

PARENTAL RELATIONSHIPS AND CHILDREN'S HEALTH BEHAVIORS:
AN EXAMINATION OF BASELINE DATA FROM THE
TEXAS GROW! EAT! GO! PROGRAM

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BY

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DEDICATION

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for your continued support and encouragement.

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ABSTRACT

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PARENTAL RELATIONSHIPS AND CHILDREN'S HEALTH BEHAVIORS: AN EXAMINATION OF BASELINE DATA FROM THE TEXAS GROW! EAT! GO! PROJECT

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This research study used secondary, baseline data that was collected as part of the Texas Grow! Eat! Go! (TGEG) program. The data was collected from 1,369 third-grade students and 1,206 parents or caregivers. The survey questions were derived from the School Physical Activity Nutrition Survey, the Marathon Kids Survey, and the GIMME5 Survey, with additional survey questions developed by the TGEG research team. Specific measures were identified for the independent variables of parental role modeling, parental confidence, and the engagement of parents and children in activities related to a healthy lifestyle. The dependent variables of children's physical activity and children's healthy eating behaviors were chosen for this study.

Because the data was non-parametric, Spearman's Correlation was the statistical analysis used. The findings of this study indicated that no statistically significant relationship was found between the independent and dependent variables.

Because children's health is an important topic, further examining these variables is beneficial to guide parents when it comes to children and health related behaviors. It

will also provide valuable information to health professionals and child development specialist to aid them in addressing the issue of childhood obesity.

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CHAPTER I

INTRODUCTION

There is a large body of research focused on the issue of childhood obesity and interventions designed to address this issue. Much of the research has focused on the link between healthy habits such as increased vegetable consumption and better health (Boeing et al., 2012; Key, 2011; Li et al., 2014; as cited in Sarti, Dijkstra, Nury, Seidell, & Dedding, 2017), yet many children still do not consume the suggested amounts of vegetables (Kromhout et al., 2016; Van Rossum et al., 2011; as cited in Sarti et al., 2017)

Parental influence as an important aspect of children's development of healthy eating patterns should not be overlooked (DeCosta, Moller, Frost, & Olsen, 2017). DeCosta, Moller, Frost, and Olsen (2017) pointed out that parents are essentially the gatekeepers of the food that is offered in the household. Additionally, parents play a key role in the development of food preferences and eating patterns.

De Lepeleere, De Smet, Verloigne, Cardon, and Bourdeaudhuij (2013) provided insight into the opinions of parents regarding children and healthy behaviors. First, parents do see themselves as a role model for the behaviors that they believe their children should adopt. They also feel it is their responsibility to provide healthy food options for their children and that if they allow children to have some food-related choices, then they will help their children to build positive behaviors. De Lepeleere et al.

(2013) also reported that parents feel that helping children to understand the importance of positive health-related behaviors leads to greater adoption of such behaviors.

Parents play an essential role in shaping the eating behaviors of their children. As the primary source for providing food in the home, parents directly affect the children's eating behaviors. The behaviors that children form in the early years are likely to affect them for their remaining lifetime (Sealy & Farmer, 2011). Berge, Wall, Larson, Loth, and Neumark-Sztainer (2013) explained the influence of family using the theoretical foundation of family systems theory. Family systems theory illustrates the impact of family relationships on the development of children. The habits, patterns, attitudes, and beliefs that parents share with children through interaction with family members plays a central role in forming and defining habits, patterns, attitudes, and beliefs in children. The impact can be positive or negative (Berge, Wall, Larson, Loth, & Neumark-Sztainer, 2013). When parents understand the importance of guiding children towards healthy lifestyles and the development of positive health-related habits, parents are more likely to initiate positive change in their own lives. These changes contribute to the positive development of healthy lifestyles in their children (Sealy & Farmer, 2011).

This study utilized secondary, baseline data to look more closely at the relationship between parents and children's behaviors. This study focused on parental role modeling of physical activity and healthy eating behaviors, along with parental confidence in selecting, preparing, and encouraging their children to consume vegetables.

Lastly, this study utilized the data to determine the impact of parent-child engagement on children's healthy eating and physical activity behaviors.

Statement of the Problem

A review of data focused on child and youth obesity statistics indicated that there were no major changes in obesity prevalence over a span of 12 years (Ogden, Carroll, Kit, & Flegal, 2012). Ogden, Carroll, Kit, and Flegal (2012) shared the most recent data regarding obesity and children that was available from 2009-2010. It included data from newborn children to 19 years of age. The results show that "9.7% of infants and toddlers had a high weight-for-incumbent length, and 16.9% of children and adolescents from 2 through 19 years of age were obese" (p. 483). In infants, there were some dissimilarities among racial and ethnic groups, with Hispanic infants having a higher weight than other races, which was based on widely recognized standards for growth. In children aged 2 to 19, the percentage of obese males was higher than that of females. In this same age group, the findings also revealed that there are some disparities among racial and ethnic groups with Black and Hispanic youth having higher trends toward obesity (Ogden et al., 2012).

Research points to the fact that increased body weight in childhood may lead to a greater risk of death at an earlier age in adulthood. Increased body weight in childhood is a contributing factor associated with chronic disease and a higher possibility of having type 2 diabetes or other diseases associated with cardiovascular health (Park, Falconer, Viner, & Kinra, 2012).

Taylor, Forhan, Vigod, McIntyre, and Morrison (2013) provided evidence that a relationship exists between obesity and mental illness. Taylor et al. (2013) cited the social aspects of obesity and treatment for co-occurring conditions may lead to further complications related to mental illness. The effects of mental illness and obesity together may also lead to a lower quality of life. Michels, Kriemler, Marques-Vidal, Nydegger, and Pruder (2016) suggested that in children, a lower quality of life at an early age leads to an increased risk of unhealthy weight. The Ballabeina Study, conducted by Michels et al. (2016), concluded that there was a relationship between an unhealthy diet, lower levels of regular and moderate exertion, and enjoyment of daily life. When associated with a higher weight status, higher levels of regular and moderate physical exertion seemed to be a controlling factor for lowered levels of satisfaction with everyday life (Michels, Kriemler, Marques-Vidal, Nydegger, & Pruder, 2016).

Brown and Ogden (2004) found that parents play an important role in the development of behaviors that are associated with good health. These findings hold true in today's research. More specifically, parents play an important role in helping children to develop a healthy level of activity and consuming foods that are part of a healthy diet; however, parents identify barriers to adopting these healthier behaviors such as difficulty in changing the way a parent raises their children, as well as lacking the positive encouragement of others who are important in the children's and parents' lives (Schalkwijk et al., 2015).

Statement of the Purpose

This study focused on the existing baseline measures from the Texas Grow! Eat! Go! (TGEG) research program. The TGEG research program was developed and implemented to assess the impact of a multi-faceted, school-based approach on limited resource students and their parents (Evans et al., 2016).

The impact of obesity on children influences all aspects of their life, including relationships and interaction with others (Sealy & Farmer, 2011). The purpose of this study was to review the baseline data available and focus on the impact that parents have on their children's food selection, consumption, and physical activity levels. The data was further reviewed to determine how parental self-confidence in selecting and preparing healthier foods affects the children's healthy eating habits. The data was also examined to determine if there was a correlation between parent's healthy habits and children's healthy habits.

There is a gap in the research related to parent's confidence in their abilities to select and prepare vegetables for their families. This research study was used to examine the construct of parent confidence more closely. This research was also used to provide additional information on the aspect of parental role modeling of physical activity as it relates to the level of children's physical activity.

The findings of this research study are relevant to children's development. Those who are employed in child development and health-related professions might find them useful in furthering the work related to prevention and intervention education for both

parents and children. For example, parents might be involved in education that would encourage and empower them so that they could better guide and assist their children in developing healthier habits. Also, children and parents might be involved in intervention activities that increase their skills related to healthy food selection, and preparation that might lead to consumption of healthier foods.

Research Questions and Hypotheses

RQ1. What is the relationship between parental role modeling of healthy eating behaviors and physical activity and children's healthy eating behaviors and physical activity?

Ho1. Parental role modeling of healthy eating behaviors and physical activity will positively relate to children's healthy eating behaviors and children's physical activity.

RQ2. What is the relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, allowing children to make decisions regarding vegetable consumption, and children's healthy eating behaviors?

Ho1. There will be a positive relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, allowing children to make decisions regarding vegetable consumption and children's healthy eating behaviors

RQ3. What is the relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity?

H01. There will be a positive relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity.

Definitions

Body mass index (BMI). The measurement used to determine if an individual is at an appropriate weight. BMI is determined by using weight and height in a mathematical equation (Ogden & Flegal, 2010).

Confidence. Parents' reported efficacy in the selection and preparation of foods (Hartmann, Dohle, & Siegrist, 2013), specifically the selection of vegetables for consumption by their children.

Eating behaviors. The intake of food and drink (Wilson, 2016), specifically the consumption of vegetables and fruits.

Interaction. Engaging children in cooking (van der Horst, Ferrage, & Rytz, 2014) and involving them in buying food (Allirot, Mais, & Urdaneta, 2018).

Obesity. Standardized measurements for growth according to age are used to determine if the child is growing at an appropriate rate for their age. Utilizing BMI calculations, children are determined to be obese if they fall into the 95th percentile, according to their weight on the standardized measures for growth.

Further, children are determined to be overweight if they fall into the 85th–95th percentile according to standardized measurements for growth (Ogden & Flegal, 2010). For the purposes of this study, the terminology *obese* and *overweight* was used according to the research that was cited.

Physical activity. Includes more intense activities such as walking or riding a bicycle to school, organized classroom activities, and active play (Bassett, Dinesh, Conger, Fitzhugh, & Coe, 2015). Intense activities might also include children's involvement in an organized sports activity in the school setting or in a youth league sponsored by youth-serving agencies.

Role modeling. Activities that parents perform related to healthy eating and physical activity and with the expectation that children will adopt the same or similar behaviors (De Lepeleere, De Smet, Verloigne, Cardon, & Bourdeaudhuij, 2013).

Assumptions

The study utilized secondary data obtained from the TGEG program. The participants involved in the research project were parents or caregivers and children and they provided the baseline data in a survey form. This author assumes those involved in the TGEG research project were the parents or the caregivers of the children who participated in the research project.

The variables chosen for this research study were extracted from the measures used in the survey instruments. This author assumes that participants understood each of

the terms, concepts, and constructs that were represented in the survey questions. The author also assumes that questions were answered in a truthful and honest manner.

The TGEG project was implemented with schools identified as Title 1, indicating a larger population of children from families with limited resources. Therefore, this data can be generalized across similar populations in other areas.

Delimitations

The use of secondary data fit with the intentions of this study, which was to use a non-experimental design. However, the use of secondary, baseline data does provide constraints. This research study was limited to the specific survey questions used in the original TGEG study.

The variables that were most appropriate for use in this study were identified once the boundaries of the study were fully defined. The variables were then narrowed to those that were most relevant for the purposes of the study.

The use of baseline data does not allow for the comparison of data from the beginning and the conclusion of the intervention. However, the use of baseline data did align with this study and the purpose of determining the relationship between independent and dependent variables before an intervention had been initiated.

Summary

Overweight children have a greater likelihood of becoming overweight adults. This extra weight leads to an increased risk of the development of chronic diseases such

as osteoarthritis, heart disease, and diabetes. These chronic diseases have the potential to affect the individual's quality of life (Auria, 2011).

While the evidence points to the vital role that parents play in forming children's health-related habits, this study aimed to further explore the interaction between parents and children. More specifically, this study looked at how this interaction impacted the children's formation of healthy habits. This study was used to provide further information on the role of the parent in modeling positive behaviors, the confidence of the parent towards the selection and preparation of healthy foods, and parental encouragement towards children's consumption of healthy foods.

The findings of this study could be used to advance the prevention and intervention efforts related to childhood obesity. Child development and health professionals could utilize the results of this study to design health education programs and interventions for both parents and children. Such programs might be focused on strategies to encourage and empower parents to guide and assist their children in developing healthier habits that will impact the children's overall quality of life.

CHAPTER II

REVIEW OF THE LITERATURE

There has been a significant focus on the issue of childhood weight. While there are many factors that relate to the weight status of an individual, food intake is certainly a factor of high interest in the research field. Over the past several years, the research focused on children's consumption of healthy foods has continued to suggest that those involved in preparing and providing food for children can affect the consumption of healthy foods in a positive or a negative way (DeCosta et al., 2017).

In the study of childhood obesity and overweight, it makes sense that the family unit serves an important role in the development of healthy eating behaviors and engagement in positive physical activity. Berge, Arikian, Doherty, and Neumark-Sztainer (2012) suggested that involving the family in the conversation about these lifestyle behaviors is a crucial aspect that often does not occur. These researchers found that the parent's role is vital in helping children maintain a healthy weight status, potentially helping to alleviate the impact of childhood obesity. The participants in the research of Berge et al. (2012) indicated that becoming involved in healthy behaviors as a family was valuable (Berge et al., 2012). Berge et al. (2012) identified the areas that families could have a greater impact on the issue of childhood obesity, including time set aside to have family meals together and being involved in physical activities as a family (Berge et al., 2012). Berge et al. (2012) also identified that parental role modeling is important for

children to develop healthy habits and noted that parents should exhibit the positive behaviors that they want their children to develop. The study also revealed that having parents verbally share the positive benefits of healthy habits was important because this discussion with parents allowed the children to identify how these behaviors would positively affect their health. Finally, engaging family members in the desired healthy behaviors should become a part of daily family life (Berge et al., 2012).

This study was used to review the existing data from the TGEG program and to determine the impact that parents have on children's food selection, consumption, and physical activity levels. It was also used to examine the data to determine how parental self-confidence in the selection and preparation of healthier foods impacts children's healthy eating habits. Lastly, this research study was used to determine if there was a correlation between parent's healthy habits and children's healthy habits. The variables included in this study were parental role modeling, parental confidence, parent and children's interactions, children's physical activity, and children's healthy eating behaviors.

Parental Role Modeling

An integral part of the learning process for children is to model behaviors they see in others. When children observe parents consuming healthy foods and participating in an active lifestyle, they will adopt these same behaviors (DeCosta et al., 2017).

Hendrie, Sohonpal, Lange, and Golley (2013) studied families and food eaten in the home. Their findings indicated that as the parents gained more information about

selecting healthier options of foods containing saturated fat, parents served those specific foods less often. Their findings also concluded that there is no significant relationship between parents displaying the behavior they desired in their children and their children adopting the desired behavior (Hendrie, Sohonpal, Lange, & Golley, 2013). However, on average when parents set the example of consuming fruits and vegetables, the consumption of similar foods was higher in their children when compared to those children whose parents did not set the example of consumption of certain foods (Draxten, Fulkerson, Friend, Flattum, & Schow, 2014). Parents and children's reports of parental role modeling during mealtime corresponded most significantly when reporting about the evening meal. Parents who reported that their children most often ate fruits and vegetables outside of mealtime and during the evening most commonly had children who met the suggested guidelines for intake of fruits and vegetables (Draxten et al., 2014).

Parents play an essential role in helping children to develop the habits of consuming healthy foods. Parents serve as the role model for specific behaviors, control the access to foods, and encourage or discourage certain eating behaviors (DeCosta et al., 2017).

Offering children certain foods and the co-occurrence of watching others consume the same food has a positive effect on children's food intake (Mitchell, Farrow, Haycraft, & Meyer, 2013). The inherited factors surrounding children's food preference warrants some consideration, but more importantly, the aspect of the home atmosphere was found to have a greater influence on children (Larsen et al., 2015).

The combination of parental physical activity role modeling and parental support of children engaging in physical activities had a positive effect on the children's physical activity (Tate et al., 2015). The findings of Sigmund, Sigmudova, Badura, and Madarascova Geckova (2018) differ as they concluded that the influence of the mother when modeling positive physical activity behaviors was more influential than the influence of the father.

The recommendation to walk at least 10,000 steps each day was the focus of their study (Sigmund et al., 2018). Parents of children who were identified as having a higher body weight than recommended were involved in the study. The study found no correlation between the parent's involvement in an organized, sports-type activity and how physically active the children were; however, there was a relationship between the children being involved in organized sports activities and achieving the recommended number of steps each day (Sigmund et al., 2018).

Children who see their parents modeling positive behaviors associated with healthy eating are more likely to perform similar behaviors. While parents do control what foods are available to children, this is not the only area of influence. Merely offering or ensuring that children have healthy choices does not mean that they will consume these choices. The act of modeling the desired behavior seems to be a key component affecting healthy eating behaviors.

Parental role modeling as it relates to physical activity was not shown to have a significant impact on children's level of physical activity. The findings were more

significant in showing that parents who were supportive of their children's physical activity level were more likely to have children who were more active. There were some inconsistencies in the research surrounding the relationship between maternal and paternal role modeling of physically active behaviors.

Parental Confidence

Hartman, Dohle, and Siegrist (2013) posited that there is a relationship between meal preparation ability and consumption of a healthy diet with regard to the consumption of vegetables. Through their research with adults, they found that a greater percentage of women cook as related to men. Women report that they are more focused on health. There is a positive relationship between vegetable consumption and meal preparation abilities for both men and women (Hartman et al., 2013).

Overcash et al. (2017) examined the results of parent and child participants who were involved in hands-on cooking and nutrition education classes. Their goal was to determine the comfort level of participants in preparing vegetables with a comparison at baseline and the end of the educational series. Their findings showed that parent confidence in preparing certain vegetables significantly increased throughout the course of the educational intervention. In general, parents became more assured in their cooking skills and their ability to prepare foods in a healthy manner. Also of note, the participants indicated that they added new vegetables to their list of vegetable preferences and varied the type of vegetables that they served at home (Overcash et al., 2017).

Burton, Reid, Worsley, and Mavondo (2017) conducted research on the self-assurance of the home food gatekeeper. Burton et al. (2017) examined the relationship between the gatekeeper's self-assurance and their ability to plan, select, and cook healthier foods for their families. Burton et al. (2017) found that those who had a higher level of self-assurance also felt that they were better able to select healthier foods when shopping. In addition, they more often developed a plan for shopping before going into the supermarket (Burton et al., 2017). The benefit of this behavior was also supported in research by Morin, Demers, Turcotte, and Mongeau (2013). Morin et al. (2013) found that parents who had a less stringent work schedule were more likely to use a list when they shopped for groceries. Also, parents of an older age more often prepared meals at home, and they were also more comfortable using certain skills to make meal preparation less time-consuming. For example, older parents might prepare foods and store them for later use. Older parents might also prepare food in larger quantities, which Morin et al. (2013) indicated could help ease the stress of meal preparation. Those with higher levels of self-assurance did not seem to feel that they encountered obstacles in preparing healthy meals for their families (Burton et al., 2017). Morin et al. (2013) indicated that parents who reported eating meals more often at restaurants known for quick meal preparation and drive through meal pick-up had a greater likelihood of having lower self-confidence when it came to preparing meals at home. Burton et al. (2017) concluded that there is a positive relationship between the gatekeeper's self-assurance, their ability to purchase healthy foods and cook them, and increased service of vegetables at mealtime. Morin et

al. (2013) indicated that parents with a higher level of education are more attuned to providing mealtime options for children that include healthier foods.

There is a correlation between a parent's level of confidence and serving healthy foods to their children. For example, people shop for and purchase foods based on different criteria. On finding reported by Stewart, Hyman, Frazao, Buzby, and Carlson (2011) determined that for some, food items are selected based on the need for a more healthful diet. Stewart et al. (2011) also found that some adults seek to meet the standards of fruit and vegetable consumption as proposed by experts.

Banks et al. (2012) conducted a study to determine if the higher cost of healthy food was indeed a deterrent to making healthful dietary changes. Banks et al. (2012) found that families with children who were above the recommended weight status found it more difficult to make appropriate changes to decrease weight. In a review of pricing options, Banks et al. (2012) compared the prices of purchasing healthier foods and those of lower nutritional quality. Banks et al. (2012) found that it was possible to purchase healthier foods at a cost that is lower than or in-line with foods that are not as nutritionally sound; however, this was most relevant to local sources where food was obtained (Banks et al., 2012).

Nansel et al. (2016) designed a study to determine the real versus supposed expense associated with consumption of a diet made up of healthier foods as compared to those foods that are less healthy. The study by Nansel et al. (2016) resulted in a determination that an individual could purchase healthier foods without increasing the

amount of money spent. Nansel et al.'s (2016) conclusions were also validated in research conducted by Katz et al. (2011) who suggested that when comparing foods of a similar nature, healthier options could be selected without increasing the amount spent. More recent data is not available on the topic of consumers and the purchase price of food. The earlier research of Glanz, Basil, Maibach, Goldberg, and Snyder (1998) suggests that the price of food does play a role in the choice individuals make when shopping for food.

This research study focused on the relationship between the parental confidence in their abilities related to preparing, serving, and encouraging children to eat vegetables. This research study explored parental confidence related to involving children in vegetable preparation, planning menus, and serving vegetables at meals. The independent variable of parental confidence was examined regarding parental encouragement of children to eat vegetables, parental reinforcement of positive eating behaviors, and providing reasons that children should consume certain foods.

Parent-Child Engagement

The influence of family in creating and promoting healthy eating patterns was the focus of a further review of the literature. The research suggests that both children and adults find value in having a time when the family eats a meal together. This is also a time when parents can demonstrate the actions that they expect of their children. These findings are from the earlier work of Fulkerson, Neumark-Sztainer, and Story (2006).

More recent work validates these findings. Fulkerson et al. (2014) suggested that family mealtime is an important aspect for people of all ages.

Families report specific issues associated with mealtime and their children. They indicate that they cannot focus their attention on the meal only when eating a meal with their children, as other tasks require attention during this time (Fulkerson et al., 2011). Parents also cite the fact that children are selective about the foods that they will consume, and this makes it difficult when preparing a meal to serve to their family (Fulkerson et al., 2011). In addition, Fulkerson et al. (2011) reported that parents stated that there are other aspects of daily life that impact what foods their children would consume. This includes the food served when children are in the care of others. Furthermore, Fulkerson et al. (2014) concluded that the evidence suggests that when meals are eaten together as a family, a positive association with adolescent weight management was noted. Fulkerson et al. (2014) submitted that intervention with families at an early stage of children's development might be a potential point of focus for educational efforts surrounding the family meal as a factor in alleviating childhood obesity.

When compared to children who do not participate in preparing foods for mealtime, children who are involved in preparing the food to be eaten are more likely to consume fruits and vegetables at mealtime (Chu, Storey, & Veugelers, 2013). Additional research revealed that when children helped to prepare foods at home then they had an

increased level of self-confidence in making food choices that were associated with better health.

The research has demonstrated that time spent with family while consuming meals plays a vital role in the development of children's healthy eating behaviors. This study reviewed the relationship between parents and children with a specific interest in their interaction in meal planning, purchasing, preparing, and consuming foods, with a focus on vegetables and the physical activity of parents and children.

Parental Physical Activity

Parents' level of physical activity and the impact it has on children has been the focus of a significant number of research studies. The findings of Tate, Shah, Jones, and Pentz (2015) reinforced the earlier works of Trost et al. (2003), which supports the idea that when parents encourage their children's physical activity then the children's level of physical activity increased. Furthermore, there is a more significant impact when the parent role models the desired behavior (Tate Shah, Jones, & Pentz, 2015; Trost et al., 2003). Parental encouragement seems to impact the children in two ways. First, parents encourage participation in physical activity. For example, parents can ensure that children have the opportunity to participate in physical activity by driving them to a location, watching children participate, and positively reinforcing the children's participation. Secondly, when parents provide this type of encouragement for their children, the children develop a positive sense of their physical abilities. This leads to greater levels of physical activity for children (Tate et al., 2015; Trost et al., 2003). Tate et al. (2015)

concluded that even when parents are not as engaged in their own physical activity, their support of their children leads to a higher activity level for children. The study also showed that if a parent was not physically active, yet they provided support for their child's physical activity, the result was a higher level of physical activity in their children (Tate et al., 2015).

There are interesting findings associated with the differences in the influence of mothers and fathers on children's physical activity. For example, Zahra, Sebire, and Jago (2015) examined the mother's thoughts about the father's impact on children's physical activity. Their findings indicated that mothers see the father's role modeling of certain behaviors related to an active lifestyle as being considerably important to the children's engagement in moderate levels of active behavior (Zahra, Sebire, & Jago, 2015). The father's role is also important in enabling certain active behaviors in their children. For example, fathers may drive their children to a location so that they may participate in activities, or they may ensure that children have the equipment and other resources that promote children's physical activity. Mothers also indicated that they believe that the fathers are more likely to participate in their own physical activity as a part daily life that facilitates the role modeling of a positive and healthy lifestyle behavior (Zahra et al., 2015).

Tandon et al. (2014) reported that the parents' role in supporting active behaviors that fosters children's involvement in regular moderate activity is important. Also, they did note some limitations that control the amount of time children are involved in

behaviors that promote less activity. These limitations included activities such as time spent with hand-held games or computer time. Tandon et al. (2014) suggested monitoring those behaviors to ensure adherence to the limits is as equally as important as supporting physical activity. Tandon et al. (2014) concluded that a combination of the parental strategies that discourage children's inactivity while promoting greater participation in moderate levels of activity at home had more significant impacts on the children's level of positive behaviors associated with being physically active

When compared to the parent demonstrating the specific behaviors associated with an active lifestyle, the research suggests that the most important element for children to develop positive physical activity habits is parental encouragement. This encouragement happens when parents ensure that children are involved in activities, drive them to a location where they will engage in an activity, ensure that children have the resources needed to be active, and help children develop confidence in their abilities related to leading a physically active life.

Children's Physical Activity

Over the past 40 years, society has revolutionized and adapted its lifestyle. Physical activity has been directly impacted by changes related to changes in modes of transportation (Bassett et al., 2015). In past decades, walking was a mode of transportation for many, and most children spent a considerable amount of time outside and involved in active play. Today, most individuals travel in automobiles, and the time that children spend outside in active play has diminished (Bassett et al., 2015).

The work of Denker and Anderson (2008) continues to remain relevant today. Through numerous studies, Denker and Anderson (2008) found that adults who do not participate in regular, moderate levels of activity have an increased risk of developing chronic disease. This risk has been associated with a higher risk of premature death (Denker & Anderson, 2008). The findings of Nader, Bradley, Houts, McRitchie, and O'Brien's (2008) remain constant today; they suggest that inactive children are more likely to be overweight or obese and conclude that at least 60 minutes of moderate levels of activity each day can reduce this risk.

A review of research spanning a number of decades revealed that there has been an increase in female sports activity at the high school level. However, in more recent years, an increase in less active behaviors has been noted in females and males (Bassett et al., 2015). This increase in less active behaviors has been attributed to the rise in the use of computers and computer games (Basset et al., 2015).

Kunin-Batson et al. (2015) developed a research study focused on children and the recommended amounts of time associated with sedentary behaviors and active behaviors. They set out to compare the behaviors of the children who were meeting the standards related to more active behaviors with those of the children who were exceeding the recommended limits of sedentary behaviors. They found that less than one-third of the children in the study met the recommended standards for being physically active. Kunin-Batson et al. (2015) also found that children who were below or just meeting the

limits associated with sedentary behaviors, such as watching television, were more likely to have higher levels of moderate activity.

Some additional interesting associations between gender, age, and physical activity levels are found in the literature. For example, Kunin-Batson et al. (2015) found that for younger children, there were not any differences between boys and girls in meeting the criteria associated with the recommended levels of activity. Findings suggest that as children age, boys more often met the criteria associated with being physically active as compared to girls. However, Craggs, Corder, van Sluijs, and Griffin (2011) found that in children, females more quickly lessened their level of moderate activity as they aged when compared to males. Craggs et al. (2011) also found that no relationship existed between children's level of moderate activity and single or married parents. Finally, Craggs et al. (2011) concluded that there was a significant relationship between children and their confidence in their ability to excel at physical activities and their level of moderate activity.

There are many factors affecting one's health. The lack of physical activity has been associated with an increased risk of developing certain chronic diseases. By increasing the level physical activity, one can reduce the risk factors associated with the development of chronic diseases (Reiner, Niermann, Jekauc, & Woll, 2013). Continual engagement of moderate levels of physical activity over one's lifetime has been associated with the lessened risk of development of certain lifestyle-related diseases (Reiner et al., 2013).

The research suggests that physical activity is a key component for remaining healthy throughout life and reducing the risk of early death. It also indicates that regular physical activity throughout life can decrease the impact of chronic disease. The literature on children and physical activity suggests that there has been a rise in sedentary behaviors in more recent years. This study was used to provide further information on the construct of children's physical activity. The data was analyzed to determine the activity level of children and any association between parental role modeling and children's physical activity levels.

Children's Healthy Eating Behaviors

Parents set the stage for the development of their children's healthy eating behaviors. Parents should take steps to ensure that all family members are engaging in the habits associated with healthy eating (Kuzbicka & Rachon, 2013). Providing meals for children that contain foods high in nutritional value supports the development of eating behaviors that will benefit children throughout their lifetime (Kuzbicka & Rachon, 2013). In addition, parents need to monitor children's food consumption and discourage the consumption of high-calorie snacks and sugar-sweetened drinks. This allows for the children's own satiety cues to guide them in their food consumption (Kuzbicka & Rachon, 2013).

A study evaluating an in-school gardening program revealed that children take pride and a greater interest when they are involved in the decisions surrounding what foods are being consumed (Sarti, Dijkstra, Nury, Seidell, & Dedding, 2017). The results

of their research indicated that once the children began to have some input on the decisions related to the gardening project, such as when to harvest, the children became more interested in eating the vegetables. The children's interest in eating the vegetables increased as the vegetables were harvested, and as the abundance of the garden was more than could be consumed in the classroom, the children were excited to take the vegetables home. As the children became involved in the decisions around preparing and serving the vegetables at home, they were intent on making sure that the vegetables did not go to waste (Sarti et al., 2017). In addition, Sarti et al. (2017) reported that children were surprised to find that they liked some of the vegetables that they had not previously liked.

The research indicates that parents play an important role in guiding the development of healthy food behaviors in children, especially in younger children. There are certain aspects of influence outside the home, and perhaps if children have developed a sound foundation of healthy eating behaviors at home and early in life then the outside influence will not negatively sway their eating behaviors.

This study was used to provide further information on the construct of children's eating behaviors. The research regarding children's healthy eating behaviors included further examination of the influence of parental behaviors and the correlation to children's healthy eating behaviors.

Summary

The research related to childhood obesity is abundant and the parental roles as they relate to childhood obesity have been examined extensively. The existing research

points to the fact that healthy habits related to physical activity and food consumption significantly affects our health and quality of life. In addition, the research emphasizes the critical role that parents play in helping children to form healthy habits related to physical activity and eating behaviors.

The research related to parental confidence and attitudes points to the level of capability pertaining to selection and preparation. Those who feel more comfortable with preparing fresh vegetables find greater opportunity to include them in meals. Expense is also a factor in what foods parents select and prepare for their children. The research indicates that children like to be involved in the selection and preparation of their food, and the aspect of growing their food is appealing. This involvement has been shown to lead to an increased consumption of healthy foods.

The interaction between parents and children is an important aspect of family life. The current research shows that there is a positive relationship between children, health-related behaviors, and engagement with parents, especially when consuming meals together. This activity affords parents the opportunity to demonstrate the healthy eating behaviors they want the children to adopt. The research findings suggest that helping children develop the skills associated with choosing healthy foods during these family mealtime engagements will also help them over the course of their lives (Fulkerson et al., 2014).

The literature shows the important role of parents in the guiding children towards healthy habits related to food behaviors and physical activity. Parental role modeling of

certain behaviors and the interaction between parents and children in health-related behaviors is a vital part of this guidance.

This study was used to extend the current knowledge by further examination of the independent variables of parental role modeling, parental confidence, and parent's and children's interaction and of the dependent variables of children's healthy eating behaviors, and children's physical activity behaviors. This study was to be used to discover the influence that parents have on their children's healthy eating and physical activity behaviors.

CHAPTER III

METHODOLOGY

The literature reveals the influence of parents on their children in creating and promoting healthy eating patterns. Parents are a key factor in any effort to change the activity levels and eating behaviors of children; what takes place in the home is a contributing factor to this change (Ward et al., 2011). Several important points were found in the work of Patrick and Nicklaus (2005). In this important piece of literature, these researchers suggest that strong family influence is essential to the development of healthy eating patterns and these findings have not changed in recent years. Their research also suggests that parents should practice patience when incorporating new foods into the diet, and they should make healthy options available and easily accessible for children (Patrick & Nicklaus, 2005).

According to Golan (2006), what takes place in the children's home is central to the development of children, further indicating that the role of the parent is important in aiding children in developing healthy behaviors related to physical activity. The more recent work of Berge et al. (2012) confirmed these findings. The research conducted by Berge et al. (2012) showed that families identified being involved in healthy behaviors, such as physical activity, an important practice. Berge et al. (2012) also suggested that involvement in healthy activities that the family could enjoy together led to a more supportive relationship. This was beneficial in helping all family members to develop

healthy habits. However, there are barriers associated with healthy habits such as physical activity (Berge et al., 2012). The research indicates that in order to overcome the barriers that the physical activity behavior must be purposeful, meaning that the activity has to be planned, and consistent in order for it to become a habit, and a conscious effort must be made to maintain the habit (Berge et al., 2012).

This chapter outlines the methodology used in this research study. It includes the description of the study participants, the sampling procedures, and measures used in this study. In addition, this chapter includes discussion on the protection of human subjects, data collection procedures, and statistical analysis of the data.

Procedures

This study used quantitative methods in a non-experimental design. This study used secondary data, available from the TGEG program. The baseline data were obtained from the TGEG program and made available through the University of Texas School of Public Health (Evans et al., 2016). The TGEG program used hands-on gardening to aid the children in developing an appreciation for vegetables. It provided vegetable recipe demonstrations and tasting of certain vegetables combined with a physical activity program for the children. It also included a parent engagement aspect. This intervention was designed with the specific intent of addressing childhood obesity (Evans et al., 2016).

For the TGEG study, researchers obtained a completed an assent form from each third-grade student that participated in the study (Evans et al., 2016). This form also

stated that answers to the survey would be confidential (Evans et al., 2016). In addition, it outlined the steps of the program. The survey data were collected from the students in the classroom setting and during regular school hours. Each student took a packet of information home, which explained the TGEG program. This packet included a parent survey, which one parent in the home completed and returned to the school via the student. The data collected from the students and the parents was self-reported. The parents could choose not to complete the survey, but still allow their students to participate in the TGEG program (Evans et al., 2016).

The project was unique in that it combined the different components of gardening, food demonstrations, food tasting, and physical activity into one intervention, something that had not been done previously due to the intensive nature of each of the separate components and the necessary expertise needed to implement each component (Evans et al., 2016). The collaboration between the two previously mentioned institutions allowed for the adaptation of an existing youth gardening curriculum and physical activity component that would allow for easier implementation in the school setting (Evans et al., 2016).

This secondary data source was chosen because it included parents and children's self-reported data that could be analyzed to examine the dynamic between parents and children, the development of healthy eating and physical activity habits. The TGEG study design "consisted of a factorial group randomized control trial" (Evans et al., 2016, p. 3). There were 28 schools located in different areas of Texas. The participation for each

school in the treatment group was determined through indiscriminate selection (Evans et al., 2016). Two cohorts were established in the TGEG study with baseline data collection occurring for the first cohort in the fall of 2012 and baseline data collected from the second cohort beginning in fall 2013 (Evans et al., 2016). Although data were collected at various points throughout the TGEG project, only the baseline data was used for this study.

The schools that were selected to participate in the TGEG project were already participating in the Coordinated Approach to Child Health (CATCH) program as a part of their Coordinated School Health (CSH) program (Evans et al., 2016). The baseline data used for this study was drawn from the control group and the experimental groups in the TGEG study. The data from the control group and experimental group was not identified; therefore, this research study did not compare the control group and experimental group.

Walk Across Texas (WAT) is a physical activity program developed and implemented by Texas A&M AgriLife Extension Service. This program includes several activities to encourage the development of the habit of regular physical activity. The students participating in WAT were challenged as a classroom to walk 832 miles over the course of the eight-week program. At the conclusion of WAT, a celebration event was held, which included a kick-off for the TGEG study. In addition, classroom mileage could be enhanced by utilizing bonus miles, miles reported based on family members' mileage counted while walking at home (Evans et al., 2016). The program also included some projects for the classroom and materials that were sent home with the student.

These handouts included tips for increasing family physical activity and promoted consumption of fruits and vegetables (Evans et al., 2016).

CATCH is a program designed specifically for schools. The intent of the CATCH program is to increase physical activity, provide more healthful food options, and deter the use of tobacco products (Evans et al., 2016). It integrates various aspects of education and the school setting to impart positive health-related changes for the student. CATCH incorporates change and focuses on children's health in the school's student meal service. The classroom activities of CATCH include physical activity and take-home activities to involve the family. The intent of the program was to create an overall healthier setting for children (Evans et al., 2016).

LGEG is a curriculum adapted from the Junior Master Gardener program and created specifically for the TGEG study. The LGEG program consists of classroom activities involving the preparation and tasting of certain vegetables. A gardening component enhances the classroom learning with hands-on activities, which includes building a raised bed and growing vegetables. The students maintain a garden journal and participate in children's storybook readings that relate to eating vegetables (Evans et al., 2016). In addition, family activities and messages are outlined and sent home with the students to engage the family in activities that can increase their consumption of vegetables and encourage family involvement in physical activity (Evans et al., 2016).

Protection of Human Subjects

This study followed and complied with the policies and procedures of Texas Woman's University (TWU) research guidelines as conducted by TWU faculty, staff, or students using human subjects. An exempt application was submitted to the TWU Institutional Review Board (IRB). Exempt applications are reserved for studies that pose little-to-no risk to human subjects. This study posed no risk to participants as it used preexisting, de-identified data from the TGEG study. The original study packet included consent and assent forms for the parent and child participants. The original study recruitment procedures and data collection protocols were approved by both University of Texas and Texas A&M University Institutional Review Boards, and each participating school district provided approval from their research authority (Evans et al., 2016).

Subjects

Baseline data were collected from 1,369 third-grade students and 1,206 individuals who were noted as a parent or caretaker of a third-grade student in a participating school. In the TGEG study, participating schools were all designated as Title 1 schools, which indicates that most students enrolled qualify for free or reduced meals at the school. Eighty-five percent of the students involved in the TGEG study met the criteria for qualification for free or reduced meals (Evans et al., 2016). Ethnicity was collected from the adult participants in the TGEG study. Participant ethnicity in the TGEG study was 23.6% White, 52.5% Hispanic, 17.7% Black, and 6% Other (Evans et al., 2016).

The data used for this study were drawn from the TGEG study, using only the baseline data gathered from the TGEG study. The third-grade students that participated in the TGEG study were required to consent to completing the survey four times over the course of the study, have English or Spanish as their primary language, and not be on a special diet or have any dietary restrictions. The parent or caretakers were required to read English or Spanish and have a child in the third grade of a participating school (Evans et al., 2016).

Measures

The study used selected items from the parent's survey and the children's survey from the TGEG study to address the research questions. The Student Survey was developed using questions taken from existing instruments. These questions were validated through other research studies (Evans, et al., 2016). These sources included the School Physical Activity Nutrition Survey, the Marathon Kids Survey, and the GIMME5 Survey. Additional questions were purposefully designed by the TGEG research group to be used for the TGEG project. The parent survey was developed to align with the questions on the student survey (Evans et al., 2016).

The student survey questions concerned their preferences for fruits and vegetables, physical activity, family meals eaten together, and involvement with family members in gardening activities. The parent survey included similar questions, with answers based on their current activities related to fruit and vegetable consumption, physical activity, and gardening. It also included questions related to mealtime as a

family, food preparation, and availability of certain foods in the home environment. In addition, the parent survey included questions that referred to parental role modeling, confidence, and interaction.

The TGEG study has provided a robust data set that includes data from a variety of measures for both parent and child. The TGEG data set was used in this study to answer research questions and test hypotheses related to the relationship between and child behaviors. The analysis of the data will be used specifically to determine the relationship between parental role modeling and children's healthy eating behaviors and physical activity levels, parental confidence and children's healthy eating behaviors, and parent and child interaction and children's healthy eating behaviors and physical activity levels.

Parental role modeling

Specific questions related to parental role modeling found in the TGEG survey were included in a Likert-type scale with response options of "never," "less than once a month," "about once a month," "about once a week," and "about once a day." The survey asked, "about how often your child sees you eating vegetables, drinking water, drinking regular soda, being active (outside or inside)."

Parental confidence

The measures related to parental confidence were used to determine the relationship between parental confidence in abilities related to preparing, serving, and encouraging children to eat vegetables. They were included in a Likert-type scale with

responses of “not at all confident,” “a little confident,” “somewhat confident,” “pretty confident,” and “very confident.”

The first question asks the respondent to select answers in response to the main question of “How confident are you that you can regularly do the following?” Responses were requested for the follow-up questions: “Involve your child in preparing vegetables?” “Plan menus for the family that contain at least one serving of vegetables at every dinner?” “Serve vegetables at every dinner?” “Insist that your child try at least one bite of a new vegetable?” “Encourage your child to eat vegetables?”

A second question asks participants to select answers in response to the main question of “Please tell us how strongly you agree or disagree with the following set of statements.” Several statements followed: “I encourage my child to try new foods?” “I show approval when my child eats what I want him/her to eat?” “I try to give reasons why my child should eat particular foods?” “I promise my child a reward if she/he eats something she/he doesn’t like?” “I encourage my child to eat vegetables?” “I let my child help decide what she/he eats at dinner?”

Parent-child engagement

Several measures from the TGEG survey focus on the variable of parent-child engagement as it relates the child’s healthy eating and physical activity. The first construct related to the parent and child interaction variable is related to involving the children in purchasing, preparing, and consuming vegetables. The first questions allow the respondent to answer “yes” or “no” in response to the following general question,

“During the last week, did you do the following with your child?” The survey then asked the following specific questions: “Planned meals that had vegetable that your child liked?” “Took your child to the store to get vegetables?” “Bought vegetables that your child liked?” “Helped your child make a snack that included vegetables?” “Showed your child how to make vegetable snacks?” “Prepared food together?” “Chose foods to buy at the grocery store together?” “Ate evening meal together?”

The second construct refers to physical activity with the child. The first question allows for the respondent to select one of the following “none, one day, two days, three days, four days, five days, six days, or seven days” in response to the question “During the last week how many days did you go for a walk with your child?” In the second question, the respondent is asked to respond with the “number of minutes per week” in response to the question “If you go for walks with your child, how much time do you usually spend walking?” The third question in this set asks the respondent to select “none, one day, two days, three days, four days, five days, six days, or seven days” in response to the question “During the last week, how many days were you physically active with your child, not including walking (for example, swimming, jogging, playing basketball, or soccer, etc.)?”

The second set of questions under this construct used a Likert-type scale with response options of “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree.” The questions were “I encourage my child to play sports or do physical activities?” “I watch my child when she or he is physically active or playing

sports?” “After work, I am too tired to be physically active with my child?” “I give reasons why my child should be more physically active?”

Finally, the third construct is related to gardening activities. This set of questions allows for the answer of “never,” “once,” more than once.” The questions all follow the question “During the last school year have you ever done any of the following at school OR home?” The questions were “Planned a vegetable garden with your child(ren)?” “Planted seeds or plants in a garden with your child(ren)?” “Weeded or watered a garden with your child(ren)?” “Picked vegetables from a garden with your child(ren)?” “Tasted vegetables from a garden with your child(ren)?”

The TGEG child survey has gardening questions that parallel the parent survey questions. The responses on the child survey allow for a response of “yes” or “no.” In addition, the child survey includes interaction questions involving family meal consumption. Three questions were used with the response selections of “never or almost never,” “sometimes,” and almost always or always The questions asked, “how often do you,” with various endings: “eat breakfast with members of your family,” “eat evening meals with your members of your family,” “go out to eat with your family,” and “help make food with your family?”

Parental physical activity

Several questions were related to parental physical activity in the TGEG survey. There were three questions that ask the respondent to indicate by writing in the specific number “____ of days last week” or “none/no vigorous activity.” The questions were

“During the last seven days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, soccer, or fast bicycling?” “During the last seven days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, gardening or yard work, or dancing (do not include walking)?” “During the last seven days, on how many days did you walk for at least 10 minutes at a time?”

There were four questions that ask for a response of “____ hours, ____ minutes” or don’t know/not sure.” The questions were “On average, how much time did you usually spend doing vigorous physical activities on those days?” “On average, how much time did you spend doing moderate physical activities on those days?” “How much time did you usually spend walking on one of those days?” During the last seven days how much time did you usually spend sitting on a weekday?”

Child physical activity

Several questions related to physical activity from the TGEG child survey were used for this study. The first set of questions ask for a “yes” or “no” response. The first set of questions fall under one general question “How physically active are you?” The questions included “Do you agree with the following sentences?” “Almost every day I do light physical activities?” “Almost every day I do moderate physical activities?” “Almost every day I do vigorous physical activities?”

The second question is “Yesterday, did you do any moderate or vigorous physical activities for about 30 minutes (e.g., the time it takes to watch a cartoon), throughout the

day (count in school and out of school activities). Examples were basketball, running or jogging, fast dancing, swimming laps, tennis, fast bicycling, soccer, jumping ropes, jumping on the trampoline, hockey, fast skating, or rollerblading?” The third question is “Yesterday, did you play outdoors for about 30 minutes (e.g., the time it takes to watch a cartoon) when away from school?” The next question related to child physical activity allows the student to select one of the following “I didn’t spend any time watching TV yesterday”, “less than 1 hour”, “1-2 hours”, “2-4 hours”, “more than 4 hours.” The question is “yesterday, how many hours did you sit watching TV, DVD’s or movies away from school?” An additional question related to child physical activity allows for the selection of one of the following responses “I didn’t spend any time playing on the computer yesterday”, “less than 1 hour”, “1-2 hours”, “2-4 hours”, “more than 4 hours”. The question is “Yesterday, how many hours did you sit playing on the computer away from school?” The next set of questions allows the student to select the activity that they “would rather do” The first question is “if I could choose and the weather is nice, I would rather,” and the responses were “play outdoors” or “play indoors.” The second question in this set is “if I could choose and the weather is nice, I would rather,” and the responses were “play a running game with friends” or “take a walk with friends.” The third question in this set is “if I could choose and the weather is nice, I would rather,” and the responses were “take a walk with friends” or “watch TV.” The fourth question in this set is “if I could choose and the weather is nice, I would rather,” and the responses were “take a walk with friends” or “watch TV.”

Child healthy eating behaviors

Several questions from the TGEG survey were related to child healthy eating behaviors were used for this study. The first set of questions relate to the construct of vegetable and fruit consumption. The response to these questions can be selected from the following options, “no, I did not eat any of these vegetables yesterday,” “yes, I ate the vegetables 1 time yesterday,” “yes, I ate these vegetables 2 times yesterday,” or “yes, I ate these vegetables 3 or more times yesterday.”

The first question is “Yesterday, did you eat any orange vegetables, like carrots, squash, or sweet potatoes?” The second question is “Yesterday, did you eat a salad made with lettuce, or any green vegetables like spinach, collard greens, Swiss chard, green beans, sugar snap peas, broccoli, or other greens?” The third question is “Yesterday did you eat any other vegetables like tomatoes, asparagus, red cabbage, cauliflower, cucumbers, mushrooms, green or red bell peppers, eggplant, or celery?”

An additional question related to vegetable consumption is “Yesterday did you eat any beans like pinto, garbanzo, or kidney beans?,” and the response options to this question were “no, I did not eat any of these beans yesterday,” “yes, I ate the vegetables 1 time yesterday,” “yes, I ate these vegetables 2 times yesterday,” or “yes, I ate these vegetables 3 or more times yesterday.” The next question is “Yesterday did you eat fruit? Fruits are all fresh, frozen, canned, or dried fruits. Do not count fruit juice.” Response options to this question were “no, I did not eat any fruit yesterday,” “yes, I ate fruit 1 time

yesterday,” “yes, I ate fruit 2 times yesterday,” or “yes, I ate these fruit 3 or more times yesterday.”

The next set of questions regards beverage consumption. The first set of questions have the following response selections, “no, I did not drink any of the drinks yesterday,” “yes, I drank one of these drinks 1 time yesterday,” “yes, I drank one of these drinks 2 times yesterday,” or “yes, I drank one of these drinks 3 or more times yesterday.” The questions were “Yesterday, did you drink any punch, Kool-Aid, sports drinks, or other fruit-flavored drinks? Do not count 100% fruit juice,” and “Yesterday, did you drink any 100% fruit juice? Fruit juice is a drink that is 100% juice, like orange juice, apple juice or grape juice. Do not count punch Kool-Aid, sports drinks, or other fruit-flavored drinks.” The next question is “Yesterday did you drink any regular sodas or soft drinks?” The response selections for this question were “no, I did not drink any regular (not diet) sodas or soft drinks yesterday,” “yes, I drank regular (not diet) sodas or soft drinks 1 time yesterday,” “yes, I drank regular (not diet) sodas or soft drinks 2 times yesterday,” or “yes, I drank regular (not diet) sodas or soft drinks 3 or more times yesterday.” The final question related to child healthy eating behaviors is “Yesterday, how many times did you drink a cup or bottle of water?” The response options to this question were “no, I didn’t drink any water yesterday,” “yes, I drank a cup or bottle of water 1 time yesterday,” “yes, I drank a cup or bottle of water 2 times yesterday,” or “yes, I drank a cup or bottle of water 3 or more times yesterday.”

Research Questions and Hypotheses

RQ1. What is the relationship between parental role modeling of healthy eating behaviors and physical activity, and children's healthy eating behaviors and physical activity?

Ho1. Parental role modeling of healthy eating behaviors and physical activity will positively relate to children's healthy eating behaviors.

RQ2. What is the relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption?

Ho1. There will be a positive relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption. **Rq3.** What is the relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity?

Ho1. There will be a positive relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity.

Plan of Analysis

The plan of analysis for this study began by collapsing the measures related to parental eating and parental physical activity into one independent variable. Each of the measures listed below represented activities that the parent might perform, and children

might observe; therefore, it was determined to combine parental eating and parental physical activity into one independent variable that represented parental role modeling:

- How often does your child see you eating vegetables?
- How often does your child see you drinking soda?
- How often does your child see you drinking water?
- How often does your child see you being active inside or outside?

In addition, the survey questions that sought the parental response to level of confidence for specific activities were collapsed into the independent variable of parental confidence. The questions that were used included

- Regularly involve your child in preparing vegetables?
- Plan menus for the family that contain at least one serving of vegetables at every dinner?
- Serve vegetables at each dinner?
- Insist that your child try at least one bite of a new vegetable?
- Encourage your child to eat vegetables?
- Encourage your child to try new?
- Show approval when my child eat what I want him/her to?
- Give reasons why my child should eat a particular food?
- Promise a reward if she/he eat something she/he doesn't like?
- Encourage my child to eat vegetables?
- Let my child help decide what she/he eats at dinner?

The third independent variable included the parent's response to seven questions that were collapsed into the independent variable of parent-child engagement. The questions solicited a response to the main question, "During the last week, did you do the following with your child?"

- Planned meals that had vegetables that your child liked?
- Took your child to the store to get vegetables?
- Bought vegetables that your child liked?
- Helped your child make a snack that included vegetables?
- Showed your child how to make vegetable snacks?
- Prepared food together?
- Chose foods to buy at the grocery store together?
- Ate evening meal together?

The children's questions related to eating vegetables and fruits were collapsed into one dependent variable of children's healthy eating behaviors. The questions sought the response of how many times the specific vegetables were consumed the previous day.

The question used were

- Did you eat any orange vegetables like carrots, squash, or sweet potatoes?
- Did you eat a salad made with lettuce, or any green vegetables like spinach, collard greens, Swiss chard, green beans, sugar snap peas, broccoli, or other greens?
- Did you eat any beans like pinto, garbanzo, or kidney beans?

- Did you eat any other vegetables like tomatoes, asparagus, red cabbage, cauliflower, cucumbers, mushrooms, green or red bell peppers, eggplant, or celery?
- Did you eat fruit? Fruits are all fresh, frozen, canned, or dried fruits. Do not count fruit juice.

The children's survey questions related to physical activity were collapsed into one dependent variable of children physical activity. The children were shown pictures of certain activities and then responded to the survey question. The question asked was "how physically active are you? Do you agree with the following sentences?" Of which the responses the child could select were "yes" or "no." The sentences were

- Almost every day I do light physical activity.
- Almost every day I do moderate physical activity.
- Almost every day I do vigorous physical activities.

The variables for this research study are shown in the following chart:

Independent Variables	Dependent Variables
Parental Role Modeling	Children's Physical Activity
Parental Confidence	Children's Healthy Eating Behaviors
Parent-Child Engagement	

The analysis plan and identified dependent and independent variables for the research question and corresponding hypotheses are outlined below.

RQ1. What is the relationship between the independent variables of parental role modeling of healthy eating behaviors and physical activity and dependent variables of children's healthy eating behaviors and physical activity?

Ho1. Parental role modeling of healthy eating behaviors will be positively related to children's healthy eating behaviors and children's physical activity behaviors.

This hypothesis required implementation of Spearman's correlation. This statistical analysis is used determine the relationship and direction between the independent variable of parental role modeling of healthy eating behaviors and the dependent variables of children healthy eating behaviors and children's physical activity behaviors. This statistical analysis was used because the data are non-parametric and ranked.

RQ2. What is the relationship between the independent variables of parental confidence in involving the child in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption, and the dependent variable of children's healthy eating behaviors?

Ho1. There will be a positive relationship between parental confidence in involving children in preparing vegetables, encourage children to eat vegetables, and allowing children to make decisions regarding vegetable consumption and children's healthy eating behaviors

This hypothesis required implementation of Spearman's correlation. This statistical analysis is used determine the relationship and direction between the three independent variables related to parental confidence (involving children in preparing vegetables,

encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption) and the dependent variable of children healthy eating habits. This statistical analysis was used because the data are non-parametric and ranked.

RQ3. What is the relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity?

H01. There will be a positive relationship between a parent engaging children in healthy eating habits and physical activity and children's participation in healthy eating habits and physical activity.

This hypothesis required implementation of Spearman's correlation. This statistical analysis is used determine the relationship and direction between the independent variables of the parents engaging children in healthy eating habits (plan meals with vegetables children like, took children to the store to get vegetables, bought vegetables that children liked, helped children make a snack with vegetables, show children how to make a snack with vegetables, prepared food together, choose foods to buy at the grocery store together, and ate an evening meal together) and the dependent variable of children physical activity. This statistical analysis was used because the data are non-parametric and ranked.

Summary

This research study was used to quantify the relationship between parents' behaviors and children's behaviors related to healthy eating and physical activity. More

specifically, this research study was used to examine how parental role modeling of healthy behaviors, confidence in preparing and serving vegetables, and physical activity levels affects children's healthy eating behaviors and physical activity. In addition, this research study was used to assess the relationship between the parents and children's report of certain activities such as gardening, consuming family meals together, and engaging in physical activity together. Another purpose of this study was to more accurately define the important role that parental influence plays in children's development of healthy eating and physical activity behaviors.

This research study utilized secondary, baseline data from the TGEG study. The subjects of the TGEG study were third-grade children and their parents or caretakers. The children attended Title I schools, which indicates that most of the children qualify for free or reduced meals at the school. The participants were 23.6% White, 52.5% Hispanic, and 17.7% Black (Evans, et al., 2016).

The independent variables for this study included parental role modeling, parental confidence, parent-child engagement, and parental physical activity. These were examined to determine the influence on the dependent variables of children's healthy eating behaviors and children's physical activity.

Spearman Correlation was the statistical analysis that was used in determining the strength and relationship between the independent and dependent variables. Spearman's Correlation is used when the data does not fit a normal distribution, which was the case in this study.

CHAPTER IV

ANALYSES

This research study was used to examine the relationship between parental role modeling and children's healthy eating and physical activity levels. An additional focus of this study was to examine the relationship between parents' confidence in involving children in preparing vegetables and encouraging children to eat vegetables, along with allowing children to make decisions regarding vegetable consumption and their children's healthy eating and physical activity behaviors. Lastly, this research study was used to examine the relationship between parent-child engagement and the child's physical activity and healthy eating behaviors.

Sample Size and Frequencies

The sample size included 1,325 child participants and 1,136 adult participants. The child participants were closely divided between male (49.2%) and female (50.8%). The ethnicity of the child participants was Hispanic (43%), White (18%), Black or African American (16%), more than one race (8.0%), Asian (1%), American Indian or Alaskan Native (0.3%), and not identified (14%).

The majority of the parent participants were female (88%) as compared to male (12%). The ethnicity of the parent participants was Hispanic (52%), White (25%), Black or African American (18%), more than one race (4%), Asian (1%), and American Indian or Alaskan Native (0.3%).

Descriptive Statistics

The mean and standard deviations for the independent variables were parental role modeling ($M = 2.02$; $SD = 38.1$), parental confidence ($M = 3.26$; $SD = 0.402$), and parent-child engagement ($M = .402$; $SD = 1.67$). The mean and standard deviations for the dependent variables were children's physical activity behaviors ($M = 1.84$; $SD = 0.237$) and children's healthy eating behaviors ($M = 2.02$; $SD = 0.75$). These data are represented in Table 1.

Table 1

Descriptive Statistics for Variables

	Measure	<i>M</i>	<i>SD</i>
1	Parental Role Modeling	2.02	38.1
2	Parental Confidence	3.26	0.402
3	Parent-child Engagement	0.402	1.67
4	Children's Physical Activity Behaviors	1.84	0.237
5	Children's Healthy Eating Behaviors	2.02	0.75

Independent variables

The standard deviation for variables of parental role modeling and parent-child engagement was high. When compared to the mean in each of these variables, one can conclude that the mean is not a good representation of the variables of parental role modeling and parent-child engagement because of the large amount of variability in the responses to the measures used for these variables. The standard deviation of the variable parental confidence is considered low when compared to the mean. This indicates that the parent responses did not vary far from the mean. From this result, one might interpret that

the mean is a good representation of the data and that while parents were not very confident in their ability to involve children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumptions, they were somewhat confident in these abilities.

Dependent variables

The standard deviation for the children's variables of healthy eating and physical activity are small, indicating that variance in the children's responses related to these variables was small. Therefore, one can conclude that the mean is a good fit for the variables of children's healthy eating and children's physical activity.

Correlations

Spearman's correlations were conducted to examine the relationship between the independent variables of parental role modeling, parental confidence, parent-child engagement, and the dependent variables of children's healthy eating behaviors and children's physical activity. Spearman's correlations allow one to determine the strength and the direction, positive or negative, of the relationship between the independent and the dependent variables. The results of this research study indicated that there was no statistically significant relationship between the parent variables and dependent variables of children's healthy eating behaviors or children's physical activity ($p > .01$). These results indicate that the data does not provide sufficient evidence to prove that there is a relationship between the independent and the dependent variables; however, the data does not provide proof that a relationship does not exist. The details of these variables are shown in Table 2.

Table 2

Correlations

	Measure	1	2	3	4	5
1	Parental Role Modeling	-	-	-	-0.01	0.04
2	Parental Confidence	-	-	-	-0.01	-
3	Parent-child Engagement	-	-	-	0.03	0.04
4	Children's Healthy Eating Behaviors	-0.01	-0.01	0.03	-	-
5	Children's Physical Activity Behaviors	0.04	-	0.04	-	-

** . Correlation is significant at the 0.01 level (2-tailed).

Note. Spearman's Correlations Between Parental Role Modeling of Healthy Eating Behaviors and Physical Activity and Children's Healthy Eating Behaviors and Physical Activity; between Parental Confidence in Involving Children in Preparing Vegetables, Encouraging Children to Eat Vegetables, and Allowing Children to Make Decisions Regarding Vegetable Consumption and Children's Healthy Eating Behaviors; and between Parent-Child Engagement and Children's Healthy Eating Behaviors and Children's Physical Activity

Summary

Spearman's correlation was used to determine the relationship between the independent and dependent variables. The results of the analysis were not as expected with no significant relationship found between the independent variable and the independent variables.

RQ1. What is the relationship between parental role modeling of healthy eating behaviors and physical activity and children's healthy eating behaviors and physical activity?

H01. Parental role modeling of healthy eating behaviors and healthy physical activity behaviors will positively relate to children's healthy eating behaviors.

The findings of this research study show that there was no statistically significant relationship between parental role modeling of healthy eating behaviors and physical activity and children's healthy eating behaviors and physical activity.

RQ2. What is the relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption and children's healthy eating behaviors?

H01. There will be a positive relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption and children's healthy eating behaviors.

The findings of this research study showed that there was no statistically significant relationship between parental confidence in involving children in preparing vegetables, encouraging children to eat vegetables, and allowing children to make decisions regarding vegetable consumption and children's healthy eating behaviors.

RQ3. What is the relationship between parent engaging children in healthy eating habits and physical activity?

H01. There will be a positive relationship between parent engaging children in healthy eating habits and physical activity

The findings of this research study showed that there was no statistically significant relationship between parent engaging children in healthy eating habits and physical activity and children's healthy eating habits and physical activity.

CHAPTER V

CONCLUSIONS

Discussion

The purpose of this research study was to examine the relationship between parent and child behaviors related to healthy eating and physical activity. The research questions were developed with the intention of exploring how certain parent-child engagements and parental role modeling influenced children's healthy eating and physical activity. Specific variables involved in this study included parental role modeling of healthy eating and physical activities, parental self-confidence, and parent-child engagements focused on healthy eating and physical activity. The hypotheses were created with the prediction that there would be a positive correlation between the independent variables of parental role modeling, parental confidence, parent-child engagements, and the dependent variables of child's healthy eating and physical activity.

The statistical analysis of the baseline data for this study did not support the hypotheses as previously outlined. However, there are avenues for further research that should be considered, and these will be discussed further.

Limitations

Because the data obtained from research participants were self-reported, there is an inherent issue of bias. It is possible that participants were providing socially desirable answers rather than honest answers. This could have led to some inconsistency in the data. In addition, student participant data collection was conducted in a classroom setting.

It is possible that some students may have been influenced by the responses of their peers who were also participating in the TGEG study. As such, it is difficult to know if all responses from all participants were accurate.

The use of secondary data for this study limits the researcher to use the specific measures utilized by the TGEG research team. This study also focused solely on the baseline data that were collected, therefore, the researcher was only able to examine the data at a specific point in time, which provided a limited snapshot into the individuals' thoughts and behaviors. All comparisons and correlations between the parents and children's responses to the survey items are specific only to that point in their life.

Another limitation to this study pertained to the population included in the data set. The TGEG project was implemented in schools where the student population was identified as having limited resources. Therefore, generalizability of this study across other populations, such as families of a higher socioeconomic status, is not possible.

The participation of adult mothers (88%) was significantly higher than the participation of adult fathers (12%). The larger percentage of mother respondents could represent some bias in the data. The lack of a larger father population in the study may also represent a form of bias in the data. According to some research, mothers often feel that fathers' physical activities are more important than their own (Zahra et al., 2015). Without the benefit of a larger sample of fathers, there is no way to know if mothers and fathers are equally influential on their children's physical activity levels. Additionally, there is no way to know if fathers are more actively engaged in role modeling, have more

self-confidence, and engage more with their children than mothers due to the over-sampling of mothers in the data set.

Implications

As Ogden et al. (2012) discussed in their research regarding the prevalence of obesity in children, there have been no significant changes over a 12-year period. This finding, in conjunction with the fact that racial disparities exist, with higher prevalence among Hispanic and Black youth (Ogden et al., 2012), is evidence that further research is necessary. The conclusions of this study foster thoughts for possible areas of further research that might focus on families of different socioeconomic status and those living in different geographic areas. Aspects of rural versus urban living might play an important role in parenting strategies as they relate to the health behaviors of children. The geographic location of the study participants and effects of food deserts would provide the opportunity to compare how access or lack of access to healthy food options, such as fresh fruits and vegetables, may affect both parental role modeling and children's healthy eating behaviors.

The role of family dynamics is an area rich for further research. For example, the relationship between parental influence and children's healthy eating and physical activity might be an area focus in the future. An avenue for further study might be parent role modeling in comparison to the supportive role a parent plays in the development of healthy behaviors in children. Another example for future research is the child's relationship with their mother or father and how each of those relationships affects the child's behaviors. This focus on the paternal or maternal relationship might lead to

findings that revealed a different outcome in the child's healthy eating and physical activity behaviors. Outside stressors may affect family relationships. Considerations for research related to the impact of family stress might include the parent's employment outside of the home, or status as the lead parent in the household.

Summary

This research study was initiated to explore the influence of parents on their children's healthy eating and physical activity behaviors and further inform those working with parents and children in areas related to healthy lifestyles. Although the outcome of the research was not as hypothesized, it has provided considerations for future efforts that might lead to the development of health-related habits for both children and adults. For example, preparation of meals is an important aspect related to healthy eating behaviors. The engagement of parents and children in activities that teach healthy food preparation skills might lead to increased consumption of vegetables and fruits. In this study, parental role modeling and parent-child engagement were not found to have a significant impact on children's healthy eating behaviors and physical activity, but perhaps a different combination of role modeling and engagement would have a significant impact. For example, health care professionals and educators could develop interventions that might include parents and children learning together about physical activity. This could involve outdoor activities provided at a local park in which parents and children could engage in physical activity together. The end result could be parents and children learning how to incorporate physical activity into their daily lives.

Parental role modeling

Although this research study found no relationship between parental role modeling of desired behaviors and the behaviors in children, the findings are consistent with those of previous research. For example, Hendrie et al. (2013) also found no relationship between parental role modeling of healthy eating behaviors and children's healthy eating behaviors. That said, Hendrie et al (2013) did find a significant relationship with parents who learned about healthy eating behaviors. Therefore, there is evidence in other research that suggests there is a link between parents and healthy eating habits in their children. It stands to reason that further studies should explore what factors may be most influential in the way parents influence their children's choices with regard to healthy eating.

Blissett (2011) conducted a meta-analysis of studies focusing on parental role modeling and healthy eating in children. It appears that these studies all suggest a combination of factors leads to children's healthy eating. Blissett posits that a positive approach is most effective (2011). This positive approach involves parental guidance accompanied by parental demonstration of fruit and vegetable consumption and having fruit and vegetables readily available for children to consume. These factors appear to result in greater adoption of healthier eating. Blissett continues by suggesting that this positive approach is far more influential than setting limits, controlling, and forcing the consumption of specific foods (2011).

Although the previous studies focused on effective ways parents can influence their children's healthy eating behaviors, effective ways parents can influence their

children's physical activities is still uncertain. The qualitative research of Zahra et al. (2015) suggests that mothers believe that fathers play an instrumental role in developing positive physical activity behaviors in children. While parents are equally important in ensuring that children are involved in a variety of different types of physical activities, from organized to impromptu, fathers are more likely to involve children in activities that are not planned or organized. The mothers who were interviewed for the qualitative study indicated that fathers were better at some activities, and it seemed natural that they would involve the children. In addition, the respondents felt that involving children in activities inspired them to be more physically active as opposed to just observing the parent's physical activity (Zahra et al., 2015). Further, children are more likely to meet the requirements for daily involvement in active behaviors if parents are engaged with them in such behaviors (Pyper, Harrington, & Manson, 2016). Similarly, as Lloyd, Lubans, Plotnikoff, and Morgan (2015) reported, as fathers learned more about healthy eating and physical activity, they were better equipped to provide support for and participate with their children in healthy eating. They also reported that they were more active with their children. In return, the study findings supported the fact that children's healthy habits were increased with this involvement from the fathers.

Parent-child engagement

While parent-child engagement was found to have no significant relationship to children's healthy eating and physical activity behaviors, one might consider a shift in parental focus that would engage children in healthy behaviors and involve parent support for their involvement in active behaviors. This would allow children to see the

parent involved in the healthy behavior and provide the child with the opportunity to take part in active behaviors, which allows for the development of skills and self-efficacy. De Lepeleere et al. (2013) found the involvement of parents with children in physical activity, while also providing positive reinforcement for children in physical activity, was a greater incentive for children to engage in physical activity. In addition, the increased development of skills led to children's self-assurance in active behaviors, which had a positive impact on children's active behaviors (Sigmund et al., 2018).

Parental confidence

The activities that support parental confidence in helping children to develop healthy eating behaviors come with some barriers. These barriers may explain why the findings of this study do not support the positive relationship between parental confidence and children's healthy eating behaviors. Fulkerson et al. (2011) conducted focus group interviews with parents of elementary age children. The parents shared that they found it difficult to encourage children to eat healthier foods when the children would only refuse them. Parents also indicated that involving children in the kitchen activities and allowing them to cook meant there would be more to clean up, meaning that involving children took more time from an already hectic day (Fulkerson et al., 2011). A significant number of the parents involved in the focus group study did indicate that they ate the evening meal together as a family. However, parents also reported that they were often doing other activities while eating because of limited time and the need to complete other activities as an end to their day (Fulkerson et al., 2011). In the future, educational activities that provide hands-on education to improve parents and children's

abilities in selecting and preparing healthy foods may lead to greater self-confidence in parents.

Jarpe-Ratner, Folkens, Sharma, Dara, and Edens (2016) conducted an intervention with elementary school age children where hands-on cooking activities were conducted. Their findings suggested that parents were more likely to allow children to help in the kitchen at the conclusion of the intervention, and after they felt they had developed some basic food preparation skills. Also, at the conclusion of the intervention, when compared to before, parent and child discussions more often included some reference to healthy food consumption behaviors. In addition, although the parents were not participants in the afterschool food preparation intervention, they felt more capable of their ability to prepare meals at home with their children (Jarpe-Ratner et al., 2016).

The findings of this research study do not support a significant relationship between children's healthy eating and physical activity and parental role modeling, parent-child engagement, and parental confidence. However, there is evidence to suggest that further education for parents and children is needed. Those who work in child health and child development related fields can focus on the importance of further education for parents and children. Interventions that provide parents and children with similar messages related to healthy lifestyles could have a greater impact.

There are differences between role modeling behaviors and engagement in behaviors. This is most notable when one views the parent role as that of a teacher. This concept is demonstrated in the work of De Lepeleere et al. (2013). Their research suggests that parents who help their children understand and find importance in being

active is a better way of ensuring that children adopt positive behaviors related to physical activity. Further, Berge et al. (2012) suggested that when families are involved in activities together, the children are more likely to be able to maintain a healthy weight. This might also be a result of the home environment and the relation to healthy lifestyles. Providing a positive home environment was not the focus of this research study, however, the implications of providing such an environment are important as indicated by the research of Pyper et al. (2016). They suggest that children's consumption of specific healthy foods was more likely to be in line with recommendations if the children were engaged in family mealtime. Also, if parents focused on specific servings of healthy foods during mealtime and if there was not a television to provide a distraction during mealtime, children were likely to consume healthier foods (Pyper et al., 2016).

Previous research has shown that there are parents who are trying to help their children develop healthy lifestyles (Allirot, Maiz, & Urdaneta, 2018; Berge et al., 2012; Brown & Ogden, 2004). The findings of this research study may not have shown a link between parental role modeling and children's healthy eating. However, the lack of conclusive evidence in this study does not negate previous research indicating that parents serve as the first teachers for their children. As illustrated in previous research, parents who involve their children in, and talk to them about, healthy eating and physical activity are more influential than those who just demonstrate healthy eating and physical activity. It would seem that if parents talk to their children about why healthy behaviors are important, set a positive example, and include their children in making healthy

choices, they can help children understand that healthy behaviors are a lifestyle and can positively affect the child's entire life (Kuzbicka & Rachon, 2013).

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