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School Nurses' Perceptions of Their Role in Healthy Eating School Environments

Jean Muckian

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SCHOOL NURSES' PERCEPTIONS OF THEIR ROLE IN HEALTHY
EATING SCHOOL ENVIRONMENTS

by

Jean Muckian

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

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ABSTRACT

SCHOOL NURSES' PERCEPTIONS OF THEIR ROLE IN HEALTH EATING SCHOOL ENVIRONMENTS

by

Jean Muckian

The University of Wisconsin-Milwaukee, 2015
Under the Supervision of Dr. Julia Snethen

School nurses provide health services within schools, as healthy children have a greater potential for optimal learning. Farm to School programs to increase fruit and vegetable intake have been initiated to promote health in many schools. However, the prevalence rate in Wisconsin of children who are overweight is 13.4%, with 15.4% of children categorically obese. Limited information is available related to school nurses' knowledge of their role in promoting the Farm to School program to advance the health of school children. The purpose of this study was to examine school nurses' knowledge about the Farm to School program in Wisconsin. A secondary aim was to examine school nurses' perception of their role in promoting increased fruit and vegetable consumption in the school setting.

A qualitative focus group design was used for this investigation, with a purposive sample of school nurses. School nurses were asked to participate in a focus group to share their perspectives in one on the Farm to School program in Wisconsin, and discuss their role in promoting the health of children. Data was recorded and transcribed verbatim, and then analyzed using a thematic analysis format.

A majority of the 15 participants in the study were BSN prepared (73%), had been a school nurse for more than 7 years (73%) and provided nursing care to 750-999

students (53%). Themes that emerged from the focus groups included: *If there were more of me, I could do more*; *Food environment in schools*; *School nurses promote health*; *Obesity is a sensitive issue*; and *Influences of policy on wellness*.

School nurses reported having limited knowledge of the Farm to School programs or how the programs were implemented. Although childhood overweight/obesity was reported as being a health concern, participants did not spend a lot of time at school specifically addressing childhood obesity. School nurse addressed health issues more broadly in their roles as educators, collaborators, advocates and role models of healthy behaviors.

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Chapter One

School Nurses' Perceptions of Their Role in Healthy Eating School Environments

School nurses are responsible for overseeing school health services and promoting health education, as children who are healthy have a greater potential for optimal learning (National Association of School Nurses, 2011). A major health issue that children within the school system have been experiencing is excess weight and obesity (Budd & Hayman, 2008) though programs to increase fruit and vegetable consumption have been initiated to prevent the development of childhood overweight and obesity (USDA, 2007). Increased fruit and vegetable consumption has been encouraged through Farm to School programs developed to improve the nutritional value of lunches while also giving farmers an outlet for their produce (USDA Food and Nutrition Service, 2013).

School nurses are reported in the literature to be responsible for health promotion and services within the school, but limited specificity is provided about the school nurse role (NASN, 2011; DPI, 2011; RWJ, 2010). Nothing was found in the literature on the school nurse's role in relation to the Farm to School program, though the program promotes the health of children, which is one of the roles of the school nurse (Wisconsin Farm to School, 2014). It remains unclear why there is limited information in the literature related to school nurses and their role in promoting dietary health specifically with the Farm to School program.

The Role of the School Nurse in Health Promotion

The National Association of School Nurses and the American Nurses Association (NASN/ANA, 2011) describe the role of the school nurse as: (a) a leader who supervises and participates in the creation of health policies and programs in the school, (b)

promotes health education, (c) serves as liaison between the school and community, (d) conducts health screenings, (e) cares for children with chronic health conditions, (f) provide care for physical as well as mental health issues. The goal of the school nurse is to assure that school children are healthy as a healthy child has a greater chance of academic success.

School nurses have many roles including collaborating inter-professionally to create a healthy and safe school environment (NASN, 2011), including promoting a healthy eating environment (NASN, 2013). Similarly, the Robert Wood Johnson Foundation (2010) describes the role of school nurses as a multifaceted one that provides care for chronically ill children, promotes health, and acts as a liaison between the health needs of children and the community. School nurses in Wisconsin have similar roles as those reported in the NASN (2011) guidelines: provide health services for school children, conduct health screenings, and promote healthy, safe school environments.

Wisconsin school nurses are licensed by the State, and in preparation for their role, must complete a course in community health. Additionally, school nurses collaborate with parents, students, community leaders and school administrators to develop wellness policies as required by the National School Lunch Program (Wisconsin Department of Public Instruction, 2011). Wellness policies are one way that school nurses can promote healthy eating within the school environment and address childhood obesity.

Farm to School Programs

Increased access to fruits and vegetables in the school setting is one of the goals of the USDA sponsored National Farm to School program. After conducting two successful

farm-to-school pilot projects in California and Florida, the United States Department of Agriculture Initiative for Future Agriculture and Food Systems (Kish, 2008) supported a Farm to School (F2S) program starting in 2000. The F2S program provides grants to qualifying school districts for training, equipment, planning, developing partnerships, school gardens, and implementing the program (National Farm to School Network, 2012), and is available in all 50 states.

Wisconsin Farm to School Programs (F2S)

The Wisconsin Farm to School program is currently in more than 200 of the 457 school districts in Wisconsin (S. Elliot, personal communication, December 2, 2014). The CDC (Dietz, 2009) recommends expansion of Farm to School (F2S) programs as one strategy communities can use to increase fruit and vegetable consumption in children and potentially prevent childhood obesity. Although Farm to School programs are relatively new to school districts, data suggests improvement in students' knowledge and attitudes regarding fruits and vegetables (LaRowe, Yoder, Knitter, Meinen, Liebhart, & Schoeller, 2012). Additional research is needed to examine the long-term effects of Farm to School programs and its impact on students' dietary behaviors and BMI. No information was found in the research literature related to elementary school nurses' knowledge of F2S programs or the nurses' perceived role in F2S programs.

School Nurses Role in F2S Programs

In 2006 by the United States Congress mandated school wellness policies for all public schools that participate in the National Lunch Program and the School Breakfast Program source (<http://www.schoolwellnesspolicies.org>). The Wisconsin State Department of Public Instruction (2013) identifies school nurses as key stakeholders in the creation of

school wellness policies. School wellness policies are one method for including Farm to School programs in schools (Davidson, 2012).

Childhood Obesity

Childhood overweight and obesity is defined by the body mass index (BMI) and is calculated by dividing the weight in kilograms by the height in meters squared (Ogden & Carroll, 2010). Children's BMIs vary according to age and gender, as reflected by the CDC's BMI growth charts in which age and gender differences identify children as categorically overweight or obese (Ogden, Carroll, Curtin, Lamb & Flegal, 2010). In an effort to address more effectively the identification of excess weight in children, an American Academy of Pediatrics' (AAP) expert committee in 2007 recommended changes in the parameters for childhood overweight and obesity. The new parameters categorize children and adolescents with a BMI between $\geq 85\%$ and $< 95\%$ for age and gender as overweight, and those with a BMI of $\geq 95\%$ for age and gender as obese.

Significance of Childhood Obesity

Co-morbid conditions associated with childhood obesity impact a child well before adulthood (Bor, 2010). Overweight or obesity in childhood can lead to the development of many secondary health conditions, such as hip misalignment, sleep apnea, psychological alterations, type 2 diabetes, and cardiovascular alterations such as hypertension (Bor, 2010; MMWR, 2011). Additionally, children who are obese are more likely to continue to have elevated weight, and experience obesity in adulthood (Lakshman, Elks & Ong, 2012).

Prevalence of Childhood Obesity

The CDC conducted a survey analysis of childhood overweight and obesity trends (Ogden, Carroll, Kit & Flegal, 2012) using data collected from the National Health and Nutrition Examination Survey (NHANES). Between 2007-2008 and 2009-2010 there was no significant increase in the prevalence of childhood obesity among all age groups. For children aged 6-11 years obesity rates increased from 6.5% to 19.6% between 1980 and 2007-2008. The obesity rates decreased to 18% for this age group in 2010 (Ogden, Carroll, Kit & Flegal, 2012). According to Ogden et al. (2012), the significant trend of childhood obesity increased during the 12- year period from 1999-2000 to 2009-2010 in all male children between the ages of 2 and 19 years. Between 2005 and 2008, the National Health and Nutrition Examination Survey (NHANES) the CDC and the National Center for Health Statistics (NCHS) reported 17.4% of children aged 6 to 11 years were obese. *Healthy People 2020* obesity target for children 6-11 years is 15.7% (Healthy People.gov, 2013).

Currently the prevalence rate for childhood overweight (BMI \geq 85% to $<$ 95% for age and gender) and obesity (BMI \geq 95% for age and gender) in the United States is 31.8%. The prevalence rate includes children and adolescents in all racial and ethnic groups between 2 and 19 years of age, suggesting a childhood obesity epidemic and public health concern in the United States. However, BMI reflects a ratio between one's weight and one's height and is not considered a perfect measure for overweight or obesity (Ogden et al., 2012).

Prevalence rate data are not publically available for elementary school aged children between the ages of 6 and 11 years; however, prevalence data in Wisconsin for

obese children age 10 through 17 years of age is 13.4%. Only 12 states rank higher than Wisconsin in the prevalence of childhood obesity in the 50 states (Robert Wood Johnson Foundation, 2013).

Schools in Wisconsin are not required to assess BMI measurements, however, the Wisconsin Department of Public Instruction reports 41% of schools measured children's BMIs and sent reports to the parents (Wisconsin Nutrition and Physical Activity Program, 2013).

USDA in School Lunches and Childhood Obesity

Several researchers have suggested that the USDA and its policies regarding the United States food supply have played a role in the increased obesity prevalence rates in the U.S. (Wallinga, 2010; Jackson, Minjares, Naumoff, Shrimali & Martin, 2009; Hofferth & Curtin, 2009; Wallinga, Schoonover, & Muller 2009). Wallinga (2010) reports that agriculture policy provides farmers with subsidies that encourage them to produce low-cost, calorie-dense crops such as corn and soybeans that accounts for extra fats and sugars in the American diet. The average American consumed an increase of 300 calories (ages not specified) per day between 1985 and 2002 in which half of the calories consumed consisted of refined grains, one quarter of the calories consumed consisted of added fat, and one quarter of the calories consisted of added sugar (Wallinga, 2010; Putnum, Allshouse & Kantor, 2002).

According to Jackson, Minjares, Naumoff, Shrimali and Martin (2009) there is a relationship between the USDA's regulations related to the U.S. food supply and childhood obesity. Jackson et al. (2009) reported that Federal farm subsidies encourage the production of calorie-dense foods, yet do not subsidize healthier fruits and vegetables.

Less than 4% of the cropland in the U.S. is used for fruit and vegetable production compared to 74% of the cropland used for 8 commodity crops (corn, wheat, cotton, soybeans, rice, barley, oats and sorghum). Eighty percent of the commodity crops are subsidized and then are processed into foods with added fats and sugars.

There are inconsistencies within the USDA regarding the consumption of fruits and vegetables and the production of commodity crops. Farmers who grow fruits and vegetables, the so-called “specialty crops” do not receive any direct subsidies for their crops (Jackson et al., 2009). According to Jackson et al. (2009), if consumers began to eat the amounts of fruits and vegetables recommended by the USDA, there would not be an adequate supply of fruits and vegetables available for consumption. An example Jackson et al. (2009) provided was that only a little over a cup of vegetables per day per adult are produced by farmers, yet the USDA dietary guidelines recommend adults consume a minimum 2 cups of non-starchy vegetables per day.

Hofferth and Curtin (2005) examined the relationship between federally funded food programs and obesity in children aged 6 to 11 years. The authors found that participants in the National School Lunch Program (NSLP) consumed 115% more of the recommended dietary allowances than non-NSLP participants who brought their lunches from home. Hofferth and Curtin (2005) also found that children from low-income households who participate in federally funded food programs such as the National School Breakfast Program or the National School Lunch Program did not have discretionary income to purchase foods that are available in vending machines, snack bars or school stores defined as competitive food. Consequently, the researchers suggested that increased BMIs in children who participate in the National School Lunch

Program might be related to a child's food selection (preference for eating larger meals and meals with increased fats) rather than participation in a federally funded food program.

Wallinga, Schoonover and Muller (2009) have examined the role of USDA agriculture policies in relation to obesity. According to Wallinga et al. the USDA administers 15 food assistance programs in the U.S. while also supporting agricultural policies that encourage overproduction of commodity foods. An overproduction of commodity foods, such as corn and soybeans, enables the creation of processed foods that are high in calories and low in nutrition. Additionally, more fats, sugars, and grains are produced than required by the 2005 USDA Dietary Food Guidelines (Krebs-Smith, Reedy & Bosire, 2010). In 2005, the USDA recommended that children consume 2 cups of vegetables and 2 cups of fruits per day, yet only a little over a cup of vegetables are produced and only 2/3 cups of fruits are produced per child, per day (Jackson et al., 2009).

The USDA administers the National School Lunch Program and enacted changes in January 2012 to improve the nutrition available in school lunches. The changes require the school lunches include four food groups: meat or meat alternate, grains or breads, fruits and vegetables, and milk. The USDA also administers the National Farm to School program, which provides schools with access to increased amounts of fruit and vegetables.

Statement of Purpose

The purpose of this study was to examine school nurses' knowledge about the Farm to School program in Wisconsin. A secondary aim was to examine school nurses'

perception of their role in promoting increased fruit and vegetable consumption in the school setting.

Research Questions

The specific research questions are:

1. What experiences have school nurses had with Farm to School programs?
2. What are school nurses' perceptions of Farm to School programs?
3. What are school nurses perceptions of their role in promoting fruit and vegetable consumption in the school setting?

Assumptions

The following are the assumptions of this research study:

1. School nurses are willing to discuss their perceptions of their roles in healthy eating school environments.
2. School nurses have some knowledge of Farm to School programs.
3. School nurses advocate for increasing fruit and vegetable consumption in the school.

Significance and Justification

According to Joshi, Azuma and Feenstra (2008) little research has been conducted on the role of school teachers and food service workers in Farm to School programs. There have been no studies conducted on the role of school nurses in Farm to School programs. It has been suggested that Farm to School programs may help promote healthy weight (Chomitz, McGowan, Wendel, Williams, Cabral, King, et al., 2010). According to the National Association of School Nurses (NASN, 2013), school nurses have considerable influence on students' decision-making related to healthy food choices.

This research focus will use qualitative methodology to examine school nurses' perceptions of their role in healthy eating school environments such as Farm to School programs.

Summary

School nurses are key stakeholders in the health of children within the school and the school environment. As leaders who promote the health of children, their roles include health education and promotion that includes nutritious food choices. Childhood obesity is a chronic health condition, and foods available in schools may play a role in the development of childhood obesity. The Farm to School program is a possible solution to improving children's food choices and increasing consumption of fruits and vegetables in the school.

Key stakeholders in the Farm to School programs include food service personnel and administrators, but the research literature does not mention the pivotal role played by school nurses. The purpose of this proposed study is to examine school nurses' knowledge about Farm to School programs and their perceptions of their role in increasing fruits and vegetable consumption in the school environment.

Chapter Two

Review of the Literature

Childhood Obesity: Role of school nurses and the eating environment

Childhood obesity is a complex problem that requires individual solutions as well as community involvement, including schools (Katan, 2009). As healthcare providers within the school environment, school nurses can play an important role in the prevention and treatment of childhood obesity (Price, Desmond, Ruppert & Stelzer, 1987; Bryan, Broussard, & Beller, 2013; Walker, 2014; Quelly, 2014). However, little research has been done to examine the role of the school nurse in the prevention or treatment of childhood obesity in the school setting.

In this chapter the literature related to the school nurses' role in preventing and treating childhood obesity is reviewed as well as one strategy for addressing childhood obesity, the Farm to School programs. In addition, articles were included that addressed the food environment in schools. A review of the literature identified few articles that specifically addressed the role of the school nurse in the prevention or treatment of childhood obesity. Consequently, an integrative review format, based on the integrative review guidelines by Whittemore and Knafl (2005) was used to develop this literature review.

Researchers have studied childhood obesity interventions that used an individual or family-centered approach (Snethen, Broome & Cashin, 2006; Young, Northern, Lister, Drummond & O'Brien, 2006; Ho et al., 2013; Niemeier, Hektner & Enger, 2013). A gap is noted in the literature on childhood obesity interventions and treatment using a public health focus, and according to Cowell (2011), there is a need for studies that examine the

role of school nurses in the prevention and treatment of childhood obesity. The purpose of this integrative literature review is to examine articles addressing childhood obesity that included public health, federal policies, and interventions used by schools to prevent or manage childhood obesity.

Methods

A variety of databases were accessed in order to identify studies associated with the role (or perceived role) of the school nurse in the prevention or treatment of childhood obesity. Publications examined for the integrated review came from research journals published between October 1987 and July 2014. Four databases were used in the literature search: Cumulative Index of Nursing and Allied Health Literature (CINAHL), Pub Med, Google Scholar and Web of Knowledge using the following key words: “childhood obesity” or “overweight”, “role of school nurses”, “farm to school”, “children’s BMI”, “nutrition,” and “childhood obesity prevention.” The key words “food in schools” or “food in school environments” were used to search for articles addressing schools eating environment.

No articles were found on school nurses’ perceived role in Farm to School programs. Therefore, a more comprehensive approach was undertaken to include: (a) the role (or perceived role) of the school nurse in the prevention and/or treatment of childhood obesity, (b) recommendations for school programs that address childhood obesity, (c) current federal policies that regulate school programs, and (d) research studies that examined the efficacy of specific interventions for the prevention or treatment of childhood obesity in the school.

Inclusion criteria for the review were articles: (a) written in English, (b) addressed

either school nurses' roles (or perceived roles) in childhood obesity prevention/treatment in the schools, (c) recommendations for school nurses in the prevention/treatment of childhood obesity, (d) federal policies that are involved in childhood obesity prevention/treatment in schools, (e) specific interventions used by school personnel in the prevention/treatment of childhood obesity and (f) schools' food environments.

Of the more than 14,500 articles in the initial searches among the databases, 68 articles were chosen for the initial sample based on the title and abstract. Of the 68 articles chosen, 43 were eliminated because they either did not include school nurses in the study or they were literature reviews. Twenty-two articles were selected for the literature review. Each article was read a minimum of two times and then sorted into categories for synthesis.

Findings

The 25 articles reviewed were categorized into 4 groups. In eleven articles the role of the school nurse in the prevention or treatment of childhood obesity was examined. Four articles examined interventions used by school nurses (or interventions that could be used by school nurses) in the prevention or treatment of childhood obesity. Seven articles addressed the school environment and/or the public policies that shape the school environment. The final 3 of the reports addressed schools' food environment.

The Roles or Perceived Roles of School Nurses

The role of the school nurse was the focus of half of the reviewed publications ($n = 11$). Topics in the research literature included school nurses' perceived roles in the treatment/prevention of childhood obesity, barriers to fulfilling those roles, and parents' perceptions of the role of schools and school nurses in the prevention/treatment of

childhood obesity. The first 2 articles are from the American Academy of Pediatrics' (AAP) Council on School Health and discuss general recommendations for school nurses based on the National Association of School Nurses (NASN) in the providing health services in the schools.

Price, Desmond, Ruppert and Stelzer (1987) examined the role of the school nurse using surveys administered to a sample of 250 school nurses who are members of the American School Health Association. The purpose of the study was to get a better understanding of the school nurses perceptions of their role in addressing childhood obesity. Price et al. (1987) found that while a majority of the school nurses (65%) believed the schools were not doing enough to combat childhood obesity, less than half of the school nurses (48%) perceived it was their responsibility to counsel students and their families on health problems related to obesity. In addition, very few (25%) reported feeling competent to create a weight loss program for their students.

In an effort to further explore the school nurses perceptions, Moyers, Bugle and Jackson (2005) replicated Price et al.'s (1987) study in 2005 with school nurses and found similar results: 71% of school nurses responded that the schools were not doing enough to combat childhood obesity whereas 40% perceived it was their responsibility to counsel students and their families on health problems related to obesity. Only 26% of the school nurses felt competent in creating or recommending weight loss programs for students.

Similarly, a study was conducted by Kubik, Story and Davey (2007) who also used self-administered surveys to examine the role of school nurses in obesity prevention. A majority of the 275 school nurses (76%) reported that school health

services should be used for preventing childhood obesity. Seventy-one percent of the participants believed that school nurses were capable of monitoring obesity prevention services. However, 88% of the school nurses believed that lack of time prevented them from monitoring obesity prevention services.

The role of the school nurse was also examined in relation to actually implementing strategies for addressing childhood obesity. Gance-Cleveland and Bushmiaer (2005) sought to describe the school nurses protocol for accurately measuring students BMIs in Arkansas after legislation was passed requiring BMI measurement in schools. Therefore, the investigators examined the school nurses' role in obtaining BMI's for more than 400,000 school children in Arkansas during the 2003-2004 school year. The researchers found that of the 449,485 schools in Arkansas, 421,973 (94%) measured children's BMIs and 345,892 of the schools (82%) had statistically valid BMI measurements. Results from the BMI measurements revealed that 21% of the children measured were considered overweight; 17% were at risk for overweight; and 38% of the children were at risk of developing future chronic problems related to their weight (Gance-Cleveland et al. 2005).

In addition to physical measurements to address childhood obesity, counseling is another component of the school nurses role. Magnusson, Kjellgren, and Winkvist (2012) addressed school nurses' roles in counseling multilingual overweight students in Sweden using a qualitative method. A content analysis was conducted to examine 8 school nurses' counseling sessions with 20 overweight children in Sweden. The researchers found that the nurses used general advice on nutrition and did not offer specific recommendations based on the students' or families' needs. Similar to the study by Story

et al. (2002), the findings from the study suggested a need for school nurses to have more nutritional knowledge to help them counsel children about eating habits.

The prevention of childhood obesity was also reported in the literature, in a study conducted by Morrison-Sandberg, Kubik, and Johnson (2011). The investigators interviewed 21 licensed school nurses (LSNs) using a semi-structured interview guide to better understand the roles, beliefs, and thoughts of the LSNs regarding school-based obesity prevention programs. Approximately 50% of the respondents stated they were involved in childhood obesity prevention such as National Association of School Nurses (NASN) *School Nurse Childhood Obesity Prevention Education* (S.C.O.P.E) program. Ninety percent of the school nurses reported using secondary prevention methods in addressing childhood obesity by monitoring children's height, weight, and blood pressure. The school nurses reported lack of time as a perceived barrier in providing obesity prevention services, which is similar to the findings reported by Kubik et al. (2007).

Murphy and Polivka (2007) examined parents' perceptions of the role of the school, as well as the school nurses, in the prevention and treatment of childhood obesity. In this study, parents (N=117) were asked to share their perceptions of the school's role in preventing and treating childhood obesity. A majority of the parents (60%) responded that schools should provide treatment for childhood obesity if the parents or child requested treatment. Eighty percent of the parents reported that the schools should use BMI measurements to screen for childhood obesity and 68% of the parents wanted to be notified of their child's BMI.

Kubik and Lee (2013) wanted to know if parents would be interested in a school-

nurse led weight management program and to determine if there was a difference in the interest level between overweight children and normal weight children. Two hundred eighty-one parents of second and fourth grade students in a Midwestern public school district were invited to complete a survey regarding elements of a school nurse led weight management program. The final response rate was 43% (n = 122).

Most of the parents who participated in the study were female, White, and had more than a high school education. Parents of 47 children (38%) reported their child was overweight. More parents of overweight children were concerned about their child's weight than parents of normal weight children (68% vs. 28%; $p < .0001$). In addition, more parents of overweight children were more interested in participating in an after school weight management program than parents of normal weight children, although not statistically significant (61% vs. 49%; $p = .19$).

Kubik and Lee (2013) also found that parents of overweight children were more interested in participating in a parent support group than parents of normal weight children (54% vs. 39%; $p = 0.10$). Lastly, more parents of overweight children were interested in meeting with the school nurse to discuss dietary choices and physical activity than parents of normal weight children (56% vs. 44%; $p = 0.22$). It is important to note that while the study was conducted to better understand parents' interest level in school nurse led weight management program, the researchers did not indicate whether the program was ever conducted. The investigators simply suggested a school nurse led weight management program might be a role school nurses could fill to address childhood weight concerns (Table 1).

Author(s)	Year	Role/Relationship to Role
AAP, Council on School Health	2008, 2013	Policy statement
Price et al.	1987	School nurses' perception of their role
Moyers et al.	2005	School nurses' perception of their role
Murphy et al.	2007	Parents' perceptions of school nurses' role
Kubik et al.	2014	Parent interest in school nurses' role
Magnusson et al.	2012	School nurses' assessment of their role
Story et al.	2002	Needs assessment of school nurses' role
Kubik et al.	2007	Role of school nurses in childhood obesity
Gance-Cleveland et al.	2005	Role of school nurses in childhood obesity
Morrison-Sandberg et al.	2011	Role of school nurses in childhood obesity

Table 1. School Nurses Role Category

School Based Interventions to Address Childhood Obesity

In the literature it has been reported that school nurses can be instrumental in addressing childhood obesity in the schools. However, there are few intervention studies in the literature that suggest school nurses are involved in childhood obesity interventions in the schools. African-American obesity prevalence rates in Louisiana were 35.1% during the time that Edwards (2005) conducted an intervention study that focused on African-American children in the sixth to eighth grades in Louisiana. The study was conducted in the school-based health care center (SBHC) in Baton Rouge that employed a registered nurse or nurse practitioner who taught the intervention classes.

Edwards (2005) conducted a study in Louisiana to examine if nurses and nurse practitioners in school-based health center could successfully implement a weight-loss intervention with overweight or obese low-income African American eighth-grade students. Thirty-three students who were categorized as overweight or obese were invited to participate in the investigation and 28 students agreed to participate. The intervention consisted of increased physical activity and receiving nutritional information for the duration of the school year. An additional fourteen students who did not receive the intervention were enrolled to serve as the control group.

During the school year, 13 students completed the intervention, and 5 students lowered their weight and BMIs (weight loss = 33.25 lbs.). Three of the students who had gained >5 pounds in the previous school year did not lose weight, but were found to gain less (< 5 pounds) than in the prior school year. Two students in the treatment group gained > 15 pounds at the end of the school year, similar to their weight gain in the prior year. The remaining 3 students gained between 6 pounds and 14 pounds during the school year.

Three of the 14 students in the control group lowered their weight and BMIs (weight loss = 6.5 lbs.); 3 students in the control group gained < 5 lbs. during the school year; and 2 students gained >10 pounds during the school year. The remaining students in the control group (n = 7) gained between 5 and 10 lbs. during the school year. Edwards (2005) suggests that the findings indicate that weight loss interventions may be successful in a public school setting with low-income African American students.

Another intervention study, called the TEAM Mississippi Project (Greening, Harrell, Low & Fielder, 2011) was conducted with 450 school-age children (ages 6-10).

The purpose of the study was to apply Social Learning Theory to an obesity intervention program in Mississippi, a state that has the highest rates of obesity in the United States (Greening et al., 2011). Two schools were selected to participate in the study. One school consisted of a treatment group of children ($n = 204$) who participated in a 9-month program to increase their physical activity and nutritional knowledge. Students from a second school were selected to act as a control group ($n = 246$).

Pre- and post-intervention measures included the children's: (a) BMIs; (b) waist circumferences; (c) physical activity patterns; and (d) dietary habits were assessed pre and post-intervention. Pretest measurements of children in the intervention group indicated that nearly one-third of the students (32%) had a BMI at the 95th percentile for age and gender, with an average body fat of 26.1%. Pretest measurements of the children in the control group indicated similar BMIs (33%) at the 95th percentile for age and gender, with a 27.15% average body fat.

The intervention consisted of monthly family events that involved either physical activities or nutritional knowledge during a 9-month school year. Upon completion of the intervention, Greening et al. reported that the children in the treatment group were found to have a statistically significant decline in percentage of body fat compared to the control group $\{F(1,449) = 5.56, p = 0.02.\}$. Children in the control group's percentage of body fat remained stable $\{F(1,449) = 4.56, p = 0.04\}$ suggesting that the intervention was instrumental in treating childhood obesity.

Similarly, in another school based weight loss intervention study Johnston, Moreno, El-Mubasher, Gallagher, Tyler, and Woehler (2013) the investigators examined the weight loss success of children whose teachers participated in a professional-

facilitated intervention (PFI). The researchers conducted a randomized control study over 24 months in a Houston, Texas school district comprised of 41 schools. Investigators divided second grade students from 7 schools (N= 835 students) into two groups; one group of students (n= 509) had teachers who had the professional-facilitated intervention (PFI) and the other group of students (n=326) whose teachers had self-help (SH).

Children in the treatment group (n=509) had teachers that received the PFI intervention, which consisted of health professionals who guided teachers, administrators, cafeteria staff and school nurses. The interventions were to be used on a daily basis in all aspects of the school's curriculum/environment. The researchers did not define the term "health professionals". Children in the control, or self-help, group (n=326) had teachers who received one day of training at the beginning of the school year. After 2 years in the study, children in the PFI group who were overweight or obese reduced their standard BMI score (zBMI) compared to children in the self-help (SH) group (Wald $X^2 = 28.7$; $p < .0001$). End-of-year grades decreased for both groups, but the PFI group showed less of a decline than the SH group (Wald $X^2 = 80.3$; $p < .0001$).

Jain and Langwith (2013) conducted a research study with 19 key informants (school nurses and wellness coordinators) representing 6 school districts in 3 states (Florida, Georgia and Texas). The purpose of the study was to evaluate the effects of a multifaceted intervention (Activate for Kids) after a one-year implementation period. The intervention consisted of 4 separate components: (a) BMI screening and parent notification; (b) wellness coordinators in the schools; (c) a community-based lifestyle intervention for overweight children; and (d) training for school nurses using the S.C.O.P.E intervention.

After the program was completed, the researchers conducted interviews with key informants including 4 school district administrators and 6 school nurses. The authors found that the Activate for Kids program was too costly to implement and that school nurses could not conduct childhood obesity interventions without funding and support from coordinators (Table 2).

Authors	Year	Type of Intervention
Edwards	2005	Food & Fitness 101 (weight loss)
Greening et al.	2011	TEAM Mississippi Project (weight loss)
Jain et al.	2013	AFK—how healthy behaviors are implemented in schools
Johnston et al.	2013	Implementation of healthy behaviors with professional-facilitated professional (PFI)

Table 2. Intervention Studies Category

Public policy and the School Eating Environment

Schafft, Hinrichs and Bloom (2010) were interested in examining the growing numbers of local farm to school programs that were implemented in Pennsylvania. A secondary aim was to explore school personnel's knowledge of farm to school programs. The authors conducted a mixed method study in Pennsylvania to examine the implementation of Farm to School (FTS) programs in the state. Surveys included questions regarding the participants' knowledge of FTS programs, their opinions on the benefits of accessing produce from local farmers and their actual food purchasing practices. The surveys were mailed to all the food service directors in the state (n= 501), with a 75.4% response rate.

The researchers report that 20% of the respondents knew nothing about farm to school programs; 9% of the food service directors knew some aspects of farm to school programs; and 1% of the food service directors considered themselves to be very knowledgeable. The remaining 70% had heard of the term farm to school, but did not

know anything else about the program.

Leviton (2008) discussed national survey results from the Youth Education and Society (YES) survey, School Health Policies and Programs Study (SHPPS), School Health Profile survey, School Nutrition Dietary Assessment Study (SNDA), and the U.S. Department of Education study and the results from these studies indicate there is room for improvement in the schools' food environment. Leviton reported that although the school environment is not going to solve the childhood obesity problem, it is a starting place because children spend 6-8 hours per day in school. According to Leviton, several practices that may be useful in the school setting such as increasing physical activity, changing the diet by increasing healthy foods in the cafeteria and limiting unhealthy foods. It was also suggested by Leviton that combining interventions has the potential to achieve optimum results.

Bagdonis, Hinrichs, and Schafft (2009) interviewed key stakeholders who supported farm to school programs and community involvement in advocating for healthier schools. The authors examined rural and urban school districts in Pennsylvania who had implemented farm to school programs through a "comparative qualitative cross study approach" (Bagdonis, et al., 2009, p. 111). The purpose of the study was to examine the use of a civic agricultural framework to increase the number of farm to school programs in Pennsylvania.

Framing is a method that uses key personnel to define a situation in such a way as to influence individuals. By using frame analysis, the researchers hypothesized people could be persuaded to embrace farm to school programs in Pennsylvania. Using semi-structured templates, Bagdonis et al. conducted 28 interviews with key stakeholders

including school administrators, teachers, parents and school nurses. Results from the interviews suggest that framing is a way to expand farm to school programs in Pennsylvania to connect childhood health problems such as obesity and local agriculture.

Story, Nanney, and Schwartz (2009) discussed the schools' role in obesity prevention by examining research that addresses issues such as physical activity and the food served in school cafeterias. The researchers further examined the impact of public policy (federal, state and local) in helping to shape school environments. Story et al. (2009) discussed physical activity and public policy, schools' food environment and public policy, body mass index measurements in schools, and school wellness policies. The article compared the gap between the ideal of public policy and the reality of practices in school environments. Story et al. (2009), suggested key stakeholders, which did not include school nurses, who could support wellness policies: teachers, administrators, parents, students, and the school board.

Similar to Story et al. (2009), Turner and Chaloupka (2012) examined the change in food choices in public and private school environments to better understand if healthier food was replacing competitive foods. The researchers reviewed the prevalence of competitive foods, school lunches and other school food-related behaviors by collecting survey data from a national sample of schools during 2 specific time periods (2006-2007 and 2009-2010) Schools participating in the survey were public (n = 578) and private (n =259). The researchers also examined data between 2006-2007 and from 2009-2010 there were 680 public and 313 private schools.

Results from the study indicated an increase in the number of schools that participated in school gardens or farm to school programs. Turner et al. (2012) report

there was a slight improvement in the types of foods found in both public and private schools. However, the improvement was greater in public schools than in private schools.

Nihiser, Merlo and Lee (2013) focused their paper on how schools can be effective in the prevention of childhood obesity by implementing prevention interventions. In the paper, the authors discuss the 2012 Weight of the Nation Conference and the IOM's 5 recommended goals for the prevention of childhood obesity that include the goal "to make schools a national focal point for obesity prevention" (p. 28).

However, Nihiser et al. do not mention school nurses per se in the report but rather use the term "school health practitioners" (p. 32). As no definition or explanation of the term 'school health practitioners' is provided it is not clear if the term includes school nurses.

Sandoval, Turner, Nicholson, Chriqui, Tortorelli, & Chaloupka (2012) reviewed the relationship between state law, school districts' policies and BMI measurements in the school. The researchers collected data from a national sample during 3 school years (2006-2007, 2007-2008, 2008-2009) and examined the relationship of policy and practice regarding measuring children's BMI.

The study included data from 1733 public elementary schools in the United States. The researchers also collected information regarding state laws where the schools were located to examine if there was legislation mandating BMI measurements in the schools. Sandoval et al. found that BMI measurements were completed in 65% of the schools that were in states mandating the measurement versus 38.4% of the schools that were in states that did not mandate BMI measurement. Sandoval et al. (2012) also found that school BMI measurements were not affected by whether or not the school district had a policy requiring BMI measurement (49.8% versus 49.2%). The researchers also

found that in the national sample, schools in the South were more likely to measure BMI than schools in the North (Table 3).

Authors	Year	Policy/Recommendation
Bagdonis et al.	2009	Farm to school
Schafft et al.	2010	Farm to school
Leviton	2008	Obesity prevention
Nihiser et al.	2013	Obesity prevention
Story et al.	2009	Obesity prevention
Turner et al.	2012	Impact of public policy
Sandoval et al.	2012	Impact of public policy

Table 3 Public Policy/Recommendations Category

Schools' Food Environment

Three reports are included in the category of schools' food environment. Terry-McElrath, O'Malley and Johnston analyzed data from cross-sectional samples of middle and high school students during 2008-2012. The purpose of the study was to examine associations between schools' food environment and students' fruit and vegetable consumption.

Results found that candy and fat-laden snacks were negatively associated with low fruit consumption in middle schools. Conversely, availability of salad bars was positively associated with middle school vegetable consumption. The accessibility of fruits and vegetables were positively associated with high school fruit and vegetable consumption. The findings were consistent among students from all racial/ethnic and socioeconomic backgrounds.

An association was noted between the food school environment and the BMI of public school students. Fox, Dodd, Wilson and Gleason (2009) found that elementary school students who were served food such as French fries and desserts more than once per week were more likely to have higher BMI z-scores (odds ratio =2.70; $P<0.01$);

middle school students who had access to vending machines with low-nutrient, energy-dense food also had higher BMI z -scores ($\beta= 0.21$; $P=<0.05$). The availability of the same types of food via à la carte purchase (and therefore, less available) was associated with lower BMI z -scores ($\beta= 0.32$; $P= <0.01$).

Story (2009) examined 4 key areas in school environments: (a) school food environments and policies, (b) school physical activity environments, (c) school measurements of students' BMI, and (d) school wellness policies. For the literature review, only the food environment component will be discussed. The researcher reports that school food environments can have a large impact on children's health because children eat between 19% and 50% of their daily calories in schools.

Story (2009) found that competitive foods are widely available in schools and that the availability of such foods has been associated with an increase in childhood obesity. The author reports 33% of elementary schools, 71% of middle schools and 89% of high schools have either vending machines, school stores, snack bars, or canteens where students can purchase competitive foods. Story also reports from the third School Nutrition and Dietary Assessment Study (SNDA-III) study that student consume 150 extra calories a day from competitive foods. In addition, students who have access to food used as rewards in school and foods from fund-raising increase their BMI units by 0.10 for each additional food brought into the schools. Farm to School programs, school gardens and federal grants for fresh fruits and vegetables can be used to increase healthy food in the school environment (Story, 2009) Table 4.

Authors	Year	Schools Food Environment
Terry-McElrath, et al.	2014	Association between school food environment and fruit and green vegetable consumption
Fox, et al.	2009	Association between school food environment and BMIs
Story et al.	2009	Schools' food environment

Table 4. Schools' Food Environment Category

Implications

School Nurses' Role Recommendations

The two reports compiled by the AAP's Council on School Health (2008, 2013) make recommendations for the role of the school nurse. In the report written in 2008, the school nurses' role is defined by the National Association of School Nurses (AAP, 2008). Seven key areas or "core roles" (AAP, 2008, p. 1052) are outlined to promote children and adolescents health apply to all school nurses "at all levels of practice, in all geographic settings, and with all clients" (p. 1053). The roles include direct patient care, leader of the school's health services, screenings and referrals for a variety of health concerns, promotion of a healthy school environment, promotion of health through health education, leader in health policies and programs such as wellness programs, and as liaison between school personnel, family, health care providers, and the community. The recommendation also encourages the school nurse to act as the leader in the school's health services team such as physical therapists, occupational therapists, and speech-language pathologists. It is also recommended that there is a full-time nurse at every school.

The second article from AAP's Council on School Health (2013) focuses on the role of the pediatrician. However, there is a strong recommendation that every school

employ at least one “registered professional nurse” (p.179) under the supervision of a pediatrician. The school nurse is responsible for implementing school health services, but there should be a pediatrician who oversees care provided to children and adolescents. Neither article expressly describes the role of the school nurse in childhood obesity, but does include recommendations for the treatment of chronic conditions such as obesity (AAP, 2008). The AAP recommendations describe benchmark for school nurses. The practice of school nurses is considerably different from the benchmark as evidenced by the research literature.

School Nurses’ Perceptions of Their Roles in Childhood Obesity

School nurses perceived roles differ from the recommendations provided by the AAP (2008; 2013). Whereas school nurses perceived that schools were not doing enough to address childhood obesity, they also did not feel confident in recommending obesity treatment programs for children who were overweight (Price et al., 1987; Moyers et al., 2005). School nurses also believed that school-based obesity prevention/treatment would be ideal, they also believed they lacked adequate time to participate in school-based interventions (Kubik et al., 2007; Morrison et al., 2011).

Story, Neumark-Stzainer, Sherwood, Holt, Sofka, Trowbridge and Barlow’s (2002) report suggests health care providers agree with school nurses in that childhood obesity but that there was not enough clinic time or school time to adequately address the problem (Story et al. 2002). In addition to lack of time, health care providers and school nurses believed that they needed more training in nutrition and obesity prevention to adequately meet the needs of obese children (Story et al., 2002; Magnusson et al., 2012).

BMI measurement was addressed in 2 of the literature review categories (Murphy

et al., 2007; Gance-Cleveland et al., 2005; Sandoval et al., 2012; Story et al., 2009). Murphy et al. (2007) discussed parents' desire for BMI measurements conducted by school nurses, and preferred that they be notified of their child's BMI, particularly if their child was considered overweight or obese. Gance-Cleveland et al. (2005) provides a detail protocol for BMI measurement conducted by school nurses in Arkansas after state legislation passed requiring BMI measurement in schools. In the public policy and recommendations category, BMI measurement was discussed as a means of preventing/treating childhood obesity (Sandoval et al., 2012; Story et al., 2009).

Sandoval et al. reports (2012) that BMI measurement in elementary schools occurred more often when there was a state law mandating BMI measurement (65% of schools vs. 38.4% of schools; $X^2 = 120.91$, $p = .001$). There was no difference in BMI measurements if the school district had a policy mandating the measurement versus no policy (49.8% vs. 49.2%) indicating that state laws make a difference in the policy, but district policies do not. One report indicated that school nurses use BMI measurements to define a child's weight status (Moyers et al., 2005). School nurses in Minnesota were reported to measure heights and weights of school children, but do not calculate BMIs (Morrison-Sandberg et al., 2011).

School Nurses' Roles in Intervention Studies

None of the intervention articles (Johnston et al., 2013; Edwards, 2005; Jain et al., 2013; Greening et al., 2011) included school nurses conducting the intervention. However school nurses were involved in some degree either working with a wellness coordinator (Jain et al., 2013), Department of Education employees (Greening et al., 2011), nurses from a school-based health center (SBHC) (Edwards, 2005), or health care professionals

(Johnston et al., 2013). There are few intervention studies in the literature that involves school nurses and childhood obesity treatment/prevention programs. The limited amount of interventions studies in the literature suggests more research is needed to better understand the school nurses' role in childhood obesity treatment and how big a role school nurses have in the treatment/prevention of childhood obesity.

Public Policies and Recommendations for Improving School Environments

Farm to School Research Studies

Farm to School programs provide local fresh fruits and vegetables to schools and are one of the recommendations suggested increasing healthy food in the school environment (Story et al., 2009). Farm to school programs have gained support throughout the U.S. in recent years but school personnel's knowledge of the program is lacking. Only 2 studies were found in the literature which focus on farm to school (FTS) programs (Bagdonis, Hinrichs & Schafft, 2009; Schafft, Hinrichs, & Bloom, 2010), and Schafft et al. (2010) found that more than half of the respondents had limited knowledge of the farm to school program. The participants indicated they had heard of the farm to school, but did not have any knowledge about the program.

Research Studies on Public Policies that Regulate School Environments

Several recommendations and public policy laws included in the literature review provide a benchmark for how schools can improve their environments to prevent/treat childhood obesity (Leviton, 2008; Nihiser et al., 2013; Story et al. 2009; Turner et al., 2012; Sandoval et al. 2012). However, as Leviton (2008) reports, policies have not produced the intended results of improving public schools' eating environment in part, because schools do not implement the policies created at the district, state and federal level.

Increasing physical activity is one recommendation for the prevention/treatment of childhood obesity (Nihiser, et al., 2013; Story, et al., 2009; Leviton, 2008) and is mentioned as one of the roles of school nurses (Story, et al., 2002; Murphy, et al., 2007). Several reports discuss the use of wellness policies in the prevention/treatment of childhood obesity (Leviton, 2008; Story et al., 2009). The authors in both reports state that wellness policies are typically not implemented in the schools.

Other recommendations for improving the quality of food in schools include decreasing competitive foods in the school environment (Nihiser, et al., 2013; Story, et al., 2009). However, as Turner et al. (2012) report there has been little change in schools' food environment and suggest public policy may be needed to improve schools' food environment. Leviton (2008) and Nihiser et al. (2013) recommend school personnel follow the guidelines of the Centers for Disease Control and Prevention (CDC) and the Institute of Medicine (IOM) in the prevention and treatment of childhood obesity.

Conclusion

The 25 articles included in this integrative review of the literature provide a view of how the school environment in general and school nurses in particular could address childhood obesity. There were 4 categories of articles: (a) those that included school nurses' perceived roles (b) intervention studies, (c) recommendations or public policies that impact schools' eating environment, and (d) schools' food environment.

Several of the articles offered recommendations for the ideal role of the school nurse in the prevention/treatment of childhood obesity. But the recommendations fall short of the reality of either the school nurses' role in the treatment/prevention of childhood obesity. None of the intervention studies included in the review identified

school nurses as the one who administered the intervention indicating a gap in the literature. One possible reason for the lack of childhood obesity intervention studies involving school nurses could be because the perceived barriers school nurses reported to adequately administer childhood obesity treatment/prevention interventions. Articles on school nurses' perceptions of their roles in childhood obesity comprise another category in the literature review.

The rigor of the intervention studies is sufficient to provide insights into what may work in treating or preventing childhood obesity. However, the studies were either too small to indicate generalizability (Edwards, 2005) or required multiple steps and hiring personnel that rendered the intervention not feasible for most school districts as reported by the researchers (Johnston et al., 2013). The study conducted by Jain et al. (2013) reported similar limitations: grant needed to complete intervention due to high cost and time involved in training and conducting the intervention.

The third category consisted of articles on recommendations and benchmarks for school nurses that did not reflect the reports from school nurses' actual role. Again, there appears to be a gap between what is recommended and what is actually found in the school environment. In addition, public policies that affect the school environment either regarding food served in the schools, required physical activity or measuring BMI were included in the literature review. Several authors, however, reported that there is also a gap between public policies that are implemented in the schools and those that are simply ignored by the schools' administration.

The final category, schools' food environment found that the availability of competitive foods is associated with increased BMI in students. Conversely, the

availability of salad bars is associated with increased green vegetable consumption.

Competitive foods are available in schools and come from vending machines, foods used as rewards, fund-raising and school stores. Schools can improve their food environment through Farm to School programs, school gardens or fruit and vegetable grants.

Chapter Three

Methodology

Introduction

School nurses care for children in many ways: managing chronic conditions, promoting health through health education and acting as a liaison between the health needs of children in schools and the community (Robert Wood Johnson Foundation, 2010). However, little research has been conducted that examines school nurses knowledge about Farm to School programs or how school nurses perceive their role in promoting fruit and vegetable consumption in the schools. The focus group study was conducted with school nurses to better understand their perceived knowledge about Farm to School programs in Wisconsin and their perceptions of the role they play in increasing fruits and vegetable consumption in the school environment.

Research Design

The Institutional Review Board (IRB) approval was obtained prior to beginning this study. Qualitative methodology was used for this study due to the lack of information available regarding school nurses' knowledge about Farm to School programs and their perceptions of the school nurses' role in increased fruits and vegetable consumption in the school environment. Specific methods and principles guide each type of qualitative approach, but the underlying goal is to understand one's lived experience through the method chosen. The study design was focus group interviews because the method is used when the researcher wants to examine a wide range of ideas, perceptions, and feelings of a specific population in this case, school nurses (Krueger & Casey, 2009).

There are several focus group designs that can be implemented in conducting a study. The design chosen for the study with school nurses was the single-category design also called the traditional. The single-category design is used when the researcher wants to conduct focus group interviews with a single type of participant, such as school nurses. The design is also used frequently in academic settings when the goal is to reach theoretical saturation. Theoretical saturation occurs when the information collected is repetitive and are no new insights are developed (Krueger & Casey, 2009).

The purpose of the study was to examine school nurses' knowledge about the Farm to School program in Wisconsin. A secondary aim was to examine school nurses' perception of their role in promoting increased fruit and vegetable consumption in the school setting.

Research Questions

The specific research questions for the focus group study were:

4. What experiences have school nurses had with Farm to School programs?
5. What are school nurses' perceptions of Farm to School programs?
6. What are school nurses perceptions of their role in promoting fruit and vegetable consumption in the school setting?

Recruitment

Focus group participants for this investigation were school nurses. Consequently purposive sampling was used to recruit participants. Inclusion criteria were school nurses who practice in one of the Wisconsin public schools, English speaking, and willing to participate in a focus group interview.

There are 77 counties in Wisconsin. During the 2013 recruitment period, there were 426 school districts, 2,243 schools, and 871,105 students (kindergarten through 12th grade).

(http://sunshinereview.org/index.php/My_Government_Website:_Number_of_school_districts). There were 564 public school nurses in Wisconsin who filled 456 full-time equivalent (FTE) positions during the 2013 recruitment period (B. Carr, personal communication, November 13, 2013).

Initially, school nurses were invited to participate in the focus groups in one of two ways: by a mass email with an attached informational flyer sent by the president of the Wisconsin Association of School Nurses (WASN) or they were recruited directly by the student researcher at the annual WASN conference with the permission of the conference sponsor. If recruited via email, participants were asked on the flyer to contact the investigator directly. School nurses who emailed the researcher expressing an interest in participating in the focus group interviews were sent an informed consent form and a demographic data sheet in an email attachment. Informed consent was obtained by the researcher after reading the form to the participants prior to the start of the focus group discussion as approved by the IRB. Participants consented verbally prior to the start of the focus group discussion. Participants were given the opportunity to ask questions regarding the focus group discussion and all questions were answered prior to the start of the focus group.

Participants who were recruited at the conference were provided with a verbal explanation of the study as well as a hard copy of the recruitment flyer with written information providing details about the study. If the school nurse indicated that she was

interested in participating in the focus group, contact information was obtained from the school nurse. If school nurses agreed to participate, they were given a choice of times to meet with the other participants at a mutually agreed upon time and day. Each potential participant was emailed individually to assure anonymity. No names or other personal identifiers were used in the focus group discussions.

Additional recruitment measures were added to ensure that invitations were sent to school nurses who may not be members of WASN or were not at the WASN conference. In addition to the WASN recruitment, email invitations were sent to all 564 school nurses in Wisconsin Public Schools via the Wisconsin Department of Education. There was one heterogeneous focus groups those that included school nurses from rural and urban school districts and 4 homogeneous focus groups. Two of the groups included school nurses from urban school districts and two of the groups included school nurses from rural school districts.

Instrumentation

Demographic Data Sheet

A short survey (see Appendix B) was used to collect demographic information from the study participants. The information included: (a) number of years practicing in a school setting; (b) educational level (bachelors' versus masters' degrees); (c) location of school (rural or urban); (d) number of students under school nurse's care; (e) participation in Farm to School programs; and (f) participation in other programs that focus on fruit and vegetable consumption.

Semi-Structured Interview Guide

A semi-structured interview guide based on Krueger and Casey (2009) was developed based on current literature and was reviewed for relevance and succinctness by other doctoral-prepared researchers. Krueger and Casey (2009) suggest using 5 types of questions in focus groups: opening, introductory, transition, key, and ending questions. The opening question acts as an icebreaker to encourage all participants to speak. The introductory questions provide the participants with a framework to think about the topic. Transition questions direct the participants to the key questions that are the focus of the research. Key questions are those that are directly related to the research topic and are the focal point of the focus group interview. Ending questions provide closure and sum up the discussion (Krueger & Casey, 2009).

Data Collection

Setting

Focus groups met at a time and day mutually agreed upon by the participants. The format was either on-line using Skype or through teleconferencing, depending upon the participant's choice. Privacy was achieved by using either a secure Skype user name or individual phone number. The location of the moderator was in an office behind closed doors. The moderator's location was a quiet, comfortable setting with no distractions. The participants were in their offices in the school where they were working that day. Two digital audio recorders were used to record the focus group's discussion. The moderator guided the discussion using the semi-structured interview using open-ended questions, intermediate questions, and ending questions.

Procedures

Questions for the interview guide were based on pertinent focus group literature and were approved by the research committee. Focus groups lasted approximately one hour and were digitally recorded. The principle investigator asked questions from the interview guide and facilitated participation.

Participants were asked to share their knowledge regarding Farm to School programs that increase fruit and vegetable consumption in their schools and what they perceived the role of the school nurse to be in programs that increase fruit and vegetable consumption in the school setting. Open-ended questions were used to initiate discussion. Probing questions followed the general questions.

Participants' names were not used in the transcripts to maintain confidentiality. In addition, focus group participants gave their permission to be quoted directly, but anonymously for publications. Confidentiality of all participants based on the Health Insurance Portability and Accountability Act (HIPAA) was maintained throughout the process.

The principle investigator had experience in conducting focus groups and moderated the discussion. Coté-Arsenaut and Morrison-Breedy (2005) offer 3 suggestions for conducting successful focus group discussions: keep the discussion focused on answering the research questions, create an environment that encourages discussion and use a moderator with experience in conducting focus groups

All of the focus group's discussions were digitally recorded using a digital voice recorder, and transcribed verbatim by the principle investigator. Neither participants' names nor any identifying information were used in the transcription. The transcriber

referred to the participants via numerical codes assigned to them moving clockwise around the virtual table beginning with “1”, then “2” etc. The digital were reviewed and verified by the investigator by listening to the recordings and following along with the transcription. Discrepancies were corrected so the transcription reflected the exact words of the participants. The recordings were stored in a locked desk drawer in the investigator’s office and were referred to during the data analysis. The recordings will be destroyed when the dissemination of the study is completed.

Data Management and Analysis

Hsieh and Shannon (2005) describe a method for analyzing data using a conventional content analysis approach. Conventional content analysis typically occurs when the study examines a phenomenon, such as school nurses’ perception of their role in promoting increased fruit and vegetable consumption in the school setting.

After transcribing the audio recordings, the researcher used the Hsieh and Shannon method for analyzing the data. First, the transcripts were read as if reading a novel without writing notes or initial impressions. In the next step, the researcher read the transcripts and highlighting key words that suggested codes. Once the codes were established, the transcripts were imported into NVivo 10, a data management software program on a password-protected computer available to the principle investigator. The following 6 steps were used in the thematic analysis of the data:

1. Read through transcripts to become familiar with the data.
2. Re-read transcripts and highlight data that suggest initial codes and patterns in text.
3. Code text using the codes developed in step 2.

4. Re-read coded text under individual codes and develop initial themes by analyzing underlying patterns.
5. Connect coded text according to themes and patterns.
6. Analyze themes to confirm findings from the text. (Fereday & Muir-Cochrane, 2006).

Records of the investigator's thoughts, ideas, and perceptions were written as the analysis progressed thereby creating an audit trail (Richards 2005). Both individual participant responses and individual group generalities were considered as 'units of analysis'.

Patterns and relationships that emerged between groups and within groups were recorded. (Morgan 1996, 1997). Qualitative researchers suggest staying close to the data during analysis and to explore where the data takes you (Riessman, 2008; Charmaz, 2010).

Each step in the data analysis process was discussed with an expert researcher and approved.

In addition to thematic analysis, particular attention was given to the interaction of participants during the discussion. Duggleby (2005) reports that there are 3 levels of focus group analysis; the individual, the group, and the group interaction that need to be considered during analysis. Morgan (2005) suggests analysis of differences in topics discussed in the focus groups and to note topics that are discussed briefly and those that are discussed in depth. Group dynamics and interaction played a role in the data collection and were considered in the analysis.

The focus groups were conducted in a private office, virtually, either online using a secure SKYPE name or teleconferencing. Therefore, participant interaction was determined visually, if on SKYPE or by the verbal exchanges among the participants.

Teleconference and online focus groups are becoming more common in health research as more sophisticated technology become available (Tolhurst & Dean, 2004; Turney & Pocknee, 2005). The advantages of using virtual focus group includes (a) providing access to participants who are in different geographic locations, (b) decreased cost, and (c) increased participation due to the convenience of meeting times and place (Tuttas, 2014; Allen, 2014).

The disadvantages of virtual focus groups are the lack of visual cues or interactions among the participants (Tuttas, 2014; Allen, 2014). In addition, there may be technical difficulties such as poor sound quality, dropped calls or breaks in Internet streaming (Tuttas, 2014). However, in the school nurses' focus groups, there were no technical problems. Participants interacted with each other in a professional manner and did not speak over anyone and asked each other for clarification, if it was needed. Allen (2014) suggests the use of a semi-structured interview guide to allow for spontaneous responses and to create a sense of "social presence" (p. 576). A semi-structured interview guide was used in the school nurses' focus groups.

Morgan (1997) discusses differentiating between topics that participants may have found interesting, and those they may have found important. One way to determine if the topic is important is to analyze how often the topic is mentioned, and in how many focus groups the same topic is mentioned. Persistent discussion of a topic may suggest importance and is to be noted in the analysis.

In focus group research as in other qualitative methods, the goal is to achieve theoretical saturation. It is recommended to conduct 3 or 4 focus groups to determine if saturation has been achieved (Krueger & Casey, 2000). Although researchers' definition

of saturation varies, the underlying meaning is the same. The concept is either a redundancy in topics discussed (Krueger and Casey, 2000) or repetition in the breadth of the topic (Richards, 2005). “

One way to think about saturation is when you can almost predict what people are going to say. When you ask the first question, you are pretty sure about the range of responses you will hear (D. Morgan, personal communication, June 19, 2013).

The five focus groups included participants from rural areas (2 focus groups), from urban areas (2 focus groups) and from a combination of rural and urban areas (1 focus group). Topics of discussion were repeated among all 5 focus groups until no new data were revealed indicating saturation had been achieved.

Analysis continued until all key aspects had been examined and patterns had been noted. The process was iterative in that the researcher would refer to transcripts and recordings during the analysis. The researcher wrote memos, drew concept maps and when questions arose, returned to the data to assure that as themes emerged they were consistent with the words of the participants. The analysis was systematic, sequential, continuous and iterative (Krueger & Casey, 2000).

Scientific Rigor or Trustworthiness

Scientific rigor was monitored by maintaining a detailed audit trail of notes, impressions and decisions (Wolf, 2003). Richards (2005) recommends keeping a consistent paper trail of decisions made and ideas that were considered in the analysis. Consistent recording of thoughts, impressions and rationale for decision-making were kept throughout the data analysis using the memo tool in NVivo 10 for Mac.

Reliability of the focus group analysis and findings relates to the stability, equivalence and internal consistency (Kidd & Parshall, 2000). Stability refers to how many times a certain focus group meets to discuss the topic. In the Farm to School proposed study, stability is not a factor because each group only met once. Equivalence refers to the number of coders and moderators are involved in the study. Again, in this proposed study, there was only one moderator (student researcher) so equivalence is not a concern. Internal consistency was maintained by the PI and major professor coding the transcripts independently and discussing discrepancies until consensus was achieved.

Kidd and Parshall (2000) discuss the importance of validity in establishing scientific rigor in focus group analysis. Both content and construct validity are required during the analysis. Content validity refers to recurring topics discussed across several focus group discussions. Construct validity refers to thematic patterns that develop within and across groups.

There are different views among qualitative researchers in how to verify the findings to assure trustworthiness or scientific rigor. Riessman (2007) suggests consulting research participants to check for errors or to provide comments. However, Reissman does not recommend allowing the participants to make decisions regarding the analysis. Morgan (1997) offers an opposing perspective and suggests checking with participants during the data collection in order to understand what is important to them rather than making assumptions during the analysis. In conducting the focus groups, the investigator used Morgan's approach and asked participants during the focus groups to clarify any comments that were ambiguous.

Summary

The qualitative focus group study explored school nurses' knowledge of Farm to School programs in Wisconsin and their perceptions of their role in fruit and vegetable consumption in the school environment. The use of a semi-structured interview guide promoted the participants' discussion to most effectively respond to the research questions. The five focus groups were heterogeneous in that they included school nurses who worked in schools that had a Farm to School program and schools that did not have a Farm to School program. By conducting focus groups, the researcher obtained information regarding school nurses knowledge of Farm to School programs and what they perceive their role to be in increasing fruit and vegetable consumption in the school environment.

Chapter Four

Findings

The purpose of this focus group study was to examine school nurses' knowledge about the Farm to School program in Wisconsin. A secondary aim was to examine school nurses' perception of their role in promoting increased fruit and vegetable consumption in the school setting. Chapter four discusses the findings of the study and includes school nurses' demographic information as well as the themes that emerged from the focus group transcripts. The findings may be helpful to those who are interested in school nurses' participation and advocacy for Farm to School programs or programs that promote increased fruit and vegetable consumption in the school environment.

Demographic Characteristics of Participants

School nurses (N = 15) participating in focus groups conducted for this qualitative study, and all had a minimum of a bachelor's or Bachelor of Science in Nursing (BSN) degree. A little more than half of the participants (53%) worked in a rural school district (See Table 4.1).

Demographic data indicated 70% of the participants worked in 2 schools in their school district, whereas 33% of the participants worked in more than 4 schools in their district. The school nurses worked in elementary, middle and high schools and oftentimes were the only school nurse in the district. Most of the participants (53%) reported their schools participated in a fruit and vegetable program; 40% of the participants reported that the schools where they worked did not participate in a fruit and vegetable program and 7% of the participants did not know if the schools where she worked participated in a fruit and vegetable program. Twenty-six percent of the participants reported working in a

school that had a Farm to School program, while 73% reported working in a school that had no Farm to School program. See Table 4 for demographic data of the participants.

Demographic Data	<i>N = 15 (n %)</i>
Education	
BSN	73%
BS	7%
MSN	13%
MS	7%
Enrolled in School Nursing Courses	
47%	
Number of Years as RN	
Less than 3 years	7%
7-10 years	7%
More than 10 years	87%
Number of Years as School Nurse	
Less than 3 years	13%
3-6 years	13%
7 to 10 years	40%
More than 10 years	33%
Number of Schools Where School Nurses Practiced	
1-2 schools	67%
More than 4 schools	33%
Number of Students in the Schools Where Nurses Practiced	
Less than 750 students	13%

750-999 students	53%
1,000-1,500	7%
More than 1,500 students	27%

Setting

Rural	53%
Urban	47%

Fruit and Vegetable Program in Schools

Yes	53%
No	40%
Don't know	7%

Farm to School Programs in Schools

Yes	27%
No	73%

Table 4 Demographic Data

Themes

Five themes emerged from the focus group analysis: *If there were more of me, I could do more*; *Food environment in schools*; *School nurses promote health*; *Obesity is a sensitive issue*; and *Influences of policy on wellness*. Each of these themes will be described in this chapter along with participants' quotes used to illustrate the theme.

Theme One: If There Were More of Me, I Could Do More

Participants in the focus groups discussed Farm to School programs and a lack of resources as the primary barrier in achieving a healthy eating environment such as Farm to School programs within the school setting. The school nurses specified a lack of time,

money and personnel within the school districts that impacted their ability to accomplish all that they wanted to do to promote the health of the children in their schools. They indicated they would like to be involved with a Farm to School program, but would not have the time to start one or to administer a Farm to School program.

Farm to School Programs

Most of the participants (60%) reported that they knew about Farm to School programs, but only 2 of the school nurses reported having a Farm to School program in their school district. When asked if the school nurses would like to be involved with a program such as Farm to School, the participants' responses were positive. However, lack of time and personnel due to budgetary cuts were the reasons why the school nurses were not as involved as they would have liked: "I would love to take an active role, but the problem is lack of time. I'm spread so thin. I'm three days a week." Another school nurse responding to a participant in the focus group explained her obstacle in participating in a Farm to School Program:

What [participant] is doing is awesome because she is really doing a lot of what I'd like to do, but I simply lack the time. I understand that it's important, but I just need some time to figure out how to make that work. And, I need help.

One school nurse reported time as a barrier in participating in a fruit and vegetable program:

In my opinion, if there were more school nursing hours it would be more practical to ask a nurse to get involved to assist with this. But until that is accomplished this is extra that's hard to manage given all the other

duties. Not that there isn't an interest or a willingness to try and help people but this is one of those extras that we just don't have the luxury of being so heavily involved with any more.

Another school nurse suggested investigating the possibility of acquiring a grant to pay for a fresh fruit and vegetable program, because there is not enough money in the budget to cover it:

I would think the [school nurses'] role would be to investigate how to go about getting a grant in order to introduce that program into the school.

I agree with [participant] and just encouraging and assisting in any type of facilitation. I think it would be a buy-in if we could get the money.

Limited Personnel

School districts may have only one school nurse or even no school nurses and rely on public health nurses to screen students for vision and hearing and/or to check immunization status:

And first off, the recommendation for school nurses is one full-time school nurse for every 750 regular education kids. When you start getting into special education and special needs and some medically fragile, then those numbers drop. We're at one to 1,600 I think in our district, so we're more than double the recommendation. So, the budget is not helping. If there were more of me to go around I could do so much more with prevention.

It is not only school nurses who are in demand in the Wisconsin public schools. School nurses also reported on decreased numbers of staff in schools, such as qualified food service personnel, due to budgetary cuts: "Again, money. Money is an issue." One school

nurse described the impact of fewer staff and more work:

Well, I just feel if you start cutting back [referring to lack of money]—we have had cuts in school nurses because of the budget. I think physical activity has been cut back...or PE teachers' times have been cut back and that affects not only [children's] weight, but affects, the educational piece. Again I have to go back to, it's not all the reading and writing—if you don't have a healthy kid, they're not ready to learn. So, as far as nurses, school nurses, we've certainly felt it.

Another school nurse described her experience in the district: “But I have to tell you, that school nurses are spread incredibly thin. I'm one for 3,200 kids.”

School secretaries and teachers are acquiring the roles school nurses typically would fill. School nurses continue to work with chronic conditions such as diabetes, but children with less serious conditions rely on care from the school secretaries. If a child has a serious condition such as epilepsy that may occur in the classroom, teachers provide care:

A lot of it falls on the shoulders of the secretary ...who is wonderful. And just because she doesn't have “RN” at the end of her name, she does well. The teachers in the classroom are doing some of the nebulizer treatments or carrying the inhalers around with them or carrying epi pens around. It falls on the hands of the teacher. This year we had our first child with seizure disorder and when we did the training with the teacher, the teacher said “I did not go to school for that.”

Lack of qualified school food service personnel due to decreased budgets is also a barrier, according to the participants: “We do not have a nutritionist or a dietician in our food service director position. It is someone who has managed bars and restaurants in

the past.”

Another school nurse commented on the lack of a dietician in her school district: That’s been a challenge because we don’t have a dietician. We have a food service person who is maybe good at ordering supplies but a couple of years ago when I had a student who needed a low sodium diet the whole concept of what was sodium and what was low sodium and how do you measure sodium and what’s the appropriate amount of sodium was really a foreign concept to him.

One participant discussed her frustration at the lack of a registered dietician in the school district: “Our food service person has absolutely no food background. It’s either a 4-year degree in music or biology or something. I don’t feel real adequate to be able to take on the registered dietician role that I feel needs to be there.”

Dwindling Money Allocations

The participants related the lack of adequate staff to the decreased school budget. Money was a concern in all of the school districts represented, particularly when it comes to programs like school gardens and Farm to School:

My dietary manager could not figure out how anybody would give her enough staff to handle the produce from a garden. She didn’t have the time or the money to devote a staff person to tend the produce as it came in. And you have to store it and you can’t freeze it for later. There are just all these rules.

Lack of money is a limitation to participating in programs that increase fruits and vegetables in the school. One school nurse explained:

I’m a consultant and collaborator with the dietary manager but, she really

knows what she's got time for and money in her budget so what she wants me to promote and what she wants me to encourage and help her that way, I do. But I didn't feel right saying 'I'm going to push this school garden', because these other schools are talking about it—they all loved it ...[but] I could see that there isn't time and unless the school board says 'we really want this so let's give this more money in that direction.' I don't see how she could do it.

Lunch reimbursement was a limitation the participants discussed to participating in and promoting healthy food programs. If students don't purchase the school lunches, the lunch revenue decreased:

I know one barrier that our food service director has talked about is meal reimbursement. She is constantly struggling with offering healthier foods but needing to keep her purchase numbers up. So sometimes what happens is if she puts a new healthy food on the menu. If she hasn't done taste testing with the kids ahead of time so they know they're going to like it ...they won't take hot lunch that day and food service programs are self-supporting budgets within school districts...they're not suppose to be funded by the school.

Money, or lack of money was a concern expressed by the participants. Lack of money allocated in the school budget affects staffing and food choices. One school nurse described her situation:

The budget is not helping because I'm being told that fresh fruits and vegetables [are] expensive, even though it's the right thing to do, it's expensive. I obviously don't have a registered dietician in my district.

If I had the money there'd be one. We had one on consult for awhile,
and she's moving out of town now because she couldn't get enough hours.

So we won't even have her next year. So, money matters. It definitely matters.

Summary of Theme One: If There Were More of Me, I Could Do More

In theme 3 the participants discussed what they perceived to be barriers in achieving a healthy-eating school environment, including fruit and vegetable programs such as Farm to School.

Focus group participants discussed 3 inter-related obstacles that affected their roles in school: lack of money, personnel and time. Lack of money led to decreased staff that led to increased duties and demands on the school nurses' time. The participants discussed how lack of money in the school budget left school districts without a registered dietician or without adequate number of school nurses. The decrease in staff meant that teachers and school secretaries had to take on the role once performed by school nurses, such as medication administration or managing a seizure disorder.

The focus group participants also discussed how a lack of time meant that they could not perform some of the tasks that led to healthier school eating environments. Examples they discussed were advocating for Farm to School programs or other fruit and vegetable programs. The school nurses described how lack of money, due to budgetary cuts was responsible for the lack of fresh fruits and vegetable programs in the schools.

Theme Two: Food Environment in Schools

The second theme, *Food Environment in Schools* refers to the food found in the school environment. Food enters the school environment for a variety of purposes, and from multiple different providers. Foods are brought into the school through the lunch program

(which could include farm to school programs), vending machines, for special events, and to supply the school store. Teachers bring in treats to share with students as rewards for achievement and to support or encourage good behavior. Parents send lunches in with their children, or bring in treats for birthdays and holiday parties.

Input in Regulating Food

The school nurses reported not having direct input into being able to regulate the food environment in the schools, including the route and types of foods that come into the schools. However, when the health and safety of a child is an issue, they are able to implement some monitoring of the food environment, as in the case of food allergies. When children with food allergies are attending the school, the school nurses will create allergy free zones, such as ‘peanut safe zones’ or ‘peanut aware zones’, as described by one nurse:

But with [food] allergies, I have to go “is there peanut oil in it? Is there soy? Show me what you made. I mean, it’s crazy. Was it made in a peanut factory even though there are no peanuts in it? And so, I mean for me, as a school nurse, I can’t even begin to regulate the food that is coming in.

School nurses have input in regulating the food environment for specific occasions, such as special events that the school sponsors. For special events, the nurse works with the food service personnel to identify and select the foods that will be provided. The involvement of the school nurse in selecting the foods allows them to promote healthy foods, as one nurse stated:

This year for the first time I’m involved with picking out the snacks that we’re going to serve the children on—it’s called field day. They

play games all day, and historically the snacks have been potato chips, gummy bears, and string cheese. So this is the first year I've been asked to help figure out what would be better. So we're looking at fruit instead of potato chips.

Another way for nurses to have input into regulating the food environment is if they are able to actually access foods at no cost, such as fruits and vegetables, for the school. One school nurse described applying for a fruit and vegetable grant, which inadvertently connected her to an orchard that provided the school with fresh apples:

I had applied for a fresh fruit and veggie grant for one of our school buildings even though we weren't awarded it. That's how we made our Farm to School connection for the apples. I went to the local orchard down the road from my house and they graciously shared their expertise in working with other schools.

Foods Choices: Healthy, Unhealthy, or Unappealing

School nurses categorically described the school environment as having food choices that were: healthy, unhealthy, or unappealing. Healthy food choices typically were foods served in the school cafeteria for lunch. Unhealthy food choices were generally available during after school events, in the school vending machines, or brought into the school for a celebration such as a birthday party. Unappealing food choices came from both the school cafeteria and after school events. All three categories of food choices found in the school environment were discussed by the focus group participants.

According to the school nurses, efforts were made to provide healthy food choices to the students in the school cafeteria. Healthy food choices were reported to be more

prevalent within the lunches, as one nurse stated: “At least over the last year [we] saw some more fruits and vegetables, other than canned. Because we only had canned up until last year.” The participants found that some of the foods at lunch are very appealing: “And then with the addition of a side....sometimes the side of vegetables actually look really good. Like snap peas and tomatoes.” Another focus group participant agreed that school lunches look appetizing, as reflected in the following statement:

Well, sometimes I see them [school lunches] and they look really good. I mean they’ll have like a chicken patty on a bun. They’ll have a salad or they’ll have some kind of vegetable, with a little bit of ranch dressing, and then I’ve seen it with fruit. So, a lot of times it looks balanced to me.

The participants reported that progress has been made to ensure children were only served healthy food choices, especially during breakfast, as one participant shared:

Breakfast is processed stuff. Packaged. A lot of packaged cereals....they do try to reduce the sugars and stuff. We’re eliminating [sugar and fat]. If there’s chocolate milk, it has to be skim. And then it’s skim and 1% I believe. Whole milk is only for those who have a doctor’s order, needing it. So we are doing better at that.

Unhealthy food choices from multiple sources were described by the school nurses as one of the more challenging aspects in promoting healthy foods. Participants specifically discussed unhealthy food choice experiences with students bringing cupcakes for celebrations such as birthday parties: “For birthday parties 99 times out of 100 it is locally made cupcakes with an inch high frosting.” Another participant reports: “We really were trying to stop the junk food coming in...the mile high frosting on the

cupcakes...26 times a month for the 26 kids that were bringing them in at one point or another.”

Unhealthy food choices from outside sources are also found in the classroom treats. Participants reported that parents who send classroom treats from home often send food that the school nurses referred to as ‘junk food’:

So every elementary classroom has a snack period every day.

Either a morning snack or an afternoon snack. In most classrooms, that [snack] is purchased by parents and sent in. So, it is the perfect junk food.

From Twinkies to you name it. In a few classrooms, they collect money from parents and the teachers purchase the snack, which increases the quality by a hair, but, most of the time, the snacks are carbs. Not high quality carbs, either.

Unhealthy food choices were also encountered during school events. Participants described the food choices at school events, such as after school parties as “junk food”. A participant recalled:

If there is an event in the school that the kids have to earn their way into, some kind of assembly or a D.J. downstairs or something, they’ll be serving some kind of junk food. Or after school events they’ll have junk food. Sometimes they’ll order pizza parties. And it’s pizza and pop.

Individually, they’ll get candy...

The school nurses reported that a times the school will host a party for the students either after school or during the school day, where unhealthy food choices are offered: “It would only be like an after-school type thing that they did. Like hot dogs and nachos or

popcorn type of thing.” In some instances a school-related organization will host an event and serve unhealthy food choices:

I have been in schools where the PTA sells ice cream, and that sort of thing.

And a lot of schools in the district... elementary schools do ice cream in the Spring and that kind of thing.

Vending machines for students, according to the school nurses, typically contain fruit juices, sport drinks, water or milk. However, the participants shared that not all school vending machines adhere to healthier choices, as one nurse stated: “It’s amazing how junk can end up in the vending machine.”

The school nurses further discussed vending machines in the schools, reporting that they are usually turned off during school hours. Though there have been exceptions to that vending machine policy:

I would have told you ‘no’ [to the question regarding student access to vending machines] except that just 2 days ago I saw a student buying something like at 10:00 in the morning and I was like ‘oh, that’s interesting’.

Foods: Competitive Revenue Generator

Participants in the focus groups discussed school stores that offer competitive foods for staff and students. The store revenue is used to fund various groups within the school and the nurses remarked that parents sell unhealthy foods in the school stores “because they want to make money...for whatever group. And that’s what people will buy.”

Another participant observed that their school store is meant to help disabled students, but the only food people will buy is ‘junk food’:

Our school store at the high school, that’s the only [school] that has one,

is run by our special education students. So, it's vocational training. Their intention is, with good educational value for those kids. But it has struggled over the years on the healthy choices. I mean they tried some, but what sells more are more of the junk food items.

One school nurse described a program in their school store where students can redeem tickets they have earned for good behavior:

[There is a] behavioral program at school. If they [the students] get so many tickets, they're allowed to go to a special store that they have twice a month where they can buy things with their tickets. But it's all crummy stuff. Cookies and snacks.

A participant also mentioned school fund raisers as a source of calorie dense, low nutrition foods:

Well, I have a terrible thing at one school is that their biggest money-maker... they sell churros— which are just modified donuts. They're greasy, they're full of sugar, full of trans fats and they use that as a way of making money for like the field trips and things like that and it drives me crazy. I mean what is that saying as an example for our kids?

Food as Reward

Participants in the focus groups discussed the use of food as reward for either good behavior or correct answers to teachers' questions. Rewards are typically "junk food" including candy. School nurses are particularly concerned with the use of candy as a reward because some of the students have Type 1 diabetes and candy raises their blood sugar:

Some of the teachers I can convince to use sugar-free candy. When we have a [child with diabetes], it's a struggle to keep that stuff out of their hands. It's a constant struggle ...or at least to let us know so we can do something about it with the insulin.

Another school nurse believed food rewards should be not used in school because it is unhealthy and food rewards gives the wrong message to students about food:

The other thing is so often teaching staff uses food as a reward.

And I think that is a terrible thing to start—that food is food. It should be eaten for nutrition not because you were good. I think you are really messing with the kids' psyche if you're rewarding them with food and then they learn to eat for every reason that they shouldn't be.

Encouraging Healthy Foods

The focus group participants reported that they have noticed children do not readily eat healthy foods that may be new or unfamiliar to them. Food service personnel try to engage children to try new fruits or vegetables:

Our school does have a fruit and veggie program so they can have the experience of tasting things. I find that the younger ones, the little ones are more adventurous. I mean if somebody brings fruit to school they're more likely to eat it because they have not been as tainted with their taste buds as the older kids.

The school nurses spoke of healthy foods more often in the context of fresh vegetables or fruits that were acquired through a food program such as a Farm to School program. Although fresh fruits and vegetables are served in the cafeteria, additional produce is

acquired through grants that school nurses may help write along with other school personnel:

We have wonderful fresh fruits and vegetables from local CSA (consumer supported agriculture) who donate. We had almost, literally 2 tons...we had a ton and a half of fresh fruits and vegetables donated by a local CSA this year.

One focus group participant reported on how one of her schools worked very hard to assure healthy food choices. The schools where she works embraces healthy foods through community gardens and raising fish:

We also have community gardens and all of that. We have a tilapia farm in our high school...and we're going to be taking our tilapia out for our service learning day which is the 15th ... we're going to take it out of our Ag department and put it in the cafeteria that day and filet it ourselves. And so that's kind of big.

One school nurse described her school's participation in the Farm to School program and how it posed some problems because students did not want to eat unfamiliar foods: "We do have a farm to school program in our district. What we have found to be the challenging part of it is to get the kids to try the fruit and vegetable options."

Unappealing Foods are Disgusting

The last category of foods discussed by the school nurses was food they described as 'disgusting.' Regardless of the nutritional or caloric value of the foods, these 'disgusting' foods described by the participants were visually unappealing, had a strong pungent odor, or tasted bad. One school nurse described a breakfast that was unappealing: "...for

breakfast, every now and then, they'll just send juice and sunflower seeds...and that's breakfast... And that's just disgusting."

Participants reported on several attempts at serving nutritious food, but due to the odor of the food, the students wouldn't eat it:

The only things that they [the students] were adverse to...they had a hard time getting past cauliflower because by the time...I don't know if it was because it sat awhile or what, but wow! It would be so pungent! And because of the pungent smell and not having a way to enhance the taste with a dip or something, they wouldn't eat it.

Another school nurse related her experience with vegetables served in the cafeteria. She believes the quality of the vegetables was sometimes questionable:

The thing is—is that they can look so good, but the kids aren't eating them. They're just not. They're just going in the garbage. But you know how sometimes when cherry tomatoes are super-duper sour—they might look really good but then you put them in your mouth and you're like "Blah..."The questionable quality of these vegetables...I don't blame the kids half the time for not eating them.

Focus group participants also described unidentifiable food, with ingredients that they do not recognize, that are served in the cafeteria, which the students just won't eat:

A lot of times, and I don't know—the menu I think is a lot of tomato-y or Mexican-y type things. I mean they'll have Mexican lasagna, which I'm not really sure what that is...I've seen it, but I can't totally identify what's in it...those kinds of things...the kids don't like

and usually don't want to eat it.

Another concern presented by the school nurses related to disgusting foods were the types of foods that were actually combined together and then provided to the students.

One of these special treats described by a school nurse was: "Ours is nachos. Flaming hots with cheese on it. Cheetos. Flaming hot Cheetos with nacho cheese on it."

Another 'disgusting' pairing of foods was a breakfast combination that a participant recalled was served in her school. At first, the school nurse reported that she thought it was a mistake. Unfortunately, she found that the meal was actually served more than once as a menu item to the students:

They served French toast sticks with cauliflower. The cauliflower would be in the cold tray and the French toast sticks would be in the warm tray.

And I thought the first time they did that it was kind of funny, like a mistake or something, but I mean, it was 2 or 3 times a month all year long. Who would put cauliflower with something that's going to blow out your taste buds like syrup? Who would do that?

Summary of Theme Two: Food in the School Environment

School nurses described their schools' eating environment as varied and reported on the different types of food that may be found. The school nurses reported that they monitored children's exposure to food allergens by assuring nut-safe or nut-free zones. The participants collaborated with other school personnel to write grants for fruit and vegetable programs or made recommendations for ways to improve the schools' eating environment.

According to the focus group participants, school lunches typically follow USDA

guidelines. The school nurses reported school breakfasts were not as nutritious as school lunches. The participants also described food in the school environment and defined these foods as ‘junk’. ‘Junk’ foods are found at school events, birthday parties, rewards, vending machines, school stores and/or school fundraisers.

Theme Three: School Nurses Promote Health

School nurses reported that they do not provide one-on-one care for the general student population, nor do they teach health education classes, yet they do promote health within the school. The participants described their strategies for promoting health as comprised of role modeling, teaching, collaborating with other school staff, and advocating for their students. The theme: *School nurses promote health* will be discussed in detail in this section.

Role Modeling Healthy Behaviors

Role modeling health behaviors is an important aspect of the school nurses focus on health promotion within the schools. Participants described themselves as promoting a healthy school environment through role modeling healthy eating. The school nurses used role modeling to encourage students to try new fruits and/or vegetables by bringing fresh produce for lunch or snack. One school nurse described her approach to being a role model as:

I have a really good relationship with these little kids that are always trying to come to my office around lunch time and recess time. So I'll have on my desk a banana, an apple, a bag of carrots. I'll be munching on them and I'll offer to share it and like ‘mmm...I'm eating carrots and do you want to try one’?

Another school nurse reports a similar approach to health promotion, though she brings fresh fruit or vegetables to school and intentionally places the food items where students can see them: “When I offer fresh fruit in the office to the kids they love it. I mean they’ll see a banana sitting there for my lunch and it’s like ‘can I have that banana?’”

One school nurse uses role modeling to promote health with the students in the cafeteria. She does so by eating with the students and bringing a healthy lunch for the students to see thereby modeling the healthy behavior she hopes they will imitate:

If I have the opportunity, I do like to sit and eat lunch with the kids, whether it’s in the cafeteria or if there is somebody sitting in an office some place or in a small group. I always try and pack a good lunch and I do try to encourage kids to try different fruits and veggies. I like to use a tie-in with color or even encourage them that if they don’t like it raw, try it cooked or vice versa.

Another school nurse indicated specifically role modeling healthy behaviors for children with chronic diseases such as diabetes. She reported approaching the children and engaging them in discussions with her on healthy food:

I have a [child who has diabetes] that’s in kindergarten that brings her meals here. She doesn’t like her food a lot so I’ll say to her ‘just try it.’

Another example of role modeling was indicated by one nurse who brings produce that is new or different to school to encourage her students ask about the produce:

‘Or I’ll have something out [such as green peppers] and [the students] will ask ‘oh what is that?’ And they’ll ask ‘are they hot?’ and

I'll say 'no, they're really sweet.'

In addition to being role models to promote health with their students, school nurses also report role modeling healthy behaviors to teachers and school staff. Soda is available to school staff and teachers even though it is unavailable to the students. One of the participants stated she used role modeling to encourage school staff to limit the amount of soda they consume (though she did not describe specifically how she did this), stating:

“Included in that [wellness] policy is no sodas available to students. We still have them [sodas] in our staff lounge, so I still try to work on modeling to the staff and to the students.”

The school nurses also engage in health promotion with the faculty and staff by bringing healthy snacks to the school and placing them strategically in the staff lounge. As one participant stated:

“And we made it [healthy snacks] as beautiful and as appetizing as we could and got most of the staff interested in having healthy things in the lounge to eat.”

Unlike school nurses in urban areas, school nurses in rural areas described their role in health promotion as primarily administrative in addition to the aforementioned roles. Administrative tasks were necessary, because typically they were the only school nurse in the district or they worked in multiple schools:

“I'm kind of in a more administrative role so that I get to do some stuff that's fun. I'm not so much tied down to a desk.”

“My primary job I would say I'm more of a supervisor. They call me a quasi-administrator.”

“...there’s a nurse in the district at all times, but we’re definitely considered more administrative.”

Implementing Informal Education

School nurses in Wisconsin are not generally assigned to teach health classes, though they do promote health by informally educating parents, students and school staff. The school nurses reported teaching as one strategy for promoting health that they used more often than any of their other roles, as one nurse stated: “I think our role is teaching. And teaching them what [healthy food choice] is best.”

As school nurses reported that they are limited in the opportunities to teach a formal health class, they found other opportunities for teaching students about healthy eating and making good food choices. One school nurse promoted health by purchasing a subscription to a nutrition newsletter that goes out to students and parents, in an effort to educate them about good nutrition, stating:

I also do Nutrition Nuggets...I subscribe to that. And it goes out in all the elementary folders once a month. And that’s big...I mean I know it’s something I can do. But it’s easy for me and it’s a lot about increasing fruit and vegetable consumption.

The focus group participants also reported being resourceful in how they educate children and their parents about healthy eating. The nurses described a variety of strategies for educating both children and parents, including:

So if I can, I’ll even send home little guidelines that I individualize for the student because I look at things that they say they’re eating and I say ‘well you need to eliminate this and you could do this.’”

The school nurses discussed how they had used innovative and hands on approaches to teach students to make healthy food choices by introducing them to new foods:

I actually had done a nutrition class where I actually brought in green peppers, red peppers, cauliflower—all raw. And then gave them those little 2 ounce containers, or 3 ounce containers, and we put in French dressing and Ranch dressing.

In addition to the nutrition class, a school nurse helped plan and implement a health fair at one of the schools. The health fair promoted healthy eating, and included introducing foods that were unfamiliar to the students. The participant indicated that the health promotion strategy they used was to introduce new foods to the students, so they could experience for themselves the benefits of healthy food:

...and then this year we did a health fair and we actually had a soup and salad bar in the kitchen as well as vegetable smoothies. And that was a big hit, but they didn't allow enough time for the kids to do all 3 areas. [The health fair] was held in one room [and we] didn't realize it was going to be such a big hit. And [there was] so much available...but the kids they had, even boiled eggs to put on their salad. They had never had boiled egg. I mean it was just amazing.

Another teaching approach used by a school nurse was focused on promoting nutrition that the students could relate to in their everyday lives. The nurse shared that she focused on teaching her students the nutritional value of food at McDonald's—a restaurant her students frequented:

I printed out McDonald's nutrition information because a lot of them go there. I asked the kids what they liked and showed them how bad those things are for them.

The school nurses discussed that they do not limit their efforts at health promotion to just the students and parents. They try to address health promotion from a variety of perspectives, in the hopes of having a greater impact on the health of the children. In order to accomplish this, the school nurses focused on educating staff members within the school and administrators, reporting:

Then I would add an educator role [in addition to be an advocate, collaborator and role model]. For administrators to the school board, to advising employees and teachers...also encouraging changes in vending machines' offerings and fund raising situations.

Collaborating with an Interdisciplinary Team

Participants stated that in order to promote the health of children, they spent a lot of time collaborating with others within the school and community. School nurses collaborated with teachers, the dietician or food service personnel, or on a community coalition as part of an interdisciplinary team:

I'm on that [names County organization]" which is a coalition. I'm on the steering committee for childhood obesity task force [a component of the coalition]. I'm on the steering committee. We work a lot with Farm to School... there is a huge Farm to School initiative under the nutrition piece and under the physical activity obesity component.

Collaboration with the dieticians or food service personnel within the schools focused on

health promotion through encouraging healthy food choices. One of the participants stated: “I try to work very collaboratively. The nutrition director and I try to work pretty closely together.” The collaborative relationship with the food service director was also described by a school nurse in this manner:

I’m collaborative with our food service director. She and I collaborate a fair amount on strategies and ideas. She tries to do taste testings in the classroom. We talk about what works, [what is] age appropriate.

Developmentally, what do little kids’ need as opposed to the high schoolers?’

Similarly, a participant shared her efforts to increase fruit and vegetable consumption through a collaborative relationship with the dietician in her school district: “And with fruits and vegetables, I’m very active with the dietician in the district working on increasing fruit and vegetable consumption.”

Health promotion strategies the school nurses have pursued has also been through collaboration with the physical education teachers. As the physical education teachers are the personnel in the school system who usually measure the students’ BMIs, working collaboratively is beneficial. The collaborative effort enables both the PE teacher and the school nurse to be aware of health concerns related to the child’s BMI. At times the school nurses have collaborated by actually helping the PE teachers with the measurements in order to calculate the BMI. However, the collaboration may involve the PE teachers sharing BMI measurement information with the school nurses, so they are aware of any potential health concerns related to BMI levels, as one nurse stated:

And I needed BMIs on all the kids and my former gym teacher did

BMIs on all the kids. And he actually shared it—my former gym teacher

actually shared the BMIs at parent-teacher conferences.

A slightly different approach was shared by another school nurse whose collaborative efforts with the PE teacher which included assisting with physicals: “I do help with the sports physicals at the end of the year. So when those come through I will be doing height and weight.”

Advocating for Students

The last component of the theme: *School nurses promote health* involved school nurses being engaged in promoting health through advocating for their students. School nurses in all of the focus groups discussed their role of advocating to care for the students in the best way they could. School nurses view their role as an advocate as vital to the health of the students and the community, whether directly or indirectly. Indirectly advocating for the health of the student is reflected in the following statement a school nurse shared:

I also see my role as being an advocate and liaison to support her [food service director] efforts with administration and parents in the community. We’ve written some grants together and then advocate for support to administration and parents in the community.

The school nurses discussed advocating for the students by monitoring the school environment for foods harmful to students with allergies. Dietary hazards can be life threatening for children with food allergies, requiring the school nurse to actively advocate on controlling certain foods in the school environment to protect the health of these students:

I noticed they had fish a couple times at our school this year. A couple of children—had epi pens [in school] because of the fish allergies.

I had to call their moms ahead [to let them know when the school served fish] of time. And 2 of the children didn't even come to school that day because they have such severe reactions [to fish].

Another participant reported on her experience with food allergies in the school:

We have a lot of kids with allergies and for breakfast they were serving sesame seeds. So, we need to be cognizant of the food allergies...so I actually had to have them [food service personnel] make special lunch things for kids.

A school nurse also described her experience in advocating for alternate choices for food brought into the school for birthdays or as a form of rewards:

And so when these people bring in this home-made stuff...it's a nightmare for me to try to figure out what's coming into the classroom that's not regulated or produced in the school setting. Because I even talked to some of the elementary school principals and said 'here's the deal. May you not have them just bring in stickers or give the kids little fun pencils? Do you always have to give them food?'

Lastly, the school nurses viewed themselves as advocates when serving on committees that determine policies for the school:

And often, we as school nurses either chair the committee or certainly are a part of the committee and are seen as advocates and the health expert the districts need to have to help them make those right choices.

Summary of Theme Three: School Nurses Promote Health

The school nurses who participated in the focus groups described various strategies they

use to ensure health promotion within their school and community. Common components of health promotion described by the school nurses were role modeling, implementing informal education, collaborating with an interdisciplinary team and advocating for students. Participants discussed that through all of the different strategies used for health promotion, they were making progress, as reflected in this statement: “Well, I think we’re always getting the message out there...and slowly but surely, we’re gaining a little bit of ground”. Additionally, school nurses did reflect on their commitment to making a difference, indicating that: “School nurses can make a difference. If I didn’t believe that I wouldn’t still be here.”

Theme Four: Obesity is a Sensitive Issue

The fourth theme that emerged from the data addressed the prevalence as well as the sensitive nature of childhood obesity. The school nurses shared that they knew the impact of obesity on children, and felt they did have an obligation to address this with parents. However, according to the school nurses, parents are very sensitive about having the school nurses discuss their child’s weight with them. Due to the sensitive nature of the topic of children’s weight, any discussions school nurses have with the parents has to be initiated in a safe and nonjudgmental way.

School nurses reported finding that parents are very sensitive when information is shared with them that indicates their child is overweight. According to the participants, parental responses can be very negative, placing the blame for the excess weight of the child on the school. Consequently, school nurses didn’t typically discuss a child’s weight with parents unless there was an underlying medical diagnosis such as asthma or hypertension:

Those kids that I have to take blood pressures on...one of them, the parents only spoke Spanish and I'm not bilingual, but I talked to the other grandmother about it a little bit because the sister of this child was very obese also. So we reviewed what I talked about with the child's older sister. So I think it's really important to call the parents directly. And in a nice way say "hey your child is overweight and there are ways you can help."

Another issue the school nurses discussed was the fact that children who are overweight or obese have parents who are also overweight or obese.

The parents are our biggest boundaries. You don't want to offend them. So if you need to talk to them in regards to a child's weight unless THEY bring it up. I usually try to discuss a medical concern and go through the back door and say a lot of times, this is related to the child being overweight. But it's so delicate. And a lot of times these parents are very overweight.

While parental response was not reported as positive by the school nurses, the same school nurses indicated that they were very interested in working with any parents who were receptive to partnering with them to improve the health of the child. One way the nurses indicated they encourage parents to partner with them in addressing the excess weight of the child was to develop a trusting relationship with the parents:

We want to try to have the parents gain the trust and [have] confidence in us. You try to help them in ways and say things in a way that's not going to either offend them or put them on the defense. Like 'she's trying to tell us what to eat.'

Another school nurse described how she addressed the sensitivity of contacting parents:

“I don’t ever solicit...I don’t ever contact the parent as the first contact. I’ve had parents contact me and then I’ll get involved. But I don’t ever call and say ‘I noticed your child...’”

One of the participants had mixed responses from parents. Some parents are thankful that school nurse brought their child’s BMI to the parents’ attention. Other parents are upset with the school nurse for mentioning their child’s BMI:

I’ve helped parents get involved in some education nutrition, research things going on at [names University]. And I’ve had parents who have been very glad that I asked them to go see their doctor—their child may be pre-hypertensive or whatever. But I’ve also had parents who complain. ‘Why did she have to tell me his BMI?’ And one of those kids ended up getting diabetes a year later.

The participants who reported that they measured BMIs also indicated that they are not required to measure BMIs. One of the school nurses, who measured BMIs, does so as part of a routine blood pressure screening and sends the report to the parents. Another participant reported only the height and weight of the child, not the BMI. Several participants also reported that the physical education teacher does measure BMIs and shares the information with the school nurse. One participant thought it was important to notify parents, although she was not required to do so:

Our phys ed department has done heights and weights twice a year for years...and we never reported them to anybody and I thought “why are we doing this?” Well, they’re doing it for the physical fitness awards and...and that, but really, it’s just a number.

But it's one of many numbers, and shouldn't parents know? ...

Another participant made the decision not to notify parents due to the detrimental affect of informing the parents and children, stating:

I did not send out BMI letters because I went to a breakout session at the [school nurses] conference that said that it can be detrimental to their health and I also feel that I justified it for so many years but I just don't know...I don't want to hurt anyone's psyche. And I just decided maybe I wasn't going to do it this year.

The school nurses estimated the prevalence of children who were overweight or obese in the school to be between 18% and 50%, depending on the location of the school (See Table 5).

School Setting (Rural or Urban)	Measure BMI	Report BMI to Parents	Approximation % of Overweight/Obese
Rural	No, PE does them	No (PE sends home)	25%
Rural	No	No	20%
Rural	Yes	No	18% overweight/ 12% obese
Rural	No, PE does them	No	“creeping toward 30%”
Rural	No	No	No approximation
Rural	No, PE does them	Yes, part of blood pressure screening	No approximation
Rural	No, PE does them	No	No approximation
Rural	No, PE does them	No	No approximation
Urban	No, only for meds	No	20%
Urban	No (PE did them in the past)	No (PE reported them in the past)	50%
Urban	Yes	No	20-25%
Urban	Yes	Reported heights and weights, but not BMI	>50%
Urban	No	No	30-40%
Urban	Yes	No	>50%
Urban	No	No	20%

Table 5: School nurses measurement of BMI and Obesity Prevalence

The school nurses related their concerns about children in the schools who were impacted by their excess weight. One experience that was described by a school involved a young child in elementary school:

I'm going through this situation right now where I do have a kid. [The teacher and her students] went for this little walk, and this child...there was a stick on the ground. She went so much out of her way to go around the stick as opposed to lifting her leg. I'm talking about complete obesity. So she made it to the park, which is about 3 blocks away. She could not make it back. She's third grade, well over 200 pounds. The teacher had to go get her car and come and get her. I happened to walk with them, so I was there and I knew this was going on. So I called mom and I left her a message and I said, "I would really like to discuss her wellbeing with you and general wellness." She never did call me back.

The school nurses in the urban school districts reported more instances of childhood obesity than the school nurses in the rural school districts. One school nurse shared her experience with a severely overweight 8th grade student:

I have an eighth grade girl, she'll be going to high school she's 5 foot 9 and I know she's greater than 350 because my scale only goes up to 350 and she had never come in during the 3 weeks of time that our digital scale had workable batteries. But finally after months, because I had talked to her about her weight with her asthma, her mom finally got her involved in the New Kids program.

One of the concerns discussed by the participants was the possibility of underlying medical condition in an obese child: "I have concerns that a child has sleep apnea, because of the way he was falling asleep all the time in school. And he was 58 inches and 238 pounds."

Summary of Theme Four Obesity is a Sensitive Issue

The participants discussed overweight/obesity prevalence in their school districts and state mandates requiring BMI measurements. Four of the 15 participants measured BMIs but did not report them to parents unless it was a part of a blood pressure screening. The school nurses described several students in their schools who were obese and the complex issues associated with notifying parents of children's BMIs, such as the sensitive nature of obesity. One school nurse explained the juxtaposition of children not only being obese, but also hungry.

Theme Five: Influences of Policy on Wellness

The school nurses discussed public policies that influenced the schools food environment specifically the United States Department of Agriculture (USDA) changes in the breakfasts and lunches nutritional requirements and the 'free or reduced lunches'. Directly related to "free or reduced lunches" is the requirement for schools to have a Wellness Policy if the school receives federal funding for school lunches. Participants reported that they worked in school districts that participated in the "free or reduced lunches" and receive federal dollars for school meals.

The school nurses reported improvement in both school breakfasts and lunches with the new USDA Guidelines:

Well, they have to follow the USDA, so they have requirements and I think they've just increased fruits and vegetables because we have signs at the end of our line that says "You MUST take 2 fruits or 2 vegetables" or something. It says that at the end of the cafeteria line because we see them send the kids back—they have to get more.

Another participant also reported on how the policy impacts changes in school lunches and requirements outlined for the students:

...with the new rules, they have to take a certain amount of fruits and...
I don't think they can have seconds on...I forget if it's carbs. There has to be a certain percent of calories. There's a sign up that kind of tells the students what they have to have. We don't have an open campus, so everyone has to eat in the cafeteria and there's not an à la carte line where they can eat pizza and nachos everyday.

One school nurse discussed changes in the school lunches due to another policy, the Healthy Hunger-Free Kids Act. She said she thought that due to the policy, there were improvements in the amounts of fresh produce:

With the health and hungry free nutrition act that came into play, we're obviously offering more fruits and vegetables. But what we have found to be the challenge is getting the kids to try them and eat them. What I think is improving is the federal guidelines have improved the opportunity.

The school district complies with the USDA standards but there is room for improvement according to one of the participants:

[We're] following the USDA guidelines. Increased in fruits and vegetables has happened, higher fiber has happened. I know kids are angry that they're decreasing the calories and they don't think they're getting enough food at the high school level. To me it appears that they are eating way too many starchy carbs.

Although the school districts where the nurses worked were complying with the new federal guidelines, the requirement for federal Wellness Policies was not always met. A limited number of school nurses reported having the federal Wellness Policies in their school districts. These participants were actively involved in the implementation of the federal Wellness Policies in their school districts. However, quite a few of the school nurses reported that they worked in schools where 94% to 98% of the students received free or reduced breakfasts or lunches, yet they stated that they did not know what federal Wellness Policies were or that the policies were required:

“I know that there’s a wellness division, but how, how influential are they and actually creating wellness in the school community—that I couldn’t tell you.”

The school nurses were unsure if the wellness division was the federal Wellness Policy in their school district or if there was a separate Wellness Policy in the school district,

responding with: “Yeah, nothing that I’m really familiar with.”

Other school nurses who indicated they were familiar with federal Wellness Policy reported that their schools did not have them: “There really isn’t a Wellness Policy.”

Another school nurse agreed about the lack of a wellness policy and acknowledged that the federal Wellness Policy is one way school nurses can become involved in promoting student health: “I would think the best way would be through the wellness committee.

But we don’t have a wellness committee.” Another participant in the same focus group responded, “We don’t either.” As stated by school nurse who is aware that the school she

worked was in violation of the law: “Yes, we recognize that it’s legally required.”

Summary of Theme Five: Influences of Policy on Wellness

The participants reported that the role of public policy in the schools’ food environment

influences what may or may not be served for school breakfasts or lunches. Similarly, they realized the need for public policy in addressing the nutrition requirements of students. The school nurses were also very candid in their comments on the lack of federal Wellness Policies in their schools or their general lack of knowledge of federal Wellness Policies even though their schools participated in the “free or reduced school lunches”.

Theme	Definition	Subthemes
If there were more of me, I could do more	Lack of resources are the primary barrier in achieving healthy eating school environment.	Farm to School programs Limited personnel Dwindling money allocations
Food in school environment	Nurses described limited input on the quality of food in the school environment, which is affected by foods prepared, brought into or sold within the school.	Input in regulating food Food choices: healthy, unhealthy, or unappealing Foods: competitive revenue generator Food as reward Encouraging healthy foods Unappealing foods are disgusting
School nurses promote health	Health promotion was identified as school nurses role, functioning as role model, educator, collaborator and student advocate.	Role modeling healthy behaviors Implementing informal education Collaborating with an interdisciplinary team Advocating for students
Obesity is a sensitive issue	School nurses identified measuring students' BMI as a sensitive issue.	None
Influences of policy on wellness	School nurses discussed public policies and how they impacted the school environment.	None

Table 6. Themes, definition and subthemes

Summary of Findings

Fifteen school nurses participated in 5 focus groups held throughout the state of Wisconsin in both rural and urban school districts. The participants described what they believed to be their role in creating a healthy eating school environment. Five themes emerged from the data analysis: If There Were More of Me, I Could Do More; Food Environment in Schools; School Nurses Promote Health; Influences of Policy on Wellness; and Obesity is a Sensitive Issue.

Through these 5 themes, the school nurses described what they perceived their role was in creating healthy eating school environments: role modeling healthy behaviors, implementing informal education, collaborating with and interdisciplinary team and advocating for students. The participants also discussed the many sources of food in the schools that include such as breakfasts and lunches, but also food brought into the school for parties or after-school events. Other sources of food discussed by the school nurses were vending machines, school stores and food used as rewards for good behavior. The school nurses described the food as either being healthy, unhealthy and even disgusting.

The third theme that emerged from the data was the perceived barriers the school nurses discussed. The participants emphasized the lack of money due to budgetary cuts, which led to fewer school staff and less time to accomplish the tasks the school nurses felt were important in a healthy eating school environment. The participants also discussed the role of policy and its impact on wellness in the school environment. Lastly, the focus group participants discussed the prevalence of overweight and obesity in their schools. They emphasized that there is no law requiring the schools to measure students' BMIs and how discussing a child's weight with parents is a sensitive issue.

From the data, a picture of the role of school nurses emerged indicating that they are concerned about the health of their students. They also described their roles in how impact the health of their students, stating that they wished they could do more.

Chapter 5

Discussion

No studies were found in the literature on the role of school nurses in Farm to School programs nor in their role in promoting fruit and vegetable consumption in the schools. Due to the lack of information on the role of school nurses in programs such as Farm to School programs, school nurses' knowledge of Farm to School programs and their perceptions of their role in promoting increased fruit and vegetable consumption in the school setting has been reported in this study. Five themes and several subthemes emerged from the transcripts and discussed in this chapter within the context of current literature on school nurses perceptions of their roles in promoting fruit and vegetable intake and healthy-eating school environments. Recommendations for nursing education are presented in this chapter along with a section on limitations of the study and implications for future research.

Theme One: If There Were More of Me I Could Do More

Over half of the school nurses (60%) reported that they were aware of the Farm to School programs. However, only 2 school nurses worked in school districts that participated in, or had participated in Farm to School programs, limiting the number of participants who shared direct knowledge of the Farm to School programs. The low number of nurses with knowledge of or involved in schools with Farm to School programs was surprising, given that the Healthy Hunger Free Kids Act of 2010 mandates the availability of Farm to School programs to increase fruit and vegetable availability in the school environment. Additionally, the growth of Farm to School programs has been supported in the Wisconsin's State Legislature, which passed a bill in 2010 that provided

a Farm to School Coordinator and Advisory Council (LaRowe, Yoder, Knitter, Meinen, Liebart & Schoeller, 2012).

All of the focus group participants stated that they would support a program such as Farm to School, as they felt it could be beneficial for students. Studies have been reported supporting the positive effects of Farm to School programs, LaRowe et al. (2012) reported that after one year in the program, students improved their knowledge and attitude toward trying and/or liking fruits and vegetables, suggesting that Farm to School programs may impact children's food preferences. Similarly, Story, Nannery and Schwartz (2009) reported on the positive effects of policies that improve the quality of food in the school environment. Specifically, the researchers discussed Farm to School programs, school gardens, and the federal fruit and vegetable program available through grants from the USDA and how these programs increased the availability of fruits and vegetables in school environments (Figure 1).

The greatest barrier to the school nurses in this study creating a healthy food environment to promote health in the schools were limited resources such as lack of time, budget cuts and fewer school personnel. Time demands on school nurses were reported in a study conducted by Kubik, Story, & Davey, (2007) who discussed school nurses' reports of lack of time as a barrier to health promotion. Similarly Morrison-Sandberg et al. (2011) in their study found that lack of time and school personnel were a barrier for school nurses' health promotion efforts.

School nurses from this investigation reported there were limited school nurses for the large number of students within the school system, which according to the state records was an average nurse-to-student ratio of 1 nurse to 1,596 students. The

school nurses indicated that they might oversee the care for as many as 1,500 students. One school nurse reported there was 1.5 school nurses for 2,400 students in the district. According to the school nurses in the current study, the high nurse-to-student ratio in their schools limited the health care services that they could provide, and the health promotion programs they were able to implement. The nurse to student ratio is higher than reported in the Guttu et al. (2004) study examining educational systems where school nurses were employed in North Carolina. The investigation found that schools with a nurse-to-student ratio of 1-to-750 had better health services and managed chronic health conditions such as asthma and diabetes better than schools that had a higher nurse-to-student ratio (>1/1,000 students).

According to Baisch, Lundeen and Murphy (2011), the ratio of school nurses to students positively influences the health of the students. Baisch et al. examined public schools in an urban Midwestern city that employed school nurses and matched them with schools that did not employ school nurses. The researchers found that in schools where nurses were employed, the amount of time teachers, clerical staff, and school principals spent on students' health care issues were reduced by approximately 13 hours per day. Additionally, districts that employed schools nurses had higher immunization rates, better health records and health management for students with chronic health conditions.

Theme Two: Food Environment in Schools

According to the school nurses, a variety of foods are found in the school environment, and there is little that the school nurses can do to regulate the food in the school environment. However, school nurses reported they try to give as much input into the food environment at the schools as possible. The health promotion efforts to influence the

school food environment are reflected in 2 subthemes: (a) input in regulating food; and (b) food choices: healthy, unhealthy or unappealing (Figure 1).

Input in Regulating Food

One of the major concerns the participants discussed related to regulating food was in relation to protecting children with allergies. As the school nurses are not aware of all the food that is brought into the school, it is a difficult task to monitor the food environment. Even when nurses are aware of the food in the school, they are not always sure if the food contains allergens that may cause an allergic reaction in students. Similar concerns about food allergens was discussed in a research study by Morrison-Sandberg et al. (2011) in their study with school nurses in Minnesota. The researchers reported that the school nurses' biggest concerns were managing chronic health conditions such as diabetes, food allergies and mental health issues. According to the investigators, school nurses spent more of their time monitoring food in the school because of the potential of life-threatening food allergies rather than focusing on health promotion in the schools.

Another way that school nurses in the current study reported having input into the school food environment was to write grants to fund access to fresh fruits and vegetables for the students in the school. Unfortunately, the fresh fruits and vegetables were only available for students at the school if a grant was successfully funded. No other study was found that reported on school nurses writing grants to obtain funding for fresh fruits and vegetables for children in the schools. However, the USDA grant program is reported in the literature as one source of funding for obtaining fresh fruit and vegetable grants. The grants are available to elementary schools and can provide funds up to \$50 to \$75 per student per school year (USDA, 2013), to improve the school food environment.

Food Choices: Healthy, Unhealthy or Unappealing

Participants discussed the USDA guidelines in the focus groups, describing the changes that have occurred in USDA food guidelines in recent few years. The USDA food guidelines for school meals are based on the Healthy Hunger Free Kids Act of 2010 mandate requiring that children receive healthier food in school. The guidelines state that students should have fruits and vegetables every day of the week, whole-grain foods, serve fat-free or low-fat milk, and limit the number of calories children receive (based on their age) and saturated fats, trans fats and sodium (USDA, 2013). School nurses in this study reported seeing more whole grains, fresh fruits and vegetables served for school lunches in recent years than prior to the USDA mandate, suggesting that the nutritional value of the school meals have improved.

It is important to discuss that while school meals have improved and become healthier, according to the school nurses, there are other foods that compose the school food environment that are not healthy. School nurses in this study reported that students have access to competitive foods which are pervasive in the schools in vending machines, as rewards, for school fundraisers, after-school events, and during school parties. The availability of competitive foods versus fruits and vegetables in schools was examined by Larson and Story (2010). The investigators found that schools where the availability of competitive foods was pervasive also had students with higher BMIs and poorer dietary habits than schools which limited competitive foods.

Competitive foods in school were also examined by Fernandes (2013) who conducted a study in 19 states where competitive foods in schools were restricted and compared them with schools where competitive foods were not restricted. The

investigator found that in schools limiting competitive foods there was a reduction in: the availability of soft drinks (16.5%); low nutrient snacks (22.0%); and sweets (18.1%) when compared to states that did not limit competitive foods. Similarly, Taber, Chriqui and Chaloupka (2012) conducted a study comparing schools in California that limit competitive foods, with 14 other states that do not limit competitive foods. Researchers found that students attending schools that allow unrestricted competitive foods consumed more calories than students who attend schools limiting competitive foods.

Theme Three: School Nurses Promote Health

Participants from the focus groups reported that their major role was to promote health. However, there were a variety of roles that they filled in order to promote the health of children on any given school day. The school nurses discussed promoting health through their role of administrator, clinician, leader, resource person, hands-on care, liaison, and health assessments. Health promotion was most frequently achieved through the school nurses role of role model, educator, collaborator and advocate, and these roles were discussed in the most depth by the participants (Figure 1).

School nurses described ensuring health promotion through their administrator role, as they have the responsibility of overseeing the health of the students in the school district. Administrative oversight to promote the health of the school children included overseeing health screenings, immunizations, and chronic care management. As an administrator the school nurses did not necessarily provide hands on care, but supervised unlicensed personnel who provided the actual care.

Administrative roles to promote the health of children have been reported in other studies. Quelly (2014) conducted a study on school nurses perceptions of their practices

related to childhood obesity in Florida. The administrative role was perceived as one of the roles the school nurses used to address childhood obesity. In addition, to the administrative role, the school nurses had a clinician role when addressing the health of the school children, unlike the school nurses in this study who reported they did not generally perform in a clinician role.

Role Modeling Healthy Behaviors

School nurses described promoting the health of students through role modeling health behaviors for students and staff. The nurses provided multiple examples of how they promoted the health of children through their modeling of healthy eating behaviors within the school. The NASN (2013) suggests that school nurses promote the health of children through role modeling healthy choices not only for students, but for teachers and parents as well. NASN's policy statement describes promoting healthy food choices in the school by having the school nurses make healthy food choices, offering fruits and vegetables to students, avoiding soda, and placing healthy foods in the staff lounge. Participants in the focus groups for this study reported promoting healthy behaviors that were consistent with the school nurses in an article by Walker (2014). Walker discussed how school nurses can promote the health of children through modeling healthy behavior such as eating fresh fruit and vegetables at school and drinking water instead of soda in schools. She based her recommendations on the National Association of School Nurses' standards that outline specific strategies for health promotion in the school environment.

In the literature there are several research reports on school nurses' perceptions of their roles in relation to addressing childhood obesity through health promotion. In those reports, the investigators describe role modeling as one method to encourage children to

make healthy food choices (Price, Desmond, Ruppert & Stelzer, 1987; Moyers, Bulge & Jackson, 2005, Walker, 2014). The researchers found that when school nurses' role model healthy eating behaviors, it encouraged the students to demonstrate healthy eating behaviors.

Implementing Informal Education

Participants in this study discussed using their 'educator role' to promote health by providing information to help students learn about healthy food choices. The 'educator role' that the school nurses described during the focus groups includes educating not only the students, but the teachers, parents, and other staff at the schools. The perceptions of the school nurses as educators is similar to that of the Wisconsin Department of Instruction (DPI, 2011) which states that school nurses' act as educators by monitoring the health of students, as well as that of the school personnel. It is explicitly identified in the School Nurses Handbook (DPI, 2011) that their role of educator encompasses school personnel, other school nurses, teachers, community partners, and unlicensed personnel.

The role of school nurses as an educator was further discussed in work done by Quelly (2014), NASN (2011) and the Robert Wood Johnson Foundation (2010). However, the research presented in the literature describes consistent, though not identical perspectives of the educator component of the school nurse role. Quelly (2014) found that school nurses' perceived their role as that of educator, but no definition or specific details of what the role of educator entailed was presented in the study report. The NASN (2011) report was more consistent with the findings of this study; that the role of school nurses was educating school personnel as well as students about healthy lifestyle and food choices. Conversely, the Robert Wood Johnson Foundation (2010)

publication on school nurses focuses on the educator role as one of educating students not school personnel.

Collaborating with an Interdisciplinary Team

School nurses in this study reported that they were also able to promote the health of the children in the school through collaboration with interdisciplinary colleagues. The collaborative efforts varied, and included working with physical education teachers, classroom teachers, and food service personnel. Similarly, Morrison-Sandberg, Kubik, and Johnson (2011) conducted a study with school nurses in Minnesota and found that school nurses collaborate not only with physical education teachers, but with food service staff in the school districts, and their wellness councils.

Health promotion through collaboration was also discussed in a study by Bryan, Brossard, and Bellar (2013), who found that school nurses collaborate by working with physical education teachers. The investigators reported that the partnership between school nurses and physical education teachers can be very effective in helping students develop a healthy lifestyle by collaboratively advocating for physical education interventions. Bryan et al. suggest that interdisciplinary collaboration can influence school policy by promoting healthy behaviors through a variety of interventions such as school health fairs.

School nurses' collaborative efforts are not limited to the confines of the school structure, as participants in this study shared experiences they had collaborating with community partners. Health promotion through collaboration with community partners focused on securing fruit and vegetable grants or participating in coalitions for healthier lifestyles, such as working with local farmers to bring in fresh strawberries and other

produce to the school. No articles were found in the literature addressing collaboration between public schools and farmers. However, Bontrager-Yoder, Liebhart, McCarty, Meinen, Schoeller, Vargas and LaRowe (2014) reported on the success of Farm to School programs in Wisconsin. The investigators found that students at a school participating in the Farm to School program, whose fruit and vegetable consumption was low prior to the initiation of the program, increased their fruit and vegetable consumption. In addition, the researchers found that for students in schools with Farm to School programs, their attitudes and knowledge of increasing fruit and vegetable consumption improved.

The focus group participants collaborated with various school personnel, but admitted they did not collaborate with food service personnel nor other personnel associated with the Farm to School programs (if their school district participated in the program). The school nurses stated that they would be interested in collaborating with school personnel in securing a Farm to School program, but were not interested in administering the program.

Advocating for Students

The school nurses promoted the health of children by advocating for the students in their roles as members of wellness committees, providing the opportunity to advocate for health and wellness. There were similar health promotion initiatives that the school nurses reported advocating for, including: healthier food choices in the schools, increasing funds for fresh produce, and increasing physical activity.

One health issue that the school nurses have had to be very vocal about in their role of advocate is the need for reducing the amount of allergens that come into the school. Peanuts and other nuts are a major concern, as exposure to the allergen can create

a preventable life-threatening medical emergency for students with allergies. The prevalence of students with allergies continues to increase, so it is incredibly important that school nurses be vigilant to keep those students safe (Sicherer, 2011).

Advocacy by school nurses was also discussed by Sicherer and Mahr (2010) in an article from the American Academy of Pediatrics (AAP). The AAP report indicates that 1 out of 25 school children suffer from allergic reactions, which are the primary cause of anaphylaxis in children. Sicherer and Mahr also indicated that 25% of the anaphylactic episodes occur in children who have not had a previous allergic reaction. It is recommended in the AAP report that school personnel be aware of the potential threat of anaphylaxis. One way for the information to be disseminated to school personnel is by having school nurses advocate for the health of the children by developing an emergency action plan and make it available to all school personnel who work with students (Figure 1).

Theme Four: Obesity is a Sensitive Issue

Participant's discussed health promotion and the food environment in the schools including the prevalence of childhood overweight and obesity in their schools and the sensitivity surrounding the topic. The school nurses shared their individual practices for reporting BMI rates with the parents, as well as the sensitive nature of disclosing a child's BMI to parents. Childhood obesity can be a sensitive issue according to reports in the literature, and has been linked to depression, low self-esteem, anxiety, and stigmatization (Rojas & Storch, 2010; Crocker & Garcia, 2005; Kaplan, Liverman, Kraak, & Wisham, 2007; Puhl & Lattner, 2007; Reeves, Postolache, & Snitker, 2008) leading to parents becoming defensive and angry with the school nurse, particularly if the parent(s) is also

overweight (Quelly, 2014).

Nauta (2009) who used the Price et al. survey regarding school nurses' perceptions of their roles in childhood obesity also suggests parents perceive that reports of a child's BMI may be stigmatizing or stressful. However, Nihiser, Lee, Wechsler, McKenna, Odom, Reinold, Thompson, and Grummer-Strawn (2009) report parents appreciated notification of children's BMI measurements. Similarly, Flaherty (2013) acknowledges the controversial and possibly detrimental effects of BMI measurements and parental notification. The investigator reports possible negative effects of identifying overweight and obese children that includes bullying and increased incidences of eating disorders. Despite these possible deleterious effects, Flaherty recommends BMI measurement and parent notification to help in childhood obesity treatment.

Conversely, Gundersen, Mahatmya, Garasky and Lohman (2011) conducted a literature review and found stressors such as depression are associated with high BMIs in children. The authors recommend that practitioners who care for children with high BMIs also provide resources to help the children manage stressors such as depression and low self-esteem related to their BMI.

Several of the focus group participants (20%) measured BMIs in their schools and 40% of the school nurses reported that physical education teachers measured BMIs. Research reports were not found in the literature addressing the school nurses' perceptions or estimates of childhood obesity. However, Linchey and Madsen (2011) report 20 states require BMI measurement in the schools and 9 states recommend BMI measurements. The researchers found that childhood obesity rates were higher in states that require BMI measurements in the schools and attribute this finding to the fact that

states with higher childhood obesity rates are more likely to require BMI measurements.

Rural school nurses who participated in this study estimated childhood overweight and obesity prevalence rates in their schools of between 18% and 25%. Urban school nurses estimated overweight and obesity prevalence in their schools between 20% and over 50%. The national prevalence rate for all ethnic groups for children between the ages of 2 years and 19 years old is 31.8% (Ogden, Carroll, Kit & Flegal, 2014). The rural school nurses' estimates are slightly lower than the national rates and the urban school nurses' estimates are higher.

LaRowe et al. (2012) discussed similar rates of childhood obesity in Wisconsin in their one-year evaluation of Farm to School programs in Wisconsin. The authors suggested that Wisconsin Farm to School programs could possibly help decrease childhood overweight and obesity rates but interestingly, the researchers did not measure BMIs at the conclusion of the study. Yoder and Schoeller (2014) report Farm to School programs have increased fruit and vegetable consumption in Wisconsin, but the overall calories consumed in schools have not decreased as a result.

Theme Five: Influences of Policy on Wellness

Federal policies that impact the public school food environment are designed to improve the wellness of students and staff. The public policies for health promotion included wellness policies, and the school nurses in the focus groups described their wellness policies—or lack of wellness policies in their school districts. Only 13% of the participants in the focus groups reported that their schools had wellness policies in place within their school districts. One school nurse admitted her school district did not have a wellness policy and stated, “we recognize that it’s legally required.” Wellness policies are

mandated by the Healthy Hunger-Free Kids Act of 2010 for all school districts who participate in the National School Lunch or Breakfast Programs also known as ‘free or reduced lunches’ (Public Law 111-296, 2010).

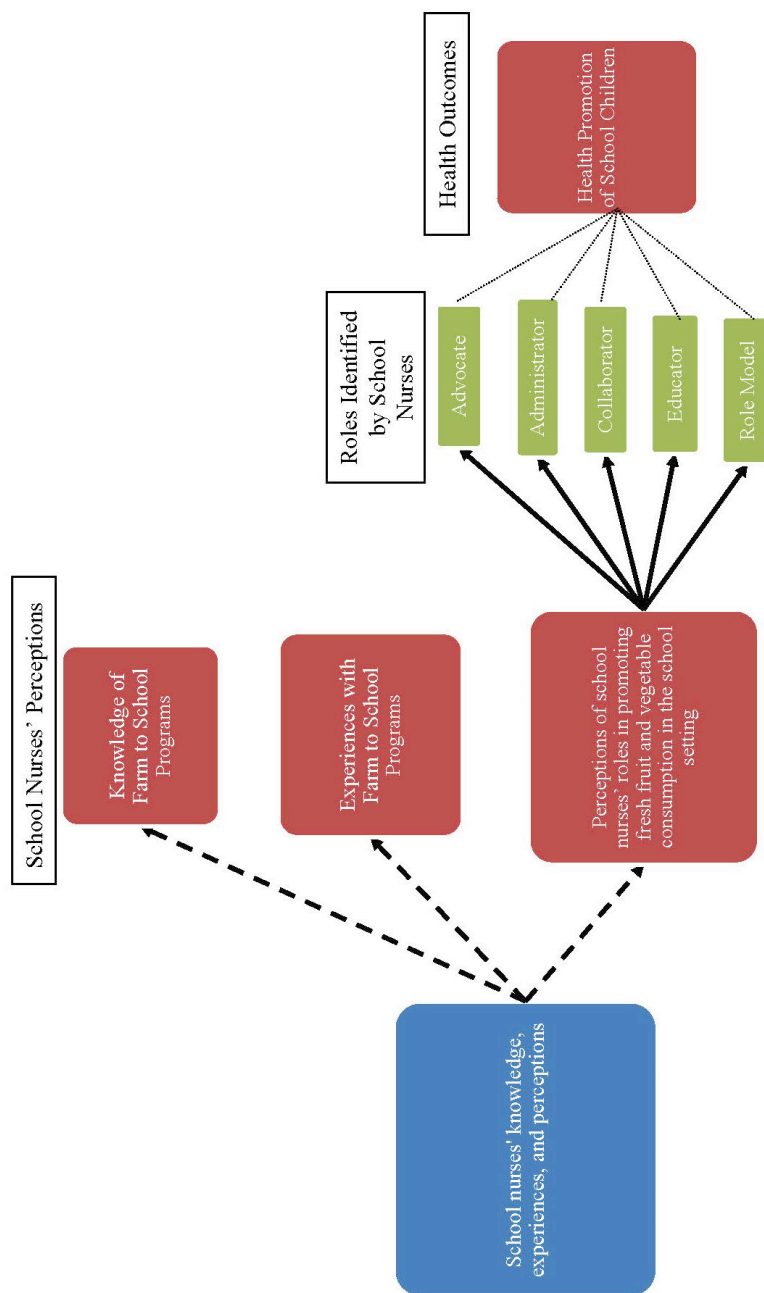
The research literature is consistent with the responses of the school nurses regarding school wellness policies. Moag-Stahlberg, Howley, and Luscri (2008) reported in a national sample that 62% of the school wellness policies complied with the federal mandate in all components (nutrition policy, physical education, nutrition education, and other school-based activities such as recess before lunch). However, of the wellness policies reported in the study, 32% did not address all components of the federal mandate, though 85% of the wellness policies did include methods for evaluating and implementing the policies. In a similar manner, Longley and Sneed (2009) found that 72.4% of the aforementioned components were implemented. However, the guidelines for competitive foods sources—vending machines, fund-raisers, parties, a la carte items, and beverages were not met. Interestingly, school nurses were not involved in wellness policies that were consistent with the statements of the focus group participants (Longley & Sneed, 2009).

In the literature French and Story (2013) commented on the National School Lunch and Breakfast programs and the improved nutritional standards mandated by the Healthy, Hunger-Free Kids Act of 2010. Similar to the school nurses in the focus group study, French et al. (2013) reported increased fruits and vegetables being served, decreased amounts of calories, sodium, saturated and trans fats and smaller portion sizes. The authors also concurred with the focus group participants when they reported that carbohydrates such as French fries and pizza were still available to students in the schools.

The focus group participants also discussed The Healthy Hunger-Free Kids Act of 2010 that mandates nutritional requirements for school breakfasts and lunches from the USDA. The focus group participants from this study stated that the changes in the USDA guidelines for healthier school lunches and breakfasts improved the foods available to students. Several of the participants reported a need to talk with parents and prepare them for the changes in the school lunches and acclimate them to the new food items that would be available.

Similar to the school nurses' discussion, Prokup and Galon (2011) recommend school nurses use the Healthy Hunger-Free Kids Act of 2010 as a means to teaching students about healthy eating. The authors suggest using school mealtimes as "teachable moments" (p. 401) to educate students on healthy food choices and portion control. In addition Prokup and Galon (2011) suggested educating parents about healthy nutrition by using the information in the Healthy Hunger-Free Kids Act similar to the focus group participants' suggestions.

Figure 1



Implications for Nursing Education

The role of school nurses in promoting the health of children is typically taught in a baccalaureate program in Community or Public Health courses. Topics related to school nursing include nutrition, immunizations, health education, health services—such as vision, hearing, or blood pressure screenings—physical education, healthy school environments and counseling, and psychological and social services (Nies & McEwen, 2011). Nurse educators may also want to direct students to the National Association of School Nurses (NASN) that provide specific information for school nurses on their website: www.nasn.org. Nurse educators may want to emphasize the importance of increasing fruit and vegetable consumption in schools through programs such as Farm to School programs as a means to promote the health of children.

The Institute of Medicine (2010) in its report on the *Future of Nursing Focus on Education* states that highly educated nurses are needed to meet the demands of health care. The IOM lists competencies for all nurses: “leadership, health policy, system improvement, research and evidence-based practice, and teamwork and collaboration, as well as competency in specific content areas such as community and public health and geriatrics” (p. 2). The IOM competencies would prepare school nurses to not only meet the health promotion needs of their students, but to specifically address the school food environment.

Implications for Nursing Research

The focus group interviews conducted with school nurses throughout Wisconsin was a qualitative study that explored school nurses experiences with and knowledge of the Farm to School programs in Wisconsin. A secondary aim was to examine school

nurses' perception of their role in promoting increased fruit and vegetable consumption in the school setting.

In this research study school nurses perceived that they have a role in promoting increased fruit and vegetable consumption, but are unsure of how that role relates to Farm to School programs. Therefore, it would be beneficial in future research to expand this study to further explore school nurse knowledge of Farm to School programs. Ten of the 15 participants in this current study knew of Farm to School programs, but only one school nurse worked in a school that had a Farm to School program. Conducting interviews with nurses who work in school districts that participate in Farm to School programs would provide additional insight that could build on the knowledge obtained from this study. It would also allow further exploration of how nurse can effectively promote fruit and vegetable consumption in the school setting.

One of the benefits of conducting interviews with the school nurses is that the data could be used to design a survey that would include topics from both the focus group study and the individual focused interview study. A similar survey to the instrument developed by Price, Desmond, Ruppert, and Stelzer (1987) could be developed to examine school nurses' perceptions of their role in promoting increased fruit and vegetable consumption in the school setting. Once the survey was developed, it could be available on-line, thereby providing a more convenient method for allowing school nurses to participate in sharing their perceptions.

Implications for Public Policy

Public policies, such as the Healthy Hunger-Free Kids Act 2010 as discussed by the participants in this study are in place within the school system to improve the quality

of food available to students for breakfast and lunch. Both the Healthy Hunger-Free Kids Act of 2010 (HHFK) and the dietary guidelines from the USDA require increased availability of fruits and vegetables, increased availability of whole grains, low-fat or no-fat dairy products and fewer calories due to portion control

(<http://www.fns.usda.gov/pressrelease/002312>; para. 4).

One method for responding to the HHFK act policy has been the participation of schools in the Farm to School programs to increase access, and hopefully consumption, of fruit and vegetables in public schools. Additional support that can increase the success for this policy has come through a Wisconsin public policy that mandates the availability of Farm to School programs in the public schools, and has even provided funding support of \$125,000 during the 2013-14 biennium (Wisconsin Assembly Bill 304, 2013).

The participants in the study did reflect on the National School Breakfast Program and the National School Lunch Program that are in place to ensure that school children receive nutritional meals. However, according to the school nurses, the prevalence of competitive foods, or those foods that are typically found in vending machines, school stores, after-school events, rewards or other sources are not regulated (Gearhardt, Bragg, Pearl, Schvey, Roberto & Brownell, 2012). No school district in the United States has a policy that limits competitive foods in middle or high schools (Gearhardt et al., 2012). A major concern the school nurses shared was the need for limiting the amount of competitive foods served in the school.

A public policy could be developed and implemented by the state or federal government that limits the amount of competitive foods served in the school. However, according to the school nurses the competitive foods, such as cupcakes for birthday

parties, are so important to the parents that there would be a lot of opposition to limiting competitive foods, making it a hard policy to enforce. Therefore, it might be beneficial to consider creating wellness committees with parents within standing organizations, such as the PTA/PTO to come up with strategies for improving the food environment in schools, such as limiting competitive foods. Parental support for and involvement in improving the food environment, and decreasing competitive foods, would strengthen the ability of the school system and the school personnel to enforce those changes.

Wellness committees were another policy concern that was presented by the participants in this study. It was emphasized by the participants in this study that while there are governmental policies mandating wellness committees, the policy is not always enforced, as evidenced by many schools without a wellness committee. Reconsidering the wellness committees, and how they should be developed within the confines of the policy mandate might be a beneficial strategy for the school nurse to consider. Working with interdisciplinary teams, as well as students and parents, might be one approach to changing the effectiveness of the wellness committee.

Limitations

Focus group recruitment was challenging. A total of 564 public school nurses in Wisconsin filled 456 FTE positions during the 9-month recruitment period that ran from April 2013 to November 2013. Recruitment invitations were sent out 23 different times to a variety of school districts, state and professional organizations. Of the 564 potential school nurse participants, 33 were eliminated from the pool of possible participants because one school district did not approve the proposal to conduct the research study with the school nurses they employed. There were 531 school nurses who received the

invitation to participate and 29 (5.46%) school nurses responded that they were interested in participating in the study. Sixteen participants (3%) confirmed, but one participant eventually withdrew because of scheduling conflicts.

Although the number of participants was small, there were 5 focus groups conducted with 3 members per focus group. Focus groups typically consist of 4 or more members, however, Morgan (2013) has developed procedures consisting of 2 participants or dyadic interviews and suggested 3-person focus groups as a possible new methodology for focus groups (D. Morgan, personal communication, June 19, 2013). The groups consisted of participants from rural school districts and urban school districts providing input from potentially diverse perspectives.

Barriers to recruiting could have been related to the logistics of conducting the focus groups with school nurses throughout the state. In order to accomplish the inclusion of participants for the focus groups from different locations the use of technology was required, so focus groups were conducted via the Internet and teleconferencing. Another potential barrier was actually finding a time that allowed groups of nurses who had different schedules to participate. The use of technology may have also restricted the recruitment of potential participants due to lack of Internet service or other technology issues. In addition, it is possible that the topic of the research study did not appeal to potential participants. Lack of interest and time due to their workloads may have also been a barrier to recruitment efforts.

One way to encourage participation was to remain flexible and give the potential participants a variety of days/times available to participate in the focus groups. However, in this particular study, all participants were given a choice of 3 different days of the

week and 3 different times available. Potential participants emailed the researcher with their preferences and necessary arrangements were made to accommodate the school nurses. The availability of either Skype or teleconference was also appealing in that participants who did not have Skype could still participate via teleconference.

Conclusions

This focus group study explored school nurses' knowledge and perceptions of the Farm to School program in Wisconsin and examined school nurses' perception of their role in promoting increased fruit and vegetable consumption in the school setting. Farm to School is a health promotion program to increase fruit and vegetable consumption in schools and thus promote the health of school children. However, the findings suggest that most of the school nurses have limited or no knowledge or experience with Farm to School programs in Wisconsin, as most did not have programs located within their schools. The limited number of participants who did have a Farm to School program within the school where they worked reported not having enough time to actively participate in the program. Given that the role of the school nurse is to promote the health of children within the school, and the Farm to School program was developed to promote the health of children, it would seem that school nurses would be optimally positioned to actively participate in the Farm to School program.

School nurses' in this study reported having many roles that contribute in some way to promote fruits and vegetables within the school environment, but they are indirect roles. The school nurses' perceptions of their roles in promoting fruit and vegetable consumption included: advocating for nutritious foods, even getting grants written to finance the foods; administrating healthy eating programs; collaborating with

other school personnel; educating students, families, and teachers; and role modeling healthy eating behavior.

The focus of this study was not on childhood obesity or overweight, yet participants identified obesity as a major health concern in their schools. Given that it was a major health concern within the schools, it was interesting to note that addressing childhood obesity was not a major health promotion focus within the schools. A second concern which was raised by the participants, though not the intent of this study, was the issue of measuring students' BMI. The school nurses found discussing a child's weight and BMI could be a sensitive issue to both the parents and the children who were overweight or obese. The school nurses also raised the concern that addressing the obesity or BMI with children and parents was something they avoided, as participants did not want to be responsible for "hurting anyone's psyche."

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APPENDIX A: Consent Form

**University of Wisconsin – Milwaukee
Consent to Participate in Research**

Study Title: Exploring School Nurses' Knowledge and Perceptions of School Eating Environments

Person Responsible for Research: Julia Snethen Ph.D, RN; Jean Muckian, MS, RN, (student researcher).

Study Description: The purpose of the proposed study is to examine elementary school nurses' knowledge about the Farm to School program in Wisconsin. A secondary objective is to examine elementary school nurses perception of their role in promoting increased fruit and vegetable consumption in the school setting.

Participation in this research project will include participating in a focus group with other school nurses. Focus groups will be conducted with school nurses from Wisconsin. Each of the focus groups will be made of 3 to 8 participants and will last approximately 1-2 hours depending on how much participants would like to share. Participants will be asked to share their knowledge regarding Farm to School programs and their perceptions of the role of the school nurse to be in programs that increase fruit and vegetable consumption in their schools.

The principle investigator will ask the participants questions related to the research objectives using an interview guide. The focus group participants will meet either in-person at a mutually agreed upon time and location or in an on-line secure meeting site (such as Go To Meeting) or via Skype, depending on participants preference, or a combination if some participants are available to meet face to face, while other participants could join via skype or Go To Meeting. An assistant will be available to help with various tasks, (e.g. collecting the informed consent documents) during the focus group sessions. All of the focus group's discussions will be digitally recorded using a digital voice recorder. Either the student researcher or a transcriber trained in the protection of human subjects will transcribe the recordings verbatim. Participants' names will not be used in the transcription. The digital recordings will be destroyed after transcription has been reviewed and verified, and data analysis and data dissemination has been completed.

Risks / Benefits: There are minimal risks for participation in this study. You do not have to respond to any questions that make you uncomfortable. You can stop participation at any time, up until the focus group is conducted. All information will be reported as aggregate data, no names or identifiers will be used to specifically identify any participant. There are no costs for participating. There are no benefits to you other than to further research.

Confidentiality: All information collected about you during the course of this study will be kept confidential to the extent permitted by law. We will present as aggregated data what we find to others, or publish our results in scientific journals or at scientific conferences. Only the student researcher, her advisor, biostatistician and members of the research team will have access to the information. However the Institutional Review Board at UW-Milwaukee, or appropriate federal agencies like the Office for Human Research Protections may review your records.

You will be identified on tape or on paper with a numerical code. Your name will not appear anywhere and no one will know your answers except the other focus group participants in the meeting and the research team. After the focus group meets, the voice recordings of the activities

will be typed word for word by the student researcher. Participants' names will not be used in the transcription. The digital recordings will be destroyed after transcription has been reviewed and verified, and data analysis and data dissemination has been completed.

The transcripts of the recordings will be stored in a password-protected computer and will be destroyed once data analysis and data dissemination has been completed. The recordings and hard copies of transcripts will be stored in a locked drawer in the student researchers office.

Voluntary Participation: Your participation in this study is voluntary. You may choose not to take part in this study, and you are free to not answer any questions. If you decide to take part, you can change your mind up until the focus group is completed. As there is no information on the tape to identify any specific participant, once the focus group is conducted and completed, there is no way for the researcher to identify and remove your comments. Your decision will not change any present or future relationships with the University of Wisconsin Milwaukee. There are no known alternatives available to participating in this research study other than not taking part.

Who do I contact for questions about the study: For more information about the study or study procedures, contact Jean Muckian at jmuckian@uwm.edu or 608-212-4915.

Who do I contact for questions about my rights or complaints towards my treatment as a research subject? Contact the UWM IRB at 414-229-3173 or irbinfo@uwm.edu.

Research Subject's Consent to Participate in Research:

To voluntarily agree to take part in this study, you must be 18 years of age or older. By signing the consent form, you are giving your consent to voluntarily participate in this research project.

Printed Name of Subject/Legally Authorized Representative

Signature of Subject/Legally Authorized Representative

Date

Research Subject's Consent to Audio/Video/Photo Recording:

It is okay to digitally tape me and use my digitally taped data in the research.

Please initial: ____ Yes ____ No

APPENDIX B: School Nurses Demographic Data Sheet

School Nurses' Demographic Data Sheet

The information on the demographic data sheet is confidential. Please do not include your name or any identifying information. Your answers will provide background for the research study. Thank you.

1. Educational levelBSN BS MSN MS

Other _____

2. Have you taken any courses specific to becoming a school nurse?No Yes If yes, please list name(s) of course(s)
_____**3. How many years have you practiced as a Registered Nurse?**Less than 3 years 3 to 6 years 7 to 10 years More than 10 years **4. How many years have you been practicing in a school setting?**Less than 3 years 3 to 6 years 7 to 10 years More than 10 years **5. How many schools does your practice include?**1-2 Schools 3-4 Schools More than 4 Schools

6. How many students are under your care within the school(s)?

750 to 999

1,000 to 1,499

1,500 or more

7. Do you practice in a rural or urban setting? (Urban areas: population greater than 100,000. Rural areas: Population less than 100,000)

Urban

Rural

8. Does your school participate in any program that provides access to fruits and vegetables?

Yes

No

If yes, please list

9. Does your school participate in a Farm to School program?

Yes

No

APPENDIX C:

SCHOOL NURSES' PERCEPTIONS OF THEIR ROLE IN HEALTHY EATING SCHOOL ENVIRONMENTS

- If you are an elementary school nurse
 - Practice in one of the Wisconsin public schools,
 - English speaking, and
 - Willing to participate in a focus group
-
- Research study exploring elementary school nurses':
 - Knowledge about the Farm to School program in Wisconsin.
 - Perceptions of their role in promoting increased fruit and vegetable consumption in the school setting.

Invitation to Participate

Participation entails:

- Focus group
- Conducted with other Wisconsin elementary school nurses,
- Approximately 1-2 hours in length

The research study is being conducted by Jean Muckian MS, RN, a University of Wisconsin—Milwaukee, College of Nursing doctoral student.

If you are interested in participating, please contact:

Jean Muckian

608-212-4915

jmuckian@uwm.edu

Thank you!

APPENDIX D:

Focus Group Semi-Structured Interview Guide*Opening*

1. Thank you for participating in this focus group. My goal of this focus group is to better understand your knowledge regarding Farm to School programs and what you perceive your role to be in increasing access to fruits and vegetables in your school.

Introductory

2. Tell me what you think of when you hear the phrase “fruit and vegetable consumption in school”
3. What comes to mind when you hear the term “farm to school”?

Transition Questions

4. What role might school nurses have in fruit and vegetable consumption in the school?
5. Discuss how easy is it for your school to access fruits and vegetables for school lunches?
6. How might nurses influence access to fruits and vegetables in the school?
7. How would you, as a school nurse, be involved in increasing access to fruits and vegetables in your school?

Key Questions

8. What do you know about Farm to School programs?
9. What do you think is the role of the school nurse in either Farm to School programs or increasing access to fruits and vegetables in your school?

10. Tell me about the types of foods served in your school from vending machines,
11. Tell me about the types of foods served in your school from school snack bars.
12. Tell me about the types of foods served in your school from school stores.
13. As the school nurse, how do you influence students' food choices at school?
14. What kind of changes have you experienced in the schools' food environment?

Tell me about your role in making those changes.

Ending Question

15. My goal of this focus group is to better understand your knowledge regarding Farm to School programs and what you perceive your role to be in increasing access to fruits and vegetables in your school. Is there anything that I may have missed or something else that you would like to tell me about your experiences either Farm to School programs or increasing access to fruit and vegetables?

CURRICULUM VITAE

Jean Muckian, Ph.D., RN

EDUCATION

Doctor of Philosophy-Nursing
 Minor: Nursing Education
 University of Wisconsin
 Milwaukee, WI

Dissertation: School Nurses'
 Perceptions of Their Role
 in Healthy Eating School
 Environments
 Defense: April 6, 2015
 Graduation: May 17, 2015

Doctor of Philosophy—Nursing
 Minor: Organization and Information Management
 (Quality Improvement)
 University of Wisconsin
 Madison, WI

All but dissertation

Master of Science—Nursing
 Pediatric Nurse Practitioner
 University of Wisconsin
 Madison, WI

May, 2001

Bachelor of Science—Nursing
 University of Wisconsin
 Madison, WI

May, 1998

Associate Degree—Nursing
 Madison Area Technical College
 Madison, WI

December, 1995

Bachelor of Science—Education
 University of Wisconsin
 Oshkosh, WI

December 1973

EMPLOYMENT

Director of UW-Stevens Point Nursing Program. University of Wisconsin-Stevens Point. September 2013 to current.

Taught 5 courses

University of Wisconsin System's BSN@ Home taught nursing courses Wrote self-study report for CCNE accreditation at UW-Stevens Point. Successfully achieved accreditation for the baccalaureate completion program. BSN@Home Steering Committee member.

Co-Director/Consultant Nursing Program, Herzing College. January 2008 to December 2008. Emphasis of position was on preparing nursing program for National League for Nursing Accrediting Commission (NLNAC) accreditation. Wrote the self-study report and achieved NLNAC accreditation for Herzing College.

Taught classes in Nursing Fundamentals and Medical-Surgical Nursing I and II.

Teaching Assistant, University of Wisconsin School of Nursing. September 2006—May 2007. Teaching assistant for three classes: Community Health, Legal, Ethical and Political Issues in Nursing and Nursing Management. Spring 2007.

Teaching Assistant, University of Wisconsin School of Nursing. September 2005—May 2006

Project Assistant, University of Wisconsin School of Nursing. September 2003—August 2004

Private Practice, Madison, WI. Advance Practice Nurse Prescriber. Specializing in meeting the healthcare needs of children with autism. December 2001—January 2004

Pediatric Nurse Practitioner collaborative relationship with Family Practice physician in Colorado Springs, CO. Focused on medical needs of children with autism. December 2001--July, 2002

UW Physicians Plus HMO, Madison, WI. Pediatric Nurse. Worked with a pediatrician in a general pediatric practice. Tasks include history taking, assessments, medication administration, telephone triage. Patient population emphasis on children with special needs, particularly autism. June 1998--October 2000

Wisconsin Medical Assistance Program (WMAP), Madison, WI. Private Duty Nurse. Cared for adult in a home setting. Tasks include G-tube feedings, suctioning, pulmonary hygiene, medication administration, general nursing care. December 1997—June 1998

Olsten Health Services, Madison, WI. Pediatric Home Health Nurse. Provided general nursing care to chronically ill children, in-home. Duties included general nursing care, medication administration, infant massage, suctioning.

March, 1997—June 1997

Chinle Nursing Home, Chinle, AZ. Provided general nursing care to elderly Navajo patients. Duties included assessments and medication administration.

January 1997—March 1997

SOCIETY/BOARD MEMBERSHIPS

American Academy of Colleges of Nursing
 Society for Pediatric Nurses
 Midwest Nursing Research Society
 American Nurses' Association.
 Wisconsin Nurses' Association
 Sigma Theta Tau. International
 Wisconsin League for Nursing
 WNA Workforce Advocacy Advisory Council

PUBLICATIONS

Muckian, J (2007). Whirling dervish of autism in-home services. *Journal of Pediatric Nursing*.

FUNDING

UW—Madison School of Nursing Research Committee Parent—Child Conflict Management 2003-04
 Helen Denne Schulte Research/Project Assistantship (25%) 2004-05.
 Iowa Family Strengthening Program SAMHSA grant (8%) 2004-05.
 Eckburg Fund April, 2006

PRESENTATIONS

Muckian, J.M., Snethen, J. & Kelber, S. (2011). Children and parents' perspectives on familial environment related to food and physical activity Poster session presented at the Pediatric Nursing Conference in Brookfield, WI.

Muckian, J.M., Snethen, J. & Kelber, S. (2012). Children and parents' perspectives on familial environment related to food and physical activity Poster session presented at the Midwest Nursing Research Society Conference in Detroit, MI.

Muckian, J.M., Snethen, J. & Kelber, S. (2012). Children and parents' perspectives on familial environment related to food and physical activity Poster session presented at the Society of Pediatric Nurses Conference in Houston, TX.

Muckian, J. (April 2007). "The Business of Autism--\$100 an Hour \$1,000 a Day". Keynote. Good Samaritan Award Dinner. Edgewood College School of Business.

Muckian, J. (September 2006). Tackling the Difficult Issues; A Framework for Ethical Decision-Making and Case Study Discussion. Terrific Tuesday Presentation from The UW Madison School of Nursing Continuing Education in Nursing and Gunderson Lutheran.

Muckian, J. (April, 2006). Whirling dervish of autism in-home services. Poster session presented at the University of Wisconsin School of Nursing First Annual Nursing Research Poster Fair.

Muckian, J. (May 2005). Whirling dervish of autism in-home services. Poster session presented at the University of Wisconsin Hospital and Clinics Research Fair, Madison, WI.

Audience: Student and faculty of the University of Wisconsin School of Nursing.

Muckian, J. (February, 2005). Whirling dervish of autism in-home services. Poster session presented at the annual international Pacific Rim Conference on Developmental Disabilities, University of Hawaii, Honolulu, Hawaii.

Audience: Professionals, researchers, clinical practice

Muckian, J. (October, 2004). Whirling dervish of autism in-home services. Paper presented at the Strengthening Families and Communities through Research and Scholarship Symposium, Madison, WI

Audience: Students and faculty of the University of Wisconsin School of Nursing.

Muckian, J. (October, 2004). Whirling dervish of autism in-home services. Paper presented at the UW-Madison School of Nursing Community & System Centered Colloquium, Madison, Wisconsin.

Audience: Students and faculty of the University of Wisconsin School of Nursing.

