

THE SCHOOL NURSE TEACHER'S ROLE IN PREVENTING CHILDHOOD OBESITY AT  
SCHOOL: A LITERATURE REVIEW OF NURSING RESEARCH

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### Abstract

Childhood obesity has become a major health concern for children of all ages. One out of every three children have been identified as being overweight or obese, putting those children at an increased risk for detrimental health consequences such as hypertension, type 2 diabetes mellitus, and early mortality (Institute of Medicine, 2014, & CDC, 2014). The continuation and progression of incidences of childhood obesity are also contributing to a potential issue for America's national security, due to children being physically unfit to fight for the country (Christeson, Taggart, & Messner-Zidell, 2010). This paper is focused on the findings from nursing research on school nurse teacher prevention of childhood obesity related to three main objectives: Identified communication barriers for school nurse teachers, effective educational practices, and nursing interventions that have proven to be effective. This paper identifies effective, evidence-based nursing interventions utilized by school nurse teachers in reducing childhood obesity at school. This review of literature demonstrates that school nurses can have a major impact in preventing obesity. A pamphlet identifying the effective, school nurse led interventions was created and will be distributed to school nurses to be used as a resource for trying new methods in controlling the "obesogenic" environment found in their school system (Penn & Kerr, 2014).

*Keywords:* Childhood Obesity, prevention, School Nursing, elementary school, communication barriers, treatment, pediatric nursing, pediatric obesity, overweight.

## The School Nurse Teacher's Role in Preventing Childhood Obesity at School

### **Background**

For more than twenty years, the rate of childhood obesity has been increasing in a drastic manner (Nauta, Byrne, & Wesley, 2008). Currently, the Institute of Medicine and the Center for Disease Control and Prevention are announcing that 17% of children in the United States are obese (2014). While two out of every three adults in America are overweight and obese, one out of every three children in the United States are either overweight or obese (Institute of Medicine, 2014; CDC, 2014). From an international standpoint, the United States of America is ranked number one for having the highest rates of people whom are obese among all other developed nations, exceeding China, Russia, Mexico and Germany whom have also been ranked within the top ten most obese nations (Khan, 2014).

An analysis of research from the American Association for Marriage and Family Therapies (2014) suggests that today's generation of children whom are living an overweight and obese lifestyle "may not outlive their parent's generation". The military has strict guidelines for their members in regards to their physical fitness. Mission Readiness published an article, "Too Fat to Fight", and in that article, a retired U.S. Army General, Johnnie E. Wilson stated, "Child obesity has become so serious in this country that military leaders are viewing this epidemic as a potential threat to our national security," due to the inability of the children to meet physical and fitness requirements (Christeson, Taggart, & Zidell, 2010, p. 4). In addition to the risk of national security, it is essential to recognize that obesity is significantly contributing to America's major economic crisis, particularly in healthcare. Khan (2014) recognizes that while 25.8% of children are obese in addition to the 65.6% of American men and women who are diagnosed as obese, the healthcare costs to treat obesity and its complications, annually, can be as much as \$147 billion.

Childhood obesity is defined by the CDC as having a BMI at or above the 95th percentile for children of the same age and sex (CDC Basics About Childhood Obesity, 2014). Obesity results from an accumulation of factors: Fast food, sedentary lifestyle, knowledge deficit,

economic crisis, recess time being cut in schools, genetic predispositions, and much more (CDC Basics About Childhood Obesity, 2014). The risk for a child becoming overweight and obese may become apparent in years as early as infancy, when a mother is determining whether a baby should be breastfed or bottle fed with formula. There are serious, detrimental consequences for children who are obese and have been obese for the majority of their short lives (CDC, 2014). Early exposure to overweight and obese lifestyle can impact a child in nearly every organ of their bodies. In particular, cardiovascular disease, type 2 diabetes mellitus, sleep apnea and asthma are among the most common and most serious (NASN, 2014).

There have been numerous attempts across the globe to reduce the average child's BMI effectively; such as: APPLE: A Pilot Program for Lifestyle and Exercise in New Zealand, HENRY: Health, Exercise, Nutrition for the Really Young in the United Kingdom, and Healthy Kids, Healthy Futures, and CHEER: Communicating about Health, Exercise, and Eating Right in America (Penn & Kerr, 2014; Resnik, Bishop, O'Connell, Hugo, Isern, Timm, Geller, 2009). A number of interventions have been initiated throughout the United States to motivate families to become healthier; one example is First Lady, Michelle Obama's *Let's Move!* Campaign, which is aimed at educating families about healthy lifestyles and choices, providing schools with healthy lunch choices, improving affordability, and getting children to move more (Obama, 2014). Even though the American Medical Association has shown a 40% decline in the percentage of pre-schoolers being obese in the last ten years, the overall percentage of children ages two to nineteen years remains substantially high at 16.9% (McKay, 2014). In 2014, The World Health Organization has established a "Global Action Plan for the prevention and control of noncommunicable diseases 2013-2020" and within these action plans, include a goal related to childhood obesity, in that there will be a discontinuation of increasing obesity rates among school-aged children by 2025. Any effort that committees, partnerships and organizations make to prevent and reduce the ratings of childhood obesity is of significant importance today. Research of the current literature can play a major role in guiding school nurses on which evidence-based intervention they will utilize to control this health concern in their school.

Being the number one health concern among the pediatric population, surpassing the issue on drug abuse, school nurses play a vital role in addressing childhood obesity in their school systems (American Heart Association, 2014). School nurses have significant opportunities to assist in preventing and decreasing the rate of childhood obesity. School nurses have the benefit of seeing children on a daily basis since children spend the majority of their day in school. They are capable of screening, educating, referring, and ultimately making a significant difference in all students' lives (NASN, 2014). However, studies have demonstrated that there are a number of inconsistencies and barriers in communicating, educating, and providing services to, not only children, but their families on how to live a healthy lifestyle, making the battle against obesity even more complex to fix (Kubik & Lee, 2014; Stalter, Kaylor, Steinke, & Barker, 2011; Steele, 2011). It is important the barriers in communication between the school nurse, families, and students be identified, and that interventions are implemented to overcome these barriers in order for children and families to live healthier, and more gratifying lifestyles.

The rates of childhood obesity are alarmingly high, and interventions such as the School Nurse Childhood Obesity Toolkit, abbreviated SCOT, act as great initiatives to reverse the direction of childhood obesity prevalence (NASN, 2014); however, interventions to promote better communication with families needs to be established. Healthy People 2020 has many goals towards improving nutrition and weight status among children at specific developmental and age ranges, and school nurses can play a major role in ensuring that those goals are met (USDHHS, 2014). A decline in childhood obesity rates is critical. The World Health Organization states, 70 million children under 5 years of age will be overweight or obese by 2025 if current trends continue (2014). School nurses play a major role in preventing this from becoming reality. As stated by Marmot (2010), "Children cannot assume responsibility for their own lifestyle choices independent of family, social, environment, and economic influences," (2010, p. 6); it is up to school nurse teachers who are knowledgeable and have the ability to find resources and create

partnerships with community organizations to promote healthy lives for children and their families.

### **Literature Review**

With the utilization of Cumulative Index to Nursing and Allied Health Literature (CINAHL), nursing research articles were obtained, read, and analyzed that contributed to the knowledge related to three objectives: Identified the school nurse teacher's perspective on communication barriers with students and families of obese children, described education practices that school nurses are providing to students in the school setting relating to obesity, and identified interventions that have been implemented and proven to be effective in reducing the number of children who are obese or overweight. Twenty articles were chosen to be thoroughly analyzed and utilized within the project and school nurse pamphlet.

Eight of the twenty articles have been chosen to address the objective on communication barriers between school nurse teachers, children, and their families relation to the prevention and treatment of childhood obesity; four articles under the objective of identified education practices that nurses are providing to students in the school setting; and eight articles under the objective of identified effective interventions implemented by school nurse teachers that prevent or reduce the number of students living an overweight or obese lifestyle. Communication barriers for the school nurse teacher needed to be identified to understand why certain education practices have been more effective than others. Successful and effective interventions implemented by school nurse teachers have also been identified, which will aid in guiding the school nurse teacher on which interventions can be implemented in their school system to control childhood obesity.

### **Communication Barriers Identified by School Nurse Teachers**

There are numerous communication barriers identified by the school nurse teacher in the review of literature related to childhood obesity. This indicates that there is a need to identify which barriers are most prevalent and create and implement a plan that can overcome those barriers. The implementation of nursing interventions should be effective in discussing weight related issues with families and students so that their health and quality of life can improve. Discussions with families regarding the recognition of a child's BMI, which determines them as being overweight or obese, is a very delicate issue to be addressed (Banks, Shield, & Sharp, 2011). The way in which individuals visualize or define obesity can be very subjective and the accuracy or effectiveness in the tools or methods used to identify children as overweight or obese may cause some difficulties between parents and school nurses (Bonde, Bentsen, & Hindhede, 2014; Penn & Kerr, 2014; Quelly, 2014; Steele, Wu, Jensen, Pankey, Davis, & Aylward, 2011; Wu & Steele, 2011). School nurses around the world encounter and deal with childhood obesity associated issues, such as building a rapport with families and students when trying to discuss issues related to weight control, and lifestyle habits. The question that arises once the communication barriers are identified is, "Are school nurses doing enough to prevent obesity"? According to Nauta, Byrne, and Wesley (2009), 77 percent of school nurses feel that schools are not doing enough to help reverse this major problem.

Using the acronym SNAP, School Nurse Attitudes and Perceptions, Wu and Steele (2011) identified ten significant barriers that school nurses faced while communicating with parents or students about physical health and well being and the impact on their families from childhood obesity. Subscale one of ten discussed how a nurse's lack of knowledge or access to resources greatly impacted the way in which she could direct families and students to get the help they needed for their weight issues. Within the first subscale, nurses recognized that they had lacked knowledge and/ or access to weight management program referrals, educational handouts, and knowledge about nutrition or activity. In regards to knowledge deficit, Nauta, Byrne, and Wesley (2009) also found that 35.9% of the one hundred and three nurse participants



in that study felt that they were incompetent to recommend weight loss programs for the students, 40% do not recommend weight loss treatment for all obese children, and 58.4% do not usually recommend weight loss treatment for only those students with a health problem that may have arisen from obesity.

The second barrier with subscale was self perceived competency which included feelings such as unpreparedness and incompetence while trying to address the issue of a child's weight to him and to his family (Wu & Steele, 2011). Personal challenges that nurses had a tendency to be faced with included personal weight issues so that they were not acting as a role model to students. The nurses stated concern about what kind of negative reactions they may receive for mentioning a child and obesity in the same conversation. A statement found in Penn and Kerr's Cochrane Review which supports this evidence is, "The main challenge seems to be that parents deny that their child is overweight and a reluctance to discuss the issue is present," (2014, p. 19). Nurses need to help parents become aware of childhood obesity and its effects on their children.

The school nurses' role in the fourth subscale is nurse's time constraints (Wu & Steele, 2011). Nurses felt that lacked enough time to educate and discuss weight related issues, or they did not feel that they were obligated to identify and educate about the issue in their scope of practice. Nurses reported that the support that they wanted to receive from people such as the district nurse supervisor, school food service personnel, state government, school administration, teachers, other school nurses, and families was very inadequate, stopping them from attempting to make continuing efforts to reverse this major issue (Wu & Steele, 2011). Quelly (2014) also acknowledged the barriers, related to time constraints, which school nurses face while trying to communicate with parents. Time restraint is a significant issues for school nurses; they care for a large number of students and must meet deadlines for screenings, leaving obesity education and discussions for a later time. Quelly (2014) reinforced the notion that having a lower student to nurse ratio improved obesity- related issues within the school system: "Nurses working in schools with lower student to school nurse ratios spent more time providing care for students

with asthma, injuries, vision and psychosocial problems than those working in settings with higher ratios” (2014, p. 206). To become more effective educators and caregivers in the school settings, it is critical to have a lower nurse to student ratio so that extra time can be made available to provide classroom discussions and/or activities with students on health wellness.

Culture is also a barrier for communicating effectively because some cultures have an increased prevalence in overweight measurements (CDC, 2014; Steele et al., 2011; Wu & Steele, 2011). Nurses must ensure that they are being culturally competent to have effective communication with families. Unfamiliarity of cultural norms may prevent a nurse from giving adequate recommendations, teachings, and perhaps building professional rapport with families. Regber, Mayrild, and Johansson Hanse (2013) acknowledges that if a nurse is trying to educate a family about the importance of following MyPlate’s (USDA, 2015) recommendation on portion sizes of different foods, the family may be reluctant to learn because their culture either prohibits them from eating or preparing a certain food or the culture has an expectation that a child eats a large portion and the entire meal placed on a plate.

An apparent communication issue that occurs is when the two parties do not agree that there is an issue actually present. What childhood obesity looks like to one individual may not be considered obesity to another individual due to many factors one being cultural influences. This was the major focus of subscale eight: Understanding families (Wu & Steele, 2011). Families may not view weight management as a priority issue to address, nor may they believe that weight is an issue, regardless of whether or not a child’s BMI shows that a child is obese. CDC (2014) and WHO (2014) recognize that children from low socioeconomic status tend to have a higher percentage of overweight and obese children. Some families may not have the financial capabilities to make the change, therefore while the nurse tries to discuss healthy diet habits to follow, the family simply cannot implement the recommendation that the nurse is providing them. It is important that the nurse perform an assessment of the child’s and family’s

socioeconomic status before making recommendations to the families on how they can change their current habits simply by asking general questions about education status, housing, or career.

Subscale nine includes five areas that need to be improved upon within an institution in order for nurses to be effective in their management and abilities to talk and build rapport with students and families (Wu & Steele, 2011). Nurses can play a major role in educating students about general health, healthy eating, and physical activity. However, when time is not allotted or made a priority by the institution, especially when understanding what constitutes a typical school cafeteria hot lunch, the nurse may be unable to carry out the teaching programs that will aid in reversing obesity prevalence in the school system. Due to the barrier between school administration and the school nurse teacher related to school lunch, the nurse may be faced with the inability to fully commit to implementing the plan to minimize BMI because the school does not provide healthy choices for hot lunch. The other issue that makes implementation more difficult is when students are being rewarded with nonnutritive, unhealthy snacks because of someone's birthday, a holiday party, or there has been excellent performance in the classroom (Steele et al., 2011). In conclusion, effective communication and commitment to change can only be made possible if teachers, school administrators, and staff members are cooperative with the plan (Steele et al., 2011).

Subscale ten discusses barriers that the nurse is unable to have any control over, which includes the children's preferences for fast food restaurants, large portion sizes, unhealthy, yet eye-intriguing food advertisements on television or labels (Wu & Steele, 2011). Often, the media sends the message to the public to "be comfortable with yourself; large is okay" (Steele, et al., 2011). It is essential that while nurses promote adequate self esteem in children and families, it is important to educate them on the consequences that may arise if they continue to "live large." Media ties in with societal factors in that half of the nurses found societal norms create barriers and challenges by encouraging more self-esteem rather than weight based health promotion along with it (Steele, et al, 2011). Society realizes that obesity is prevalent in the country, and it

seems like “being overweight is becoming the norm” for children (Steele, et al., 2011). It may not be seen as such a major health concern, especially if there are so many children walking around at school with a BMI signifying overweight or obesity. Succession of children’s weight status will continue to challenge nurses who are attempting to reverse the process.

Steele’s (2011) research study surveyed 22 nurses, asking them to relate themselves in accordance to six different barriers in their effectiveness to communicate with others about childhood obesity: Nurse factors, family factors, interactions between nurses and families, institutional factors, and societal factors. Twenty-one of twenty-two nurses reported that they did not have adequate amounts of resources regarding referrals, or handouts to utilize during their conversation with parents. Additionally, a quarter of the nurses felt incompetent to discuss weight related issues with families due to their own personal weight issues and possible behavioral issues residing within the family. The factors associated with families according to Steele’s (2011) include language barriers, lack of knowledge, different ideas of what constitute overweight and obese, family cultural practices, and parent/child conflicts regarding losing weight and how to do so. To add to the barrier of differing child and parent opinions, research was conducted on 12 school nurses, and among the identified barriers, one nurse stated, “We should work more with the parents alone. I have seen children begging their parents not to give them sweets” (Bonde, Bentsen, & Hindhede, 2014). It was also recommended that parents set limits for themselves as to what foods they offer their child for snack time or lunches (Bonde, Bentsen, & Hindhede, 2014).

With childhood obesity recognition, there comes a lot of stigmatization. According to Quelly (2014), “Stigmatization of overweight and obese children has been a concern since the 1960’s when research found that school aged children ranked drawings of obese children as least likeable when compared to other child characteristics,” (Quelly, 2014, p. 205). Stigmatization can start simply with the nurse trying to communicate with students individually during the school day or by the nurse contacting parents to come and meet with them for a discussion on

weight loss management or obesity referral programs. Penn and Kerr (2013) identified a barrier having to do with engaging the family in health promotion discussions and programs. This barrier of engagement became evident because while three hundred letters were sent home to parents, asking them to take part in secondary care regarding obesity, only nineteen responded and accepted the offer. This demonstrates one example that a major barrier exists in the school nurses' ability to obtain a parent's interest and concern about obesity and the health related potential issues (Penn & Kerr, 2013).

In conclusion, there are a multiple barriers present in the school setting that make communication between the school nurse teacher, students and parents extremely difficult to be effective in preventing obesity. Each school, individually, must identify barriers and try to find ways to overcome these obstacles. While nurses may not be able to overcome all barriers, it is important to minimize them in order to have effective communication and education practices. The school nurse, families, students, school administrators and other faculty need to come together as a team and work together to minimize, or if possible, eradicate the barriers and achieve short and long term health goals for children related to childhood obesity.

### **Childhood Obesity Prevention Education Practices**

Daily education is a priority intervention that the school nurse must deliver to not just the students that are being cared for, but the educators and parents as well. While communication and time have been acknowledged as significant barriers to education, evidence in nursing research has shown that these barriers can be overcome in a variety of ways, and nurses can deliver the message effectively and efficiently (Borup & Holstein, 2010; Kubik & Lee, 2014; Mayer & Villaire, 2010; Melin & Lenner, 2009). The nurse can utilize SCOPE, Specialist Certification of Obesity Professional Education, or HANDS, Helping Administer to the Needs of the Student with Diabetes in School, programs so that a better understanding of the concepts, resources, and tools regarding childhood obesity can be developed (Arkansas, 2010). Creativity in the delivery of obesity education can help nurses achieve satisfactory decreases in their school's rates of childhood obesity.

One important aspect that a school nurse should take into consideration before implementing an educational intervention is to assess the interest level of the audience. Without interest and motivation to listen and be engaged in the health teaching, the school nurse may not be successful in her outcome achievements. One hundred and twenty two parents of second and fourth grade students were surveyed with approximately 38% of the student population being overweight (Kubik & Lee, 2014). Sixty one percent of parents whose child was overweight felt interested in a nurse led initiative to control weight issues in students, versus 49% of parents whose child is normal weight to feel interested in this offering (Kubik & Lee, 2014). In this same study, 56% of parents of overweight children expressed an interest in meeting with the school nurse to learn about how activity and diet can be altered to change their child's weight status; this is three times the number of parents who have normal weight students to have the same desires and take initiative (Kubik & Lee, 2014). These parents were also five times more likely to participate in the afterschool program (Kubik & Lee, 2014). This reinforces the notion that

parents do want to learn the answers on how they can alter the weight status of their child, and potentially themselves, to make their homes healthier.

The question of what is the right and wrong approach to educating students and families about childhood obesity may be present in the minds of school nurse teachers across the United States. Mayer and Villaire (2010) focused on low literacy rates within the American population. Illiteracy in the United States is evident in the 2015 statistics of the US Department of Education and National Institute of Literacy. Only thirteen percent of the general public is proficiently literate (National Institute of Literacy & US Department of education, 2015). Childhood obesity can become a greater problem due to illiteracy if people do not understand what obesity means or how weight can be reduced. A list of do's and don'ts introduces five key concepts that nurses need to keep in mind while they engage in education practices with the students, teachers, and parents (Mayer & Villaire, 2010). These five concepts include posting nutrition fact labels visible to visitors at the school, talk to families about portion control, about health issues related to obesity such as Diabetes, about rethinking breakfast lunch and dinner, and not making the assumption that parents know the appropriate weights for children (Mayer & Villaire, 2010).

In initiating the discussion of obesity in children, nurses should start off by telling their audience how obesity is defined among a group of children. Mayer and Vallaire (2010) suggests that nurses do not assume that these groups of people understand the American Academy of Pediatrics and CDC recommends for appropriate weight ranges. The best way to teach about the problem of obesity in children is by using a visual aid while discussing the identification of the issue (Mayer & Vallaire, 2010). For example, when nurses are performing obesity screenings, how BMI is calculated can be shown to parents and teacher. Furthering the discussion, Mayer and Vallaire (2010) suggests that nurses using a height and weight chart as part of their teaching is helpful for parents to see where there child stands in relation to other people in their age group, while maintaining student confidentiality. Visual aids such as the nutrition label or a dinner plate can also help school nurses educate children and families regarding how to choose the right

foods to buy and consume (Nauta, Byrne, & Wesley 2009). The nurse can define terms that may not be understood by the audience, such as the difference between a child being normal weight, underweight, overweight or obese. Identifying a child as obese or overweight, or someone believing a child is “just big-boned” or eating the wrong foods may be hurtful or misunderstood by a family because of their culture. Therefore, being concrete in terms of definitions is essential for education practices to be effective.

Discussing children’s weight is a sensitive topic with any population to discuss how to change the weight status of a child (Banks, Shield, & Sharp, 2011). Because the reasons why a child is overweight and obese are unique to each family, a thorough nursing assessment needs to be performed in order to meet the needs of the child and family. Utilizing Sweden’s health guidelines, Borup and Holstein (2010) recommends focusing on the following content in health dialogues with students: Grades 1-3 focus on bedtime, hygiene, diet and general wellness, grades 4-6 discuss overweight, puberty, bullying and peer pressure, and grades 7-9 focus on physical activity, school/ work balance, sex education, and risky behaviors. Borup and Holstein (2010) determined how effective annual health dialogues with the school nurse can be by assessing how often students thought about the health dialogue afterwards and if they took any of the advice that the nurse had given them (Borup & Holstein, 2010). Interesting results that came from this study include 50% of students had a discussion about the health dialogue with a parent. A result of fifty percent success rate in this study is a promising method that school nurses can utilize in combination with other interventions, with students, to remind them and guide them to healthier lifestyles to both reduce and prevent childhood obesity (Borup & Holstein, 2010). The dialogues are a great way to introduce to a child an issue that they may be experiencing, educate them on what they can do, and motivate them to make a change to improve their health. This helps the nurse educate the student about a health concern, and also brings the concern and interest into the home. They were also more likely to visit the school nurse again to discuss the issue further especially when the child is being bullied by peers due the overweight or obese status (Borup & Holstein, 2010). It is possible that the effectiveness is due, in part, that the dialogues were



performed in a non-judgmental, non-threatening way, such as in front of peers, so students would feel more empowered to make necessary changes.

It is crucial that the school nurse attracts members of all different races, cultures, and genders. The CDC (2014) discusses that obesity is a more significant problem for children who are Hispanic (22.4%) and Non-Hispanic Blacks (20.2%), so accessing these populations is essential. It was evident that non-white parents were four times more likely to attend a support group hosted by the school nurse, and five times more likely to attend an afterschool weight management program conducted by the school nurse (Kubik & Lee, 2014). While discussing diet changes, the nurse may post a diagram in her office of a nutrition label, and how to make the healthiest choice of food based on the information provided by the nutrition label. In addition to the food labels, educating parents on how to manage choices for the three main meals a day and how to avoid large portions can help reduce weight in their family.

Tying into the education intervention regarding nutrition, several school nurses have been recognized for their efforts in teaching students how to make the right food choices. A school nurse teacher has proven to be very successful in her teaching moments during the school year (Kelly, 2014). The nurse teaches a supplemental nutrition education program at her school when she realized that obesity was becoming a prevalent problem in her school system (Kelly, 2014). In addition to explaining why certain food groups are healthful, competitions were incorporated and policies into her school system so that children are forced and encouraged to be healthier during the school hours (Kelly, 2014). Methods that school nurses teachers may use to introduce students to new food choices include activities such as children taste-testing different fruits or vegetables with their friends may make it more likely that kids will accept the foods they try at school with peers (Kelly, 2014). The nurse measured the outcome of her intervention by assessing how many children would eat the taste-tested foods after the challenge had been completed (Kelly, 2014). “Twenty one out of twenty two students in one second grade class now ordered salads for lunch whenever they were available,” (Kelly, 2014, p. 3). This experience

supports the idea that fun, creative, and motivating education interventions can engage children in their own health maintenance.

Poor diet and lack of exercise and physical activity are the two main causes for an increased prevalence of childhood obesity (CDC, 2014). It is important that school nurses dedicate a major focus of their educational practices to these two causes when teaching people how to reverse the obesity rates, or prevent it altogether. Melin and Lenner (2009) determined the effectiveness of a school nurse training program that helped them educate families on obesity prevention and weight reduction related to diet and exercise. Nurses sent home a questionnaire for families to fill out to be sent back to the school nurse (Melin & Lenner, 2009). Then, the nurse would meet with the families and give advice on how to go about weight management based on the families' answers. (Melin & Lenner, 2009). Nursing education effectiveness was measured by comparing baseline measurements to the measurements after implementation was carried out (Melin & Lenner, 2009). Results were that 73% of all advice provided by the school nurse had been adhered to by families throughout the duration of the study and 75% of families adhered to the nurses' advice regarding dietary alteration. Compliance with the nurse's health teaching became evident as there was a decrease in BMI (Melin & Lenner, 2009). In regards to physical activity, more children either rode bikes or walked to school compared to being driven in by a parent or school bus and the number of hours that children spent watching television a day declined from 2.9-2.2 hours a day to 1.4-1.2 hours a day (Melin & Lenner, 2009). When children were asked how they felt about the program, they responded with a general good feeling, yet at times, they felt "teased or self-conscious" (Melin & Lenner, 2009). This school nurse initiative that advises and educates families on how to manage weight issues for or with their child did have positive outcomes and may be effective (Melin & Lenner, 2009).

School nurses have the opportunity to educate students and families on the prevention of childhood obesity. Nurses may spend some time to educate the families on short and long term health related problems may occur if overweight and obesity is not reversed. For the first time in

history, children are not expected to outlive their parents' generation, greatly because of the obesogenic lifestyle experienced by children today (American Association of Marriage and Family Therapies, 2014). During their lifetime, kids who are obese are expected to have chronic health conditions like type 2 Diabetes Mellitus, hypertension, fertility problems, cancer, and much more (CDC, 2014). It is vital that nurses advocate for the students by expressing concern for the child's wellbeing by educating children and their families on the short and long term effects of obesity.

### **Effective School Nurse Teacher Interventions**

School nurses are often times the first person to notice any health discrepancies in children that are attending school (NASN, 2014). Health concerns related to childhood obesity that the school nurse may assess without having to directly speak to a child can be things such as walking through the cafeteria and noticing an overweight/obese child's lunch consisting of sugary beverage, high calorie snacks and a lack of fruits or vegetables (Pfeiler, 2014). While on the playground, the nurse may notice that a child is having trouble keeping up with friends in a game of soccer, whether it is because the child is having trouble breathing, or does not have the energy to run. Screenings such as blood pressure, BMI, height and weight, alone can provide the nurse with information that show a trend in how a child is developing physically (NASN, 2014). The school nurse may also learn that a child who is overweight or obese may be struggling with fitting in with classmates through instances of bullying. The nurse may also be approached directly by the child seeking advice or concern about complications related to obesity. The parents of an obese child may consult with the nurse due to some concerns that they have related to the increase in weight of their child, or a new diagnosis of Diabetes Mellitus, hypertension, asthma, or hyperlipidemia. Regardless of how the nurse discovers the issue of childhood obesity in the school's body of students, it is important to address the problem through discussion of the importance of weight control, and healthy dieting and exercise.

It has been demonstrated that there are cases where the good intention of a nurse's implementation ends unsuccessfully due to either financial constraints, lack of support from administration, or parent opposition to participate in the intervention (Wu & Steele, 2011). Effective interventions implemented by school nurse teachers have been identified and compiled that could be helpful to other (Hohman, Price, Sonnevile, Rifas-Shiman, Gortmaker, Gillman & Tavaras, 2012; Johnson, Moreno, El-Mubasher, Gallagher, Tyler, & Woehler, 2013; Morrison-Sandberg, Kubik, & Johnson, 2011; NASN, 2014; Steele, Wu, Cushing, & Jensen, 2013; Soderlund, Malmsten, Bendtsen, & Nilsen, 2010).

To reiterate the role and responsibility of the school nurse in context to childhood obesity, the National Association of School Nurses' position statement says,

“the registered professional school nurse (herein after referred to as the school nurse) has the knowledge and expertise to promote the prevention of overweight and obesity and address the needs of overweight and obese youth in schools...collaborates with students, families, school personnel, and health care providers to promote healthy weight and identify overweight and obese youth who may be at risk for health problems, refer and follow up with students who may need to see a health care provider... also educates and advocates for changes in school and district policies that promote a healthy lifestyle for all students” (NASN, 2014).

Among any interventions that the school nurse teacher implements in the school, the elements incorporated into the NASN's (2014) position statement should be included in order for the intervention to be considered effective. The School Nurse Toolkit (NASN, 2014) provides school nurses with basic information on how they can prevent obesity in their school system. Some of the recommendations that this organization has for school nurse teachers trying to prevent higher rates of obesity in their schools include early recognition of trends in weight, being a role model, referring students and families to dietitians, partnering with community leaders and staff member to create wellness policies and programs within the school, and ultimately educate students about weight, exercise and healthy eating in a variety of ways (NASN, 2014).

Within the scope of practice for the registered school nurse teacher, childhood obesity can be detected with the utilization of screenings such as height/weight, BMI, blood pressure, and assessing the neck region for acanthosis nigricans, evidence of Type 2 Diabetes Mellitus (NASN, 2014). Should the student be recognized as overweight or obese, the school nurse teacher may identify community resources and refer the student for further assessment and treatment and create a care plan for the student that incorporates modifications to the child's lifestyle at school and home (NASN, 2014). While including the parents, education and support

regarding healthy diet and exercise is essential, in addition to providing follow up meetings to ensure the child is trending towards improvement in weight and overall health. The school nurse is expected to be a role model to the students, their parents, and staff (NASN, 2014). This is done by promoting the consumption of healthy foods and increasing the amount of time spent on daily physical activity, as well as providing direct education about the risk factors for those that are overweight/obese, and how to prevent obesity and its complications, based on the evidence provided from the American Academy of Pediatrics' recommendations for diet and daily exercise (AAP, 2014).

In the toolkit, NASN (2014) suggests that the school nurse is the primary force in creating policies within the school that relate to youth-wellness and creating and hosting programs which are held before, during, or after school that encourage students to eat healthy and become more physically active in a fun way. The school nurses are also the perfect advocates for things such as nutritious lunches, access to drinking water sources, daily physical education classes, sustained recess, proper youth- community education opportunities, and further research about the causes and effects of childhood obesity, and which interventions are proven to be effective.

There are several avenues that the school nurse can try in order to overcome multiple barriers and provide a healthful learning experience for both students and their families. Because parental involvement is an important aspect in preventing childhood obesity in schools, the school nurse teacher should understand what the parents' perception is when they are asked if they feel that school nurses do enough to provide their children with a health conscious environment (Murphy & Polivka, 2007). As the results may differ depending on several factors, the majority of parents want to know about a child's weight issue via a letter sent home after a BMI screening; yet very little of these parents wanted to have a face to face conversation with the nurse about this issue (Murphy & Polivka, 2007). Parents wanted to see schools provide their children with more physical education classes, more nutritionally balanced meals, and eliminate

junk food machines within the school (Murphy & Polivka, 2007). Physical activity programs built into the school curriculum can have a positive impact on childhood obesity prevention (Shaya, Flores, Gbarayor, & Wang, 2008). Asking parents how they believe childhood obesity can best be prevented during the school day may help the school nurse teacher engage the parents and ultimately partner with them to bring about the healthful results that the child needs.

Communication between the school nurse, students and families can be a major barrier for the school nurse when providing the families with effective education about healthy lifestyles and obesity. Motivational interviewing involves the school nurse teacher having to incorporate four elements in a discussion: actively listening to the concerns and opinions of the interviewee, obtain consent from the interviewee before providing specific information, following up with the interviewee by summarizing what they have stated, and keep a constant awareness of the interviewee's change talk (Soderlund, et al., 2010). A total of 91% of nurses felt that motivational interviewing was compatible to a large degree with their value and norms of how pediatric healthcare should work as well as being advantageous over traditional advice giving (Soderlund, et al., 2010). Other comments made by nurse respondents included, "motivational interviewing is better for influencing client motivation and behavior," and "believe it is simple to implement" (Soderlund, et al., 2010). Motivational interviewing being used to break the communication barrier was shown to be effective as more than half of the participants were able to visually observe progress in a child's weight after using it, and about half of the participants continued to incorporate it in their everyday practice (2010).

Continuing to minimize the communication barrier in discussing childhood obesity with students and families, a program known as CHEER, Communicating about Health, Exercise, and Eating Right, had a focus on the reduction of BMI amongst students in two elementary school districts (Resnik, et al., 2009). This educational program can be implemented by school nurses to parents who would prefer some guidance on how to fight against and already existing overweight or obesity problem within their home. Once CHEER (2009) had been implemented, it was found

that more students and parents were consuming the recommended amounts of fruits and vegetables as compared to before. Additionally, while 58% of students watched less than two hours of television a day prior to the implementation, the percentage had increased to 76% (Resnik, et al., 2009). A satisfying result from this method was the 2.41 point reduction in BMI amongst students following CHEER (Resnik, et al., 2009). Children and their families had taken the path to a healthier life, and 88% of parents would recommend this program to others. The study had made the suggestion that, based on its results, school nurses would benefit by taking advantage of an emailing system, asking parents to complete a quick survey, and develop programs within the school that are intriguing to both parents and students. Having community leaders that may volunteer to create or provide informative websites and brochures for the community would also provide positive results in the fight against obesity. In the end, parents may feel more confident while discussing ways to make their child healthier.

Children are growing up in a time where computers are central to everyday functioning. Internet can be used for fun and games, communicating with others, obtaining information on subjects like health and wellness, and so much more (Hohman, et al., 2012). Parents accessing the Internet for information on health were more likely to be parents of overweight children (Hohman, et al., 2012). High Five for Kids (2012), a computer and internet program, provided an interactive experience for parents wanting to learn about childhood obesity and healthy living (Hohman, et al., 2012). Because there are so many people that have access to the Internet, whether it is because they own a computer or other device in their homes, or have access to the public library's Internet, having a computer-based intervention may be helpful for school nurses to utilize to contact parents. The Institute of Medicine voices concerns about how interventions should be implemented, and recommends that "multi-component efforts to address the complexity of childhood obesity" be included, making the Internet a great method to engage parents in taking action to help themselves and their children (Hohman, et al., 2012). School nurses may be able to create web pages within the school's website that speak to the concern of their school's issue on childhood obesity, and interact with parents in this manner.



The benefits of online tutorials that aid a school nurse teacher in discussing issues related to childhood obesity with families of students has shown evidence of efficacy and acceptability (Steele, Wu, Cushing, & Jensen, 2013). Tutorials help school nurses lessen their perceptions of the barriers regarding communication about childhood obesity with families (Steele, Wu, Cushing, & Jensen, 2013). When school nurse teachers engage in online tutorials, they are better able to serve their students and families such as: Addressing an obesity issue, discussing the barriers relating to losing weight or eating healthful, educating families about the short and long term consequences to health related to obesity, motivating families to act on their present weight related issues, and making referrals to both students and families (Steele, Wu, Cushing, & Jensen, 2013). Each of these are duties that the school nurse teacher needs to fulfill to achieve positive changes in relation to childhood obesity (NASN, 2014).

School nurse teachers today have been recognized for their successes in preventing childhood obesity within their school systems. Research has demonstrated that when children are actively involved in a childhood obesity prevention program, they are more likely to stay committed to the plan for a longer duration of time (CDC, 2014; NASBE, 2014). Activities such as board games, student-led seminars, or health fairs can be utilized by the school nurse to get the weight related message across to children (Shaya, Flores, Gbarayor, & Wang, 2008). Utilizing the Internet to get donations that would be directed towards setting up programs in the school to promote health and wellness for students may be beneficial for both the school nurse and students (Kelly, 2014). The school nurse may implement policies such as healthy snacks are only to be eaten while at school, and sixty minutes of activity during the school day is required. The school nurse can work with the teachers to ensure that students meet the policy requirement, and had even designated some time to create a supplemental nutrition course for students (Kelly, 2014). The nurse utilizes the internet to obtain the funding needed to initiate specific health policies, partnered with other leaders to gain support, and basing the interventions around the growth and development of the student body.

Using existing interventions but engaging more people is another effective option that school nurse teachers can implement to reduce their school's obesity issues (Agrawal, Hoffman, Ahl, Bhaumik, Healey, Carter, & Castaneda-Sceppa, 2012). Because schools offer physical education and health services to students during the day, it is possible that the school nurse partner with the physical education instructor and promote a family evening that supports healthy eating and an open gymnasium, such that exists in the We Can! initiative (Agrawal, et al., 2012). The We Can! Initiative, also known as, "Ways to Enhance Children's Activity & Nutrition", helps families live healthier and more active lifestyles by providing them with resources, community outreach programs, and science based education programs (NIH, 2015; USDHHS, 2015). This type of implementation will allow for school personnel and families to be more interactive and form more of a team approach to promoting health in young children (Agrawal, et al., 2012). In Rhode Island, the We Can! Program, which originates from the National Institute of Health is projected to reach out to more than just schools, but to communities across the state (RIDOH, 2014). Additionally in Rhode Island, The Great Outdoors Pursuit (2014) is another initiative that encourages families to become more active by exploring nature. This is a fun, active program designed for adults and children to become more healthy and active while exploring Rhode Island's state parks. Seven pursuits are offered within twelve weeks for families to attend, and with each pursuit, the families can engage in free, or low cost activities such as hiking, biking, kayaking and rock climbing (Rhode Island Great Outdoors Pursuit, 2015).

Partnering with the homeroom teachers has also shown to reduce the rate of childhood obesity in school systems (Johnson, et al., 2013). Educating the teachers about the health consequences related to childhood obesity and how to prevent health deterioration may help engage school teachers in incorporating health education into everyday curriculum (Johnson, et al., 2013). The teachers may instruct students on 7 health concepts: Portion control, choose fruits and vegetables, health snacks, drink more water and less sugary drinks, less screen time and more activity, and eating a nutritious breakfast (Johnson, et al., 2013). If the teacher has very little room in the curriculum to add healthful topics to already existing subjects, help from a

librarian can be utilized, who can provide children with books that tell children about healthy habits (Johnson, et al., 2013). It has been suggested that the school nurse can use motivational interviewing to help encourage teachers to incorporate healthful messages into the everyday classroom curriculum (Johnson, et al., 2013).

Whether school nurse teachers use the internet, an open gymnasium night, or student led seminars as their means for communicating with families about the issues related to childhood obesity, there are a multitude of effective interventions that can be chosen to promote health and wellness in the school setting and community. Nurses can make an impact on students and families through education practices and partnerships with school personnel to reduce childhood obesity. To be successful, the school nurse teacher may take many different approaches in order to meet the unique learning needs and interests of the students and families. With the utilization of several intriguing and effective interventions, the school nurse may see improvement in the school's overall health status, and a reduction in childhood obesity rates.

### **Implications for Nursing Practice**

Childhood obesity is a growing concern for children all around the United States and several methods to reduce the number of obese children in schools have been implemented and deemed either effective or ineffective (Agrawal, et al., 2012; Hohman, et al., 2012; Johnson, et al., 2013; Kelly, 2014; Morrison-Sandberg, Kubik, & Johnson, 2011; NASN, 2014; Steele, Wu, Cushing, Jensen, 2013; Soderlund, et al., 2010). Described previously are interventions that have been implemented by school nurse teachers across the globe that have been proven to be effective for many school systems. It should be recognized that every school system is unique; while one school district found a specific intervention had remarkable results on BMI of the student body, there may be little to no improvement in another district. The purpose of this paper was to identify the barriers and educational practices that school nurse teachers have the most difficulty in overcoming and collect as many effective interventions as possible that are directed towards reducing the rate of childhood obesity.

Recognizing perceptions of others regarding childhood obesity is a wise first step for school nurse teachers to begin managing the health problem. The nurse, objectively, determines the issue centered on obesity in the school and whether others view the problem in the same manner. The barrier to communicating with children and families is an obstacle for many school nurse teachers. Therefore, nurses may turn to online tutorials, or other methods for guidance on how to initiate discussion with families on this sensitive subject.

Childhood obesity is a big problem that will take some time to resolve. Rather, it is an ongoing struggle that school nurses are likely to continue to face in their school systems for a number of years. The prevention of childhood obesity requires multiple methods of interventions because every individual, family, and community is different. An assessment of the school system and community at large is important before initiation of interventions. Engaging and gaining support of community members is critical to helping children in many ways such as

creating a safe environment for children to walk or bike to school, or building playgrounds, and partnering with local businesses to make fruits and vegetables more easily accessible to families.

Additionally, while children are spending much time in their days in school, speaking to educators about incorporating physical fitness into their classroom learning activities may be beneficial. School nurse teacher may feel more confident in their ability to be effective in minimizing childhood obesity in their schools when they are presented with several methods and ideas for implementation. School wellness committees are found to have much success when their finances are able cover the expense programs within the school system (Kelly, 2014). This can be done through Internet sources that encourage visitors to donate financial assistance towards the success of a wellness program. Also, the school nurse teacher is not solely responsible for preventing or reducing childhood obesity incidences within a school community; it is a team effort that includes the students, families, educators, medical personnel, such as the nurse and social worker, and all others that may interfere with the health of a child.

### **Nursing Student Implementation**

Information was provided by several nursing studies on the barriers of communication with parents and students about childhood obesity and learning how school nurse teachers from around the world are battling the epidemic in their school systems. The researcher had chosen to take some of the ideas that have proven to be effective, and share them with school nurse teachers across Rhode Island. School nurses across Rhode Island communication via an emailing system, discussing issues that nurses are faced with, looking for some advice on a given topic and communicating on specific dates for school nurse meetings. This method of communicating with other nurses has proven to be easy and acceptable to use. The researcher created a pamphlet that highlights important childhood obesity facts and statistics, lists the recognized barriers that school nurses have identified, and provides a chart of specific interventions that the school nurse may want to utilize to help reduce the number of children who are overweight and obese in school. The plan is to have pamphlet be accessed online via an emailing system such as the one that Rhode Island school nurses are utilizing, as an attachment to a mass email.

Because the elementary school students in the United States have been increasing in their overall weight, it is important that nurses have a variety of methods that they can choose to implement within their school system to determine which intervention may be most easily implemented and effective in their specific school. Every school has unique characteristics in their student body as well as differing levels of family and community involvement. The student body is unique because of the various cultures and ages that attend the school. The extended involvement in the school such as the families of the students as well as the community, at large make each school system unique as well. This pamphlet will provide information and interventions that may have a positive impact on how the school nurse teacher can help in preventing and decreasing childhood obesity in their school community.

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Addendum A.

**Resources**  
 NATIONAL ACADEMY OF SCIENCES, NATIONAL CENTER FOR DIETETIC CONTROL & PREVENTION, DEPARTMENT OF MEDICINE, AMERICAN ACADEMY OF PEDIATRICS, NATIONAL INSTITUTE OF HEALTH, NATIONAL HEALTH EDUCATION CENTER, US DEPARTMENT OF HEALTH & HUMAN SERVICES, AMERICAN HEART ASSOCIATION

**The Facts:**  
 \*In 2013, 42 million American children were overweight or obese.  
 \*If trends continue, 70 million children will be obese by 2025.  
 \*Healthcare expenses related to obesity are \$147 billion, annually.  
 \*This epidemic is a potential threat to our national security... \*US Army General (2010)

**In Rhode Island (2011):**  
 Obesity Rate (2-4 yrs) 16.6%  
 Rank Among States 2.44  
 Obesity rate (10-17 yrs) 12.2%  
 Rank Among States 41.51

**10 Most Commonly Identified School Nurse Teacher Barriers in Reducing Childhood Obesity at School**  
 1. Communication with Families and Students  
 2. Self Competence  
 3. Personal weight challenges  
 4. Lack of time/job description  
 5. Lack of Support  
 6. Fear of Reaction  
 7. Differing Cultural Practices  
 8. Family Challenges (Money, perceptions)  
 9. School System Barriers  
 10. Today's Trends and Societal Factors

**Education Practices**  
**To Better Understand How to Communicate:**  
 \*Discover what interests your audience  
 \*Motivational Interviewing  
 \*Visual Aids, Nutrition Labels  
 \*Group Games  
 \*Play Food Pyramids  
 \*Concrete Terminology  
 \*Determine Family's perception of "health"

**To Understand Childhood Obesity:**  
 \*Definition of Obesity 3% Overweight  
 Obese:  
 BMI @ >27\* percentile  
 Overweight:  
 BMI @ >19\*, <27\* percentile  
 Normal:  
 BMI 19\*-27\* Percentile  
 \*Read research through the topic  
 \*Educational Websites: CDC & NIA  
 \*NASN for specific interventions

**Effective Interventions to Try**  
 Continuation of early detection methods  
 BMI Screenings, Physical Fitness Tests  
 Open Family Fun Nights at the School Gym  
 Partner with Community Organizations to host Health & Wellness Fairs  
 Student Led Health Seminars  
 Taste Testing in the Classroom  
 Safe Walkways to School Program  
 Encouragement of Sporting Activities  
 Private Health Talks/Referrals to Students in Need  
 Weekly Handouts on Health Promotion (Recipes, Exercise challenges, tips)  
 Utilizing the Internet to Partner with Families  
 Curriculum Substitution: More movement in the classroom and health teaching with each subject  
 Motivational Interviewing During Health Talks  
 Utilization of Professional Development Tools such as NASN's School Nurse Toolkit  
 School Wide Healthy Eating Exercise Competitions  
 Continuation of Physical Education, Recess Periods, and Field Day Events  
 School Visit Garden & Healthy Lunch Policies  
 Make Healthy Lifestyle Fun for Students and Families!

**Weighing the Issue on Childhood Obesity: What School Nurse Teachers Need to Know**

**The Facts**  
 Current Research  
 Potential Solutions for Your School  
 Together, we can make Rhode Island Children Healthy & Happy!

**How to Engage Students to Be Healthy**  
 In the Lunchroom: Fight out healthy foods  
 Make a yearbook project  
 Explain benefits of certain food groups  
 Identify Portion Distortions  
 In the Classroom: Changes in curriculum  
 Nutrition Discussions  
 Physical Education  
 In the Playground: Encourage sporting games  
 More access to activities  
 Annual Health Dialogues  
 Offer healthy snacks  
 In the Home: Unique Recipes that are affordable and diverse  
 Health Promotion Letters  
 Nutrition Mandates

Figure A. Pamphlet created and will be distributed to school nurse teachers in Rhode Island to guide them in minimizing childhood obesity in their school system.



Author	Year	Location	Obj. 1	Obj. 2	Obj. 3	Used in ROL	Source
Agrawal	2012	USA			X	X	Qualitative
Agron	2010	USA					Quantitative
AAP	2014	USA	X	X	X	X	N/A
AAMFT	2014	USA					N/A
AHA	2014	USA				X	N/A
ANA	2014	USA					N/A
Arkansas	2010	USA		X		X	News Article
Banks	2011	UK	X			X	Quantitative
Ben-Sefer	2009						Lit. Review
Berkowitz	2009						Lit. Review
Bonde	2014	Denmark	X			X	Qualitative
Borup	2010	Sweden		X		X	Quantitative
Bryan	2013	USA					Lit. Review
CDC	2014	USA	X	X	X	X	N/A
Childhood	2011	USA					N/A
Christeson	2010	USA				X	Article
Davies	2014	USA					Lit. Review
Della Torre	2010	Switzerland					Qualitative
Heitmann	2009						Lit. Review
Hoffman	2012						Documentary
Hohman	2012	USA			X	X	Cross-Sectional
IOM	2014	USA				X	N/A
Jain	2013	USA					Qualitative
Johnston	2013	USA			X	X	Quantitative
Kelly	2014	USA		X	X	X	Qualitative
Kubik	2014	USA		X		X	Cross-Sectional
Gollust	2014	USA					Quantitative
Lazarou	2010						Lit. Review
Lemelin	2012						Interpretation
Li	2010						Quantitative
Magnusson	2012	Sweden					Qualitative
Mareno	2014	USA					Concept Analysis
Maughan	2011	USA					Qualitative
Mayer	2010	USA		X		X	Descriptive
McKay	2014	USA					Article
Melin	2009	Sweden		X		X	Quantitative
Morrison-Sandberg	2011	USA			X	X	Quantitative
MPL Geraldts	2012	Netherlands					Qualitative
Mullersdorf	2010	Sweden					Qualitative
Murphy	2007	USA			X	X	Quantitative
NASN	2014	USA	X	X	X	X	N/A
Nauta	2009	USA	X	X		X	Quantitative
O'Brien	2012						
Pbert	2013						Qualitative
Prokop	2011	USA			X		Lit. Review
Penn & Kerr	2014	Multiple	X			X	Lit. Review
Quelly S.B.	2014	USA	X			X	Lit. Review
Quelly S.B.	2014	USA	X			X	Quantitative
Regber	2013	Sweden	X			X	Mixed
Resnik	2009	USA			X	X	Quantitative
Seal	2011						N/A
Shaya	2008	USA			X	X	Lit. Review
Smith	2010						Annotated Bib.
Speroni	2014						Lit. Review
Stalter	2011	USA					Cross Sectional
RIDOH	2014	USA	X		X	X	N/A
Steele	2011	USA	X		X	X	Qualitative
Steele	2013	USA	X		X	X	Quantitative
Story	2006						Lit. Review
Soderlund	2010	Sweden			X	X	Cross-Sectional
Tuckson	2013						
USDHHS	2014	USA					N/A
Water	2011						
WHO	2014	USA	X	X	X	X	N/A
Wu	2011	USA	X			X	Qualitative

**Table A:**  
sources were  
gather

about childhood obesity. This table shows which articles fulfilled each objective of the paper. Twenty research articles were used in the review of literature.

Sixty six  
used to  
information

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THE SCHOOL NURSE TEACHER'S ROLE IN PREVENTING CHILDHOOD OBESITY AT  
SCHOOL: A LITERATURE REVIEW OF NURSING RESEARCH

An Undergraduate Honors Project Presented

By  
Melissa R. Pelletier

To  
Rhode Island College  
School of Nursing

Approved:

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Project Advisor

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Chair, Department Honors Committee

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