means that the complex family system experiences reciprocal patterns,

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constantly forming bonds and shaping one another, including relationships between parents, children, and siblings. Through reciprocating health patterns, stronger bonds are formed, further encouraging communication and consistent health behaviors [15].

A theory driven approach to family function may help to explain the development of adolescent health related behaviors. Studies in this area have found that parents and children who report higher levels of family functioning, especially when measuring communication between family members [16] and participating in family meals, typically do lead healthier lives [11, 15] including greater mental health, less sedentary behavior, adequate PA, and more healthful dietary choices. A meta-analysis conducted by Halliday et al. (2013) determined that both family functioning and parenting were associated with 14-24% of variability in adolescents' body mass index (BMI). Family functioning is hypothesized as acting as a protective factor against adolescent weight gain, obesity [11, 13] and weight-related dissatisfaction, possibly due to more comfortable parent-child communication [16]. Other indications state that stronger communication of health-related information or effective parent modeling behavior of health-related behaviors may play a role in adolescent weight-related behaviors [11, 17]. Conversely, poor family functioning may cause a stressful and less structured family environment, leading to greater likelihood of adolescent health-risk behaviors [9, 11]. Poor family functioning consists of uncomfortable or lacking parent-child communication, perceptions of an unfair or unsupportive relationship, low satisfaction with family dynamics, or lack of parental involvement and knowledge of child's life [16]. In a focus group study involving both parents and children, family members reported together that parent modeling is important for establishing PA and dietary behaviors that children will follow, and that it is important for establishing household values towards healthful behaviors [15]. Positive parent modeling may be one step in developing a cohesive dynamic between parents and

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children, therefore, when families act together to achieve healthful behaviors, such as spending more mealtimes together, or engaging in PA together, just as families reported in their focus groups, their family relationships become stronger [15].

As supported by two family functioning assessment tools, the Family Assessment Model/Process Model of family functioning and the McMaster Model of family functioning, a key element that goes into family functioning is communication [18, 19]. A trusting relationship between parents and their children facilitates communication relating to lifestyle choices. Further, supportive parent-child relationships provide a safe environment in the home for growing adolescents to practice healthful behaviors and begin to develop individual lifestyles [17]. Consequently, especially among adolescent girls, it has been shown that greater conflict, less cohesion, and less adaptability among family members influences weight-related eating behaviors such as over-eating, binging, and practicing extreme weight-loss behaviors [16, 20]. Consistent with previous research [16, 17], a study conducted by Ackard, et al. (2006) determined that family connectedness, defined as valuing maternal and/or paternal opinions and adolescents' reports of maternal/paternal caring, had an inverse association to adolescent health risk behaviors, including psychological health and weight-related behaviors.

Physical Activity Among Adolescents

During their school-aged years, adolescents who are physically active are psychologically healthier, have improved cardiorespiratory fitness, maintain a healthier weight, are able to focus better on schoolwork and in class, have improved sleep quality, and are less likely to develop depression or anxiety. Adolescents who engage in regular PA are also more likely to lead a healthier adulthood with a lower risk for developing chronic diseases, maintain a healthier body

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weight, and have stronger bones [7]. As youth surveillance data continue to show a high prevalence of overweight and obesity among children and adolescents, research has also identified factors that may be influencing these rising numbers. Based on the *2008 Physical Activity Guidelines for Americans*, the U.S. Department of Health and Human Services recommends that youths participate in at least 60 minutes of moderate- or vigorous-intensity aerobic PA/day. Within the recommended 60 minutes of aerobic exercise, it is also recommended that adolescents incorporate muscle- and bone-strengthening exercises each at least 3 days a week. Analysis of data from of the 2013 Center for Disease Control and Prevention Youth Risk Behavior Surveillance Summary indicates that 15% of adolescents in grades 9 through 12 did not participate in any PA that lasted at least 60 minutes/day during the past 7 days, about half (47%) participated in at least 60 minutes of PA/day on 5 or more days during the previous 7 days, and about a quarter (27%) had been physically active on all of the previous 7 days [5].

There are many identified barriers to PA that affect families and adolescents. One study isolated the most common concerns Swedish parents (n=84) of 6-year-old children exhibit based on their family's PA and dietary behaviors. They reported that common barriers of PA were time, parent-child interplay, parent overload and parental attitude were common when considering concerns of organizing activities that were as a family, part of everyday life, and outside the home [22, 23]. Other identified barriers include motivation, lack of energy, weather and safety [22]. Among school-aged children and adolescents, a lack of PA may be due to insufficient time for PA during school hours and in physical education curricula as well as an increase in sedentary behavior after school such as television watching [1].

Dietary Patterns and Nutrition among Adolescents

In addition to PA, a healthful diet is necessary to avoid health risks and to benefit from nutritional content that the body needs to develop and thrive. A healthful diet incorporates a balanced variety of nutrient-dense foods including lean/low-fat protein and dairy, whole-grains, and fruits and vegetables [4]. The problematic foods that American adolescents are consuming in excess are primarily sweetened beverages, overly processed foods, fast foods, high sodium and added sugar content in foods, and foods with Trans and saturated fats [4]. The Youth Risk Behavior Surveillance Summary reports that only 28% of adolescents had eaten vegetables two or more times a day during the previous 7 days and only 22% had not drunk soda [5]. According to daily dietary guidelines, adolescents should be consuming 2-3 servings of each fruits and vegetables, 2-3 cups of fat-free or low-fat dairy, 3-6 ounces of lean meat/protein, at least half of grains should be whole grains, reduce sodium to less than 2300 mg, and reduce added sugars and solid fats [8].

Perceived barriers to maintaining a healthful diet according to parental concerns include child-parent interplay, lack of parental teamwork, lack of time and parent overload [22]. Additionally, parents report enforcing less nutritious food options in the home because they do not want to upset their child or because it is easier to comply with their child's preferences to avoid conflict with their child or spouse [23]. Adolescents report that barriers to eating well include cost to their family, availability of healthy options, time and effort it takes to prepare meals, and a lack of family mealtimes [15].

Ultimately, the household is a vital environment for adolescents to learn nutritious dietary habits and PA to develop positive attitudes towards a healthful lifestyle. Establishing a structured family meal routine will promote effective positive modeling and may increase communication

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between parents and children and may even reduce risk for disordered eating in adolescents [24, 25]. There is need for educating both parents and children on healthy food choices, and a family who has better all-around functioning may be more likely to adhere to recommended household routines of diet and exercise.

Current study

The purpose of this research is to investigate the associations between family functioning as perceived by adolescents and the adolescents' self-reported PA and nutritional behaviors. The primary research question asks: is more positive family functioning indicative of supporting a healthy lifestyle of the adolescent? It is hypothesized that adolescents who report higher levels of family satisfaction, will also report higher levels of PA, fruits and vegetable intake, and less consumption of sweets, fast food, and sweetened beverages than those who report not being satisfied with parent relationships. It is also hypothesized that participants who report greater ease of communication with parental figures will show the same levels of increased PA and more favorable nutritional intake than those who find it difficult to talk with parents. Participants whom report less parental involvement in the participant's personal life, will consequently be expected to report less PA, and less favorable nutritional intake including more fast food consumption than those whose parents are more involved with and knowledgeable of their personal lives. Finally, participants who spend most days of the week having family evening meals will also be more likely to report more healthful dietary behaviors and greater PA. It is believed that those who spend evening meals as a family will also report higher satisfaction with their relationship with parents and ease of communication with parents will be greater.

Health Behaviors of School-Aged Children Dataset

The study is a secondary cross-sectional analysis of data from the Health Behaviors of School-Aged Children (HBSC) dataset. HBSC is a nationally and internationally administered survey that systematically collects data every four year from school-aged adolescents ages 11-16. HBSC surveys adolescents on demographics and health behaviors through a self-report questionnaire. The current study is limited to the US sample that completed the 2009-2010 academic year survey (n=12,624).

Methods

Data Analyses

Original HBSC data were obtained for secondary analyses. Using SPSS statistical software, descriptive statistics and frequencies were calculated for all variables and outcome variables were either dichotomized or categorized. A series of logistic regression models were constructed to examine the dichotomous outcomes while a series of analysis of covariance (ANCOVA) models were constructed to examine the associations between the measures of family function and health behaviors, factoring in covariates. All models controlled for family affluence, age, BMI, and race/ethnicity. Separate models were run for both males and females.

Measures:

Family Functioning: The predictor variable, family functioning, included variables of strength and ease of parent-child communication, parental involvement with child, children's attitudes towards their parent(s), and their overall satisfaction with their relationship with their parents. Specifically, assessment of family functioning included: (1) ease in which participants can talk to their mother and/or father about important issues ("easy", "difficult", and "don't

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have/don't see"); (2) how aware participants perceived their mother/father were of aspects of social life (who friends are, how money is spent, where they were after school, where they go at night, and free time activities), ("knows a lot", "knows a little", and "doesn't know anything/don't have"); (3) perceived parental involvement in participants' life such as helping behavior of the parent, allowing child to be autonomous, and controlling behavior of the parent, (response options were summed and categorized as: best possible score, next best score, average score, and worst possible score); and (4) general satisfaction with relationship with family (scale of 0-10 categorized into "very satisfied", "satisfied", and "not satisfied").

Physical Activity: The first outcome measure was PA. Participants reported on how many days in the previous 7 days they had participated in 60+ minutes of moderate- to vigorous-intensity PA (MVPA). MVPA is designed as "any activity that usually increases your heart rate and makes you get out of breath some of the time". Measures were dichotomized into <7 days/week and ≥ 7 days/week to represent those who were not meeting adolescent PA recommendations and those who were meeting recommendations, respectively.

Nutrition: The second outcome measure was nutrition. Adolescent dietary behavior measures included fruit and vegetable consumption categorized to include response options of <1 time/week, 2-6 times/week, and ≥ 1 time/day. Sugary beverage, fast food, and sweets consumptions were also categorized as <1 time/week, 2-6 times/week, and ≥ 1 time/day, with <1 time/week being most preferable.

Demographics: Respondents reported their sex (male/female), age (11-16), grade in school (6th-10th), ethnicity (Hispanic or Latino, not Hispanic or Latino), and race (black or African American, white, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacif-

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ic Islander, other). Socioeconomic status (SES) was assessed using the Family Affluence Scale (FAS) [27], which assess computer ownership, if adolescent has own bedroom, family vehicle ownership, and family vacations (See Table 1).

Table 1: Demographics (n=12,624)

	Total		Males		Females	
	N	%	N	%	N	%
Age						
10 or younger	1155	9.1	542	8.3	613	10
11	1907	15.1	964	14.8	942	15.4
12	2245	17.8	1094	16.8	1150	18.7
13	2464	19.5	1348	20.7	1116	18.3
14	2141	16.9	1100	16.9	1039	16.9
15	1874	14.8	971	14.9	903	14.7
16	710	5.6	384	5.9	326	5.3
17 or older	127	1	89	1.4	38	0.6
BMI						
Underweight/Normal	644	5.1	367	5.6	277	4.5
Normal	6701	53	3334	51.9	3367	54.9
Overweight	1760	13.9	964	14.8	796	13.0
Obese	1497	11.8	899	13.8	598	9.7
Family Affluence						
Low	3431	27.5	1728	26.6	1701	27.7
Medium	5850	46.3	3076	47.3	2773	45.2
High	3176	25.1	1600	24.6	1575	25.7
Race						
1	3407	26.9	1784	27.4	1621	26.4
2	2302	18.2	1140	17.5	1160	18.9
3	581	4.6	273	4.2	308	5.0
4	99	0.8	46	.7	53	.9
5	366	2.9	186	2.9	180	2.9
6	5334	42.2	2769	42.6	2565	41.8
7	412	3.3	232	3.6	180	2.9
Ethnicity						
Hispanic or Latino	3407	26.9	1784	27.4	1621	26.4
Not Hispanic or Latino	8464	67	4304	66.2	4159	67.8
Grade						
5th	1717	13.6	873	13.4	843	13.7
6th	2050	16.2	1043	16.0	1006	16.4
7th	2421	19.2	1199	18.4	1221	19.9
8th	2475	19.6	1372	21.1	1103	18.0
9th	2072	16.4	1047	16.1	1024	16.7
10th	1907	15.1	968	14.9	939	15.3

Results

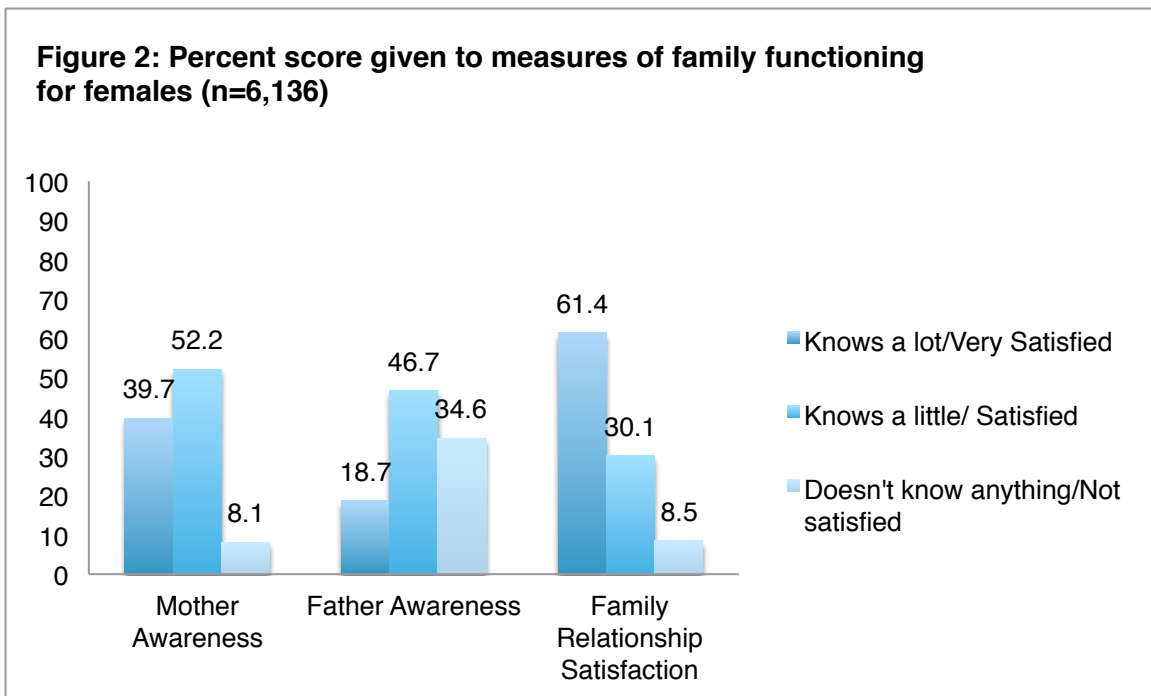
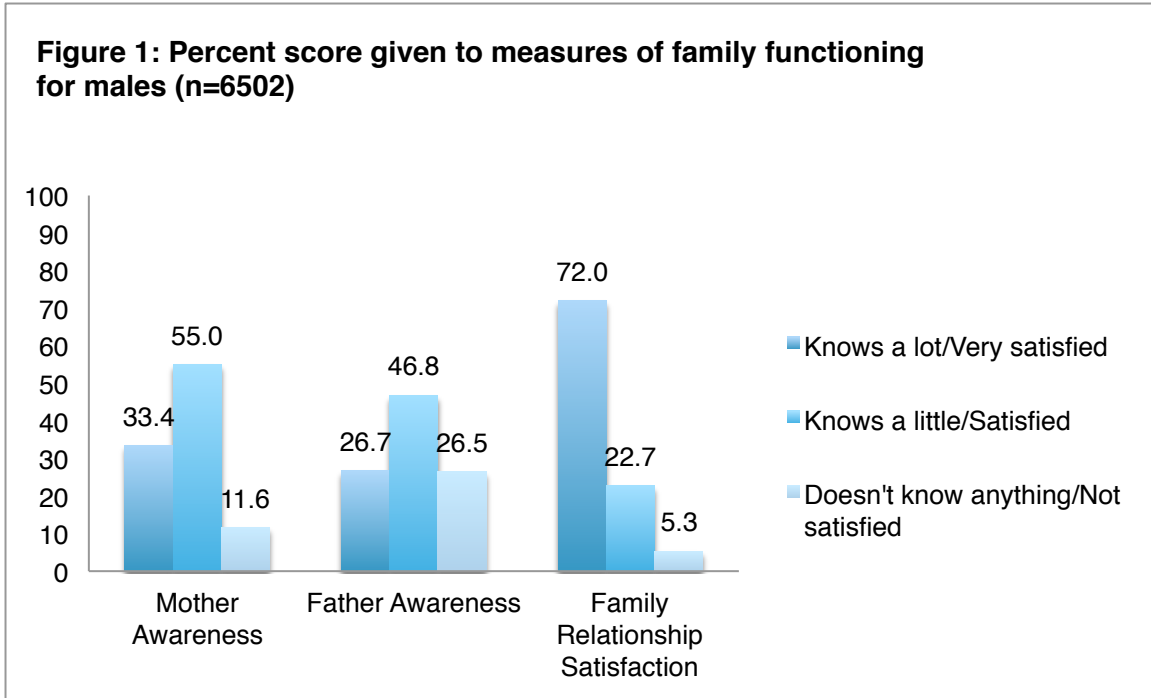
Descriptive Analysis

There was a positive association between family functioning measures and measures of PA and nutritional measures of fruits, vegetable, and a negative association with sugary beverage consumption among males and females. None of the family functioning variables (parent-child communication, mother/father awareness, general relationship satisfaction, and parental involvement) were associated with fast food or sweets consumption, except for females' communication with their fathers affecting fast food consumption ($p = 0.007$) and males' overall parental involvement and fast food consumption ($p = 0.001$).

Family Functioning

Girls ($n = 6136$, 48.5%) were more likely to perceive their mothers as being the most aware of their lives with 39.7% versus 33.4% of boys reported greatest awareness of maternal awareness. Boys reported greater perception of involvement from their fathers than girls, with 26.7% of boys reporting highest level of awareness from their fathers as opposed to 18.7% of girls reporting the highest awareness. Consequently, 34.6% of girls reported lowest paternal involvement versus 26.5% of boys reporting lowest involvement. Overall, both boys and girls perceived their mothers as being more aware of their lives than their fathers. Finally, 72% of boys and 61.4% of girls reported being "very satisfied" with their family relationships. (See figures 1 and 2).

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Health behaviors

Only 26.5% of all participants reported meeting the recommended 7 days of PA during the prior week, and boys (32.6%) were more likely to meet recommendations than girls (20.1%). Overall girls were more likely to approach recommended fruit and vegetable consumption than boys; 44.6% of girls consumed 1 or more servings of fruits and 37.7% of girls consumed 1 or more servings of vegetables. (See table 2).

Table 2: Health Behaviors of Adolescents

	Total		Males		Females	
	N	%	N	N	%	N
Physical Activity						
< 7 days/week	9023	71.4	4231	65.1	4789	78
≥ 7 days/week	3356	26.5	2122	32.6	1234	20.1
Fruits						
< 2 times/week	2378	18.8	1219	18.7	1158	18.9
2-6 times/week	4346	34.4	2358	36.3	1987	32.4
≥ 1 time/day	5297	41.9	2562	39.4	2734	44.6
Vegetables						
< 2 times /week	3317	26.2	1753	27.0	1563	25.5
2-6 times/week	4142	32.8	2202	33.9	1939	31.6
≥ 1 time/day	4382	34.7	2067	31.8	2314	37.7

Family functioning: Associations with adolescent health behaviors

Almost all linear and logistic regression models for both males and females determined that family functioning was significant as having a positive association with PA involvement, and fruit and vegetable consumption (all p values < 0.05), (See table 3). The association between maternal ease of communication and males' PA, was the only case that was not significant out of these outcome variables. Boys who reported the greatest father awareness and most involvement of parents also reported the highest levels of PA.

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Fast food and sweets consumption were not significantly associated with family functioning, except for girls' reported fast food consumption in relation to ease of communication with their fathers and boys' fast food consumption in relation to parental involvement. Results were mixed for sugary drink consumption with all measures of family functioning significantly associated with drinks for females, yet only mother's awareness, father's awareness, and ease of communication with father were associated with drink consumption for males.

Table 3: Results of family functioning on health behaviors (Mean; SE)

	Health Behaviors*					
	Male			Female		
	PA	Fruits	Vegetables	PA	Fruits	Vegetables
Mother Awareness						
Knows a lot	1.39 (0.01)	2.32 (0.02)	2.15 (0.02)	1.24 (0.01)	2.35 (0.02)	2.25 (0.02)
Knows a little	1.29 (0.01)	2.18 (0.01)	2.02 (0.01)	1.17 (0.01)	2.21 (0.01)	2.06 (0.02)
Doesn't know anything	1.34 (0.02)	2.11 (0.03)	1.92 (0.03)	1.21 (0.02)	2.16 (0.04)	1.96 (0.04)
Father Awareness						
Knows a lot	1.41 (0.01)	2.34 (0.02)	2.14 (0.02)	1.28 (0.01)	2.41 (0.02)	2.30 (0.03)
Knows a little	1.29 (0.01)	2.19 (0.01)	2.04 (0.06)	1.18 (0.01)	2.26 (0.02)	2.12 (0.02)
Doesn't know anything	1.33 (0.01)	2.15 (0.02)	2.00 (0.02)	1.19 (0.01)	2.19 (0.02)	2.04 (0.02)
Family relationship satisfaction						
Very satisfied	1.35 (0.01)	2.26 (0.01)	2.08 (0.01)	1.20 (0.02)	2.33 (0.01)	2.20 (0.01)
Satisfied	1.30 (0.01)	2.12 (0.02)	1.99 (0.02)	1.18 (0.01)	2.17 (0.02)	2.02 (0.02)
Not satisfied	1.31 (0.03)	2.07 (0.04)	1.87 (0.05)	1.22 (0.01)	2.15 (0.03)	2.00 (0.04)

Bolded text represent significant data at the $p > 0.05$ level

*Coded responses:

PA

1=<7 days/week

2 = 7 days/week

Fruits

1 = <2 times per week

2 = 2-6 times per week

3 = at least 1 time a day

Vegetables

1 = <2 times per week

2 = 2-6 times per week

3 = at least 1 time a day

Discussion

The current study supports the suggestion that certain family functioning variables may be a significant factor when it comes to understanding adolescent health behaviors. These findings primarily support a positive relationship between factors such as parent-child communication, parental involvement in the child's life, parental awareness of the child's life, and overall perceived family relationship satisfaction on PA involvement, fruit and vegetable consumption. As previously explained, it is indicated that more positive family functioning may be a factor on increasing healthful behaviors such as PA and nutrition, and reducing health-risk behaviors such as sedentary behavior. This study has similar findings to previous research on family functioning and health- and weight-related behaviors in children and adolescents [11, 13, 15, 20, 28]. These findings contribute to the growing body of evidence in adolescent health, suggesting that there may be another factor, whether directly or indirectly, affecting childhood overweight and obesity. This study provides a range of independently identified family functioning variables in order to better understand whether certain parent-child variables have a stronger affect than others.

Limitations

There are some limitations of the present study that must be addressed. First, due to the nature of cross-sectional study, which does not allow for causality to be determined. It is implied that if there is an association between the independent and dependent variables, the quality of family functioning would be the determining factor of the health behaviors, PA and nutrition, as opposed to the adolescents' independent health behaviors affecting the quality of family functioning. Secondly, the data collected uses a survey that does not ask about parental behaviors, it only asks for responses based on adolescent self-reported attitudes towards interactions with

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his/her parent(s). For this reason, parental modeling and parental encouragement of the included dependent variables may be suspected, yet they cannot be determined. In addition, since the survey only collects self-reported data, consideration must be taken as to the accuracy of responses. Often, self-reported responses may over- or under-report in order to represent oneself more favorably. Finally, the survey does not take into account recent events in the participants' lives that may influence how they might perceive their relationships with their parents or that may skew health behaviors at the time administration of the survey.

Strengths

A strength of the study includes a large and racially/ethnically diverse sample of US adolescents from across the country. African-American and Hispanic students were oversampled to account for more accurate estimates. Due to the large sample size and racial, ethnic, and socioeconomic diversity, the data is generalizable to adolescents in American schools. Many other studies focus on intrapersonal behaviors within the family context that affect adolescent health behaviors, such as enforcing or modeling behaviors from parents or the effect of different family structures on health, however this study is designed to consider the interpersonal behavioral outcomes, focusing on a multidimensional approach family.

Future Implications

The nation's obesity crisis has become a widely researched topic in the health field for its impact on children's development, psychosocial adaptation, and future health problems leading to chronic illness [3-7]. Developing healthful behaviors during adolescence can help to establish habits and attitudes in favor of reducing risk for chronic disease and promoting healthy development physically, socially, and psychologically [1]. Further research is needed to understand pos-

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sible reasoning behind more positive family functioning and adolescents' adoption of health behaviors. Focus groups involving all members of a family (both parent(s) or primary adult(s) and children) may be critical in revealing constructs contributing to the family climate and/or that provide explanation for certain health-related family habits. It will also be critical to evaluate parents' health behaviors in the household as well as target parents as educators to their children as a primary source of healthful recommendations and health- and weight-related risk behaviors. This is a promising intervention since studies have shown that adolescents report that their parents, most often their mothers, are the primary source of health care information [29]. As supported by the theoretical models, evaluating parents' and primary caregivers' behaviors may lead researchers to better understand modeling behavior and learned values as they pertain to their children in a psychosocial model [10, 11, 15].

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