

2017

# School Nurses' Role in the Management of Children with Type 2 Diabetes

Rosaline Jane Martinez-Culpepper  
*Walden University*

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# Walden University

College of Health Sciences

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Rosaline Martinez-Culpepper

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2017

Abstract

School Nurses' Role in the Management of Children with Type 2 Diabetes

by

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MS, California State University, 1994

BS, California State University, 1985

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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## Abstract

An estimated 215,000 children and adolescents younger than 20 years old were diagnosed with Type 1 or Type 2 diabetes in 2011. Management of children with Type 2 diabetes requires 24-hour care provided by health care providers, parents, and school nurses. Guided by the health belief model (HBM), the purpose of this qualitative case study was to explore and describe beliefs, attitudes, and practices of school nurses who manage children with Type 2 diabetes. A pilot study with 2 nurses was conducted to finalize interview guide. Volunteer school nurses were recruited through an e-mail announcement from their school district. Face-to-face, in-depth interviews with 10 female school nurses were conducted. School nurse work experience ranged from 4 to 20 years, selected from 4 school districts, including 8 European, 1 Asian, and 1 Hispanic American. Transcripts from digitally recorded interviews were analyzed using NVivo software version 11. Thematic analysis led to 5 themes of communication, education, management, perceived barriers (multiple schools assigned/student demand), and enablers (school aides). Individually and collectively, themes reflect a synergistic positive attitude in management of children with Type 2 diabetes. HBM constructs elucidated school nurses' behaviors and attitudes regarding severity and susceptibility to illness, benefits students received from preventive care, and barriers they encountered. The positive implications for social change include recommendations for increasing the number of school nurses per district to meet the demand in managing children with chronic diseases, and intensification of positive attitude interventions in diabetes management.

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## Dedication

I must first thank the Lord, Jesus Christ, for giving me the health, strength, and wisdom to be able to pursue this journey and finish it. Philippians 4:13 says “I can do all things through Christ which strengthen me.”

I dedicate this dissertation to my family and friends. Special gratitude to my loving husband, Norman Culpepper, who is loved and appreciated for his encouragements, patience, and his understanding about this process even through his illnesses. Thanks, Honey, for picking up the slack on the household duties and giving me the space and freedom to do my schoolwork as needed. I am forever grateful to you.

To my children, Janeen and Eugene Bonilla, Jr., for their love, support, understanding, and encouragement. To my grandchildren, Sergio Rodriguez, Jr. and Kiera Bonilla, you are my light and guide. To my sister, Mary Martinez-Lino, my brothers, Philip and Dean Martinez, and my best friend, Sally Reyes, for their constant encouragement, understanding, and support. To my friends, especially Gwen Jones, RN, who offered her guidance and suggestions and checked up on me when I am quiet, this dissertation is dedicated to you as well. I am very grateful to have people like you in my life. Finally, I dedicate this dissertation to my deceased parents, the late Ellen and Joseph Martinez; I know that you both would be proud of my accomplishments and wish you were here to share it with me.

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## Chapter 1: Introduction to the Study

Millions of individuals in the United States suffer from Type 2 diabetes (National Center for Chronic Disease Prevention and Health Promotion, [NCCDP&HP], 2010; United States Department of Health and Human Services, [USDHHS], 2007), which is of great concern to the medical field. Type 2 diabetes, which is traditionally a disease seen only among individuals above the age of 40 years, is now being observed among younger and younger individuals (NCCDP&HP, 2010; National Cooperative on Childhood Obesity Research, 2008; USDHHS, 2007). The American Diabetes Association (ADA, 2011) reported that 1 in every 400 children and adolescents has diabetes, which is indicative of the significance of this research in the exploration of how these trends may be controlled and reversed.

Federal legislation in the United States requires that diabetic children be provided the equal educational opportunities as their peers without the disease. In this regard, the school nurse is the most appropriate person to plan, coordinate, and oversee the care of students with this condition. Based on educational experience and leadership skills, per Naar-King and Suarez (2011), the school nurse can motivate the children by (a) acknowledging the difficulties inherent in changing behavior; (b) communicating that ambivalence toward change is both normal and acceptable; and (c) exploring the possibility of engaging in certain healthy behaviors that are in accord with an individual's personal values and goals. Among various staff and personnel in the school, the school nurse has the most skills and knowledge with regards to the detection and management of diabetes.

With this research, I sought to understand the school nurses' role in managing and caring of children with Type 2 diabetes. The aim was to identify and describe the care and preventive interventions provided to diabetic children from the school nurses' perspectives. Chapter 1 provides an overview of the framework for this proposed study. Major headings include the background overview, the problem statement, conceptual framework, research questions, and nature of the study, definitions, assumptions, limitations, scope, delimitations, significance, and summary.

### **Background**

The lack of knowledge and understanding about the school nurses' role in the management and care of children with Type 2 diabetes was addressed by me in the study. Diabetes is on the rise in the United States with an estimated 215,000 children and adolescents younger than 20 years old being diagnosed with Type 1 or Type 2 (Centers for Disease Control and Prevention [CDC], 2011). Many children must frequently check their blood glucose levels throughout the day, and this includes monitoring and calculating the food consumption and carbohydrate intake, as well as the insulin intake. In turn, these ensure that good glucose levels are achieved (Bobo, Kaup, McCarty, & Carlson, 2011). Additional research was done by me to assess the attitudes and experiences of school nurses in relation to their understanding and responsibility in ensuring the safety of students with diabetes and in meeting the requirements of federal laws.

Type 2 diabetes is a progressive disease that is associated with a long-term risk of morbidity and mortality (Robertson, 2012), once described as *late onset diabetes*, which

is usually associated with older adult populations, that is, among individuals older than 40 years of age (Adams & Lammon, 2007). Type 2 diabetes is reaching epidemic proportions among children and adolescents (Adams & Lammon, 2007). With the rampant surge in this disease, diabetes management in children and adolescents requires complex daily management skills (American Association of Diabetes Educators, 2008). More specifically, “type 2 diabetes was in < 1% of Pima Indian children aged 10-14 years and 2-3% of those aged 15-19 in 1967-1976 but increased to 2-3% and 4-5% respectively in the two age groups in 1987-1996” (Bloomgarden, 2004, p.1000). Furthermore, the incidence of diagnosed diabetes among 15- to 19-year-old American Indians in the southwestern United States rose from 3.2 to 4.5 per 1,000 between 1990 to 1997 (Bloomgarden, 2004). Moreover, clinic-based studies showed that the frequency of Type 2 diabetes among the youths in Cincinnati, Ohio, increased by approximately 10 times between 1982 and 1994 (Bloomgarden, 2004). In Florida, the proportion of children with Type 2 diabetes rose from 9.4% to 20% (Bloomgarden, 2004). In addition, statistics as of 2004 showed that a third of the children who had diabetes in Arkansas, Ohio, and among the Hispanics in California had Type 2 diabetes (Bloomgarden, 2004). Epidemiologic studies indicated these increases were brought about by risk factors such as obesity, positive family history of diabetes; high and low birth weight, increased blood pressure, and cholesterol (Bloomgarden, 2004).

This form of diabetes comprises nearly all the recorded cases of diabetes, that is, 90% to 95% of diabetes cases are classified as Type 2 (NCCDP&HP, 2010). Type 2 diabetes is sometimes caused by factors that, for the most part, can be controlled by

individuals. Specifically, it is seen among individuals who suffer from obesity and have low levels of physical activity (NCCDP&HP, 2010). Previous studies have shown that Type 2 diabetes results from a combination of genetic and environmental factors. Genetic factors include lowered insulin secretion levels and insulin resistance (Kaku, 2010), while the environmental factors include overeating, lack of exercise, aging, and stress (Kaku, 2010). School nurses played a crucial role not only in the treatment of Type 2 diabetes, but also in its prevention, especially when it comes to the monitoring and management of the environmental risk factors.

Based on the pathophysiology of Type 2 diabetes, aggressive treatment is necessary and should be given greater attention (Fleury-Milfort, 2008). It is the position of the National Association of School Nurses (as cited in Denehy, 2012) that the registered professional school nurse (hereinafter referred to as *school nurse*) has the expertise, knowledge, and statutory authority to address the health care needs of students with diabetes in a school setting. The school nurse must also be aware of the treatment options available: weight control, nutrition, and physical activity, as well as common pharmacotherapeutic choices (Denehy, 2012).

Every student with diabetes is entitled to a school nurse with the knowledge and expertise to provide effective care and the ability to communicate with teachers, physicians, and families (Bobo & Butler, 2010). The school nurse is positioned to promote healthy lifestyle choices and diabetes self-care (Bobo & Butler, 2010). The key premise is that when the school nurse promotes lifestyle behavior change in students, the nurse shifts from simple advice giving to a more counseling-based approach (Jansink,



Braspenning, Ban Der Weijden, Elwyn, & Grol, 2010). The latter approach, instead of the traditional modes, according to Jansink et al (2010) was found to be significant in the differences between those who continue to suffer from Type 2 diabetes and those who have managed to change the course of this disease.

According to the National Association of School Nurses as cited in Gobbins, Wesoloski, Lawinger, & Fishmen 2012) states that the professional school nurse is the leader in the school community who bears the responsibility of overseeing school health policies and programs School nurses must be prepared to use leadership skills to become positive change agents in their communities (Gibbons et al., 2012). Traditionally, school nurses are charged with overseeing the distribution of medication with informing teachers of the students they serve who are labeled diabetic.

In general, school nurses are responsible for supporting the students' success through the provision of health care in the forms of "assessment, intervention, and follow-up for children within the school setting" (Board et al., 2011). The school nurse addresses the physical, emotional, social, and mental health needs of the students (American Association of Diabetes Educators, 2008). Aside from providing for the care and safety of the students and staff, school nurses are also responsible for integrating health solutions into the education setting. Besides Type 2 diabetes, the school nurse helps in the management of other chronic conditions in children such as obesity, epilepsy, Type 1 diabetes, anaphylaxis, asthma, and mental health issues (Board et al., 2011). The school nurse also serves as a liaison between the school personnel, community, family,

and the health care providers, with the goal of advocating for health care and a healthy school environment (Board et al., 2011).

Because of the increase in the number of school children with health problems and the importance of the role played by school nurses, there is an expected increase in the demand for school nurses (Alloway, 2009). The Healthy People 2020 program has the objective to achieving one nurse for every 750 students in each school (Lockett, 2014). As of 2006, 40.6% of schools have already reached this goal (Lockett, 2014) and Healthy People 2020 aims to increase this to 44.7% by 2020 (Lockett, 2014). As of 2013, Lemongello (2013) reported that there were approximately 74,000 school nurses in the nearly 100,000 public elementary and secondary schools within the United States.

To date, school nurses' responsibilities in the care of diabetic students have not been reviewed. This study provided additional research to assess the attitudes and experiences of school nurses in relation to their understanding and responsibility of ensuring the safety of students with diabetes and meeting the requirements of federal laws. Rapid changes in science and technology that are related to diabetes management require the school nurse to maintain current knowledge and skills to fully implement a student's diabetic plan in a school setting (ADA, 2011; National Diabetes Education Program [NDEP], 2010).

### **Problem Statement**

Students with diabetes have varying levels of disability and may require different levels of assistance depending on their disease process. Controlling blood glucose levels to prevent hypoglycemia or hyperglycemia promoted growth and development,

confidence, and success in school. A key responsibility of the school nurse is to develop the individual health plan (IHP) from the medical records in collaboration with the child's family. This is done through a health assessment and use of strategies that meet the child's daily needs in a school setting. The responsibilities also include the preparation of an emergency care plan that will assist school personnel if symptoms of hypoglycemia and hyperglycemia occur.

However, with the shortages in school nurses throughout the country, a workaround that is usually implemented is for school nurses to train administrative staff who then administer care for children when a school nurse is not available (Tumolo, 2013). This solution can lead to potential problems, though, as a school's administrative staff is not able to make decisions on things such as whether a student's lungs sound clear or if they are having an asthma attack. This can result in life-threatening situations and even death. According to Nwabuzor (2007), the main reason for the shortage of school nurses is the lack of legislation that mandates school nursing. Thus, schools either have no nurses or the nurses are overloaded with very high nurse-to-patient ratios (Nwabuzor, 2007).

Although these responsibilities are vital to the management of diabetes, research dedicated to the practices of school nurses has been scarce, except for 12 studies as discussed in the literature review. Therefore, this study addressed the school nurses' role in the managing and caring for children with Type 2 diabetes. Effective strategies were developed to improve the health outcomes for students with this disease while promoting lifestyle behavior changes.

School nurses follow the mandates of state education agencies, state health agencies, and state boards that regulate nursing practice (Young-Jones, 2011). The field of public health has not been very successful in persuading most people to adopt healthy behaviors, which can prevent several chronic diseases. Because public health may not be able to prevent diabetes, it is concerned with preventing the disability that will inevitably occur if the disease is not well controlled (Schneider, 2006). As such, the school nurses' perceptions and knowledge are important in the development of these goals and outcomes.

### **Purpose of the Study**

The purpose of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of Type 2 diabetic children. This would enable education leaders to make the necessary changes or enhancements in the nursing curricula. Once described as late onset diabetes, Type 2 diabetes is reaching epidemic proportions (Adams & Lammon, 2007). The phenomenon of interest in this study is diabetes management in children and adolescents from the perspective of school nurses. School nurses play a crucial role in managing routine care, such as insulin injections and recognizing emergency situations (Georgia Association of School Nurses, 2013; NDEP, 2010). School nurses also educate students, teachers, and staff on how to prevent this chronic disease (Georgia Association of School Nurses, 2013; NDEP, 2010).

### **Nature of the Study**

This qualitative research study was a case study using the health belief model (HBM). This research study was intended to provide an in-depth understanding and exploration of nurses' perceptions for working with school-age students diagnosed with Type 2 diabetes. Per Creswell (2007), a case study research involves the study of an issue explored through one or more cases within a bounded system. This case study involved several extensive interviews of school nurses combined into a single study. For this reason, it is considered a collective case.

A quantitative design was deemed inappropriate for this study as the data were best gathered and the results best discussed in qualitative form, that is, through observation, interviews, and discussions, rather than in quantitative form such as through surveys, questionnaires, and statistics. A qualitative study design allowed me more flexibility in the gathering and analysis of data whereas a quantitative design may have been too limiting or restrictive.

Merriam (2009) described the basic qualitative tradition simply as an approach used to discover and understand a phenomenon, a process, or the perspectives of world views. Merriam explained that a qualitative researcher has many options available, such as grounded theory or case study, to approach an investigation. The key characteristic that all qualitative researchers have in common is that they are striving to understand the meaning people have constructed about their experiences and that these researchers are the primary instruments for data collection and analysis (Merriam, 2009). As such, data were derived from semi structured face-to-face interviews of school nurses. Nurses

selected for this study were those working with primary school aged students with Type 2 diabetes.

### **Research Questions**

The problem and purpose of this study was addressed in the questions listed below:

1. How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes?
2. What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?
3. What barriers, if any, do school nurses encounter in the management and care of school-aged children with Type 2 diabetes?
4. What enablers are available to facilitate the school nurses' management and care of school aged children with Type 2 diabetes?

### **Theoretical Base**

This study used the theoretical framework of the HBM, one of the most widely used models in public health (Baghianimoghadam et al., 2013). The key premise of the HBM as it applies to this study is that health care professionals play an essential role in building awareness and instilling positive beliefs and attitudes in the management of school-aged children with diabetes. (Baghianimoghadam et al., 2013).

Aligned with the HBM constructs, my intention with this study was to determine the perceptions of school nurses based on their health beliefs and attitudes that were relevant to the care and management of Type 2 diabetes among school-age children. The

HBM was used qualitatively to better understand the roles and functions of school nurses from their perspectives. According to Becker, Radius, and Rosenstock (1978), the HBM proposed that a person's health-related behavior or attitudes depend on the person's perception of four critical areas: the severity of a potential illness, the person's susceptibility to that illness, and the benefits of taking preventive action, and the barriers to taking that action. Although this model has been used mainly to understand the patient's beliefs, I used it for understanding a school nurse's perspectives, specifically their behaviors and attitudes, with regards to school children's severity of a potential illness, susceptibility to that illness, the benefits that the students received from their administration of preventive care, and the barriers they encountered when taking that action. A detailed explanation and discussion is presented in Chapter 2.

### **Definition of Terms**

The following terms were used throughout this study and are defined as follows:

*Diabetes:* Characterized by high levels of blood sugar (NCCDP&HP, 2010).

Because insulin is impaired, the use of sugar is hindered. The sugar, which an individual consumes, remains in his or her bloodstream, resulting in high levels of blood sugar (NCCDP&HP, 2010).

*Insulin:* A hormone that regulates the entry of sugar into the body's various cells, where it is converted into energy and is harnessed by the organism (NCCDP&HP, 2010).

*Hypoglycemia:* A condition characterized by an abnormally low concentration of blood sugar (glucose) in the circulating blood (Stedman, 2005).

*Hyperglycemia:* A condition characterized by abnormally high concentration of glucose in the blood (Stedman, 2005).

*Type 1 diabetes:* Used to be called *juvenile diabetes*; develops most often in young people. However, Type 1 diabetes can also develop in adults. The body no longer makes insulin or enough insulin because the body's immune system, which normally protects from infection by getting rid of bacteria, viruses, and other harmful substances, has attacked and destroyed the cells that make insulin (National Institute of Diabetes and Digestive and Kidney Diseases, 2014).

*Type 2 diabetes:* A condition where the body develops a resistance to insulin and fails to properly use insulin (CDC, 2013). As the need for insulin increases, the pancreas slowly loses its capability for producing sufficient amounts of insulin, which is needed for the regulation of blood sugar (CDC, 2013).

### **Assumptions**

The study explored school nurses' perceptions of their role and responsibilities in the care and management of children with Type 2 diabetes. I had determined that all participants had the expertise to provide rich and credible information when answering questions. It was also assumed participants answered the questions honestly, fully, and without bias.

### **Limitations**

Purposive sampling was completed with 10 school nurses in various metropolitan school districts in one western state. A school district includes between three and 10 public elementary schools on average and according to Rosales (2014) of the National



Education Association, and a single public school nurse may be assigned to care for 2.2 schools. Ten participants took part in the study and included several school districts. In addition, the findings cannot be oversimplified to a dissimilar school district in a different state. The scope of this study was within the geographical region of one western state.

### **Delimitations**

The gender and age of participants were not factors, however if any of the participants had had less than 1 year of experience as a school nurse, the person would not be able to participate. Although many care and management factors relating to Type 2 diabetes were identified, this study concentrated on the care and management of school age children.

### **Significance of the Study**

The study outcomes enhanced value to promote awareness of Type 2 diabetes, which is no longer a chronic illness that is limited to adults. It is now increasingly becoming predominant among children and adolescents. Despite this though, the public tends to accept other diseases more readily as public health issues, example of which include AIDS and distinct types of flues. However, more inquiry is required to encounter the growing burdens that diabetes has placed not only on persons, but also on relatives, groups, and societies in general. This study is a step in that direction.

The professional school nurse is the leader in the school community who oversees school health policies and programs (American Association of Diabetes Educators, 2008; Gibbons et al., 2012). School nurses have treated many children with different types of chronic diseases, but it is unclear how often or to what degree they have managed the

care of children with Type 2 diabetes. Effective strategies have been developed to improve the health outcomes for students with Type 2 diabetes (AADE, 2008; Gibbons et al., 2012). Children and adolescents in America are facing an epidemic threat of acquiring not only the disease, but also of being subjected to a young life that is full of potential complications that can significantly affect their quality of life. This study initiated a dialogue among school nurses to inhibit the progression of diabetes in the younger generation, that is, from being a metabolic syndrome to Type 2 diabetes that is under control to Type 2 diabetes that is out of control. In turn, this has led to the achievement of a positive social change.

### **Summary and Transition**

The incidence of Type 2 diabetes in children and adolescents has been increasing at an alarming rate (Quarryhorn, Evans & Kerrigan, 2003). School nurses have an essential role in implementing the ADA recommended screening guidelines to identify youth at higher risk for Type 2 diabetes (Copeland et al. 2013). The serious complications associated with this disease make it essential for school nurses to be aware of risk factors and screening guidelines, allowing for earlier diagnosis and treatment. Chapter 1 provided an overview and summary of the problem, purpose, and research questions of this study. Chapter 2 continues this discussion with an investigation and examination of a wide collection of peer-reviewed journal articles. This search included using various databases to collect information on the topic.

## Chapter 2: Literature Review

### Overview

The purpose of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. Once described as late onset diabetes, Type 2 diabetes is reaching epidemic proportions among children and adolescents (Adams & Lammon, 2007). The phenomenon of interest in this study was diabetes management in children and adolescents from the perspective of school nurses. With the number of cases of Type 2 diabetes in children rising, school nurses play a crucial role in managing routine care, such as insulin injections and recognizing emergency situations (Georgia Association of School Nurses, 2013; NDEP, 2010). The literature review began with a discussion of the theoretical framework, followed by the background and historical overview of diabetes with a focus on the types, symptoms, causes, and preventive measures of diabetes among school age youth. The role of the school nurse in the treatment and management of Type 2 diabetes is discussed. In addition, related methodologies on the topic are presented.

### Literature Search Strategy

This study reviewed literature from 2007 to present, except for pivotal articles dating back to 1973 to 1974 and 1990, to show that the problem with Type 2 diabetes in children has not been addressed. The search strategy involved use of several online databases and search engines such as Google, Google Scholar, Pub Med, EBSCO, CINHALL, ProQuest, and Thoreau to search for related key words and phrases. *Diabetes*, *Diabetes among youth*, *Diabetes and exercise*, *Diabetes and nutrition*, *School Nurse*,

*School Nurses' role, School nurse and type 2 diabetes, School nurse and adolescent diabetes, School nurse and children with type 2 diabetes, exercise, exercise among youth, Health Belief Model (HBM), History of Diabetes, Nutrition, Nutrition among youth, Type 2 diabetes, Types of Diabetes, Nutrition and Type 2 diabetes in youth, Epidemiology of diabetes in children, and Epidemiology of diabetes* were the key terms used in the literature search.

### **Epidemiology of Diabetes**

According to the CDC (2011), about 215,000 people younger than 20 years had diabetes (Type 1 and Type 2) in the United States in 2010. Estimates for undiagnosed diabetes were unavailable for this age group (CDC, 2011). Diabetes is the leading cause of kidney failure, non-traumatic lower-limb amputations, and new cases of blindness among adults in the United States (CDC, 2010). Diabetes is the major cause of heart disease and stroke and is the seventh leading cause of death (CDC, 2011). The prevalence and incidence of Type 2 diabetes among youth have increased (Mayer-Davis, et al., 2009; Rhodes et al., 2011). Overweight and obesity among U.S. children rose in the last three decades, producing generations of children at risk for metabolic complications including insulin resistance, prediabetes, and diabetes (Rhodes et al., 2011). The school nurse has helped address the primary prevention behaviors by providing the school and the students' parents with information about proper nutrition, which can affect the types of food served in the school cafeteria and the types of food that parents prepare for their children. In addition, school nurses have emphasized the importance of exercise so that the school can provide the students with the appropriate types of physical activities.

According to Nadeau and Dabelea (2008), the Search for Diabetes in Youth (SEARCH) study demonstrated that type 2 diabetes contributed to overall diabetes incidence among minority youth older than 10 years old. In addition, type 2 diabetes affects females at a 60% higher rate compared to males (Nadeau & Dabelea, 2008). Based on the data collected through SEARCH Nadeau and Dabelea (2008) also estimated that the annual number of newly diagnosed youth with type 2 diabetes in the United States is approximately 3,700.

Four primary risk factors identified by the ADA (2010) and the American Academy of Pediatrics (2008) place children at risk for the development of Type 2 diabetes: obesity, ethnicity, family history of diabetes, and the presence of insulin resistance. Approximately 17% (or 12.5 million) children and adolescents 2 to 19 years of age in the U.S. are obese (CDC, 2011b). Per ADA (2010) and the American Academy of Pediatrics (2008), all obese children should be screened beginning at 10 years of age or at the onset of puberty. Due to the rise of obesity, children are closely monitored and evaluated at schools for signs and symptoms of Type 2 diabetes through the school nurse. Early detection of the disease can prevent or delay the risks associated with Type 2 diabetes.

In a study by Rhodes et al. (2011), findings suggested that adolescents and young adults with Type 2 diabetes carry an elevated risk of microvascular (e.g., retinopathy and nephropathy) and macrovascular (e.g., myocardial infarction and stroke) complications that shorten life expectancy and reduce health-related quality of life. Cardiovascular disease is the major cause of morbidity and mortality among individuals with diabetes

(Bhattacharyya, Sha, & Booth, 2008; Canadian Diabetes Association, 2008) Deaths among youths with diabetes are rare, but diabetes death rates for African American youths are consistently higher than those for White American youths. Factors that contribute to racial disparities in adolescent diabetes mortality are access to and use of health care services and differences in the quality of disease education and care (CDC, 2007).

SEARCH is a multicenter study funded by the CDC and National Institute of Health to examine diabetes (Type 1 and Type 2) among children and adolescents in the United States (Hamman et al., 2014). The study was conducted during 2002 to 2005 and the findings indicated that 15,600 youth were newly diagnosed with Type 1 diabetes annually, and 3,600 youth were newly diagnosed with Type 2 diabetes annually (CDC, 2011). Among youth 10 years and younger, the incidence rate was 19.7 per 100,000 for Type 1 diabetes and 0.4 per 100,000 for Type 2 diabetes. Among youth aged 10 years and older, the incidence rate was 18.6 per 100,000 each year for Type 1 diabetes and 8.5 per 100,000 for Type 2 diabetes (CDC, 2011). SEARCH has ongoing studies for both types of diabetes. Type 2 diabetes is rare among children younger than 10 years of age (CDC, 2011). While still infrequent, rates were greater among youth aged 10 to 19 years than in younger children with higher rates among U.S. minority populations than in non-Hispanic Whites (CDC, 2011).

As mentioned earlier, diabetes is the seventh leading cause of death based on U.S. death certificates in 2007 (CDC, 2011). The finding is based on the underlying cause of death. Diabetes is also a contributing factor or listed in the cause of death. Diabetes is

likely to be underreported as a cause of death (CDC, 2011). Studies have found that about 35% to 40% of decedents had diabetes listed in the death certificate and about 10% to 15% had it listed as the underlying cause of death (CDC, 2011). Overall, the risk for death among people with diabetes is about twice that of people of similar age but without diabetes.

Diabetes occurs among individuals who experience insulin impairments (NCCDP&HP, 2010). This happens when the individual has lower levels of insulin in his or her system, or if the individual is unable to make use of insulin (NCCDP&HP, 2010). Insulin is a hormone that regulates the entry of sugar into the body's various cells, where it is converted into energy (NCCDP&HP, 2010). With the impairment or deficiency of insulin, sugar, in the form of glucose, is not utilized by an individual, resulting in severely low energy levels (NCCDP&HP, 2010). Glucose remains in the individual's bloodstream for an extended period where it can damage the individual's vital organs (NCCDP&HP, 2010).

Impairments with insulin, however, are not the only factors that cause diabetes. In some cases, external factors may exacerbate the risk of developing diabetes. In a study by Perez-Escamilla (2011), for example, the culture of individuals was found to be somewhat associated with the risks of developing diabetes. Per the study, certain cultural groups, especially Latinos, may be at increased risks of developing diabetes because of the acculturation to negative nutritional habits they experience and are exposed to (Perez-Escamilla, 2011).

### **Health Belief Model**

The HBM framework is presented as the theoretical approach that encourages health promotion, health management, and prevention of Type 2 diabetes. Becker (1974), developer of the HBM, based his views upon the idea that an individual must have the willingness to participate in health interventions and believe that being healthy is a highly-valued outcome. Becker posited that it was possible to predict whether an individual would engage in positive health behaviors by determining the individuals' perception of the disease, illness or accident, identification of modifying factors, and the likelihood that the individual will take some action.

With the HBM, Becker (1974) proposed that positive response to messages about health promotion or disease prevention would take place when the following four conditions for change exist:

- The person believes that he or she is at risk of developing a specific condition.
- The person believes that the risk is serious and the consequences of developing the condition are undesirable.
- The person believes that the risk will be reduced by a specific behavior change.
- The person believes that barriers to the behavior change can be overcome and managed.

While these conditions will mostly apply to adolescents who have more developed cognitive skills and thus would be more capable of assessing their own health, parents can play a vital role as they are responsible for educating their children about



caring for their health and about simple ways that they can assess their health. Although little children may not fully understand these concepts, it would help for parents to start educating their children about health care from an early age so that they develop good health-related habits as they grow up.

To better understand and develop effective school nursing programs that increase nurses' awareness and encourage early screening and counseling, more research is needed on health beliefs and barriers to care in the management of Type 2 diabetes in school-age children. This study explored and described the perceptions of school nurses relevant to their beliefs, perceptions, and attitudes in the care and management of children with Type 2 diabetes.

### **Childhood Obesity**

Risk factors that impact Type 2 diabetes include sedentary lifestyle, obesity, and lack of dietary guidelines. These factors are present in the schools and at home. Rafalson, Eysaman, and Quattrin (2011) claimed that Type 2 diabetes is no longer exclusive to the adult population and is being diagnosed more frequently in the United States among youths. There is a larger proportion (8% to 45%) of all newly diagnosed diabetes cases, especially among minority youths between 10 and 19 years of age (Rafalson, Eysaman, and Quattrin, 2011). Type 2 diabetes has been described as a new epidemic in the American pediatric population occurring mainly in African American, Mexican American, and Asian American children and young adults (Kaufman, 2009).

As in the adult population, Type 2 diabetes in children and young adults is due to the combination of insulin resistance and relative  $\beta$ -cell failure (Kaufman, 2009). Most

children with Type 2 diabetes have a family member with this disease and the most significant risk factor is obesity (Kaufman, 2009). *Acanthosis nigricans*, a disease with thickening and hyperpigmentation of the skin at the neck and curved areas, is developed in 60% to 90% of youths with diabetes (Kaufman, 2009). Children and young adults are more likely to have this skin problem than adults. Kauffman (2009) claimed this skin disease is so common that it can be used as a marker of youth at risk for Type 2 diabetes.

According to the CDC (2013), childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years. The percentage of children aged 6 to 11 years old in the United States who were obese increased from 7% in 1980 to nearly 18% in 2010; similarly, the percentage of adolescents aged 12 to 19 years old who were obese increased from 5% to 18% over the same period (CDC, 2013). In 2010, more than one third of children and adolescents were overweight or obese (Ogden, Carroll, Kit, & Flagel, 2012). Overweight is defined as having excess body weight for height from fat, muscle, bone, water, or a combination of these factors (National Institute of Health, National Heart, Lung, and Blood Institute, 2010). Obesity is defined as having excess body fat (Krebs et al., 2007). There are immediate and long-term health effects of childhood obesity. Immediate effects include the following: (a) obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure; (b) obese adolescents are more likely to have prediabetes, a condition in which blood glucose levels indicate a high risk for the development of diabetes (CDC, 2011); and (c) children and adolescents who are obese are at greater risk for bone and

joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem (Office of the Surgeon General, 2010).

Healthy People (2010) as cited in CDC, 2010, identified overweight and obesity as one of 10 leading health indicators and called for a reduction in the proportion of children and adolescents who are overweight or obese with little progress. National Health and Nutrition Examination Survey (NHANES) results from 2007 to 2008 estimated 16.9% of children and adolescents aged 2 to 19 years were obese (CDC, 2010). The prevalence of obesity increased between 1976 to 1980 and 1999 to 2000 (CDC, 2010). Among adolescents aged 12 to 19 years, obesity increased from 5% to 18.1% between 1976 and 1980 and 2007 to 2008 (National Center for Health Statistics, [NCHS], 2010).

Body mass index (BMI) is expressed as weight in kilograms divided by height in meters squared and is used to classify obesity among adults, which is also recommended in children. Children with BMI values at or above 95<sup>th</sup> percentile of the sex-specific BMI growth charts is categorized as obese (CDC, 2010). In 2007 to 2008, the prevalence of obesity was significantly higher among Mexican American adolescent boys (26.8%) than among non-Hispanic White (16.7%) adolescent boys (CDC, 2010). Among girls in the same period, non-Hispanic Black adolescents (29.2%) were significantly more likely to be obese compared with non-Hispanic White (14.5%) adolescents (NCHS, 2010). The data have shown that there is a significant increase in childhood obesity in the United States, which can lead to the development of Type 2 diabetes if not addressed.

According to Schneider et al. (2013) a 3-year study done at the University of North Carolina at Chapel Hills in 2008 called HEALTHY concluded that working with middle school children, school officials, and parents can be beneficial to decrease or eliminate type 2 diabetes. With 225 minutes of physical activity every 2 weeks, and collaborating with food service managers to make healthy changes, the children learned that physical activity can be a part of their daily routine and eating healthy nutritious meals can be manageable and fun. Communicating with parents about how students are doing and how to keep their children active and eating healthy will prevent diabetes and its complications.

The National Cooperative on Childhood Obesity Research (2008) stated that there has been a significant increase in the incidence of obesity among children and adolescents (aged 12 to 19 years). Although obesity traditionally is not seen as a disease to which children are highly vulnerable, the increase in childhood obesity has changed this view. In fact, Kaku (2010) found that obesity in individuals with a BMI just slightly greater than 25 increases the risk of developing Type 2 diabetes by up to 5 times. According to the National Cooperative on Childhood Obesity Research, there are significant positive correlations between the increase of childhood obesity and the rise of Type 2 diabetes among children and adolescents. This effect seems to be more widespread among children born to ethnic minority backgrounds (National Cooperative on Childhood Obesity Research, 2008). Despite the evidence of an increasing incidence of Type 2 diabetes, little is known about the most effective school treatment regimens, the roles of nutrition, physical activity, and counseling in improving glycemic outcomes,

and the most effective ways to reduce risk factors in these school age children (Damon, Schatzer, Hofler, Tomasec, & Hoppichler, 2011).

### **Nutrition and Type 2 Diabetes**

Nutrition is significantly linked to Type 2 diabetes and is thought to occur because nutritional habits, especially in the western world, have shifted towards food products known to be quite unhealthy to consumers (Kastorini & Panagiotakos, 2009). According to Damon et al. (2011) there are studies that have provided evidence to support the importance of nutrition and nutritional interventions for the prevention and management of Type 2 diabetes. In a randomized, multicenter, middle school-based primary prevention trial known as the HEALTHY study, interventions were carried out on children's dietary intake (Siega-Riz et al., 2011). The authors concluded that there was no improvement in self-reported dietary intake. This may indicate that interventions need to be implemented beyond the school environment to have a better likelihood of changing dietary behaviors. Nutritional interventions for the prevention of Type 2 diabetes determined that most successful interventions that combined individual dietary counseling and physical activity was beneficial in delaying or controlling Type 2 diabetes (Steyn, Lambert, & Tabana, 2009). Nutrition and exercise health behaviors can be accomplished by making small lifestyle pattern changes (Berry et al., 2012). Through these studies of various published articles, the importance of nutrition in the prevention and improvement of the conditions of individuals with Type 2 diabetes have been vastly promoted. Therefore, to prevent Type 2 diabetes individual's specifically at-risk participants, are encouraged to have a change in lifestyle. The

importance of nutritional management is ultimately important in the care of Type 2 diabetes (Damon et al., 2011).

Nutritional interventions assist to promote lifestyle modification and prevention or delay of Type 2 diabetes. Knowledge and behavioral change must be evaluated pre- and postintervention. While Damon et al. (2011) have established the importance of nutrition in the prevention and treatment of Type 2 diabetes, there is a need to explore how these findings are applied. Children have had improved knowledge, self-efficacy and behavior change related to Type 2 diabetes prevention. Emphasis on dietary modification and physical activity promoted weight loss through behavioral interventions that led to health promotion. Diets consumed are high in fat, high in carbohydrates and low in proteins (Bjerregaard & Mulvad, 2012). Children tend to learn what to eat from their families and peers. These two sources must be taken into consideration for success to occur.

According to Damon et al. (2011), past studies have provided evidence to support the importance of nutrition and nutritional interventions for the prevention and management of Type 2 diabetes. The significance of nutrition in the prevention and improvement of conditions of individuals with Type 2 diabetes have been supported by a few studies, and evidenced by numerous published articles from various parts of the world (Damon et al., 2011). Therefore, nutritional management plays a crucial role in the management of Type 2 diabetes.

Steyn et al. (2009) conducted a meta-analysis of past research endeavors involving diabetes and the success of interventions aimed at preventing the possible

development of Type 2 diabetes. Steyn et al. included studies conducted between 1975 and 2008 which employed at least 50 participants who were all at-risk of developing Type 2 diabetes. Participants in these studies were evaluated based on clinical improvements on factors such as weight, blood pressure, BMI, body fat, waist circumference, waist to hip ratio, and physiological and biochemical measures (Steyn et al., 2009). The results of the meta-analysis demonstrated that the most successful programs included both dietary interventions and activity components. Compliance with diets was positive health benefits and cost effective interventions to prevent anyone from developing Type 2 diabetes (Steyn et al., 2009).

While the importance of nutrition in preventing, and treating Type 2 diabetes has been established (Damon et al., 2011), other studies have shown that there is a need to temper how these findings are applied. The study by Perez-Escamilla (2011), for example, has shown that not all nutritional interventions will be successful all the time. They must be tailored to suit the needs of individuals based on the individuals' contexts and cultures (Perez-Escamilla, 2011). Hence, the findings of the studies presented in this section must be viewed through cultural lenses, and must not be taken to be automatically applicable to all individuals who wish to avoid, or are already suffering from Type 2 diabetes.

This conclusion drawn from Perez-Escamilla (2011) is echoed by Franz et al. (2010). According to Franz et al., nutritional interventions must be conducted based on individual needs and choices. However, in general, there are several practices which seem to be universal for the most part. These include consistency in carbohydrate

consumption, the adjustment of insulin with regards to the intake of carbohydrates, the avoidance of foods high in sucrose, and the monitoring of blood glucose (Franz et al., 2010).

According to Delahanty (2010), these guidelines which are usually the strategies used by dieticians in addressing Type 2 diabetes management and prevention, have been the main topics preoccupying most of the major clinical trials conducted in the past several years regarding diabetes. However, with the increasing knowledge regarding the impact of culture, and the specificity of clients' needs, dieticians have had to forego simply following these guidelines (Delahanty, 2010). Dieticians have had to undertake further responsibilities such as tailoring these strategies to ensure that they respond to the barriers that hinder individuals from achieving their goals of managing or preventing the development of Type 2 diabetes (Delahanty, 2010). Thus, the role of dieticians in diabetes research, is not limited to simply creating meal plans for patients, but has expanded to that of a researcher, and even, at times, that of a counselor (Delahanty, 2010).

Based on past studies, it has been unclear whether replacing dietary fat with carbohydrates had any significant associations with the reduced risks of developing Type 2 diabetes (Kodama et al., 2009). A meta-analysis was done and concluded that the low fat high carbohydrate diets was better at preventing and managing Type 2 diabetes than the high fat low carbohydrate diets.

In a study by Priebe, van Binsbergen, de Vos, and Vonk (2008), the effects of whole grain consumption in the prevention of Type 2 diabetes was studied. To carry out



the goals of the study, a meta-analysis was conducted among past research endeavors. The meta-analysis included only cohort studies which lasted at least five years. (These cohort studies needed to have analyzed any relationships between whole grain foods intake and the development of Type 2 diabetes). Randomized control trials with the same goals were also included in the study (Priebe et al., 2008). For these, only studies which lasted for at least six weeks were included (Priebe et al., 2008).

After conducting their search of various databases, Priebe et al. (2008) could include one randomized control trial and 11 cohort studies in their meta-analysis. According to the researchers, the trial study was not significant enough to merit any conclusions (Priebe et al., 2008). On the other hand, the cohort studies consistently showed that consumption of whole grain and cereal food products were significantly associated with decreases in the incidence of Type 2 diabetes (Priebe et al., 2008).

### **White Rice Consumption**

Evidence on the association between white rice consumption and risk of developing type 2 diabetes is based on prospective cohort studies yet inconclusive (Hu, Pan, Malik & Sun, 2012; Golozar et al., 2017). Consumption of white rice varies by population and amount measured is not standard (gm, servings per day or week). Hu et al. (2012) conducted a meta-analysis of seven published prospective cohort studies to estimate the risk of developing type 2 diabetes based on the amount of white rice consumed. The pooled sample included 13284 cases of type 2 diabetes and 352384 participants from Asia (Chinese/Japanese) and Western regions. Asian groups consumed greater amounts of white rice (3-4 servings/day) compared to Western groups (2

servings/week). Based on the random effects model that Hu et al. used to synthesize and evaluate these past studies, Asian participants had a relative risk of 1.55 of developing type 2 diabetes compared to Western participants with a relative risk of 1.12 ( $p=0.038$ ). A recent study by Gozar, et al. (2017) analyzed white rice consumption in two prospective cohorts in Iran, one in the capital Tehran and another in rural areas. The rural areas consumed significantly about 50% less white rice (120 gm/day) compared to urban areas (250 gm/day). The adjusted odds of developing type 2 diabetes based on consuming 250 gm/day or greater compared to less than 250 gm/day was 2.1 (95% CI 1.1,3.9) for urban areas but not significant for rural areas (Gozar, et al., 2017).

While white rice seems to increase the risk of developing Type 2 diabetes (Hu et al., 2012), other food products seem to decrease the risks of developing Type 2 diabetes. One such food product is soy. According to Yang et al. (2011), soy decreases the risks of developing Type 2 diabetes. To ascertain this, the researchers conducted a meta-analytical study among eight studies regarding soy and Type 2 diabetes. Their meta-analysis found that soy was associated with significant reductions in the following substances associated with increased risks of Type 2 diabetes: serum total cholesterol, triacylglycerol, and low density lipoprotein-cholesterol (Yang et al., 2011). The researchers proposed a mechanism to help explain how soy can reduce the risks of developing Type 2 diabetes. According to Yang et al., it is soy's ability to lower the number of lipids in a human body which makes it such a significant preventive substance against Type 2 diabetes. Yang et al. even recommended soy intake for the management of the effects of Type 2 diabetes among individuals already diagnosed with the illness.

Soy Monounsaturated fatty acids (MUFA), such as olives, nuts, seeds, and avocados, has been found to be a substance which is helpful in the management of the risks and effects of developing Type 2 diabetes (Schwingschakl, Strasser, & Hoffmann, 2011). According to Schwingschakl et al. (2011), previous studies have failed to ascertain whether substances high in MUFA were beneficial to individuals with Type 2 diabetes. Their study then aimed to investigate any relationships between MUFA and the development and the risks of developing Type 2 diabetes.

To investigate this relationship, the researchers conducted a meta-analysis of past studies (Schwingschakl et al., 2011). The meta-analysis included nine randomized controlled intervention trial studies. In total, these studies had a combined 1,547 participants (Schwingschakl et al., 2011). The meta-analysis compared individuals with high MUFA consumption and individuals with low MUFA consumption levels in the hopes of ascertaining any association between foods with high MUFA and the risks and development of Type 2 diabetes (Schwingschakl et al., 2011). The results of the study showed that individuals with higher levels of MUFA consumption were more likely to control substances associated with high risks of developing Type 2 diabetes (Schwingschakl et al., 2011). This meant that the results of the study showed significant relationships between individuals who consumed food products with high MUFA contents and the lowered risk of developing Type 2 diabetes (Schwingschakl et al., 2011). The researchers therefore recommended MUFA to individuals avoiding and coping with Type 2 diabetes (Schwingschakl et al., 2011).

## **Nutrition Among Youth with Type 2 Diabetes**

Numerous studies have been conducted to explore the effects and importance of nutrition to the prevention and management of Type 2 diabetes in the general population. However, despite the relatively new phenomenon of adolescents and younger individuals developing Type 2 diabetes, studies have already begun establishing the importance of nutrition for their population. Ventura et al. (2009) conducted a study among 54 overweight Latino adolescents with an average age of 15.5 years old. The study was aimed at identifying if reducing the consumption of sugar had any effects on decreasing the risk for developing Type 2 diabetes (Ventura et al., 2009). The study used seven factors as predictors of the development of Type 2 diabetes: (a) BMI, (b) visceral adipose tissue, (c) glucose incremental area under the curve, (d) insulin incremental area under the curve, (e) insulin sensitivity, (f) acute insulin response, and (g) disposition index (Ventura et al., 2009).

Based on the study, 55% of participants decreased their sugar consumption. Of these adolescents who reduced their sugar consumption daily in the amount corresponding to one can of soda, most showed decreased risks of developing Type 2 diabetes (Ventura et al., 2009). Specifically, these individuals showed improvements in two predictors of Type 2 diabetes: glucose incremental area under the curve, and insulin incremental area under the curve (Ventura et al., 2009).

A study conducted by Jenkins et al. (2008) aimed to identify whether high fiber diets in the form of cereal foods would have any effects on the diabetic management of individuals. Jenkins et al. conducted a randomized clinical trial among 210 participants

suffering from Type 2 diabetes. The participants were given an intervention of advice regarding high-fiber diets (Jenkins et al., 2008). The participants were also given six months of the intervention for the study (Jenkins et al., 2008). Based on the findings of the study, high fiber diets, especially using cereal were quite beneficial to the participants, allowing for better diabetic management (Jenkins et al., 2008).

The study conducted by Ventura et al. (2009) echoed the results of the study conducted by Jenkins et al. (2008). Their study also aimed to illustrate the effects of increased fiber consumption among adolescents of Latino descent. Among the 54 participants of the study, 59% could increase their daily fiber intake by up to the amount corresponding to a bowl of beans (Ventura et al., 2009). Based on the same predictors mentioned above, these individuals showed significant improvements in their body mass indices, and in their visceral adipose tissue (Ventura et al., 2009).

Ye, Chacko, Chou, Kugizaki, and Liu (2012) studied the consumption of whole-grain and high fiber food products was studied in relation to the development of Type 2 diabetes, among younger individuals. The longitudinal study was composed of 45 cohort studies and 21 randomized controlled trials. The comparison was between individuals who never or rarely ingested meals high in whole-grain materials and individuals who were used to receiving three to five servings of whole grain per day (Ye et al., 2012). According to the results of the study, compared to individuals aged 8 to 13 years old who rarely consumed whole-grain, individuals who received plenty of whole grain in their diet were 26% less likely to develop Type 2 diabetes (Ye et al., 2012). The study found that for the samples investigated, consuming more whole grain food was highly associated

with lower risks of developing cardiovascular diseases and obesity (Ye et al., 2012). The study, however, failed to identify the mechanisms by which whole grain prevented greater risks of developing Type 2 diabetes and other illnesses, partly since this was outside the study's scope. Ye et al. therefore recommended that further studies be undertaken to map out exactly how whole grain helps lessen the risk of developing Type 2 diabetes and other associated illnesses.

### **Physical Activity and Type 2 Diabetes**

In general, exercise is an effective strategy for the prevention of various diseases (Roux et al., 2008). Exercise can be a cost-effective means of receiving intervention strategies that help delay or completely prevent the onset of diseases such as diabetes. In a study by Roux et al. (2008) for example, seven community-based exercise programs were analyzed in terms of their effectiveness, and in terms of how cost-efficient they were in preventing disease. The study made use of lifetime cost-effectiveness analysis to carry out the goals of the research (Roux et al., 2008). Based on the findings of their study, community-based health initiatives, specifically, community-based physical activity programs were found to not only be successful in preventing diseases, but also found to be cost-efficient, more than rivaling the effects of expensive private disease prevention physical activity schemes (Roux et al., 2008).

According to Walker, O'Dea, Gomez, Girgis, and Colagiuri (2010), nutritional interventions may not be enough in preventing Type 2 diabetes. In a meta-analysis of four cohort studies with a total of 4,846 participants at elevated risk of developing Type 2 diabetes (Walker et al., 2010) weight loss was identified as a significant contributor to the

reduced risks of developing Type 2 diabetes. However, the researchers also found that it is necessary to maintain the lost weight, and this can be achieved with the addition of exercise into the interventions (Walker et al., 2010). More importantly, the physical activity individuals engage in must consume roughly 2,000 calories per week (Walker et al., 2010).

According to Hayes and Kriska (2008), physical activity has been increasingly emphasized by numerous studies as a crucial factor in preventing the development of Type 2 diabetes and other associated illnesses and types of diabetes. However, despite the evidence pointing to the importance of physical activity, the inactivity of the general population has been increasing, contributing to further cases of diabetes (Hayes & Kriska, 2008).

In a study by Orosco et al. (2008), the effectiveness of physical activity in preventing the development of Type 2 diabetes was compared to the effectiveness of physical activity coupled with dietary interventions in preventing the development of Type 2 diabetes. To carry out the goals of the research endeavor, Orosco et al. conducted a meta-analysis of past studies regarding physical activity and Type 2 diabetes. Studies were included in the meta-analysis if their participants included individuals who were at risk of developing Type 2 diabetes (Orosco et al., 2008). Another inclusion criterion for the meta-analysis was that all studies had to have been randomized controlled trials regarding physical activity and diet interventions carried out for at least six months (Orosco et al., 2008).

According to the analysis of past studies conducted by Orosco et al. (2008), interventions which made use of physical activity only strategies were not statistically significant in their success at preventing diabetes compared to interventions which made use of diet only strategies. Another finding of the meta-analysis was that physical activity strategies coupled with dietary interventions were quite successful in preventing the development of Type 2 diabetes among individuals who were at elevated risk of developing the illness (Orosco et al., 2008).

### **History of Diabetes**

According to Das and Shah (2011), the earliest recorded descriptions of diabetes were made by Hindu scholars as early as 1500 BC. At the time, the scholars described diabetes as “a mysterious disease causing thirst, enormous urine output, and wasting away of the body with flies and ants attracted to the urine of people” (Das & Shah, 2011, p. 6). The term diabetes was most probably created hundreds of years later, at around 250 BC (Das & Shah, 2011). According to studies, the term diabetes was probably coined by Apollonius of Memphis, and was constructed to mean “siphoning off”—relating to the tendency of the disease to deplete an individual’s bodily fluids (Das & Shah, 2011).

Early prescriptions for the treatment of diabetes included horseback riding and exercise (Das & Shah, 2011). According to early scholars, these activities created friction which was thought to lessen the large amount of urine produced by individuals suffering from diabetes (Das & Shah, 2011). Other treatments prescribed consumption of food items or beverages which were thought to address diabetes. These included wine, potatoes, oats, and even opium (Das & Shah, 2011). Still other treatments required



individuals with diabetes to either overeat, or to undergo a severe starvation diet (Das & Shah, 2011). It wasn't until the early 20th century that insulin was discovered, along with its role in the occurrence and treatment of diabetes. In 1922, insulin extracts from dogs were used as an experimental treatment for individuals suffering from diabetes (Das & Shah, 2011). The experiments paid off, and significant decrease in the blood sugar levels of patients was observed (Das & Shah, 2011).

Diabetes is usually characterized by elevated levels of blood sugar (NCCDP&HP, 2010). Because insulin is impaired, the use of sugar is hindered. Thus, the sugar which an individual consumes remains in his or her bloodstream, resulting in elevated levels of blood sugar (NCCDP&HP, 2010).

### **Types of Diabetes and Consequences**

While the most well-known forms of diabetes are labeled Type 1 and type 2 diabetes, the medical field has discovered the existence of several other forms of diabetes afflicting different populations, through different mechanisms (NCCDP&HP, 2010). These forms differ in their severity, and in their effects, but retain the basic definition of diabetes as a disease associated with insulin impairment (NCCDP&HP, 2010).

#### **Type 2 Diabetes**

Type 2 diabetes occurs in the opposite population, as compared to Type 1 diabetes. This form of the disease is usually associated with older adult populations, among individuals older than 40 years of age (NCCDP&HP, 2010; USDHHS 2007). However, in recent years, this form of diabetes has also been seen in younger populations, among children and adolescents.

This form of diabetes comprises nearly all the recorded cases of diabetes, with 90% to 95% of diabetes cases classified as Type 2 diabetes (NCCDP&HP, 2010). Unlike Type 1 diabetes which is usually unpreventable, Type 2 diabetes is sometimes caused by factors which are, for the most part, controllable by individuals. Specifically, this type of diabetes is seen among individuals who suffer from obesity, and among individuals who have low levels of physical activity (NCCDP&HP, 2010). Other less preventable factors which are associated with Type 2 diabetes include family history, impaired insulin production, and impaired glucose metabolism (NCCDP&HP, 2010). Studies have shown that this type of diabetes results from a combination of genetic and environmental factors. Genetic factors include lowered insulin secretion levels, and insulin resistance (Kaku, 2010). On the other hand, the environmental factors which cause Type 2 diabetes include overeating, lack of exercise, aging, and stress (Kaku, 2010).

### **Prediabetes**

Prediabetes occurs among individuals with elevated levels of blood sugar. However, their blood sugar levels are not high enough to be pathologically characterized as diabetes per se (NCCDP&HP, 2010; USDHHS, 2007). These individuals simply are at a greater risk of developing Type 2 diabetes in the future, along with other illnesses such as heart disease (NCCDP&HP, 2010). With proper health care, prediabetes can be prevented from progressing to Type 2 diabetes among children. Health care professionals, particularly the school nurse can help ensure that students get the proper nutrition and that they get adequate exercise so that they do not become obese.

**Other Forms of Diabetes**

Of all the recorded cases of diabetes, roughly 1% to 5% does not fall into the previous forms of diabetes (NCCDP&HP, 2010). These cases are usually brought about by genetics, pancreatic illnesses, surgery, certain forms of medication, and infection (NCCDP&HP, 2010).

**Consequences**

Even though diabetes is a medical condition, its negative effects are observed only in an individual's physical health. Diabetes also has far-reaching effects on the individual's social condition, as well as on his or her financial and economic capacities (NCCDP&HP, 2010).

According to NCCDP&HP (2010), diabetes has been known to cause blindness among older individuals. Diabetes has been the leading cause of blindness among adults 20-74 years of age (NCCDP&HP, 2010). Worldwide, diabetes is the second most prevalent cause of blindness (Riaz, 2009). Diabetes has also been known to cause kidney failure, as well as the amputation of lower limbs (NCCDP&HP, 2010). In fact, diabetes is the second most common cause for kidney failure worldwide (Riaz, 2009). However, perhaps the most severe effect of diabetes is death (NCCDP&HP, 2010). The disease makes individuals twice as likely to die, compared to individuals who do not suffer from diabetes (NCCDP&HP, 2010). Even if an individual does not die due to the complications that arise from suffering diabetes, his or her life expectancy is severely shortened (NCCDP&HP, 2010).

Individuals who die due to diabetes usually do not die from the disease itself, but from the resulting complications it brings about (Riaz, 2009). Specifically, diabetes causes vascular disease which is the leading cause of death among individuals with diabetes (Riaz, 2009). The vascular diseases caused by diabetes can include atherosclerosis, heart conditions, and strokes (Riaz, 2009). Diabetes also causes nerve damage in three ways. First, diabetes may cause peripheral neuropathy, which causes feelings of pain in an individual's limbs (Riaz, 2009). Second, diabetes can cause autonomic neuropathy. This disrupts a person's ability to digest food, and may even contribute to sexual incontinence (Riaz, 2009). Third, diabetes can cause damage to nerves which are associated with the senses. Apart from blindness, damages to an individual's hearing may also be caused by diabetes (Riaz, 2009).

In relation to nerve damage, individuals with diabetes may also experience brain damage. Should diabetes cause acute cases of hypoglycemia or hyperglycemia—both disorders regarding severe blood sugar imbalances—an individual may experience seizures strong enough to damage the brain, and put the individual in a coma (Riaz, 2009).

Other severe medical effects of diabetes include the heightened risk for developing cancer, infections, and pregnancy complications (Riaz, 2009). An individual with diabetes is more prone to developing malignant and cancerous tumors in his or her colon, pancreas, and liver (Riaz, 2009). Diabetes also causes infections in the feet of individuals, resulting in nonfatal amputations. Infections caused by diabetes, however, are not limited to the feet, and may cause ulcers, yeast infections and urinary tract

infections (Riaz, 2009). Among pregnant women, diabetes exacerbates the risks of developing “preeclampsia, miscarriage, stillbirth and birth defects” (Riaz, 2009, p. 368). Diabetes also has severe effects on an individual’s capacity to think and feel. Diabetes may also increase in the likelihood of developing psychological illnesses such as memory loss, dementia, and Alzheimer’s disease (Riaz, 2009).

Existing literature does not provide information about the medical consequences of Type 2 diabetes per se. However, this condition can lead to children experiencing symptoms such as urinating frequently, drinking much liquid, and often feeling tired (Dowshen, 2012). For children who already have this condition, lifestyle changes will be necessary. They would need to eat a healthy diet and maintain a normal body weight (Dowshen, 2012). They would also need to become physically active, regularly monitor their blood sugar levels, and take insulin or other medications that enable the body to more effectively respond to insulin. They would also need to work closely with their doctors or with a diabetes health care team to prevent complications such as retinopathy, kidney disease, foot problems, and an increased risk of heart disease (National Health Service, 2012).

### **Treating the Effects of Diabetes**

One of the more severe and more potentially fatal effects of diabetes is the development of cardiovascular disease (Kaku, 2010). To prevent this, certain forms of medication may be taken by an individual suffering from diabetes. The drug pioglitazone, for example, is prescribed to individuals with Type 2 diabetes (Kaku, 2010). This drug suppresses cardiovascular disorder which the individual may have developed because of

diabetes (Kaku, 2010). This drug prevents the recurrence of cardiovascular disease (Kaku, 2010). However, for this treatment to be more successful, it must be used earlier, and in conjunction with other treatment and preventive measures like glucose control, and blood pressure control (Kaku, 2010). Furthermore, to treat the effects of diabetes, diabetes management is needed. The goal of diabetes management is to encourage insulin levels in an individual with diabetes to approach normal levels (Thomas & Elliott, 2009). This then stops the development of further complications due to diabetes to occur in the individual.

Current conventional methods for diabetes management include using the glycemic index to plan a person's meals (Thomas & Elliott, 2009). However, according to Thomas and Elliott (2009), this method has been found to be inconsistent. Past studies conducted to survey the effectiveness of this method have not unanimously supported it (Thomas & Elliott, 2009). Thus, to establish an assessment of the effectiveness of diets informed by the glycemic control method, Thomas and Elliott conducted a meta-analysis of 11 past research endeavors which used controlled trial methods to compare low glycemic index diets with high glycemic index diets among individuals suffering from diabetes mellitus. The results of the meta-analysis showed that a low glycemic index diet can improve glycemic controls among individuals suffering from diabetes mellitus (Thomas & Elliott, 2009).

### **Financial Effects**

According to NCCDP&HP (2010), individuals who suffer from diabetes are severely affected financially by their illness. To be exact, individuals who suffer from

diabetes spend 2.3 times more compared to individuals who do not suffer from diabetes (NCCDP&HP, 2010). In total, Americans spend \$174 billion to address the adverse effects of diabetes. Of these, \$116 billion are devoted to direct medical costs such as medication and treatment, while \$58 billion are devoted to addressing the indirect costs of the disease such as the loss of income due to the inability to work (NCCDP&HP, 2010).

### **Role of School Nurse in the Management of Students with Diabetes**

Every student with diabetes is entitled to a school nurse with the knowledge and capacity to provide effective care and communicate with teachers, physicians, and families (Bobo & Butler, 2010). The school nurse is positioned to promote healthy lifestyle choices and diabetes self-care. Researchers found that promoting lifestyle behavior change requires that nurses shift from simple advice giving to a more counseling-based approach (Jansink et al., 2010).

School nurses play a vital role in the management and care of children in a school environment. Their job comprises an extensive and comprehensive scope of practice including responding to emergency situations, administering medications and providing nursing care throughout the school year. Their health care experience and management requires assessments, collaborations, and promotion of health education, which are essential to the long-term well-being of the school communities which are mostly underserved (Berkobein, 2012).

More specifically, school nurses provide students with direct care for injuries and acute illness and provide long-term management of students with special health care

needs (Council on School Health, 2008). School nurses are responsible for assessing and treating the students with the scope of professional nursing practice, communicating with parents, referring to physicians, and providing or supervising the administration of prescribed nursing care. The school nurse is also responsible for creating individualized health care plans for students who have chronic conditions as well as an emergency plan for managing potential emergent events in the school setting, such as incidents related to asthma or diabetes. Ideally, this plan should be in alignment with the management plan prescribed by the child's pediatrician and should be regularly updated through a close coordination with the doctor. The school nurse is responsible for managing the plan and communicating about it to all the appropriate school personnel (Council on School Health, 2008). As well, the school nurse is responsible for providing health services for children with special health care needs such as the children with various degrees of disability and the children with chronic illnesses. In addition, the rapid changes in science and technology related to diabetes management require the school nurse to maintain current knowledge and skills to fully implement a student's diabetic plan in the school setting (ADA, 2011; NDEP, 2010).

All students who have diabetes are in unique situations, whether developmentally or intellectually, in their abilities and needs for assistance in managing their disease. The Diabetes Medical Management Plan (DMMP) and IHP have been developed for normal or almost normal blood glucose levels. Hypoglycemic or hyperglycemic episodes should be rare and normal development and mental health as well as academic achievement should be prioritized (Kauffman, 2009).



School nurses need to develop students' IHP from medical orders (DMMP) by working with families, detecting more assessment findings, and outlining strategies for diabetes management. Additionally, other staff must be made aware of daily protocols for the students and how to identify their needs in school. School nurses coordinate and communicate with other staff the emergency care plan so that the latter know what to do if symptoms of hypoglycemia and hyperglycemia are observed.

As children with diabetes grow older, they transition to independence and self-management (Silverstein et al., 2005). The levels of supervision/assistance that they need for daily care and management will vary. Those who lack experience or who have cognitive or developmental challenges must be assisted throughout the day as dictated in their IHPs.

Students, who go into hypoglycemic states, when their blood glucose levels are low, are in immediate danger because they may not be able to manage their situations due to impaired cognitive or motor functioning. In that case, the students must not be unattended, and school personnel must be available to assist these students. Their treatments must be immediately available so that they can be administered right away (ADA, 2011).

In contrast, high blood glucose, or hyperglycemia may take hours or days to develop. However, if it is left untreated, it can be life-threatening because students may develop diabetic ketoacidosis. If they are using insulin pumps, lack of insulin may result in diabetic ketoacidosis (ADA, 2011). In those cases, school nurses can resort to the three

levels of staff training from the NDEP (2010) so that students with diabetes can get prompt care that is safe and appropriate to the situation.

It is important for students with diabetes, who are also students with disabilities, to have the same opportunities as their peers to participate in all school activities, whether academic or extracurricular. Any institutions that received federal assistance must not discriminate against people if they have disabilities of any kind per Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (NDEP, 2010). The Office for Civil Rights in the U.S. Department of Education makes schools enforce such laws, making them accountable for providing students with disabilities with free and appropriate public education (NDEP, 2010). Because diabetes management is always undergoing change, then school nurses must maintain the latest skills and knowledge so that DMMPs can be fully implemented in schools (ADA, 2011; NDEP, 2010).

Partnerships between school staff, students with diabetes, and families can lead to better management of this condition. These staff, coordinated by the school nurse, include families, the students themselves, and those who provide transportation, classroom education, physical education, counseling, and administration. School nurses are responsible for having the expertise and coordination abilities so that all the foregoing individuals can cooperate in assisting students with diabetes to manage their own disabilities.

All school nurses must develop IHPs for all students with diabetes and continue to oversee how the plans are implemented and evaluated in school (American Nurses

Association/National Association of School Nurses, 2011). Part of the duties of school nurses is to plan individualized health care. No one else can have this responsibility (American Nurses Association/National Council of State Boards of Nursing, 2006). Any delegation of these responsibilities, if the school nurse is unavailable, is up to state laws and nurse practice acts (American Nurses Association/ National Association of School Nurses, 2011).

According to Nguyen, Mason, Sanders, Yazdani, and Heptulla (2008), for those whose Type 1 diabetes is not controlled well, good nurse supervision significantly improves the control of blood glucose for these students. In the absence of this supervision, students may experience poor academic performance as well as complications that include retinopathy, cardiovascular disease, and nephropathy. If blood glucose levels are maintained within an acceptable range, long-term complications can be prevented or reduced. Butler (2007) emphasized the role of the school nurse in managing and coordinating care for diabetes in school age children, especially if they have hypoglycemic episodes there.

School nurses help students with diabetes arrive at independent decisions, adopt healthful life styles, and make a good transition between their cares in secondary school to that of adulthood (Bobo & Butler, 2010). School nurses who have the knowledge and ability to provide effective care and have excellent communication with school staff, health care providers, and families are ideally matched to students with diabetes (Bobo et al., 2011).

A sustained lifestyle change which includes nutrition and physical activities must be the cornerstone for obesity management implemented by the school nurse. The school setting is a safe and trusted environment for children since they spend most of the day there. The school nurse must emphasize the importance of physical activities which enhances insulin sensitivity by improving the transportation of glucose into the cells and increase the production of muscle glycogen, replacing the amount used (Rabbit & Coyne, 2012). School nurses, under the direction of the health care provider, can provide nutritional and physical activity advice to parents, students and staff along with strategies for change.

### **Literature on Methods**

Majority of the literature reviewed for this study made use of the qualitative method. In an article published by the American Academy of Pediatrics (2008), where the authors discussed the role of the school nurse in providing care for students, particularly for children with chronic diseases, the qualitative method in the form of a systematic review was used in discussing the role and activities of the school nurse, their professional preparation, as well as their role as part of the school health services team. Similarly, a study conducted by Bowen and Rothman (2010) used a formal review as their research method to make the assertion that the use of a multidisciplinary management team in the care of children and adolescents with Type 2 diabetes promoted increased efficiency and effectiveness, as well as improved outcomes for these children. A formal review or a systematic review is a research method that aims to sum up the best

available research about a question and is conducted through the synthesis of several studies (Campbell Collaboration, n.d.).

A formal review was also used by the National Association of School Nurses in its position statement where it asserted that the school nurse was the only member of the school staff who had the statutory authority, knowledge base, and skills necessary for meeting the needs of students with diabetes in the school setting (Butler, Fekaris, Pontius, & Zacharski, 2012). Peimani, Tabatabaei-Malazy, and Pajouhi (2010) also used the formal review method in asserting that the role of nurses in providing education for patients with diabetes was important, particularly because of their capabilities in providing effective quality care at lower costs. As well, Jameson (2006) conducted a formal review of the challenges that students with diabetes encountered at school, particularly with regards to the management of hyperglycemia and hypoglycemia, exercises and sports, nutrition management, insulin administration, blood glucose monitoring, and the training of school personnel.

The interview method was used by Wang, Brown, and Homer (2010) to determine the school-based lived experiences of adolescents with Type 1 diabetes. This interview method made use of the Heideggerian hermeneutical phenomenological approach as the philosophical underpinning that guided it. It involved adolescents who were aged between 12 and 16, were diagnosed with Type 1 diabetes mellitus for at least a year, did not have other significant health issues, and were studying in either in private or public junior high schools in Taiwan. Purposive sampling was used for recruiting the adolescents and in the end, the authors had two participants for the study – one girl and

one boy who were aged 14 and 15, respectively. Semistructured interviews were conducted. Some of the interviews were transcribed verbatim and a memo journal, along with field notes, was also used during the entire study. The gathered data was analyzed using the hermeneutic circle, which enabled the authors to gain a global understanding of the participants lived experiences. NVivo 8.0 was used for managing and analyzing the data.

On the other hand, the case study method was used by Kelo, Eriksson and Eriksson (2013) in a study where they asserted that nurses have a key role in providing patient education for children with Type 1 diabetes but that they lack knowledge about the patient education process. In this regard, this study described an educational program that enhanced the empowering patient education process for educating children about monitoring their blood glucose and that also enhanced the perceptions of nurses with regards to the use of empowering techniques. More specifically, this study involved ten nurses who conducted the diabetes education program. Eight of them also participated in the semistructured interviews, which allowed the authors to gather information about the nurses' perception regarding their use of empowering techniques. The nurses' ages ranged from 25 to 55 and their work experience in the ward ranged from 6 months to 13 years. The data were analyzed through the use deductive and inductive content analysis. On the other hand, the bases for developing the education program included previous research and literature, as well as studies that focused on the perceptions of nurses, children, and parents regarding patient education. Although this specific study is concerned with Type 1 diabetes, its use of a qualitative method of research justifies the

appropriateness of a qualitative method for conducting a research on Type 2 diabetes as well, especially because Type 1 and Type 2 diabetes share many similarities.

The case study method was also used by Foley, Dunbar, and Clancy (2013) who evaluated the success of two collaborative initiatives that were conducted by the public-school system in Springfield, Massachusetts and the Baystate Medical Center, which was affiliated with Tufts University. These initiatives highlighted the care of urban children who either had asthma or Type 1 diabetes. The authors conducted their evaluation through their attendance in grand rounds, which featured public school nurses, nurses, and academic medical center physicians. The authors found that increased communication, collaboration, and understanding of roles would benefit students, school nurses, and primary care providers.

Of the ten articles reviewed, only two described the results of quantitative studies. One is a study by Amillategui, Calle, Alvarez, Cardiel, and Barrio (2007), which aimed to identify the special needs of children with Type 1 diabetes in schools, based on the parents' perception. It also aimed to determine how the parents' perception affected the confidence they had in the school's capability in caring for their children. It involved the parents of children aged between 3 and 18 years who had Type 1 diabetes, and who attended pediatric outpatient clinics in Madrid, Spain. Self-reporting questionnaires were used for gathering data, the results of which were recorded using the Gandia Barwin statistical program. A quality control exercise was also performed to detect potential recording mistakes. In addition, a student's t-test was used.

Another quantitative study was the descriptive research conducted by Engelke, Swanson, Guttu, Warren, and Lovern (2011) where they used case management in determining the kind of care that school nurses provided to children with diabetes. It required nurses to complete an expanded health assessment and it also involved the quantitative and qualitative analysis of data for 86 children with diabetes whose ages ranged from 5 to 17. Responses were recoded using a three-point scale for children between the ages of 5 and 7 while a 5-point scale was used for the older children. The scores were then converted to a scale of 0 to 100 to facilitate their interpretation. SPSS 17.0 was used for analysis. Moreover, independent-groups t-tests were used for comparing the mean IDs between nurses who handled 1 to 2 schools and nurses who handled 3 to 4 schools. The paired samples t-test was also used for comparing the quality of life scores between the baseline and the end of case management. Assessment of the statistical significance was done at a level of .05.

With studies that examined other types of diseases that school nurses addressed, the qualitative method also seemed to be prevalent. For example, Toole (2013) used the qualitative method for discussing the role of the school nurse in the management of children's asthma while Rodriguez et al. (2013) used the quantitative method, and Liberatos, Leone, Criag, Fuentes, and Harris (2013) used both the qualitative and quantitative methods. On the other studies concerning the school nurse's role in the management of children with Attention Deficit Hyperactivity Disorder (ADHD) mostly used the qualitative methods (e.g. American Academy of Pediatrics, 2000; LeFever & Arcona, 2003; Niebuhr & Smith, 1993).



### **Summary and Transition**

Diabetes is a widespread group of diseases caused by low levels of insulin (Copeland, Becker, Gottshwalk & Hale, 2005). This causes failures in sugar metabolism, and increased levels of blood sugar. This chapter has outlined the various causes and types of diabetes, as well as their effects on an individual's physical and psychological health. The chapter also paid attention to Type 2 diabetes—a form of diabetes commonly associated with adult populations, which has been increasing in incidence among younger individuals (NCCDP&HP, 2010). According to experts, to prevent diabetes, and its ill effects, certain lifestyle changes must be made (NCCDP&HP, 2010). Hence, this chapter also outlined the physical activity and nutritional behaviors observed among youth and adolescents. Identifying these behaviors and planning strategies to improve them may yet help prevent and curb the negative consequences of diabetes, which is the main goal and significance of the current research endeavor.

## Chapter 3: Research Method

### **Introduction**

The purpose of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. The school nurse plays a key role in planning, coordinating, and monitoring the care of students with this condition. Their responsibilities also include the management of routine care, such as the administration of insulin injections and the recognition of emergency situations.

In Chapter 3, I discuss the methods employed for this research. The chapter includes discussions of the research design and approach, role of the researcher, methodology, participant selection logic, instrumentation and materials, procedures for recruitment, participation and data collection, data analysis plan, issues of trustworthiness, and ethical procedures. This chapter ends with a summary of all the important points discussed about the research method.

### **Research Design and Approach**

A qualitative research design and a case study approach were used to obtain the answers to the questions posed for this research. This approach was appropriate because it could provide complex textual descriptions of how people experience the issue posed in this research (Family Health International, Mack, Woodsong, United States Agency for International Development, 2005). The design provided information about the human factors that affect the issue, which included personal relationships, emotions, opinions, beliefs, and behaviors. This research design was also used in the identification of

intangible factors, such as religion, ethnicity, gender roles, socioeconomic status, and social norms. Unlike the quantitative method, the qualitative method provided me with more flexibility in the gathering and analysis of data by asking detailed follow-up questions or when requesting clarification on questions as needed.

In addition, the qualitative approach was effective for conducting exploratory research such as the current study in that it allowed for the use of open-ended questions, which in turn enabled further probing into the participants' responses. It also allowed the participants to elaborate or expound on their answers in their own words instead of being forced to choose from fixed responses. Open-ended questions allow obtaining rich explanatory data that are culturally and meaningfully salient to the participant. Moreover, open-ended questions can lead to responses that were unanticipated by the researcher.

Among the various traditions within the qualitative research approach, this study used the case study research tradition. This tradition is "defined by individual cases, not by the methods of inquiry used" (Cohen & Crabtree, 2006). A case can refer to any bounded system that is of interest and may be simple or complex. Its boundaries are identified by the researcher; that is, what would constitute as a case and what would not. The goal of this research tradition is to obtain an understanding of the case's boundaries and the complexity of the bounded system's behavior patterns. Moreover, it enables the examination of "a contemporary phenomenon with its real-life context" (Morgan, n.d.). The case study tradition is commonly used in health care research because the units of interest in this type of research (e.g., health system, practice, patient) can be easily bounded and considered a case. The case study method has been used in studies that

described the role of the school nurse or nurse and how they have administered care to promote health. For this research, a collective case study was conducted as it involved the joint study of multiple cases (i.e., school nurses) to obtain an understanding of the phenomenon.

### **Role of the Researcher**

I interviewed and obtained information from the participants through the conduct of qualitative interviews. Adequate background knowledge of the research topic was necessary to be able to formulate relevant questions. This enabled me as the interviewer to obtain the answers to the questions posed for this research. An interview guide was created, which contained the main questions that I would ask the participants (Appendix A). The interview guide consisted of open-ended questions, which were succinct, straightforward, and stated using simple terms, per Angus (n.d.). It started with the basic demographic questions and moved into broader questions with regards to the topic. This ensured that all participants were asked the same questions. Follow-up or probing questions were asked to obtain more in-depth information from the participants to allow the participants to clarify or expound on their answers (“Interviewing in Qualitative Research,” n.d.). In addition, I was responsible for selecting the sample for the research based on the potential participants’ resumes and the criteria established for the participants.

During the actual interviews, I first introduced myself to the participants and explained the purpose of the interview. Permission was requested from the participants to record the interview. The participants’ identity remained confidential and their anonymity

ensured by not including any personal identifiers during the recording or transcribing. All the participants' questions and concerns were addressed prior to beginning with the interview. More specifically, I allotted time for directly and verbally answering each participant's concerns. The participant was provided with the documents that assured them of the validity of the study being conducted (e.g., letters of consent from the school administrators or from the school district).

The interview was recorded and notes were taken on information that could not be captured by the tape recorder, such as the participants' responses. Short, simple, easy questions were asked and allowed the participants as much time as needed ("Interviewing in Qualitative Research," n.d.). As the interviewer, I was empathetic to the participants, but steered the participant to focus on the interview should the participant have greatly deviated from it. I was attentive to the participants' responses so that any inconsistencies were captured and clarified. The interviews were transcribed by me, then compiled, analyzed, and summarized.

### **Researcher Bias**

I did not have any prior relationship with the study participants. However, a possible source of bias may have been the findings of previous research studies that I discovered while preparing for the interviews. In this case, I ensured that the questions—whether follow-up or probing—were completely open-ended and were not suggestive. Moreover, I ensured that I had no interactions with the participants prior to the interview to prevent being preempted. As the interviewer, I may have developed bias towards the credibility of the participants' responses based on their appearance or manner of

answering the questions. Focus was on the content of the participants' responses and not on the participants' personal characteristics. The school size where the participants worked may have created bias. Objectivity was an important outcome throughout the interviews to ensure that the size of the school did not influence the analysis of the data gathered. In addition, a standard script was used for starting the interview, particularly when obtaining the participant's demographic questions. There were also a standard set of questions with regards to the topic, with only the follow-up questions possibly varying among the participants.

Before conducting the interview, permission was granted by the participants' employers to interview them. The employers were aware that the interview was done after work at participants' discretion. Information regarding their schools' work environment was brought up during the interviews. All information was kept confidential. If a participant did not consent to having their interview recorded, then I proceeded with conducting the interview and only took notes. When participants hesitated to respond to some questions, I respected the participants' wishes and did not continue to probe further.

### **Setting and Sample**

Purposive sampling was used in the selection of school nurses as the participants for this study. This means that I made the decision on who was included in the sample based on specific criteria (Oliver, 2006). This was the most appropriate sampling strategy for this research because it was necessary for the participants to have adequate

knowledge and experience in the research topic to be able to contribute meaningful and relevant information to the research.

One criterion of selecting the participants was that they have work experience working in a school setting, and had at least 1 year of experience as a school nurse. Years of service, nurses' academic background, and educational attainment were verified prior to the interview. These credentials and experience were important as many of the questions that were asked during the interview pertained to the procedures and measures that must be taken in the care of children with Type 2 diabetes. It was important that the participants were qualified nurses to ensure the validity and credibility of their responses during the interview. Participation was voluntary.

Many researchers suggested a sample size of 30 to 50 for qualitative studies or interviews, with at least 15 participants in small studies and at least six in phenomenology studies (Mason, 2010). Researchers also suggested that saturation can be achieved at a low level; thus, no benefit is gained from having more than 60 participants (Mason, 2010). Recruiting 10 school nurses ensured that adequate information was obtained to gather sufficient information to address the questions posed in this research.

Saturation occurs when the collection of new data no longer yields additional or latest information regarding the problem being investigated (Mason, 2010), or when the participants' responses become repetitive or like each other. It is important that enough participants are involved in the research so that saturation may be achieved. However, having too many participants can prove to be inefficient for the research as the additional information gathered became useless once saturation had been reached.

To identify the participants, the school nurses' director sent a letter requesting permission to be interviewed. I provided an explanation for the reason behind the request. Once permission was granted, I requested a list of the school nurses' email addresses. Such a list was sent via electronic mail. After responses were received from the district, I contacted the school nurses via email to schedule an appointment for interview at their convenience. A copy of the informed consent was sent by attachment to the participants for their review.

### **Instrumentation and Materials**

Qualitative interviews were the source of data for this research. Semi structured qualitative interviews were conducted to obtain the information that addressed the questions posed in this research. Unlike quantitative interviews, qualitative interviews are less structured and more flexible because follow-up questions can be asked ("Interviewing in Qualitative Research," n.d.). Likewise, qualitative interviews enabled the participants to provide rich and detailed answers.

An interview guide was used to conduct a semi structured interviews. This interview guide contained a list of the topics to be covered and specific questions that I would ask the participants. The participants had more freedom to choose how they wanted to reply. Other instruments used in this research included audiotapes, audiotape recorders, notepads, and pens.

The questions or topics included in the interview guide were based on literature sources, such as those reviewed for this study. After the interview guide was created, the validity of the questions was determined by the professor's review of the questions and



the feedback provided. Revisions were made until approval was complete. I also asked colleagues and acquaintances from other schools or health care facilities, who were not participants, to review the questionnaire and to provide feedback. Although the interview guide contained the specific questions that I would ask the participants, a semi structured interview enabled me to ask follow-up and probing questions until enough information was obtained to provide answers to the research questions. In instances when I did not fully understand the participant's answer, a follow-up question was asked. When asking who, what, where, why, and how, asking a follow-up question led to more clear and detailed answers.

### **Procedures for Recruitment, Participation, and Data Collection**

The interview guide included information to answer all the research questions. I conducted all the interviews with school nurses. Each interview took approximately 1 hour to complete and was held at a time and place outside of work that was convenient for the participant. An initial plan for completion of all the interviews was made for 2 months. The interviews were tape-recorded and transcribed after they had been completed.

When the recruitment efforts resulted in very few participants, I contacted other school districts and followed the district's guidelines to identify other potential research participants. The criteria for selecting the participants was re-evaluated and modified because doing so led to more participants who were still able to provide the information needed for the study.

For this research, a total of 10 school nurses were recruited. Although a larger sample of 20 school nurses was more suitable to serve the purpose of this research, the level of difficulty in obtaining a response and cooperation from the school districts made the data collection very challenging and lasted 15 months. When designing the study, I envisioned direct access to school nurses. However, I learned that I could not get their contact information without going through the school districts. The bureaucracy involved contacting the district officers, gaining their understanding of the purpose of the study. Many initially understood that the study involved interviewing students and said no. I also planned to contact one school district and after several months of interaction they denied participation. I then changed the strategy and contacted multiple school districts. I received approval at various points in time. The districts needed to obtain permission from their ethical boards.

### **Setting of Data Collection**

Once the participants agreed to partake in the study, the district imposed their organizational condition that the school nurses cannot do the interview during school hours or on the districts' time. Because of the strict guidelines for the participants, the school nurses decided to allow me to interview them after school in their offices or designated space, while others scheduled their interviews when students were not attending school. Most interviews were done during the school break. School nurses were very open to any schedule during this time because of minimum student days. The participants freely contributed their experiences while interviewing and were very excited

to do so. The setting was very comfortable and familiar to them so the interviews went smoothly.

### **Data Collection**

Four school districts in Southern California were selected for recruitment. Each school district had specific requirements for recruitment of school nurses. Once this criterion was met, the district's representative gave permission to interview the school nurses. The district's representative contacted all the school nurses via e-mail by sending them a copy of the consent form for the selected participant's review. After the person reviewed and electronically signed the consent form, each person that agreed to participate returned the form via e-mail along with a phone number and e-mail address. As the consent forms were received, I called the participant and decided to meet with them for an interview at their convenience.

Before starting each interview, I asked the participant if they understood the consent form and whether they had any questions. I emphasized the confidentiality protocol to each participant and reiterated that they had the right to exit the interview at any time without prejudice or penalty. Each participant was assigned a unique identifier which was recorded on the transcript based on the time assigned for the interview. The identifier was also recorded on the tape recorder. Names of the contributors were not included on the recorder during the interview process to provide for confidentiality. An interview guide (Appendix A) was given to each participant prior to the commencement of the dialogue to conduct a semi structured interview. If more clarification or elaboration

was needed in response to a question asked, then subsequent prompt questions (Appendix A) were asked.

After each interview, a transcription was done by replaying the tape recorder until the transcription was done accurately and completely. Once completed the transcription was saved electronically and printed out. The participants were contacted so that the transcript could be reviewed by them for accuracy and to increase trustworthiness of data and transcription. Each participant was asked to review the transcript of their interview and evolving themes to validate that their views were stated accurately. During the review and verification of the transcripts, this opportunity was also used to debrief the participants using the debriefing questions (Appendix B). Peer evaluation was also used to confirm validity of the data. None of the participants' identities was revealed to anyone who participated in the confirmation and review process so as not to encroach on the participants' confidentiality.

### **Data Analysis Plan**

Data analysis is the process of reducing data to a story and its interpretation (Kawulich, n.d.). It involves “reducing large amounts of collected data to make sense of them” (Kawulich, n.d., p. 97). Data analysis in qualitative studies involves three processes, namely the organization of data; the summarization and categorization of data; and the identification and linking of themes and patterns in the data.

The choice of the data analysis method used depended on several factors, such as the theoretical foundation of the study, the research questions being asked, and the appropriateness of the techniques for making sense of the data (Kawulich, n.d.). The

analysis of qualitative data involved that I immerse myself to gain familiarity and search for themes and patterns, as well as for relationships between the data so I could understand it and then displaying the information visually or creating a write-up.

The data collection of qualitative data relies on interpretation, which means that data may have multiple explanations because of the substantial amounts of data gathered (Alhojailan, 2010). Data collection and data analysis may be considered indistinct from each other. This also means that data analysis and interpretation can overlap in the process of reaching a conclusion.

A thematic analysis was employed for this study. This is a comprehensive process that enables researchers to identify many cross-references between the data and the emerging themes (Alhojailan, 2012). It involves a search for themes that are found to be important in describing a phenomenon according to Boyatzis (as cited in Fereday & Muir-Cochrane, 2006). Themes were identified through a careful reading and re-reading of data. It involved recognizing patterns within the data where the identified themes became categories for analysis. It involved a coding process where important moments were recognized and encoded before being interpreted. The encoding of information resulted in the organization of data, which enabled the identification and development of themes from such data. According to Boyatzis (as cited in Fereday & Muir-Cochrane, 2006), a theme is defined as “a pattern in the information that at minimum describes and organizes the possible observations and at maximum interprets aspects of the phenomenon” (p. 4). On the other hand, a good code is one that encompasses the qualitative richness of a phenomenon. It also has five elements, namely: (a) a label or a

name; (b) a definition of what characterizes the theme and what the theme concerns; (c) a description of how to determine when a theme occurs or how to determine that a unit should be coded for a theme; (d) the exclusions or qualifications to the identification of a theme; and (e) a listing of negative and positive examples to eliminate confusion (Kawulich, n.d.). The last that was developed was the label and it was concise, clear, conceptually meaningful, and close to the data. NVivo 11 was used for coding. To ensure that standard themes were created, a hierarchy of only four levels of nodes was used. A node that has more than four levels may indicate that the node can be broken further into smaller nodes. The nodes may also have labels in the forms of nouns, noun phrases, gerunds, or gerund phrases. The coding files were saved whenever the application prompts for the work to be saved as NVivo does not have a feature for background saving. Backup copies of the latest data were made daily to avoid data loss.

In an exploratory research, such as the current one, the data was read and reread, with the goal of identifying ideas, themes, trends, or key words that helped outline the analysis prior to the actual analysis being conducted (Guest, MacQueen, & Namey, 2011). Thematic analysis provided a flexible way of identifying research patterns, both inductively and deductively. Moreover, it can provide a detailed illustration of data on various subjects through interpretations. A thematic analysis is appropriate for situations that require data interpretation; deductive and inductive reasoning, the analysis of two distinct phases of data, and coding and categorizing (Alhojailan, 2012). To ensure the uniformity and consistency of the identification of themes, a colleague was asked to

review the identified themes and to provide feedback, which the researcher used for modifying how the themes were identified.

More specifically, qualitative research must be capable of drawing conclusions and being consistent with the data. With thematic analysis, I could identify the factors that influenced the issues raised by the participants. The participants' interpretations also helped me gain an understanding of their thoughts, actions, and behaviors. In addition, thematic analysis was used when both inductive and deductive methodologies were used, in turn ensuring that the themes and the data were effectively linked together. A thematic analysis is also appropriate when the research aims to obtain an understanding of an individual's practices. It was used for investigating and identifying how the present situations were influenced by the participants' points of view. Finally, a thematic analysis enabled the coding and categorizing of data into themes where data was classified and displayed according to their differences and similarities.

The process for a thematic analysis included coding, categorization, and noting of patterns. Distinct levels of themes were identified, as well as the relationship between the factors and variables so that a logical and reasonable chain of evidence was obtained. Moreover, a thematic analysis produces accurate results when the research involves various instruments (e.g., questionnaires with interview and observation) and when the participants are in different environments.

### **Research Questions**

The following are the research questions that this study aimed to answer and address to achieve its intended purpose:

1. How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes?
2. What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?
3. What barriers, if any, do school nurses encounter in the management and care of school-aged children with Type 2 diabetes?
4. What enablers are available to facilitate the school nurses' management and care of school-aged children with Type 2 diabetes?

The phenomenon of interest in this study is diabetes management in children and adolescents from the perspective of school nurses.

The current research employed the thematic analysis procedure developed by Zemke and Kramlinger (Basch, DeCicco, Malfetti, 1989; Van Houte & Connor, 2008). This process involves “generating a list of key ideas, words, phrases, and verbatim quotes and capturing sentiments; using the ideas to formulate categories of concerns and placing the ideas and quotes in the most appropriate categories; examining contents of each category for subtopics and selecting the most useful quotes and illustrations for the various ideas” (Basch et al., 1989, p. 391; Van Houte & Connor, 2008, p. 80).

This process is in conformance to Dencombe's principles for conducting an efficient qualitative data analysis (Alhojailan, 2012). The first principle states that extensive and diverse raw data should be compacted into a succinct structure through the organization of oral and written data into tables and charts; thereby enabling identification, comparison, and determination of which data to focus. The second



principle is to make a clear association between the research objectives and the summary. The third principle is that the conclusion should be based on a conceptual model.

To further ensure the accuracy of the analysis of data, the theoretical framework can be used as a basis or guide (Kawulich, n.d.). As examples, the HBM was used in a study of women's attitudes to cervical cancer and early diagnosis in Turkey (Duran, 2011) and in the identification of vaccine acceptability in college men (Mehta, Sharma, & Lee, 2013). This model provided a lens through which to view the data. It also helped me to situate the results in the theory; thereby facilitating an understanding of the data within the theoretical perspective. The research questions were reviewed as a guide for designing and implementing the research. The collected data were viewed in a way that they enabled me to answer the research questions. When the data was reported, it was not analyzed on a question by question basis, rather, key themes were summarized, and selected quotes were used to illustrate the findings (Kawulich, n.d.).

### **Issues of Trustworthiness**

To ensure the credibility of the collected data, the school nurses' resumes were thoroughly evaluated to ensure that the participants for the study had at least 1 year of work experience as a school nurse and that they had the necessary education and training in nursing. On the other hand, transferability was ensured by involving school nurses various grade levels as well as from smaller and larger schools and from both private and public schools. This increased the generalizability of the research findings. As for the conformability of the data, I used reflexivity to ensure that her interpretation of the data collected was not tinged with any bias ("Reflexivity," 2010).

To ensure the reliability and validity of the identified themes, the themes were evaluated in terms of how well they represent the entire text (Alhojailan, 2012). Validation of the themes was conducted during the early and late stages of the data analysis process. An outside reviewer was involved in evaluating the themes at the early stage. This early identification served to test whether the themes that I identified were compatible with the entire text or not. An independent reviewer was involved to provide feedback for the remainder of the data analysis process, in turn enabling to compare the two sets of feedbacks she received. This established reliability in the themes analysis coding process and it allowed me to be informed of any conflicting results that were either removed or added by the outside and independent reviewers. The first level of themes was evaluated during the first phase and the second level of themes during the second phase. By ensuring the validity of the first level of themes, the accuracy and reliability of the second level of themes were also ensured. Moreover, this ensured that the second level of themes was less prone to mistakes and errors. By involving two outside or independent reviewers at two separate phases, a strong process for analytical credibility that is like reliability from a positivistic perspective was established (Alhojailan, 2012). The participants were also asked to review the results of the study to ensure that they agreed with the findings.

Although there are issues on the reliability of research results obtained through a thematic analysis due to the degree of interpretation that is involved in the identification of data items, Guest et al. (2011) assert that thematic analysis is still the most effective way of capturing the complexities of meaning within a set of textual data. It is also the

method of analysis typically used in qualitative research. Similarly, Alhojailan (2012) contends that thematic analysis is the best method for analyzing research data through interpretations as it enables the data analysis process to be performed systematically. It enabled me to link the analysis of the frequency of analysis to the entire content. In turn, it allowed the accurate and intricate analysis of data, which led to the enhanced meaning of the entire research. It also provided an opportunity for a wider understanding of any potential issues.

### **Ethical Procedures**

Permission from the selected grade schools within the county was obtained through a letter seeking approval by the district to invite school nurses' participation in the research. Districts were asked to provide school nurses' e-mail addresses so that I could contact them and invite them to participate in study. This letter of invitation (Appendix C) included information about the purpose of the research and the school nurses' role. If a school nurse refused to participate, I considered other school nurses as potential participants.

Walden University Institutional Review Board (IRB) approval was also obtained (Approval No. 03-19-15-0153043). I logged on to the IRB website and followed the approval process ("How to Apply for IRB Approval," n.d.). In addition, approvals were obtained from Walden University or any other research institutions (FCT, n.d.; Leeds Metropolitan University, 2012; Lancaster University, n.d.). Access to participants was obtained by sending letters of invitation where the objective of the research was

indicated, as well as their potential role. Upon agreement, the participants were asked to sign a consent form.

I ensured that I “took voluntary consent to be the condition in which participants understood and agreed to their participation without any duress, prior to the research getting underway” (British Educational Research Association, 2011, p. 7). -I confirmed that the participants had a complete understanding of the process they will be engaged in, including why their participation is important and necessary, how the information they provided would be used, and to whom it would be reported. The participants were also informed that all the verbal and nonverbal communication they made during the interview would be noted. As well, I guaranteed that the participants’ “identities” and responses will remain anonymous and confidential. The identity of any children mentioned during the interviews also remained confidential. In addition, any feedback about the school administrators was discussed in a general manner, without pertaining to any specific personnel.

The participants were treated within an ethic of respect. They were treated with dignity, sensitivity and fairness. This treatment was also being free from prejudice regardless of the participants’ political belief, disability, faith, partnership status, cultural identity, nationality, class, ethnicity, race, gender, age, or any other significant difference. This ethic of respect was applicable to me and the direct or indirect participants.

The participants were also informed of their right to withdraw at any time during the research. They were informed that their interviews would be tape-recorded. If some participants refuse to have their interview tape-recorded, then I will resort only to note-

taking in the gathering of data from the interview. However, none of the participants refused to be tape-recorded for the interview.

Finally, I ensured that I complied with all the legal requirements with regards to the use and storage of personal data. The participants were informed of how and why their personal information was stored and used, as well as to whom they will be made accessible. Such data shall be made accessible only to me and my professors and shall be destroyed upon completion of the five-year limit.

### **Summary and Transition**

This chapter described the methodology used for the research which phenomenon of interest was diabetic management of children and adolescents from the perspective of school nurses. A qualitative approach was used in the form of a case study. Semistructured interviews were conducted with 10 school nurses. Each interview lasted for about one hour and was audio recorded. Data were analyzed using the thematic analysis procedure developed by Zemke and Kramlinger. The validity of the findings was ensured through the involvement of two different independent reviewers, at the beginning and end of the data analysis process.

In the next chapter, the conduct of the actual study is discussed including the nature of the study, setting, and demographics. The data collection and data analysis process is discussed and evidence of the findings' trustworthiness, as well as the results presented.

## Chapter 4: Results

### **Introduction**

The purpose of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. A case study method was used as this tradition is defined by individual cases, not by the methods of inquiry used (Cohen & Crabtree, 2006). School nurses' perceptions, attitudes, and beliefs were discovered through comprehensive interviews. The key research questions were developed to determine the care and preventive interventions that school nurses provide to children based on their perceptions. This chapter includes the recruitment, data collection and storage, data analysis, data verification, coding and thematic analysis. The study concentrated on the following research questions:

1. How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes?
2. What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?
3. What barriers, if any, do school nurses encounter in the management and care of school aged children with Type 2 diabetes?
4. What enablers are available to facilitate the school nurses' management and care of school aged children with Type 2 diabetes?

### **Pilot Study**

The pilot study included two volunteer school nurses who worked at school districts not participating in the full study. When I met with the participants I reviewed the pilot study consent form with them and had the participant sign and date the copy kept for the study records. These nurses reviewed the interview guide and provided suggestions for improvement, clarity, and comprehension. During the pilot interviews, some of the questions were removed. The interviews took place in the school nurse's office on their own time or when school was not in session. The interviews lasted from 30 minutes to 1 hour and were recorded with an Olympus Digital Voice Recorder VN-722PC. Some of the interviews were longer due to the talkative nature of the participants.

### **Characteristics of Full Study Participants**

Data collection to reach the goal of 10 participants was challenging. The data collection phase took about 15 months. Of the five school districts, four participated. All the school nurses were female with various years of service, 80% (eight) European American, 10% (one) Hispanic American, and 10% (one) Asian American. Once the school nurses learned about the purpose of the survey, they were eager to participate. Many stated that no one had ever focused on what the school nurses do and how they provide for the number of students that they serve. I had them read the informed consent form, which was signed and dated for my files. Another form that was given to the participants was the interview guide (Appendix A), which had been modified based on feedback during the pilot study; there was redundancy of some of the questions. Table 1 represents the demographic characteristics of the school nurses interviewed.

Table 1

*Participant Characteristics by Race, Gender, and Years of Service*

Participant's Number	Race	Gender	Years of Service
J001	European American	Female	19 years
J002	European American	Female	10 years
CN001	European American	Female	9 years
FUSD01	Hispanic American	Female	20 years
SBCUSD01	European American	Female	7 years
SBCUSD02	European American	Female	4 years
SBCUSD03	European American	Female	5 years
SBCUSD04	Asian American	Female	5 years
SBCUSD05	European American	Female	4 years
SBCUSD06	European American	Female	16 years

**Thematic Data Analysis**

After completion of the interviews, I reviewed each transcript for accuracy and to gain knowledge of what the interviewees' response was. The transcripts were analyzed with the help of NVivo 11, a computer assisted qualitative data analysis program (QSR International Ltd., 2016), to determine codes and themes. Word frequency analyses and output of word clouds represented the number of times the words emerged in answers to open-ended questions. All emerging codes and themes made by the participants were noted. Open coding was done to create a heading that was reviewed multiple times. Categories were then created and grouped under higher order forming subcategories. Data were then arranged into a group that showed comparison amongst them.



Formulating categories allowed me to increase understanding and knowledge of the categories. After formulating categories, I decided through interpretation which one to put into the same category. Once the categories were established, I proceeded with the evaluation. Each category was named using content-specific words.

The transcripts were read and reread to form themes constructed on categories. I merged categories that were the same from each transcript. This enabled me to make certain of any unbiased perspective of nurses' role in the care and management of children with Type 2 diabetes as described by each nurse. The sizeable quantity of the transcription and reviews of the data collected was very time consuming due to the method of identifying the themes.

To strengthen the validity of the study and decrease bias, two peers well versed in qualitative analysis and school nursing were selected to evaluate the data. They discussed the data analysis with me, and once an agreement was made the selected themes were determined. Themes were identified based on verbiage. The overall themes incorporated various views. The themes were obtained based on the group responses gathered during coding of data. Samples of participant findings were used to support the data.

When I transcribed the various categories, specific codes and themes emerged. School nurses were asked Research Question 1: How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes? The following categories emerged: (a) communication was emphasized as one of the most important aspects of their responsibilities—communication through the students' care plans, through doctors' orders, and while working with the students by allowing them to

ask questions and give feedback of their knowledge and understanding of their disease; (b) education is also important because the staff, parents, and students must be educated about the disease so that they can comprehend what is going on with the students in a classroom setting and pinpoint the behavior when associated with the disease—education is also important to help other students in the prevention or delay of acquiring the disease; (c) management is also an important aspect of care because the school nurses assist the students, parents, and teachers with the students' responsibilities in the care of their disease through frequent monitoring, a positive attitude, and ultimately referring the student to health care professionals who will implement and facilitate their care.

Regarding Research Question 2 (What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?), two of the previous categories emerged: (a) education for students, parents, and staff about the disease and (b) communication. Most people are not familiar with Type 2 diabetes, so education is of utmost importance so that everyone involved is enlightened. It is important that the school nurse speaks to the students and their parents about the disease and how to facilitate the disease to achieve a better outcome. Most of the school nurses do home visits, especially when there is a new student involved, to go over diet and exercise as a family with them. Reinforcement of skills and knowledge is necessary and crucial during the weekly visits. Referring parents to resources as needed is vital for a successful outcome.

Research Question 3 was as follows: What barriers, if any, do school nurse encounter in the management and care of school aged children with Type 2 diabetes?

Several themes emerged that I placed into one category called *barriers*. There were six themes: (a) too many students—which was the most common. This is because each school nurse takes care of about 4,000 students or roughly three to four schools per year. Some school districts have more schools or students than others because they have less school nurses; (b) time—which is a factor when so many students must be covered and taken care of. Health aides assist at school sites when school nurses are not there or not available. School nurses take care of children with other chronic diseases and minor injuries while on duty, so their day is heavily impacted with prioritizing; (c) physicians are barriers especially private physicians who will not write the appropriate order for the nurses to follow and can treat the patient appropriately. Luckily their experiences have played a key role in caring for these children. When all else fails, the children are sent to the emergency room for care; (d) parents can also become barriers because they do not communicate with the school nurses in a timely manner. Some of them do not have any phones, so when an incident occurs at school the school nurse must send the police out to the address of record to notify the parents. According to the school nurses, while the child is at school, some parents consider this their free time to take a break from the situation, not realizing that it will never go away; (e) parents' economic status may be another challenge for the school nurse. Therefore, it is so important to have the home visits so that the school nurse can readily assess the situation and refer the parents as needed. The last barrier was (f) no designated office space for the school nurses. This impedes privacy for the students and parents and does not allow the school nurse to freely speak to the

students or parents in a school setting. This impedes progress to teach and get informed about what is going on with the family.

Finally, Research Question 4 was this: What enablers are available to facilitate the school nurses' management and care of school aged children with Type 2 diabetes? This category was categorized as *enablers*. Overwhelmingly the enablers that stood out are the health aides. Each school district hires at least one health aide to assist the school nurses when they are at a different site. If the school nurse is absent for the day, depending on the district, either one of the office employees, principal, or administrators (if trained) will assist the health aide as needed. Once the health aides are hired they must be trained by the designated school nurse within that district. The most important aspect of that training for the health aide is to know that they can call the school nurse at any time when in doubt. The health aides have access to the school nurses by phone and they know how to reach them. Table 2 below demonstrates the results of the nodes and themes presented.

Table 2

*Nodes Derived from Transcripts and Mapped to Themes*

Nodes	Themes
Must initiate and follow care plans	Communication
Must receive and follow doctor's orders	Communication
Must speak to students one on one about their disease	Communication
Must speak to parents about various things regarding child	Communication
Must teach students & parents about disease maintenance	Education
Must teach staff about disease and how to handle situations	Education
Present diabetes education in various classrooms	Education
Monitor and guide students on diabetes care	Management
Refers students to outside agencies for care and treatment	Management
Follow up with students especially those with diabetes	Management
Must always have a positive attitude to assist students & staff	Management
Reinforcement of skills and knowledge with students & staff	Communication
Referral of students to outside agencies to increase knowledge	Communication
Too many students to handle efficiently	Barrier
Not enough time in a day	Barrier
Physicians not responding or communicating with nurse's	Barrier
Parents not returning calls or have telephones at home	Barrier
Parents economic status	Barrier
No designated office space for nurses at some sites	Barrier
Health Aides	Enablers
Trained Office Employees	Enablers
Trained Principals and Administrators	Enablers

### **Study Findings**

The research questions and themes drove the study findings. Themes were conveyed individually; however, the responses from the participants could have ascribed to multiple themes. The school nurses' perceptions of their role and responsibilities in the care and management of children with Type 2 diabetes were the focus of the first question. Upon completion of the thematic analysis, the following themes emerged: communication (care plans, doctor's orders, and interacting with students), education (teaching students, parents and staff), and management (taking care of students, referring students, and self-management). The second question addressed strategies used by school nurses to promote education and counseling for children with Type 2 diabetes. Two of the previous themes from the first question surfaced: education (taught students, parents and staff about disease and disease process) and communication (constant communication with students and parents, occasional communication with staff, and referral of students to outside agency to increase knowledge about disease).

The third question concentrated on barriers for school nurses in the care and management of school aged children with Type 2 diabetes. Through thematic analysis it was discovered that there were several perceived barriers noted (too many schools/students to care for, not enough time in the day, uncooperative physicians, noncompliant parents, parents' economic status, no designated space for school nurse's office). The final question focused on whether enablers were available to facilitate school nurses. It was uncovered that the key enablers are the health aides. In their absence, a

trained office employee, principal, or administrator assists the school nurse as needed.

The themes and subthemes are summarized below in Table 3 per the research question.

Table 3

*Research Questions, Themes, and Subthemes*

Research Questions	Themes	Subthemes
RQ1: How do school nurses perceive their role and responsibilities in the management of children with Type 2 diabetes?	Communication	Care plans, doctor's orders, working with students
	Education	Teaching of students, parents & staff
	Management	Taking care of students, referring of students, self-management through a positive attitude.
RQ2: What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?	Education	Teaching students, parents, & staff on disease and disease process
	Communication	Constant communication with students and parents, occasional communication with staff, referral of student to outside agency to increase knowledge about disease.
RQ3: What barriers, if any, do school nurses encounter in the management and care of school aged children with Type 2 diabetes?	Perceived barriers	Too many schools/students to care for Not enough time in the day Uncooperative physicians Noncompliant parents Parents' economic status No designated school nurse office
RQ4: What enablers are available to facilitate the school nurses' management and care of school aged children with Type 2 diabetes?	Enablers	Health aides Trained office employees Trained principal and administrators

**Theme 1: Communication**

All participants stated that lack of clear communication is a problem and interferes with their role and responsibilities in caring for the children with Type 2

diabetes. Everyone said that the diabetic students are dealt with one on one for privacy, more accurate communication, and it also gives the student a chance to feel comfortable to ask questions. Most of the school nurses allow the students to answer their own questions while probing. Every incident becomes a teachable moment as the students become more knowledgeable about their disease and the disease process. During the school year, students' make progress in learning about their disease and are more comfortable going to the office to discuss their issues.

J001 stated the following: "We have health aides in each one of our sites so when a child comes in to check his/her sugar before lunch they call us if it is abnormal or out of whack so that we can help them with responding. Maybe we just need to call the physician or maybe we need to come over there to see what's going on with the child."

J002 explained that communication is the key to successful management. "I do feel responsible for what happens to students while they are here during their school day. So, whatever the doctor's orders are, that's what we have to do and get done."

CN001 also affirmed that communication with doctors can be very difficult even though the "nurses are very capable of assisting the children with Type 2 diabetes. However, we are kind of limited by what doctors ask us to do."

FUSD01 identified that communication is crucial amongst all parties involved in caring for the child with diabetes. "First, I, as a school nurse, per Education Codes, follows doctor's orders and care plan so that it will give me everything. My role is to decipher the orders and make sure that they are followed, train staff, licensed (LVNs) and unlicensed so that we can be on the same wave length as the doctor and the parents."



SBCUSD01 expressed that communication is the absolute best thing to do. “Make sure that I have the doctor’s orders and make sure that the parents sign the orders so that everyone can be on the same page. Sometimes I’ll talk to the parents and see where the child is with his/her care.”

SBCUSD02 noted “I need to make sure that we have orders from the doctor. Also, make sure the parent also sign the consent. Talk to the parents and child to see how the information given works.”

SBCUSD03 revealed that during her communication with students that she “talks to them about diet and exercise. With middle school and high school students I can talk more directly about healthy lifestyle. I also communicate with other students through classroom presentations.”

SBCUSD04 acknowledged that it is important to communicate in person and in writing. She states that “when the Individualized Educational Plan (IEP) assessment is done it is the perfect opportunity to open up a conversation with the child. Sending a note to the parents and writing down a more formal plan for education.”

SBCUSD05 expressed her ability to communicate comfortably with the students, staff, and parents. She did this through “identifying the diabetic students, referring them, and doing some education with them. Then we will do that per doctor’s orders and following them at school.”

SBCUSD06 stated that lack of communication with the doctors continues to be a problem: “currently there is still not a lot of information that we are applying because the

doctors are still not following through. For them to identify the children with Type 2 diabetes and make that a diagnosis.”

### **Theme 2: Education**

All 10 school nurses acknowledged the importance of educating all involved in the children’s care while at school and home. Therefore, educating the students, teachers, parents and health aides are of utmost importance. While the children are at school during the school year they are taught to do self-care. This is done on an individual basis depending on the child’s comprehension level. The school nurses assist the children as needed. Those who are proficient in self-care must still visit the office before meals or if there is a change in condition so that their blood sugar levels can be obtained. This also reassures the student that he/she has someone available to assist as needed.

J001 described what was done to educate the students and health aides. All school nurses, teachers, and health aides have training and retraining once per year prior to the start of the school year. As J001 explained “we have health aides in each one of our sites that when a child comes in to check their sugar before lunch they call us if it is abnormal.” This event allows a teaching moment for the student and the health aid.

J002 stated “We guide and educate the diabetic students daily while they test their sugar or count carbs. If sugar is high, the information is reported to the parents. The nurse is the bridge between the home, doctors and school.”

CN001 also stated that it can sometimes be difficult to educate the students because of the challenges of taking them out of class. “Meeting with us is always

difficult, but the eleven of us are knowledgeable about diabetes and how to manage either Type 1 or Type 2 diabetes.”

FUSD01 specified “I case manage all the diabetic student. I help them stay in school and stay healthy. I do a lot of education. My main goal with diabetics is to have them reach self-management so that they can do their own care at any age.”

SBCUSD01 identified that education is needed as she said “I also spend time with educating the children and talking to them about how it works. You keep repeating and repeating and finally one day they go, oh, I get it. It makes sense now.”

SBCUSD02 asserted that with continued education at the children’s level, eventually they learn how to take care of themselves. If they have continued support at home with their parents, it works better. “I spend time talking to them about how the disease works. Sometimes they feel that it would get better, so the education is there to assist them.”

SBCUSD03 stated that “I usually reinforce simple health tips like drinking water instead of juice or soda, eating more fresh and whole foods, and doing something active every day. I talk more about lifestyle changes with the students.”

SBCUSD04 also stated that she “try to note their name and follow up later because you do not want to miss those opportunities. My role is to help identify it, send a note to the parent, provide education as needed, and for those that are diagnosed with diabetes, have a more formal plan for education and teaching them self-management.”

SBCUSD05 maintained that by communicating with and educating the students at risk, she asks the following: “have anyone in your family has diabetes? I notice spots on

your neck, and I know those are red flags for diabetes. Do you know what they are? I am doing education kind of, so they are not going to be so surprised when they go to the doctor and he says you probably have diabetes.”

SBCUSD06 acknowledged “I had one that was set up with a private doctor and it was an adult doctor for diabetes. The child had problems and he didn’t know what to do, so we referred him to Loma Linda. But I think Type 2 before they are diagnosed, our job is to refer them, get them started and identify the child.”

### **Theme 3: Management**

All the school nurses who participated in the research felt that they are the managers of the children, health aides, and teachers. They are the ones who react in case of any emergency. Others depend on them for their knowledge and education especially when immediate action is required. These nurses react spontaneously and work as a team even though they may not be on site. They have a school cell phone that they must answer immediately and assist from wherever they are. They are also a support system for each other.

J001 stated “we have health aides in each one of our sites that when a child comes in to check their sugar before lunch they call us if it is abnormal or out of whack so the we can help them with responding, maybe we just need to call the physician or maybe we need to come over there to see what’s going on with the child.”

J002 also stated that “if the sugars are high the information is reported to the parents. The nurse is the bridge between the home, doctors and school.”

CN001 specified “The nurses are very capable of assisting the children with Type II diabetes with learning anything about their bodies and how to daily manage it. Meeting with us is always difficult, but the 11 of us are knowledgeable about diabetes and how to assist with the management of either Type 1 or Type 2 diabetes.”

FUSD01 affirmed “I case manage all the diabetic students. My main goal with diabetics is to have them reach self-management. I have developed tolls and things that help my students actually attain self-management.”

SBCUSD01 stated “I make sure that I have orders from the doctor and that the parent signs the orders so that everyone is on the same page. I spend time educating the children and talking to them about how it works.”

SBCUSD02 expressed that “I talk to the parents and see where the child is at with their care. I sound like a broken record but I keep repeating things until they get it.”  
Repetition and follow through as crucial while managing these students.

SBCUSD03 also expressed that “we screen them for their vision, hearing, or talking to them about something else. If I see any signs of Acanthosis Nigricans I would write a referral and send it home with them with the recommendation to see the pediatrician. If the parent follow through with the doctor, then reinforcement is needed.”

SBCUSD04 acknowledged that “Ideally I want to help prevent especially when I see a child that is at risk for Type 2 diabetes. I want to talk to their parents and/or guardian and initiate a conversation. My role is to help identify it, send a note to the parent, provide education as needed, and follow-up as needed.”

SBCUSD05 acknowledged that “so I think my role and responsibility in managing the Type 2 would be identifying them first, and it could be on a day to day basis when I see them or I screen them for different things. Referring them to their medical provider to get labs, and having a conversation with them to see if they have any concerns.”

SBCUSD06 also acknowledged that “there is still not a lot of information that we are applying because the doctors are still not following through for them to identify the children with Type 2 diabetes.” We must manage these students by following through with them and sometimes referring them to another physician. All this is based on the parents’ socioeconomic status. If the parents are not financially stable, we refer the family to social service for assistance.

#### **Theme 4: Education**

Two themes emerged in response to the second question: What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes? Although there was a variety of strategies offered by individual participants on how they promote education and counseling, collectively the majority of school nurses relied on one technique.

J001 stated that “I talk to the kid one on one as if I was talking to my own child. They may be having trouble with their grades. They may be drowning themselves because they are so up and down and it is a new thing for them to be a diabetic. I would research things and watch them real close and see how they do. They may need a 504

which is just a plan in school. It gives some interventions for the teachers to look at and know that they have to follow these guidelines.”

J002 also stated that “happens now when students are testing their sugars. The best way to educate is with questions and answer statements. For example, “what is your target range? Are you in your target range? How many carbs are you having for lunch? How did you get that number? Education must include the developmental and cognitive level. These moments need to be brief because students want to be with their friends eating lunch and not in the nurse’s office.”

FUSD01 reiterated that “school nurses educate parents, staff, educate and manage children on a regular basis. I have created tools to help them individually. I have done every area of the schools: preschool, elementary, middle, high school and special education. I see that not allowing them to have confidence in themselves to manage themselves, how it affects them later. I am preparing them for the real world to be independent and not to be afraid of their disease. I enforce the side effects for management.”

SBCUSD01 stated that “I just talk with them individually. I use a check sheet that guides the student in treatment. I can take them out of the classroom to see what the students know.” Students are also listed on a computerized sheet for follow up care. This also allows for others to use this data in case the regular nurse is not at that site or is on leave.

SBCUSD02 also reiterated that “I just talk to them one on one. I get my diabetic orders together to get ready for the school year. With new students, I pull them out of

class to see what they know and what they don't know. I usually cannot take them out of the classroom during finals, so I have them on the list for next year when they come back." Students know that they can go to the nurse's office whenever they are not feeling well. The teacher has a list of who has a chronic disease and will send them to the office as needed.

SBCUSD03 stated that she has "one on one conversations with students and parents about managing their diabetes. I check on the controlled diabetic students once or twice per week to make sure that they are alright and reinforce skills and knowledge. If the student is managing their blood sugar at school, I will regularly monitor their blood sugar log and talk to the child and parents if I start to see a pattern of the blood sugars being out of range. I will also conference the doctor or nurse case manager about concerns."

SBCUSD04 stated "for me, I like motivational interviewing. Just talking to them about little changes to make. Start small with the willingness to learn. This is for someone to start thinking about it. It is a family thing. I do home visits with family because parents did not have transportation and I was having trouble connecting with her. We met, talked over some things and then start talking about Type 2 diabetes. There is a lot of challenges in the family and means well, but sitting on the edge of crisis all the time."

SBCUSD05 "Loma Linda has this "Operation Fit" program. I ask the teachers to give me names of the kids who they see that would benefit from this program. They learn



good habits, but it's for the kids with high BMI. I call the kids and asked who was interested in the program only to find out that transportation was an issue.”

SBCUSD06 “I try to encourage them to keep their appointments because if they don't, we have to fax in copies of their monitoring observations. We may call their provider and say this is what is going on in school. Educating them to keep their doctor's appointments and do what they are told is really important.” The parents tend to lie about the blood sugar results by saying that it is low at home. This is not necessarily true because the children are noncompliant at home due to the home environment.

### **Theme 5: Communication**

J001 used one communication technique to assist others in facilitating students' need by utilizing the 504 plan. As explained previously, “this plan gives some intervention for the teachers to look at and know that they have to follow these guidelines.”

J002 stated that “communication and education happens the moment when students are testing their sugars. The moment need to be brief because the students want to be with their friends eating lunch and not in the nurse's office.” Their attention span is short and to make the time with them efficient, it must be done in a timely manner for them to be able to focus about the task on hand.

CN001 guided and allowed the children to take charge of their diabetes. She introduces and teaches them how to use an app on their I-phone. “I teach them about checking the calories themselves. They must get used to being part of their own care. Take care of your own life on what you can do to empower the diabetic.”

FUSD01 stated that she “enforce the side effect of the disease through communicating and managing the students’ care. I have created tools to help them individually.” This participant has worked every area of school nursing from preschool to high school and including special education. She is very experienced.

SBCUSD01 also stated that “she sometimes is late or can’t go to the meeting held once per month due to emergencies that arises and must be taken care of immediately.” As the number of diabetics increases within the school districts, one on one care is vital since each child is different. More frequent communication must be done with the child, parents, teachers and providers.

SBCUSD02 expressed that “with a new student, I need to pull her out of class to see what she knows and what she doesn’t know.” She must follow up with the students during the school year and sometimes must make home visits to include the parents.

SBCUSD03 declared that she “does one or two class presentations per year. She refers them to their pediatrician as needed.” She has also referred students to an outpatient facility for further education, training, and counseling about their disease. The diabetic skills check sheet, which was created by one of the nurses, allows the students and nurses to keep track of their progress. This provides documentation and the students have a visual picture that can be used as reference and followed.

SBCUSD04 reiterated what was mentioned above about “motivational interviewing and just talking to them about little changes to make. When the parents have social and financial issues like losing their jobs, the school nurse refers them to a social worker for follow up.” This affects the student at home from all the stress passed on to

them from the parents due to lack of funds and the inability of the parents to provide for their basic needs.

SBCUSD05 stated that “another way is to ask them what type of breakfast did they have this morning or what kinds of things did you eat? What is your favorite thing to eat? I can get a good sense of what they eat and what they are lacking as far as healthy lifestyle choices to prevent risky behaviors.” This school nurse also focused on “individualized education about healthy foods and activities as well as counseling for diabetes. The health aide keeps track of the students and provide me with names to assess, refer, educate and counsel them individually at a better time.” Both staff members assist each other with what is best for the students to promote a healthy lifestyle.

SBCUSD06 acknowledged that communication with the parents and their diabetic child is very important so that the best care can be provided for the child both at school and at home. Communicating with the parents allows the school nurse to be able to teach and discuss diabetes at a level that parents can understand. School nurses find that the home visits are more effective because they can see firsthand what type of home the child lives in and what their needs may be. The setting is more comfortable for the parents and student and they do not feel threatened. “Try to encourage them to keep their appointments because if they don’t we have to fax copies of their monitoring observation. We may have to call the provider and say this is what is going on in school.” The school nurse communicates the information needed to the provider and keeps the parents and student in the loop. This provides the provider with a more accurate picture of what’s

going on with the patient while in the school setting. The provider communicates the findings to the parents during the visit.

### **Theme 6: Perceived Barriers**

This section is in response to the third question: What barriers, if any, do school nurses encounter in the management and care of school aged children with Type 2 diabetes? All 10 school nurses had a variety of answers but had a few common ones. One of the school nurses, SBCUSD06, was the only one who pointed out that “not having a designated office at each school so you can talk to the students. At some schools, there is no privacy to talk to the patient.”

J001 stated that “even though we have a huge number of children under our wing, I have six schools and approximately 6,000 kids. Sometimes I feel like I am drowning because I have IEPs to attend to and care plans, but there is no barrier.” This seems contradictory because in one breath she said that she feels like she is drowning, and then said that there are no barriers. This seems to be a great barrier because there are too many children to care for overall and it is not humanly possible to take care of daily tasks other than emergency care.

J002 saw parents as barriers. There are many issues with the parents that the school nurse must present. Multiple parental barriers as stated “when you contact the parent because of behavioral issues; when you call them to tell them what the sugars are looking like how high they are, or is there a problem and the parent doesn’t care, doesn’t answer the phone, doesn’t call back to discuss it.”

CN001 stated that the physicians are the barriers. “Not all physicians treat Type 2 diabetes the same. Not all physicians value the input of a school nurse. We’ll see that something else may be able to be done to help this young person change their lifestyle.”

FUSD01 also stated “Parents. The dad insists that he wants a licensed nurse watching him. The child trained to manage himself. He is a little slow but he is wonderful at managing himself.” Parents are protective with their children and don’t want them doing to be responsible for their own care. The parents need to let go and allow the school nurses and health aides to do handle the student.

SBCUSD01 specified that the parents are the barrier. “Sometimes there is difficulty getting a hold of parents. Every parent has a phone. Sometimes they have the prepaid ones and they run out of minutes. Some ignore the phone calls; others are busy at work and they cannot answer their phone. Their phone numbers are always changing.

SBCUSD02 stated that time is a barrier. “There is not enough time in a school day to do the things that are necessary to complete a task. I sometimes have to do home visits after school to speak to the parents.”

SBCUSD03 Parents are the barrier. “Unable to get a hold of the parent due to no phone in the household. Not having adequate diabetic supplies for student at school or not having current diabetic orders for the student at school.”

SBCUSD04 affirmed that they need more nurses. “We need more help. We don’t do a good enough job to work up the students well. We don’t have time to do a thorough job. There are too many students per nurse.”

SBCUSD05 also affirmed that there are too many schools and not enough school nurses. “Having too many schools because we have to juggle. We are available on the phone but it still is juggling.” Constant prioritizing along with parent follow-up is also essential.

SBCUSD06 acknowledged that there are too many students and not enough school nurses. “I think we have too many students per nurse. I can’t image having one school. Not having a designated office at each school so you can talk to the students. At some schools, there is not privacy to talk to the parent.”

### **Theme 7: Enablers**

All 10 school nurses pointed out that the principal enablers are the health aides. The health aides are trained by the lead school nurse once hired. They must always report to the school nurse who is a registered nurse (RN) and ultimately responsible for the care of the children. Other trained employees like the office clerk, the principal, and administrator fills in when the health aide is absent. These lay people must communicate with and get direction from the RN who is always available by cell phone. These cell phones are the property of the school for easy access to any staff member who is trying to reach them. The phones must also be answered promptly. This is in response to the final question: What enablers are available to facilitate the school nurses’ management and care of school-aged children with Type 2 diabetes?

J001 stated “the health aides and secretaries are trained and assist us as needed. This school nurse said that most health aides are very dependable, knows their jobs and

know that they can call the RN when in doubt about anything. It is their team work that makes it work efficiently.

J002 said overwhelmingly that the health aide “facilitate diabetic care. The clerks take on the responsibility to make sure the diabetic student comes into the health office to test and they monitor the sugar results. If unusually high or spilling ketones, a parent is contacted.” Some health aides rotate their hours throughout the districts for more coverage.

CN001 stated that “the health aide and in the event of the health aide’s absence, there are generally one or two office staff members who are trained. It could be a school secretary, a desk clerk, or an administrator that is trained.” Most of the nonlicensed school staff volunteers for training so that they can fill in if the health aide is absent.

FUSD01 also stated that “There are health assistants. One per school.” Within this school district they are supported by LVNs who have assigned schedules, but can assist as needed.

SBCUSD01 acknowledged that “the health aides and secretaries along with the principal are available to help in case of any diabetic emergencies or incidents.” This school district works as a team and get the job done. Constant communication is necessary to stay efficient.

SBCUSD02 also acknowledged that “the main enablers are health aides. When the health aide is not present, then the secretary takes over. The secretaries are also trained.” The health aides play an important role in the school setting. They are very dependable and are seldom absent.

SBCUSD03 acknowledged that they “depends on the health aides with diabetic emergencies. The designated person in the office replaces the health aide if she isn’t at the school. The nurse usually come during lunch time if there isn’t a health aide.”

SBCUSD04 confirmed that the “health aide and office employees are trained to assist in case of emergency. They call 911 if needed and call the parents to notify them of the child’s condition.” This school district has not called 911 in over a year. Most of the diabetic emergencies are handled by the RN even if she must give directions over the phone. The staff takes their duties seriously and follows the protocol.

SBCUSD05 also confirmed that “the enablers are the health aides and staff that communicate specific information about students. Due to the shortage of health aides, one school only had subs and that makes it worse because of their focus on daily task management.” Most experience RNs and health aides often prioritize daily and focus on current events. The daily tasks are done when there are clearly no emergencies. LVNs are hired to take care of individual students who need more frequent care.

SBCUSD06 affirmed that “the enablers are the health aides and/or the office worker. Their hours vary, when they are not there, others will be there.” In this school district, the lead RN makes certain that the assignments are achievable especially when someone calls off for the care and safety of the children. Other appoints must be cancelled so that the acute care and chronic care children can be taken care of.

### **Evidence of Trustworthiness**

Several steps were appropriated to confirm verification of this qualitative case study. Opportunities were given to the school nurses to examine and modify the transcript



that was achieved over numerous days. School nurses were reminded of the consent form that they had signed that they could withdraw from the process at any time. After reading and rereading data, using quotations from the school nurses' responses ensured that the findings and data were objectively gathered. Although the participants' sample in this study was small, saturation was achieved and gave an accurate description of the research findings.

### **Credibility**

To ensure the credibility of the data, two school nurses who were not associated with the study and were not participants examined the interview protocol and confirmed that there was no bias. All the participants' transcripts and data were accessible for each person to review for accuracy and to debrief each participant. A written audit of all that transpired was collected and stored securely.

### **Transferability**

Transferability was achieved by ensuring pure accounts of the sample and data collection procedure as well as offering verbatim quotations from the interview transcripts. The results of this study may be used by others within the same school districts in Southern California to discover other options and theories. Furthermore, this study can be used to gain a more insightful consideration of the beliefs, perceptions and attitudes of school nurses.

**Dependability**

Dependability was based on the qualitative case study approach through a detailed and concise account of the study from the problem identification through data analysis, discussion as well as collection and secure storage of a written audit.

**Confirmability**

Confirmability was done when the participants reviewed the results of the study to ensure that they agreed. The data including interviews and transcripts will be stored for 5 years. Data were based on the school nurses' beliefs, perceptions, and attitudes.

**Summary and Transition**

In this case study, I explored and described the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. Ten experienced school nurses, ranging in experience from 4 years to 20 years participated in the study. Everyone answered the open-ended questions that were posed to them through interviews concerning their beliefs, perceptions, and attitudes when taking care of and managing children with Type 2 diabetes. In this chapter, seven themes materialized from the thematic analysis and were used to focus on the research questions. In Chapter 5, I discussed a summary and interpretation of findings. The results are compared to current literature. Implications for social change and recommendations for future study were also included.

## Chapter 5: Discussion, Conclusions, and Recommendations

### **Introduction**

The purpose of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. Once described as late onset diabetes, Type 2 diabetes is reaching epidemic proportions (Adams & Lammon, 2007). The phenomenon of interest in this study was diabetes management in children and adolescents from the perspective of school nurses. School nurses play a crucial role in managing routine care, such as recognizing emergency situations (NDEP, 2010). Most Type 2 diabetic children are only on oral medications. However, they still need to be educated about diet, exercise, and signs and symptoms of their disease. In conjunction with the students, school nurses must also educate teachers, parents, and staff on how to prevent this chronic disease among children with prediabetic symptoms. For the students who are diagnosed with Type 2 diabetes, the school nurses must teach the parents and teachers how to take care of the students while in their care.

This qualitative research study was designed as a case study and was guided by the HBM. The qualitative data provided an in-depth understanding and exploration of the nurses' perceptions from working with school-aged students diagnosed with Type 2 diabetes. According to Creswell (2007), a case study research involves the study of an issue explored through one or more cases within a bounded system. This case study consisted of interviews with 10 school nurses from five school districts. The interviews took 30 to 60 minutes depending on the participant. Each individual participant was

considered as a unit and the results were combined into a single study. Therefore, it is considered a collective case.

A quantitative design was deemed inappropriate for this study as the data were best gathered and the results best discussed in qualitative form—that is, through observation, interviews, and discussions, rather than in quantitative form such as through surveys, questionnaires, and statistics. A qualitative design allowed me the flexibility in gathering and analyzing data whereas a quantitative design may have been limiting or restrictive. Semistructured face-to-face interviews were conducted with all the participants at a time and place that was convenient for them. The school nurses all worked in both elementary schools and high schools.

### **Interpretation of Findings**

Thematic analysis revealed that there were more similarities than differences in the themes gathered from the summary of responses on school nurses' role in the management of children with Type 2 diabetes. In this section, the findings are summarized by research question with interpretations based on the themes related to each question. Education and communication were themes common to Research Questions 1 and 2, while management (Research Question 1), perceived barriers (Research Question 3), and enablers (Research Question 4) were exclusive themes to only one question. Description of each theme is presented in the order included in research questions, whereas specific subthemes are discussed for each research question.

**Research Question 1**

How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes? Three themes emerged from this question. All the nurses agreed that communication, education, and management were essential for all to understand the management of the disease. Communication subthemes included communication with each other through care plans, through doctors' orders, with parents whether via telephone or in person, along with students or parents one-on-one. Education subthemes referred to strategies in teaching students, parents, and staff, while management subthemes referred to taking care of students personally, referrals, and self-management through a positive attitude. According to Duff (2015), health education is also essential for management and care coordination necessary for positive outcomes in chronic disease such as diabetes.

**Research Question 2**

What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes? Conclusively, two themes emerged: education and communication. School nurses described strategies to promote education and counseling by teaching students, parents, and staff on disease and disease process. Communication strategies to promote education and counseling varied in frequency depending on the purpose; communication with parents and children was constant, while with school staff it was occasional. When students and parents needed additional education beyond their scope, school nurses communicated with outside agencies for referrals. This is a vital part of the commitment to succeed, encourage, teach, and guide the children, parents, and

teachers caring for the students with Type 2 diabetes. School nurses have advantages in health education because they know their students and families and can deliver health information that is culturally appropriate and is aligned with the health literacy of their populations (Duff, 2015).

### **Research Question 3**

What barriers, if any, do school nurses encounter in the management and care of school-aged children with Type 2 diabetes? There were many barriers with these themes: school nurses have too many children to take care of at various schools; insufficient time to handle situations properly; some physicians are noncompliant with the regimen of the diabetic patients; parents are absent or in denial about what is going on with their children; parents' economic statuses have them in a bind and unable to get what is appropriate for the child; and finally, at some schools there are no designated office space for the school nurse to function and have privacy with the students and parents. Nabors, Troillett, Nash, and Masiulis (2005) surveyed 43 school nurses and concluded that three themes emerged: focus on education, communication, and administrative and policy support. The school team needs information and education to best serve these children (Nabors et al., 2005). Communication among school staff, the child's health care team, parents, and the child enhances self-management (Nabors et al., 2005). Team building along with teamwork at school assists school nurses in facilitating the health of the diabetic students. Physician and parent participation in the children's health care is essential for them to gain self-management.

**Research Question 4**

What enablers are available to facilitate the school nurses' management and care of school-aged children with Type 2 diabetes? One theme was dominant: clearly the health aides are the positive enablers. Each school has a health aide to assist the school nurse with the children and especially when the school nurse is assigned to other schools. Other enablers are trained office employees, principals, and administrators. Administrative and policy support for youth with special needs provides a critical framework to ensure that their needs are met at school (Nabors et al., 2005).

According to Brackney and Cutshall (2015), the school nurse who understands the characteristics of effective interventions in a school setting can promote the achievement of health goals and navigate the academic setting promoting access to healthy nutritious foods, physical activity, and social environments supportive of Type 2 diabetes. In a study by Schneider et al. (2013), the role of the communication campaign on health behavior indicated that schools with more students reporting awareness of the communication campaign also adopted more of the healthy behaviors. These results implied that if the school nurses experience greater communication through a collaborative effort with the teachers, students, parents and health care providers, the ultimate result for taking care of children with Type 2 diabetes would no longer be a challenge.

Interventions tailored to the interests of the students by the school nurse indicated that it benefited them. For example, nutritional guidance was maintained with support from family and school (Burnet et al., 2011), while being involved as peer educator

strengthened healthy behaviors. School nurses have extended their work days to connect with the parents or guardian of the children. Per the school nurses, they worry a lot about the children when they are not in school because they realize that they are not being monitored and supported at home as they are at school. When the school nurses have difficulty reaching the parents or guardians, they often go to the student's home after hours to make sure that the parent understands about the disease and what it entails to continue to live a healthy lifestyle. Home visits also give the nurse the opportunity to see the environment that the child lives in and to assist the parents or guardian with whatever is needed. Depending on the circumstances, this may mean referring the parents or guardian to the food pantry or speaking to them about the importance of the child taking his or her medication at home as well as at school. Supplies that are needed for school are also discussed. Some parents do not have the means to buy supplies, so the school nurse refers them to a social worker for assistance.

When the children are not in school, like on school breaks and summer, the school nurses must start over teaching the children about self-care. Even though some of the students can take care of themselves, when at home, there is no support, encouragement, or consistency. Their norm is turned upside down, especially if they live in a household that does not promote a healthy lifestyle. According to the nurses, once back in school, the students quickly return to normal behaviors with little reinforcement. An advantage of the school setting as a location for intervention is the accessibility to children and adolescents within an established infrastructure (Brackney & Cutshall, 2015). Motivational support is provided by teachers as well as peers.



All school staff caring for children with diabetes must have a basic understanding of the disease, blood glucose goals, management tasks, and symptoms of hypoglycemia and hyperglycemia, which may require intervention during school-related activities (Gallivan & Greenberg, 2003; Gallivan, Greenberg, & Warren-Boulton, 2005; Jameson, 2004). School nurses are responsible for overseeing and coordination of care for all students, especially diabetics. Communication and collaboration among the school nurse, the student with diabetes, family members, and the diabetic health team and school personnel are essential to the survival of the student. The school nurse acts as a resource person, primary contact, and advocate for the children with diabetes.

### **Application to HBM**

The HBM provided the theoretical framework for this study. The study offered understanding of the beliefs, perceptions, and attitudes of the school nurses in the care and management of children with Type 2 diabetes. One of the key premises of HBM as it applies to this study is that health care professionals play an important role in building awareness and instilling positive beliefs and attitudes in the management of Type 2 diabetes in school aged children. The perceptions of the school nurses, based on their beliefs and attitudes, were relevant to the care and management of the children with Type 2 diabetes. Their input, concerns, training, education, teaching, and communication with all involved created an atmosphere of trust and collaboration. Using the HBM, a qualitative method was applied to understand the role and functions of the school nurses through open-ended interview questions. Their health-related behavior and attitude depended on their perceptions of four critical areas:

- the severity of a potential illness;
- the person's susceptibility to that illness;
- the benefits of taking preventive action; and
- the barriers to taking the action.

In this study, the HBM was used to understand a school nurse's perspectives, specifically their behaviors and attitudes with regards to the severity of the school children's potential illness, susceptibility to that illness, the benefits that the students received from their administration of preventive care, and the barriers they encountered when acting.

The HBM framework encouraged health promotion, health management, and prevention of Type 2 diabetes. Based on this model, an individual must have the willingness to participate in health interventions and believe that being healthy is highly valued (Becker, 1974). The school nurses engaged in positive health behaviors by determining the individual's perception of the disease, illness, or accident, with identification of modifying factors, and the likelihood that the person will take some action. All the school nurses held each diabetic student accountable for his or her own actions. Whenever an issue occurred, the school nurse would have the student tell her what transpired and how it can be remedied. The student then uses that experience as a learning experience and not feel that he or she did something wrong. This experience can also be shared with other students, especially if the buddy system is used within that school.

Positive responses to messages about health promotion or disease prevention occur when the following four conditions for change exists:

- the person believes that the or she is at risk of developing a specific condition;
- the person believes that the risk is serious and the consequences of developing the condition are undesirable;
- the person believes that the risk will be reduced by a specific behavior change; and
- the person believes that barriers to the behavior change can be overcome and managed.

Parents and students along with school nurses coordinated care through education and communication. Parents learned simple ways about caring for their children and how to assess their health. Diabetic students learn self-care at an early age so that they can become self-sufficient as they grow older and learn healthy habits.

### **Limitations of Study**

Limitations included time management, sample size, analyses bias, interpretation bias, school nurses' bias, and no specific data found on the topic. Time management limitations were determined on the school nurses' part. Some of the school nurses did their interviews in thirty minutes while others took up to an hour. The nurses that utilized the shortest amount of time seemed to be in a hurry while responding to the questions and did not seem to be entertained by the questions. Facial expressions played the most important part during the interview process and showed that the participant was not truly engaged in the interview. Other issues or tasks took precedence over the interview.

Sample size was a major issue. For over a year there was no commitment from the school nurses to the allotted sample size of 10. It was very difficult to get the school

nurses from various districts to commit to participate. Recruiting ten school nurses ensured that adequate information was obtained to be able to gather sufficient data that answered the questions posed in this research. Many researchers suggest a sample size with at least 15 participants in small studies (Mason, 2010), but as cited before it was very difficult to get 10. Saturation of findings in this study was achieved when the collection of new data no longer yielded additional information regarding the problem. Therefore, even with a sample of 10 school nurses, saturation was achieved.

Analyses bias could have occurred during the analyzing process based on the researcher's bias. This may occur by getting a sense of the accumulating results. It can be predetermined planned analyses like changing what is the most important outcome, or dividing the data in several ways in subgroup analyses. Bias may occur after the study has reached completion. The researcher attempts to be impartial, but sometimes bias can be unavoidable.

Interpretation bias may also occur. It is possible that I made judgment on preconceived ideas such as theoretical commitments and previous knowledge. It is my decision to interpret the ideas that seems plausible. Interpretation was based on data analyses and having the necessary skills to interpret the results correctly and succinctly. If I was unclear about the interpretation, then the interviewees must clarify the meaning of what was said for me.

School nurses bias can be present. The school nurses had an average of three to four schools to supervise. Several school nurses from many school districts were asked to participate but declined. Some did not respond to the e-mails that were sent to them,

while others did not return phone calls. Most of the nurses who participated (80%) were excited about doing the interviews. However, there could be a possibility of bias from these nurses because they wanted to get their point across and have me to get their message out and do something about their concerns. The school nurses may have also given more information than is needed and this allowed me to have outliers. Three persons (30%) mentioned that they did not have an office space at some schools, and most did not have the privacy that was needed to conduct a conversation and gather information.

Due to the difficulty of finding data that was relevant to the school nurses' role in the management of children with Type 2 diabetes, the information gathered from the findings and from the interview can create bias. Not all school nurses considered their jobs as being difficult and challenging. Most school nurses loved what they do and wish that they had more time to teach and support their diabetic students. There were few literatures found on the school nurses' role and most of them were published by the National Association of School Nurses. Many researchers have data on Type 1 diabetes, but there was a scarcity of data on Type 2 diabetes. Because Type 2 diabetes and prediabetes are on the rise with the school aged population, more publications will be done in years to come. The findings of this study cannot be generalized to another geographical region.

### **Recommendations**

The primary focus of this qualitative case study was to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of

children with Type 2 diabetes. The results showed that the school nurses were dedicated to the care and management of children with Type 2 diabetes. Their beliefs, perceptions and attitudes were exceptional. They did everything that they could for diabetics, children with chronic diseases, even if it meant that they had to take a late lunch or sometimes skip their lunches. They responded spontaneously if their services were needed even with the shortage of nurses in their district.

The greatest challenges that the school nurses faced are as follows: (a) there were not enough school nurses for the number of schools and students allotted to each school nurse. The recommended nurse to student ratio recommended by the National Association of School Nurses is 1:750. According to the nurses interviewed their workload varies by school district. The school nurses' assignment is more than the recommended ratios; (b) Time management must be addressed with each school nurse. There are not enough hours in the day to accomplish all the tasks that require immediate care, and none left to do more teaching. If more school nurses were hired to fill the gap, most of the school nurses recommended two schools per nurse based on the number of children in each school. However, the school nurses stated that it would be more manageable and they would get to know their students more closely; (c) School nurses stated that most of the school districts did not know what they do. Even though they have a job description, the administrative team at the school district has no idea what tasks they can do. The district can benefit from details of the job descriptions of the school nurses and meet with them at least once per month for a summary of what transpired during the month. This will also allow them to get to know the school nurses personally,

thank them for the job they have done and get enlightened on what has happened on the sites; (d) Legislators must also understand and recognize the need for more school nurses. This can be accomplished through the school board and the lobbyist at the state capital (preferably a school nurse) who can explain the reality of the job to the legislators. One school nurse and one health aid per school would be ideal; (e) when hiring new school nurses, an experienced school nurse should be on the interview panel to ask the questions related to the job instead of general questions. The nurse on the interview team could play a vital role in selecting the right candidate for the job. As it stands today, there are no school nurses on the interview team to select any of the candidates related to school nursing; and (f) each school nurse should have an office at each school site so that privacy can be preserved when talking to a co-worker, teacher, parent, or student. It is crucial that students' files are protected and under lock and key so that unauthorized personnel cannot view them.

In summary, I recommend that the school districts, school nurses and the legislative bodies meet each quarter and focus on how to ease the burden of the school nurses by changing or adhering to the recommended ratios. Currently the school nurses are not taking the appropriate measure to do their assigned duties other than taking care of emergencies. There is a lot of teaching, follow up care, nurturing, and encouragement that need to be done. Nurses have said that they would like to get to know their students better. With the current scenarios, it may not be possible for the school nurses to get to know their students because of constantly being mobile. Unless there is a medical need, the students do not get to know their school nurses and vice versa. This can change if

more qualified nurses are hired. More studies must be done on the school nurses' role in the management of prediabetic Type 2 children.

### **Recommendations for Further Study**

All the school nurses interviewed agreed that they have inadequate staffing for the number of children that they serve within their districts. Due to the number of children per school district, most of the school nurses are assigned three to four schools totaling about four thousand children. In some school districts the school nurses cover charter schools along with elementary schools and high schools. This does not allow for spending adequate time with the school children. For some school nurses their days are divided amongst two to three schools to serve the children better. Further studies are strongly recommended on the importance of the proper management of prediabetic children and how many of them convert to Type 2 diabetes. More school nurses are needed to fulfill this mission and goal to get the children healthy and whole.

### **Implications for Social Change**

This study was done to understand the role of the school nurses in the care and management of children with Type 2 diabetes. Findings from this study provided insight into how the school nurses promoted their roles and how they cared for the children with Type 2 diabetes. Combining findings from this study into public health endeavors will be valuable in the future. The findings indicate a need for more nurses within the school district to better accommodate the students that requires care for their acute illness and for students who have chronic diseases. Policy makers in this state may use these findings to improve school nursing in all school districts. They must be cognizant of the need to



promote and recruit qualified school nurses to fill the gap that is present within the school districts. The school nurses can do a better more efficient job teaching and guiding, not only with the students, but also with the parents, teachers, health aides and trained staff that fills in.

Results of this study can improve nurse-student ratios while enhancing care for the children with Type 2 diabetes. The implication for social change from this study included recommendations for administrators to increase the number of school nurses per district to better manage children with chronic diseases, and intensification of positive interventions in the management of Type 2 diabetes.

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## Appendix A: Interview Guide

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Interviewer's Name: Rosaline Martinez-Culpepper  
Code \_\_\_\_\_

Interviewee's

**Please answer each question fully and completely and to the best of your ability. This interview process will take approximately 1 hour. A tape recorder will be used to record all your responses.**

How do school nurses perceive their role and responsibilities in the care and management of children with Type 2 diabetes?

1. What is your perception of your school district's capabilities pertaining to Type 2 diabetes?
  - a) What are your current policies for handling Type 2 diabetes in children?
  - b) How do you assess and guide students and parents to receive the appropriate healthcare provider?
  - c) How do you handle your diabetic emergencies?
  - d) What do you believe are the barriers to school nursing?
  - e) How can your job as a school nurse be done more efficiently with minimal to no risk for children with Type 2 diabetes?
  - f) What expectations do you have of the school district pertaining to children with Type 2 diabetes?
  - g) What strategies do school nurses use to promote education and counseling for children with Type 2 diabetes?
  - h) How do you promote lifestyle behavior change?

How do you manage diabetic children in a school environment?

When do you provide nursing care?

How do you assess, collaborate, and promote health education?

What barriers, if any, do school nurses encounter in the management and care of school aged children with Type 2 diabetes?

What legislature would you like to see implemented to increase the nurse/child ratio of children with diabetes?

How many referrals have you done during a school year?

What enablers are available to facilitate the school nurses' management and care of school-aged children with Type 2 diabetes?

Who assist you with Type 2 diabetic emergencies when you are not on site?

Who assists you with Type 2 diabetic emergencies when you are on site?

I want to take this time to personally thank you for participating in this research. I appreciate the time and effort you have made to accommodate this process. I will forward a copy of the study results to you as soon as it is completed.

## Appendix B: Participant Debriefing

The questions below will be asked to assist with debriefing activities.

1. What did you enjoy most about the research activity?
2. What was your first impulse?
3. How did you feel when I asked you questions about your job specifics?
4. What did you find most challenging??
5. If you were to do this again, what might you do differently?
6. What did you learn about yourself?
7. What did you learn about your job?
8. How are you doing physically after the interview?
9. How are you doing emotionally after the interview?
10. Was the purpose of the study clear to you?
11. Did you feel well prepared? If not, what else could you have done?
12. What concerns do you have as you finish this interview process?
13. Do you have any further questions?

Do you have any suggestions for improving the study?

## Appendix C: Invitation to Participate in Study

Date:

Dear Participant,

My name is Rosaline Martinez-Culpepper. I am inviting you to take part in a research study on the “School Nurses’ Role in the Management of Children with Type 2 Diabetes.” This study is sponsored by me in fulfillment of the Dissertation Process with Walden University. I will be conducting this study via interview questions and will be using a tape recorder to accurately document your answers. I would be grateful if you could take part in this study.

The purpose of this study is to explore and describe the beliefs, perceptions, and attitudes of school nurses in the care and management of children with Type 2 diabetes. This will enable education leaders to make the necessary changes or enhancements in the nursing curricula. The phenomenon of interest in this study is diabetes management in children and adolescents from the perspective of school nurses.

If you agree to be in this study you will be asked to answer several questions while being tape recorded. The interview will take about one hour. Doing this study will cause little or no risk. The only potential risk is that you might find certain questions to be more sensitive. The interview has been designed to protect your privacy. Participants’ names will not be on the interview guide. You can skip any questions you do not wish to answer. You may stop participating in the survey at any point without penalty.

Rigid precautions will be taken to make sure that the identity of every participant remains confidential. Therefore, all information will be kept confidential. I will not use your information for any purpose outside of this research project. Furthermore, your name or any other information will not be included anywhere that will identify you in any reports of this study.

You can direct any questions or concerns that you have by contacting me at [REDACTED] [REDACTED]. If you want to speak privately about your right as participants, you can contact the university research participant advocate at (612) 312-1210 or at [irb@waldenu.edu](mailto:irb@waldenu.edu).

Thank you for your assistance.

Sincerely,

*Rosaline Martinez-Culpepper*

Rosaline Martinez-Culpepper

Walden University PhD Student