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The role of nurses as educators in preventing the complications of Type 1 Diabetes among young patients: A systematic literature review

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Summary

The study focuses on understanding the central role of nurses in educating young children (ages between 3 and 7) who are diabetic with the purpose of preventing the complication of the disease. The research question is: what are the roles of nurses in preventing the complication of type 1 diabetes among young children? The author used Dorothea Orem's Theory to as the basis of established knowledge to provide guidance for nurses on how to support independency of type 1 diabetes patients in applying self care. This is expected to alleviate the complication of diabetes amongst the young patients. A qualitative study was conducted using content analysis method to scrutinize existing literature on diabetes and diabetes complications.

The result of the content analysis indicates four different roles of nurses that are pertinent to preventing the complication of type 1 diabetes which are; health promoter, continuous learner, autonomous agent, information disseminator. This study concludes that the combination of these roles in different situations could lead to (1) the empowerment of patients to properly take care of themselves with limited external intervention. (2) an opportunity to create customized treatment program for each patient based on their situational needs. Furthermore, the outcome of this study shows that education for the prevention of the complication is not meant only for pediatric patients but also for nurses who must continuously update their knowledge in order to better adjust to the changing needs of the diabetic patients.

Language: English Key words: diabetes, type 1 diabetes, nurses as caretaker, Diabetes patients' educator

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List of Abbreviations

β-cell	Beta cell
ZnT8	Zinc Transporter 8
C-peptide	Connecting peptide
ICN	International Council of Nurses
DCCT	Diabetes Control and Complication Trial
DSME	Diabetes Self-Management Education
NHS	National Health Service
TAPIT	T = Type of diabetes, A = A1c (glycosylated hemoglobin), P = Point-of-care testing, I = Insulin and medications, T = Transition of care and teaching
INT	Intensive
CONV	Conventional
EDIC	Epidemology of Diabetes Interventions and Complications
DASH	Disability of the Arm, Shoulder, and Hand

1 Introduction

According to a study conducted in 2001 by the Finnish Diabetes Association, Finland has the highest rate of type 1 diabetes incidence in the world, rising annually by over 2% over the past 50 years; having a total of 30,000 amongst residence and 3,000 from the total are those less than 16 years of age. The number of children developing diabetes in Finland is just about 450 yearly (DEHKO 2001). The high rate of diabetes incidence is familiar in many European countries. For instance, it was reported in 2011 that about 24,000 diabetes-related death are being recorded yearly in England (Diabetes-UK 2016). The prevalence of diabetes in Europe but mainly in Finland is attributed to five main problems which are; (1) complications resulting from poor health outcomes (2) limited education available for patients and their caregivers (3) variations in the practices available for monitoring care (4) limited resources particularly for pediatric patients (5) lack of flexibility and ignorance regarding the transition from young to adult patients (DEHKO 2001).

Although there is currently lack of agreement among scholars on methods for preventing diabetes (WHO 2016)**,** a diabetes audit conducted in the UK posits that most of the diabetes-related death could have been prevented by necessary health checks, a proper diet, and regular medication (Diabetes-UK 2016). It could be argued from the result of this audit that most of the people with diabetes are ignorant of the dangerous implications that could arise from lack of proper treatment, and it seems that people are not aware of the need to adjust their lifestyle. This assumption is confirmed by a study conducted in Asia which indicates that in multiethnic American, Finnish and Chinese populations, modification of lifestyle helps in the primary prevention of diabetes (Ramachandran et al. 2006).

It is not surprising seeing that most studies have echoed that proper education about type 1 diabetes is one primary treatment approach and preventive measure. As Atkinson and Elsenbarth (2001) posited, *"As our knowledge of type 1 diabetes increases, so does the appreciation for the pathogenic complexity of this disease and the challenges with its treatment".* As a direct consequence of advanced education and increasing knowledge about Type 1 diabetes, the authors further argued that the care and treatment of patients with type 1 diabetes has seen a rapid evolution; with genetically engineered insulin, glucose monitoring

devices, and algorithms all contributing to a decrease in disease-related complications (Atkinson & Eisenbarth 2001). Despite the increasing rate of advancement in diabetes care, premature mortality rate ensuing from complication both acute and chronic is still connected to type 1 diabetes (Harjutsalo et al. 2011). Therefore, it appears that the level of education of health care practitioners does not commensurate with the advancement in technology; particularly in the treatment process of early-onset type 1 diabetes.

Moreover, in the phase of drastic advancement of knowledge regarding the understanding of the pathogenesis of type 1 diabetes, it is reasonable to expect simultaneous changes in the roles of medical practitioners in the treatment and prevention of the disease as well as educating people with diabetes about the new realities. Therefore, this study specifically focuses on investigating how the role of nurses has changed in recent years as educators of young children with diabetes. Specifically, this study will focus on the Preschooler and early elementary school diabetic children (ages between 3 and 7). This group is interesting for 2 main reasons: first, it is the age that the children need reassurance that diabetes is not their fault; secondly, it is the age where caregivers (e.g., nurses), other than the parents of the children, are encouraged to acquire education towards diabetes management (Chiang et al. 2014).

2 Aim and research questions

This study's main aim is to understand the central role of nurses in educating young children with diabetes on how to prevent the complication of the disease. Considering that Finland has been considered as a country with the highest rate of diabetes incidence, the study will be focusing on the practices that are prevalent among nurses in Finland. In line with the work of Aubert and colleagues, the required characteristics for nurses as educators is not limited to communication and relational skills, but also demand that the nurses have sufficient management skills and some level of independence to manage diabetic patients from diagnoses throughout their treatment process (Aubert et al. 1998).

Concerning the research aim above, a research question will be investigated which is;

i) What are the roles of nurses in preventing the complication of type 1 diabetes among young children?

2.1 Structure of the thesis

The thesis is divided into eight main chapters. The background of the study will be presented in chapter 3. The theoretical framework is introduced in chapter 4, and this is followed in chapter 5 by the research methodology which comprises of data collection approach, content analysis, and ethical considerations. In the 6th chapter, the result will be presented with a specific focus on highlighting (1) The Role of Nurses as educator in preventing the complications for Type 1 Diabetic People (2) preventive strategies for managing type 1 diabetes. In chapter 7, a critical review of the results will be presented, and this is followed by discussion in chapter 8. The study is then concluded in chapter 9.

3 Background

As stated earlier, the aim of the study is geared towards an issue which is to identify the role of nurses in preventing the complication of type 1 diabetes among young children. However, it is almost impossible to discuss this issue without understanding some background information regarding diabetes (and specifically type 1 diabetes) in general. Therefore, to present an informed discussion in the content analysis, six main background issues will be discussed under this section, namely; what is Type 1 diabetes, developmental stages of Type 1 diabetes, Causes and risk factors of Type 1 diabetes, Complications of type 1 diabetes, Treatment of type 1 diabetes complications, Nurses' role.

3.1 What is Type 1 diabetes?

Diabetes Mellitus is a biological problem which is comprised of so many aggravating factors. It is comprised of multiple etiologies, a feature characterized by chronic hyperglycemia. The metabolism of carbohydrates, fat, and protein resulting from the defects in the secretion of insulin, insulin action or both contribute to the disturbance of the diabetes mellitus. It is quite impossible to discuss diabetes mellitus without mentioning its effects on the human body. Dysfunction and failures of body organs depicts the effects of the medical disorder. These

dysfunctions and failures can be very terminal or long-term. More characteristic symptoms of diabetes mellitus include blurriness of eye vision, body weight loss, polyuria, and thirstiness (WHO 1999).

Diabetes mellitus can be extremely dangerous in its severest forms. In this state, it causes the development of ketoacidosis or a non-ketotic hyperosmolar state. In the absence of adequately conducted medical treatment and patient care, coma, stupor or death can be developed from ketoacidosis. In less severe diabetes mellitus conditions or in the complete absence of characteristic symptoms, the sufficiency of hyperglycemia to cause pathological changes is adequate and real. It can also be visible for a long time before the existential making of diagnosis. There are also specific long-term effects shown by diabetes mellitus which ranges from complications of retinopathy that might lead to complete blindness, to renal failure as a result of nephropathy as well as neuropathy which can lead to damages of the foot, foot amputation and ulcers (WHO 1999).

Diabetes is of two main types: type 1 and type 2 diabetes that was initially called juvenile diabetes and adult-onset diabetes, which is due to the age of occurrence. Type 1 diabetes is caused by a malfunction of the insulin-producing cells, called pancreatic beta cells. Damage to beta cells results in absence or insufficient production of insulin produced by the body (Niemi & Winell 2006; UCSF n.d.)**.** This beta cells damage primarily occurs from the collective impact of both genetic and environmental factors (Rewers & Ludvigsson 2016). Type 1 diabetes is typically first diagnosed at the end of a prodrome of β-cell autoimmunity, and according to Pociot and Lernmark (2016), the disease is most likely activated by autoantibodies mainly directed in contrast to insulin or glutamic acid decarboxylase, or both, but seldomly against islet antigen-2 at early stage. After the first appearance of one of these autoantibody biomarkers, a subsequent second, third, or fourth autoantibody against either islet antigen-2 or the ZnT8 transporter might also appear (Pociot & Lernmark 2016).

3.2 Developmental stages of Type 1 diabetes

There is a typical usualness attached to type 1 diabetes. This usualness is significant during the development of children and young people under 30 years. One of the usual characteristics of type 1 diabetes in young people is depicted by rapid loss of weight, osmotic symptoms such as excessive hunger for liquid (water), and polyuria (Hill 2009).

There is presently lack of consensus among scholars regarding the specific demographic settings of the developmental stages of diabetes. For instance, according to Chiang and colleagues, there are 5 developmental stages of diabetes among young patients which relates to specific age groups namely: Infancy (0-12 months), Toddler (13-26months), Preschooler and early elementary school (3-7years), Older elementary school (8-11 years), Early adolescence (12-15years), and Later adolescence (16-19years) (Chiang et al. 2014).

Besides the grouping of diabetes by age, a study has revealed three-step stages of how the disease develops. Research and scientific screening by renowned entities like TrialNet have contributed to the depth knowledge of the onset of Type 1 diabetes we now possess. It helped us understand the push for a three-stage scheme of early type 1 diabetes and how the latter has helped to formulate diagnosis and treatment (Hoskins 2014).

Although, medical experts are yet to fully know the real causes of attacks to the body's full immune system and why the insulin-making cells are killed on any diabetes mellitus. The three-stage scheme according to experts helps make available clinical trials that possibly could fasten the making and development of drugs. The clinical trials are also useful in the treatment and preventative measures for Type 1 diabetes. In details, the three-stage scheme in the discussion is utilized primarily to understand the three early stages. These stages are Stage 1: Autoimmunity plus normal glucose tolerance. Stage 2: Autoimmunity plus abnormal glucose tolerance. Stage 3: The requirement of insulin therapy by classic symptomatic Type I Diabetes (Hoskins 2014).

3.3 Causes and risk factors for Type 1 diabetes

According to researchers, the risk factors for type 1 diabetes are still under research investigations and entirely unclear. Nevertheless, if there is a family member in a family with the type 1 diabetes, the risk of developing the disease increases to some extent. Being exposed to some viral infections and environmental factors has also been associated with the risk of developing type 1 diabetes (IDF 2015; Dorman et al. n.d.).

In the pathogenesis of Type 1 diabetes mellitus, several factors play essential roles. The environment is a factor source, but there are also factors which are yet uncovered despite the

high number of scientific researches that have been done on diabetes mellitus (Majeed & Hassan 2011).

Particular case research was done on 96 diabetic patients who were admitted to the pediatric wards of three hospitals in Basrah. The methodological control was performed to determine the maternal, neonatal and early childhood risk factors for diabetes type 1 in children and young adolescents in Basrah. And there was the recruitment of those who visited the primary healthcare centers' over the period of 4th, November 2006 to the ending of May 2007. During the medical research, an additional number of children were added to the research, about 299 non-diabetic children, ranging from 18 months to 17 years. The research took accounts of some exposures to environmental risk factors which are thought to play an essential role in triggering the immune process thereby bringing about the damage of the B-cell as well as type 1 diabetes development. These exposures are thus seen, during the stages of pregnancy which includes drinking of tea, pre-eclampsia, and infectious diseases, a neonatal period which includes jaundice, infections and respiratory difficulties, and early infancy (Majeed & Hassan 2011).

According to Rao (2015), differentiating type 1 diabetes mellitus from type 2 diabetes mellitus is a tedious task. The characteristics that are existent in the two types are entirely overlapping. The few differentiating factors that exist constitute why type 1 Diabetic patients' autoimmune disorders have increased incidence rates with low insulin/C-peptide levels. The insulin levels may generally be normal during a phase known as the "honeymoon phase" even with their non-obese features. The C-peptides levels are generally increased in people with type 2 diabetes. Nevertheless, there could be some normality of the C-peptides levels during diagnosis. In a usual situation, families with a strong history of diabetic infections are obese, and signs of insulin resistance are shown even in the typical case of no auto-antibodies (Rao 2015).

Rao (2015) also stated that in people who have type 1 diabetes, the normal body physique is structurally lean. Additionally, type 1 diabetic people possess the presence of autoimmunity and lowness of pancreatic beta cell function in their body, also known as "low C-peptide."

Honeymoon Phase – According to Diabetes UK (2017), production of a considerable quantity of insulin by the pancreas is still attainable during this Honeymoon Phase which is also known as Honeymoon Period. For the type 1 diabetes people, the Honeymoon Phase is thus referred to as a time before the diagnosis of diabetes when the production of a reasonable

quantity of insulin can still be reached by the pancreas to aid the control of blood glucose and reduction in the need of insulin.

3.4 Complications of type 1 diabetes

When there is a successful provision of care, the type 1 diabetic people will be able to manage their lives just so well like anybody else. Nonetheless, when diabetes lingers for over an extended period, it then causes enormous complications which are very serious. A long-term complication from type 1 diabetes is brought about by chronic hyperglycemia toxic effects thereby becoming evident as both microvascular diseases which include nephropathy, retinopathy and neuropathy, and macrovascular disease which includes coronary artery disease, peripheral vascular disease, and stroke (DEHKO 2001).

Many studies have confirmed that a good glycemic control to alleviate these effects is of paramount importance. Even though these vascular complications clinical evidence does not typically become evident until the adulthood of a diabetic person, but the causal pathophysiologic process starts near the time when diabetes is diagnosed. Besides, risk factors that can either be treated or modified which compound the risk for these concomitant turns out to be evident during the years of adolescence for diabetic people. These risk factors include hyperlipidemia, smoking, and hypertension. Therefore, because of these reasons, to prevent or lessen morbidities in future, the pediatric years show forth a vital opportunity for detecting these process early as well as intervening adequately (Gregory et al. 2013).

3.4.1 Nephropathy

In countries that are developed, diabetic nephropathy is the most common causes of renal failure (Daneman 2006). Diabetic nephropathy might need to be treated with dialysis and transplantation of kidney (DEHKO 2001). Unlike other people who have diseases which are not related to diabetes, diabetic people who have reached the end-stage of renal disease are likely to do less good in dialysis treatment and transplantation plans (Daneman 2006).

Microalbuminuria which is defined by Gregory et al. (2013) as "*albumin-to-creatinine ratio of 30 to 299 mg/g in a spot urine sample"* is the earliest indication of diabetic nephropathy.

There is a considerable risk of worsening to gross proteinuria and, eventually, to end-stage of the renal disease if it is not checked. If microalbuminuria is therefore detected early enough, it put forward an opportunity to repeal the drift toward nephropathy with meticulous glycemic control as well as blood pressure. Studies have recommended that screening for microalbuminuria annually immediately the diabetic person turns ten years or more and has had this diabetes for not less than five years (Gregory et al. 2013).

3.4.2 Retinopathy

Diabetic retinopathy ameliorates through stages which can be recognized. They are: (1) early non-proliferative changes, formerly known as background retinopathy, appearing by about twenty years period in nearly all people with type 1 diabetes, including exudates, microaneurysms, and haemorrhages. (2) Pre-proliferative retinopathy. (3) Predictable proliferative retinopathy having the risk of detached retina as well as vitreous hemorrhage, and (4) macular edema. Furthermore, in the developed globe, diabetic retinopathy is the most common cause of blindness which is acquired, with an incident rate of proliferative retinopathy in type 1 diabetes which is roughly about 20-25% (Daneman 2006).

Due to the fact that retinopathy is not normally ascertained before the age of five to ten years after diabetes have been diagnosed, and after the beginning of puberty, it is therefore vital that glycemic control is improved to reduce the furtherance of retinopathy because poor glycemic control is a process that starts very often in the pediatric years and it is also synchronous with increased risk for diabetic retinopathy in no small extent. Studies then recommend procuring of the first ophthalmologic examination of a child after the age ten and have had type 1 diabetes for three to five years, and recurrently afterward (Gregory et al. 2013).

3.4.3 Neuropathy

Neuropathy is disturbances to the function of the peripheral nerves, and it is also associated with numerous symptoms that reduce the quality of life. Above all, neuropathy makes the diabetic person disposed to foot ulcers, which ensues increased risk of amputation of the lower-limb. The symptoms or result of peripheral neuropathy include pain, loss of sensation,

a disorder in balancing, foot ulcers and other injuries on the foot. The symptoms of autonomic neuropathy which is a group of symptoms occurring in the presence of damages to nerves managing the day to day body functions include disorder of the vasomotor, gastrointestinal motility disorders, dysfunction of the genitourinary, perspiration which is not normal and perception of hypoglycemia that is impaired (DEHKO 2001).

In as much as the manifestation of diabetic neuropathy is not common in children and adolescents clinically; however, the increased risk is allied together with poor glycemic control and the extent of the disease as other microvascular complications of type 1 diabetes. Foot examinations starting at the time of puberty is therefore recommended (Gregory et al. 2013).

3.4.4 Macrovascular complications

Macrovascular complications include arteriosclerosis, coronary and cerebral arteries obstruction, which can bring about stroke, myocardial infarction, or gangrene in the legs (DEHKO 2001).

Atherosclerosis is the main complication of type 1 diabetes that is not well controlled. Even though macrovascular complications seldom become evident before adulthood, studies checking through carotid intima-media thickness which is a coronary and cerebral vascular disease sensitive marker, have shown the intima in children, young adults, and adolescents with type 1 diabetes to having greater thickness than in other people not having same disease but of same age. An ascertainable benefit has been proved by studies checking intensive insulin therapy over standard therapy for the reduction of risk for excessive carotid intima-media thickness, myocardial infarction that is not fatal, stroke, and cardiovascular disease death. Moreso, these studies emphasized on the importance of pediatric years tight glycemic control as there are suggestions that vascular changes which last longer and are fundamental, occurs early in the course of minimally controlled type 1 diabetes (Gregory et al. 2013).

3.5 Treatment of type 1 diabetes complications

An appropriate and timely treatment can prevent the complications of type 1 diabetes. For the care of a child with diabetes, it is important to already focus at the prevention of complications because they have their entire life in front of them to face those complications if not tackled (DEHKO 2001).

At the establishment of type 1 diabetes, restoring euglycemia which is the normalcy of blood sugar level and teaching the diabetic child together with their family the necessary skills needed in taking care of diabetes while at home such as checking and recording blood glucose concentrations by using a home blood glucose meter, drawing up, and delivering insulin using a syringe are the first line of care focus. The key management is determined by if the person with diabetes is severely sick when presented. For instance, if diabetic ketoacidosis is evident. It is ideal that any child that is diagnosed of type 1 diabetes newly should be checked out by a diabetic team comprising of nurse educator, dietician, pediatric endocrinologist, social worker as well as a professional in mental health, to ascertain proper care where necessary immediately. Optimal diabetes management seeks to strike a balance between restoring blood glucose into the euglycemic range undividedly, to lower a child's exceptional susceptibility to hypoglycemia and as well reduce the microvascular and macrovascular complications affiliated with chronic hyperglycemia (Gregory et al. 2013).

3.6 Nurses' role

The nurses' role is very crucial in the prevention of type 1 diabetes complication and management plan. The nurse self-reliantly teaches approaches and interventions that are within the nursing practice competence. Precocious of the right time to teach and the appropriate need of the patient (Dunning 2013). The important objectives of diabetes management education are empowering and having autonomy, stressing on the psychological and social part of the disease, open dialogue and communication that is active, improving and learning new practical skills, rendering support and discussing the distress of the client as well as sharing of more information that are connected to the patients' experience. The nurse

should be steady in conveying information as well as giving feedback to the patient and family as an educator and promoter (Cooke & Plotnick 2008).

4 Theoretical Framework

Academically, while presenting or performing any scientific research, there is a necessity to formulate the processes that will function as a knowledge-based guide to help with the process. These processes are in forms of systematic and knowledgeable approaches which form the framework or guiding toolset for theorizing. In the practice of Nursing, the theoretical framework as a toolset is assistive in providing methodological support for critical brainstorming and brooding required while planning caregiving and providing cares to patients (Masters 2015).

Dorothea Orem's Theory of Self-Care and Self-Care Deficit is the theoretical framework used in this research. This theory is specifically used for this research work because of its suitability, simplicity and easy to understand.

If not given proper education about Self-Care activities in preventing the complications of type 1 diabetes, people who have type 1 diabetes will be prone to some complications like hypoglycemia. According to Orem, patients at risk of specific consequences should be encouraged to involve themselves so well in self-care to maintain a better quality of life and health. This encouragement for involvement is because self-care is very vital when it comes to health promotion and its maintenance.

4.1 Dorothea Orem's Theory

In the 1950s, there was a growing concern for self-care in the profession of Nursing. It was during this period that Dorothea Orem commenced the processes that led to her scholarly evolution in nursing care work. During that period, Dorothea was motivated to create a precise formula to improve the knowledge utilized in nursing. She commenced her theory on the philosophy that nursing is the needful response to anyone who is unable and incapable of taking care of oneself. According to her, to add and complete the gap of incapability to maintain a required level of self-care, nurses, therefore, render assistance to their patients

when needed either by educating or otherwise. The theory of Dorothea Orem consists of three theoretical classifications.

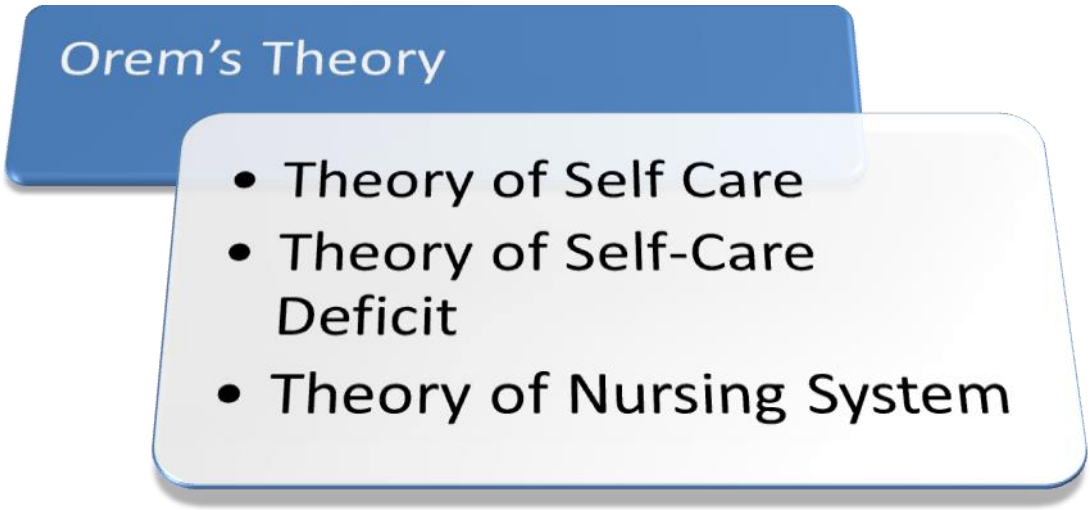

Figure 1: The constituent theories of the self-care deficit theory of nursing. Inspired by Orem (2001).

4.1.1 Theory of Self Care

As the name of the theory implies, this theory is totally about the methods and rationales people (patients) care for themselves without the professional, voluntary or assistive aids of nurses. In details, it describes why and how a patient takes care of oneself and the limits of this level of care before the needs of caregiving professional. The theory of self-care also includes agencies, therapeutic self-care services, and the basic self-care conditioning factors considered in the practice and comprehension of the self-care theory (Orem 2001).

Three possible dimensions or indicators form the concept of self-care agency. These include the adequacy, operability, and development of the practical processes of the self-care agency. Note, self-care agency can be explained as the procured ability of nature and individual to knowledgeably and functionally cater and keep up with their life and living processes leading to their own medical, growth and developmental maturity. The ideas Orem postulated further suggests that therapeutic self-care demand is the aggregate summation of all measures of

adequate caring an individual need to meet up with in care. The summation of these care or caring conditions is known as self-care requisites. According to Orem, certain basic conditions affect the medical evaluations of the therapeutic self-care demand or self-care agency of a person. These factors are identified as gender, age, factors of health care, living or lifestyle, sociocultural factors, family system, availability of resources, developmental and environmental conditions. (Orem 2001).

The three types of self-care requisites that were identified by the postulates of Orem's theory of self-care have also been integrated into the full practical frameworks of self-care to provide the basis for self-care. These self-care requisites are universalized in nature because they are those found in all human beings and are functionally associated with the human life processes. The developmental self-care requisites are associated with the stagey developments of the human life cycle. The pre-requisites of developmental self-care are different and might include or are associated with human events such as marriage, retirement, attending schools and graduation. Lastly, the self-care requisites that are associated with health is known as the health deviation requisites. They are primarily concerned with deviations in the structural and functional systems of human beings (Orem 2001).

4.1.2 Theory of Self-Care Deficit

This theory is the part of Orem theory of care that categorically explains how or better still, why people allow caregivers or nurses to take care of them when they are unable to. This theory depicts the deliberate actions performed by adults or maturing humans to control their survival, well-being, quality of life and conditions of living (Orem 2001).

In Orem's views, specifically, nurses utilize five different methods to meet the self-care needs of patients helpfully. These methods are enumerated below:

- Doing or actioning for another.
- Teaching or sharing knowledge.
- Providing the needed physical or psychological supports.
- Guidance and directions.
- Providing and sustaining a provisional environment which supports individual development.

(Orem 2001).

4.1.3 Theory of Nursing Systems

This theory is one of the three significant sub-divisions of the Theory of Care postulated by Orem Dorothea. This theory of nursing systems explains and descriptively details the kind of relationship that must exist for nursing care to occur. It also stipulates that such ties should be cultivated and always preserved during the occurrences of nursing care (Orem 2001).

5 Research Methodology

In the field of scholarly studies, the techniques utilized by research to pattern an academic study in gathering and analyzing information that is necessarily relevant in answering questions or aims of a research study is known as a research methodology. This pattern can also be referred to as the scholarly manual of performing an academic task that helps to reveal information useful to solve a problem. Problems in this regard can be social, medical, personal or scientific. Since research methodology is a scientific procedure of doing scholarly works or studies, there are two main ways of utilizing this procedure. These two main categories of research methodology are: qualitative and quantitative. Research can be performed using either qualitative or quantitative methods. Specifically, for this thesis, qualitative research method was adopted. The use of emergent design necessitates the use of a qualitative approach to research (Polit & Beck 2012).

The idea of the design allows reflections from me as a researcher while making decisions on what has already been known or learned in the process.

5.1 Qualitative Research

Qualitative research allows researchers to gain a deeper understanding of, and to interpret, the personal experience and social phenomena of patients. It is suitable for investigating questions that quantitative research cannot answer, such as why people do not adhere to a treatment regimen, why a specific health care intervention is successful or why patients are exhibiting specific behavior and attitudes (Huston & Rowan 1998).

Furthermore, according to Lacey and Luff (2007), qualitative research is particularly good at answering the 'why,' 'what' or 'how' questions, such as: why some patients with diabetes are reluctant to comply with dietary advice and insulin regimes, despite their experience of diabetic complications? Or what are the perceptions of careers living with people with learning disability, as regards their own health needs? (Lacey & Luff 2007)

Considering these aforementioned attributes, it becomes evident that qualitative method is appropriate for this thesis especially since the main focus of the thesis is to understand the interrelationship between nurses and young diabetic children when the nurses act as educators.

5.2 Data collection

Although there are many approaches to data collection in qualitative research (e.g., interviews, participant observations, case studies), this thesis focuses on obtaining data from existing peer-review nursing articles, online magazines, nursing books, relevant thesis, as well as other online sources. Searches from FINNA and databases such as EBSCO, CINAHL and Google Scholar, were used as a primary source of obtaining the articles because of the richness of the database for scientific publications. In order to maintain a focused search for the needed data, the following keywords and phrases will be utilized to identify relevantly and up-to-date articles and books: "*diabetes", "nurses as caretaker", "diabetes patients' educators", "diabetes prevention", "diabetes complications", "role of nurses in*

healthcare", "characteristics of a good nurse", "factors causing diabetes". Different Boolean operators were used in carrying out searches with the search words differing, from title page to abstract on multiple occasions. All the sourced materials obtained with the keywords were carefully assessed to ensure that the contents are sufficient to provide an answer to the research objectives and questions of this thesis. After the articles were read through, exclusion and inclusion were made.

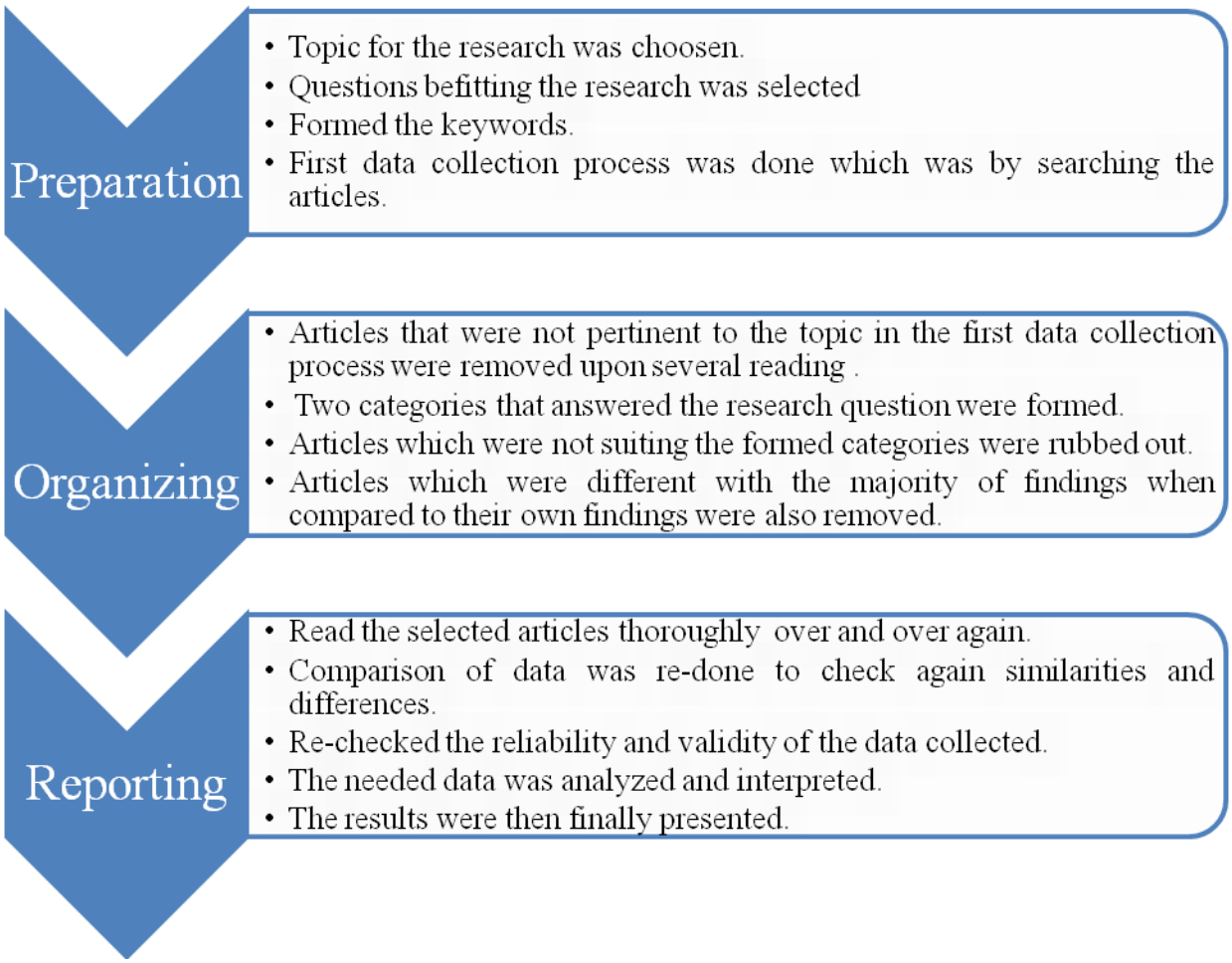

Figure 2: The Process of the Thesis.

5.2.1 Inclusion and Exclusion Criteria

After the articles were read through, exclusion and inclusion were made. Included articles were those which are in English and significant to the topic of study. The excluded articles were those that could not be opened because of the need for a fee-based subscription, articles whose focus of discussion were not related to childhood diabetes and nurse care, articles not

related to nursing. These factors were used to purposefully channel the focus of the search to the main topic of the thesis. Moreover, to further delimit the search outcome, only articles published in the last 10years were utilized.

However, 120 articles where the data collected in total. They were evaluated following the keywords needed and done systematically. The author has focused more on how the nurses can prevent the complication of type 1 diabetes and the preventive strategies, thereby collecting data with the focus only. 106 articles were then excluded afterward due to different reasons which have been enumerated in the exclusion criteria above, and 12 articles only were included. The data matrix is thus presented in table 1.

5.3 Literature Review and Content Analysis

Literature review and content analysis is a research picture that gives an in-depth analysis that is critically relevant to academic or non-academic research. A literature review puts into clear, displays the recognition, analysis, and synthesis of previous or existing scientific studies that are relevant to a new research outlook in an area of academic discourse. Literature review takes in detail the works of other researchers, scholars or academic practitioners. Furthermore, the details literature reviews provide to a given scholarly study include what has been researched and achieved during the research. A good literature review will also tell what was discovered, what theories and hypothetical postulations that exist. It should also include the different kinds of systematic methods that have been used or advised for future utility (Fink 2005; Ramdhani et al. 2014).

According to Fink (2005), there are specific basic tasks associated with literature reviews and these tasks are carefully done to gain an adequate understanding of the review. They are divided into seven steps including the following:

1. A literature review should begin with the selection of research questions. These questions are to serve as guides to the whole reviewing process.
2. Sourcing academic and scholarly databases to help answer the research questions. These databases include articles, books, websites and other scholarly materials.
3. Selection of concepts and terminologies to logically help in sourcing answers.

4. Availability of suitable screening criteria that will be useful in deciding the relevancies of included and excluded materials.
5. Application of the suitable criteria.
6. Validation and integrity checks on the materials.
7. This task requires the cohesion of all functions, indicating a systematic synthesis of the collected results and how meaningful the findings are descriptively summarized and utilized.

(Fink 2005)

There are several methods available for analyzing qualitative data which can be either with or without the use of computer software. Lacey and Luff (2007) grouped these methods into three broad levels of analyses namely: content analysis, theoretical analysis (e.g., grounded theory), and thematic analysis (Lacey & Luff 2007). For this current thesis, the qualitative content analysis is appropriate since the study is entirely base on the in-depth analysis and interpretation of the documented arguments in the existing literature that contributes to the discussion on the role of nurses in educating diabetic patients. Bryan (2004) defines qualitative content analysis as "*An approach to documents that lays emphasis on the role of the investigator in constructing the meaning of the texts as well as in texts. There is an emphasis on permitting categories to surface out of data and on identifying the essence of understanding the meaning of the context in which an item that is being analyzed (and the categories derived from it) appeared"* (Bryman 2004, p.542).

Hence, content analysis will be utilized to analyze and review existing knowledge and literature with regards to the two pillars of the causes (environmental factors and genetic factors) of diabetes as well as relating to the roles of the nurses as educators.

The analytic approach in a qualitative method is made to either give out information or to acquire knowledge. It is also a systematic method that evidence facts, produces new methodological approaches and serve as scientific aids to academic research practices. Depending on a researcher's competences, approach and applicability can be the determining factors that simplify or complicates the use of the content analytic approach (Elo & Kyngäs 2007).

The analysis of this study shows the examination of categories by the author. This examination considered the sourced data materials and how their similarities are combined in

the analysis. More so, in connecting the similarities, the author also took note of the differences and found the various factors that eventually led to the results of the analysis.

5.5 Ethical Consideration

Ethics have many definitions, but it is most commonly defined as norms of conduct that distinguish between acceptable and unacceptable behavior (Resnik 2015). To adhere to ethical standards in research, there are various reasons why it is important. Standards promote the aims of the study, such as knowledge, truth, and avoidance of error. For example, prohibitions against fabricating, falsifying, or misrepresenting research data promote the truth and minimize error. Although there are several codes of ethics from different establishments - e.g., national institute of health and the world medical association's declaration of Helsinki, there appear to be general ethical principles that most of the codes address which include honesty, objectivity, confidentiality, integrity, openness, and respect for intellectual property (Resnik 2015).

Research integrity is a very vital aspect of professional research in nursing (Polit & Beck 2012). Honesty in research requires that reports are documented and delivered truthfully (Resnik 2015). Objectivity involves the avoidance of bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required. Confidentiality is the protection of private communications, such as papers submitted for publication, personnel records, and patient records. Respect for intellectual property is crucial for students because it stipulates the necessity to honor patents, copyrights, and other forms of intellectual property. Respect for the intellectual property also entails the use of proper acknowledgment or credit for all contributions to research as well as the avoidance of plagiarism (Resnik 2015).

According to the ICN Code of Ethics for Nurses (2000), the nurse has four principal obligations that outline the standards of ethical conduct: nurse and people, nurse and practice, nurse and the profession and, nurse and co-workers (ICN 2000). This thesis is geared towards acknowledging all the crucial codes of ethics as stipulated in each of the four standards of ethical conducts in addition to the principles mentioned above thereby making sure that all the journals, articles and so on used, was not written as like the original content, in order to

avoid plagiarism. The author did not also make them up or fabricate to exaggerate the content of the data but referenced accordingly where supposed to promote this study's trustworthiness. There was also communication and guidance for proper structuring of the research between the supervisor and the author. More so, some of the diagrams in this study were originally from the author for easy clarification and one diagram which was inspired by Orem for the theory.

This research seeks to identify the role of nurses as educators in supporting young diabetic patients on their journey to prevent complications of the disease. By identifying the requirements of their roles as educators, it is expected that nurses will gain more confidence and efficiency in performing their duties.

6 Presentation of Results

The results are presented in relation to the main research question of the study in connection with the key themes identified in the reviewed literature. The qualitative analytical method was utilized to selectively analyze the contents of the articles out of which thirteen were chosen.

6.1 The Role of Nurses as an educator in preventing the complications for Type 1 Diabetic People

Nursing is a kind of profession that requires much more than the stipulate of the profession. It is multifaceted and needs a nurse to acquaint him or herself with abilities to adapt to favorable and unfavorable conditions. The profession of nursing indirectly needs much more from a nurse other than the traditional salvation of lives. A nurse's commitment includes alleviation of patient's suffering, in furtherance, promote and preserve the quality, dignity, and respect for life (Peate 2012).

A nurse assigned to clinical duties or one whose duties are clinically related understands the weightiness of being at the bedsides of patients. Being at the bedsides of patients and nursing them at all times show a bit the levels of complexities, fragmentation, and tediousness that are

related to patients' care and these kinds of assignments happen daily even with the difficulties of family dynamics (Chase et al. 2015).

Nurses are pivotally required to play a significant role in the management of type 1 diabetic patients. In other words, they succinctly act as educators and physically designed contact points to the type 1 diabetic people and their family members. It is a critical role to play, hence the mandatory regards of diabetic education as a potentiated element in the management of diabetes (Sy 2016). Based on the reviewed literature presented in table 2, four main roles of nurses as an educator of diabetes patients were identified, and two preventive strategies for managing type 1 diabetes were also identified. These roles are discussed below:

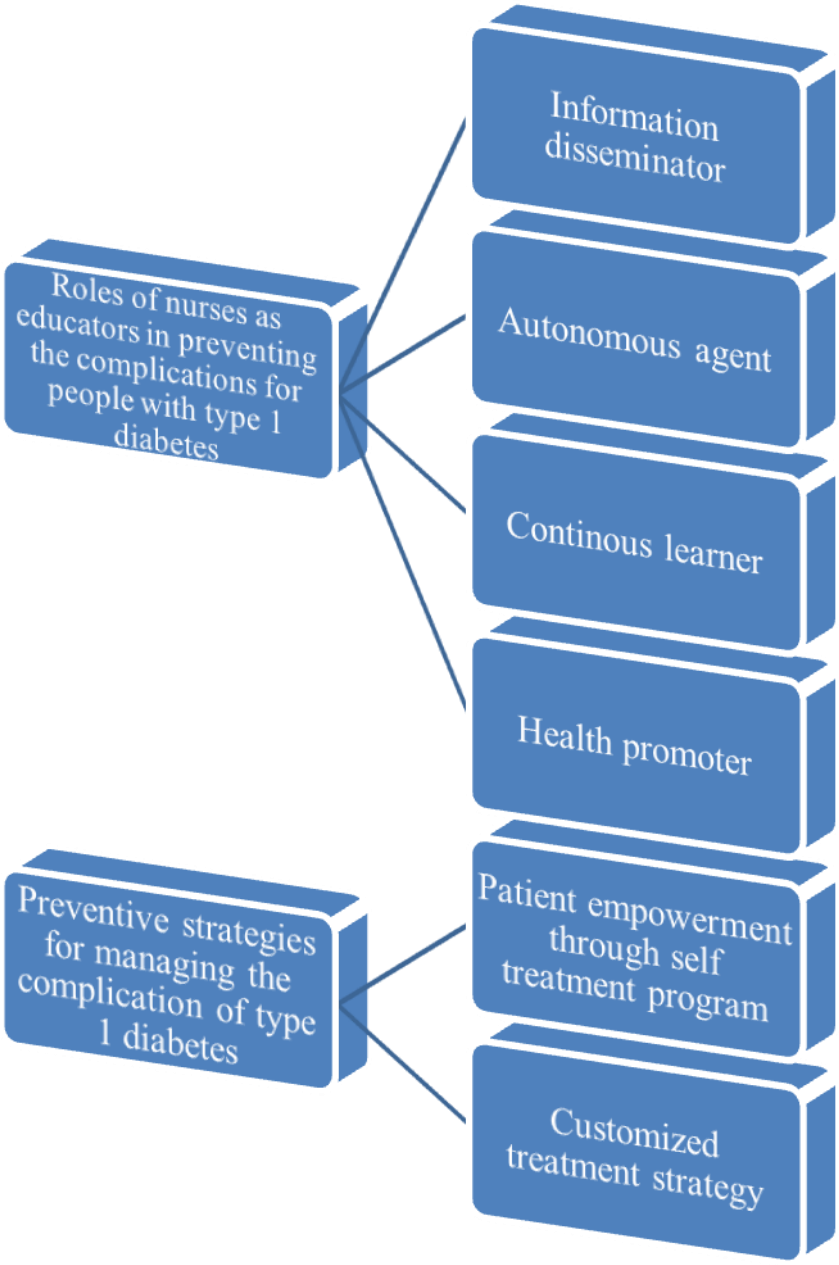

Figure 3: The categories and sub-categories concept.

6.1.1 Information disseminator

In order to effectively function as information disseminator, nurses are required to possess excellent interpersonal and proficient communication skills (Varjus et al. 2011). This skill is important because a lack or insufficient knowledge about type 1 diabetes may limit the quality of information that is being transferred between the nurses and their patients, especially in the case of young patients. Likewise, the burden associated with strict adherence to diabetes treatment has been shown by scholars to deter the normal daily lives of young patients (Ashraff et al. 2013). This burden eventually affects the personality of the patients as well as their well-being; leads to adverse behavioral outcomes between them and their family members and could, in some cases, escalate into inappropriate social behavior in different social gatherings such as schools and sporting centers. Such possibilities of negative consequences necessitate the need for nurses to effectively carry out their roles as information disseminator to mitigate against such outcomes (Ashraff et al. 2013).

6.1.2 Autonomous agent

In order for nurses to function effectively as an educator, there is the need for them to enjoy a certain level of autonomy and independence in their dealings with the patients. These points to the need for nurses empowerment in such a way that will reduce their dependence on the doctors, especially in situations that require on-the-spot decision making (Varjus et al. 2011).

6.1.3 Continuous Learner

For nurses to be able to educate people with diabetes efficiently, there is the need for them to understand the disease personally. The demand for responsive health services is increased because of rising rate of diabetes and health problems associated with diabetes. The first measure of managing diabetes is to gain an in-depth understanding of its pathogenesis (Kenny & Corkin 2013). Nurses are therefore required to, develop their knowledge on how to manage the three fundamental factors (insulin, diet, and exercise) that interrelate together to moderate the blood glucose level as well as glycaemic control (Sy 2016).

More so, nurses should seek to advance research in the area of childhood diabetes. This research advancement is because the signs and symptoms of type 1 diabetes are very quickly seen unlike type 2 diabetes thereby accounting for early diagnosis. Therefore, updating and maintaining evidence-based knowledge by the nurses and understanding theories on child development are of paramount importance to encourage the best development of children in their charge (Kenny & Corkin 2013).

6.1.4 Health promoter

The reviewed literature pointed to the role of nurses as ambassador or promoter of a healthy lifestyle (Peate 2012) and, as mentioned above, the physical point of contact with the diabetes patients and their families (Sy 2016). For instance, Nurses need to help and also educate young children with type 1 diabetes on the benefits and dangers of proper timing as well as appropriate methods for administering insulin injections. In addition, nurses can educate young type 1 diabetes children on how to consume specific amount and types of carbohydrates in proportion with the dosage of insulin injection, encourage the young children to eat sufficient amount of vegetables while also engaging in series of physical exercises in order to reduce the potential risk of coronary heart diseases that are typically associated with type 1 diabetes patients (Kenny & Corkin 2013).

6.2 Preventive Strategies for Managing the Complications of Type 1 Diabetes

The effects of type 1 diabetes can be minor or major depending on the stage of the ailment. Nevertheless, the complications that are related to type 1 diabetes can have major effects on the patients that suffer from the diseases individually. Also, these effects related to the complications from diabetes can also affect the family members of the diabetic patients financially or otherwise because the complications are costly to manage – they are expensive to the patients as well as their family members too. The cost of the type 1 diabetes complications come in different varieties and episodes. Parents or children can bear costs in ways that include taking time off to be by the bedside of the patients or expenses associated with transportation, hospitalization and keeping up with other appointments (Hill 2009).

There are two major types of preventive strategies identified in the reviewed literature. The first is a more generic strategy in which general guidance is provided to the patients and their families irrespective of the specific details of the type of complications. The goal of the generic strategy is to engender self-empowerment of the patient. The second strategy is more customized to the specific kind of complication. Based on the reviewed literature, two different complications were identified namely; microvascular and macrovascular complications. These will be discussed more in the subsequent sections.

6.2.1 Patient Empowerment through Self-Treatment Program

Complications from diabetic people are worrisome in healthcare. In most cases, treatments are usually structured to ameliorate the symptomatic effects of the disease and further help to cause reliefs for the diabetic people. Another aim of treatment for diabetic complications is to marginally alleviate additional damages to improve the quality of life for the diabetic people. This approach is an integrated one that holistically manages the complicating effects of type 1 diabetes. This commonplace has further created a source of encouragement for type 1 diabetic people into adopting healthier changes to their lifestyles which improve the levels of weight and physical activities. This holistic approach improves the conditions for type 1 diabetic people to know what their blood pressure, cholesterol and blood glucose levels are; thereby giving them hints on the acceptable levels that should be attained and how to possibly achieve the desired levels of the target (Hill 2009; Gubitosi-Klug 2014).

During the hospitalization of type 1 diabetic children, studies have shown that education received by the patients and their families have recorded outcomes that are positive for the treatment and management of the disease. In furtherance, children with type 1 diabetes recorded less frequency of returning to hospitals or being readmitted when they and their family members are properly enlightened on the preparations and management of type 1 diabetes and how best they could help themselves at home. The reduction in hospitalization, emergency check-ins, and specialized care further reduces the overall costs for the payer and the diabetic child (Sy 2016).

The necessity of education for the patients and their family members was also emphasized when the knowledge gaps of formal type 1 diabetes self-management education (DSME) for diabetic people and their families were conspicuously recorded in recent past. Without proper

enlightenment about the disease and how to manage it, unenlightened diabetic people and family members tend not to know the recommended preventive services, and because of this, they are prone to develop severe complications than those who were knowledgeably educated or informed (Burke et al. 2014).

The idea of DSME is to create emphasis on support, knowledgeable support for the diabetic people and their family members. This shared knowledge through the DSME enables them to effectively make informed decisions, cultivate self-care attitudes and empower them to solve problems that might suddenly arise during home-care. It is also an objective of DSME to facilitate active collaboration between and among the diabetic people, their family members, and the healthcare team to clinically improve the health outcomes, discussions, medical statuses and quality of life (Burke et al. 2014).

6.2.2 Customized Treatment Strategy

One of the sources of type 1 diabetes complications is insufficient management and treatment. In most cases, this arises because of inadequate or lack of knowledgeable information about the disease by the young diabetic children or their caregivers. Type 1 diabetes complications can adversely affect a one's quality of life and status of health. It can be a continuous financial burden for the diabetic people, family and healthcare institutions (Hill 2009).

Diabetes as a medical disease is related to both microvascular and macrovascular complications (Dart et al. 2014). The roles of nurses, therefore, differ in the prevention of each of the types of diabetes complications. The microvascular complication on the firsthand is subdivided into three specific complications which are known as retinopathy, nephropathy, and neuropathy (Larkin et al. 2014; Hill 2009).

One of the microvascular complications known as diabetic retinopathy is medically known as a vascular complication which arises when there is a degeneration of the retinal capillaries after some years. Ocular hemorrhages, lipid exudate, the growth of new blood vessels and connective tissues are some of the characteristics of retinopathy. This retinopathy complication is one of the major reasons that results in blindness in people diagnosed with diabetes (Sue & Ramesh 2008).

There are quite a lot attached to the job specifications of nurses, but for the treatment and management of diabetes, there is a need for thoroughness, thoroughness in nursing assessment. This form of assessment is needful to mainly ensure that the correct diagnostic measurement regarding the diabetic complication known as retinopathy is ascertained. During treatment and management of retinopathy, the diabetic patient may have some forms of worries and complains due to the vitreous hemorrhage. These early signs of vitreous hemorrhage are known as 'floaters.' Floaters are also the early signs of vitreous hemorrhage that diabetic patients complain of when under treatment. In appearance, the floaters are smallish in size with black coloration laced with curtain-like materials across the field of vision (Sue & Ramesh 2008).

The description by the diabetic people can help provide better details on the macular involvement of a general deterioration of the color vision, an eye defect that is not corrected by the wearing of contact lenses or specially designed spectacles. The above-mentioned eye problem is the type that requires medical attention; the symptoms are also the type that possibly needs medical referral for emergency action. It is instead a matter of necessity to include the best available research or evidenced-based knowledge in the health education utilized to assist the people with diabetes and their family members in the process of self-care and self-treatment. The health education is part of the preventive strategy given to diabetic people to aid them in making decisions about changes in lifestyle and possessing control over their health conditions (Sue & Ramesh 2008).

Studies have shown that microvascular complications are preventable. Studies also show that diabetic microvascular complications can be delayed from causing further deterioration. Either delayed or entirely prevented, proper medical treatment is the only way of positively combating microvascular complications. It is, therefore, the job functions of the nurse to provide knowledge-based information and advice about the necessity of proper blood glucose management, levels, and control to the diabetic people and their family members (Sue & Ramesh 2008).

Neuropathy is a type of diabetic complications that is brought about by the damages done to microvascular circulation. It is the job of microvascular flow to make supplies to the peripheral and autonomic nerves of the body. The effect of neuropathy as a diabetes complication is felt on the feet of the body. On the other hand, another kind of diabetes complication known as autonomic neuropathy affects erection. It causes erectile dysfunction,

gastroparesis, and gustatory sweating. Some body disorders such as postural hypertension, diabetic diarrhea, eating and neuropathic bladder contribute to conditions that induce autonomic neuropathy. The neuropathies mentioned above are examples of diabetes complications that are often more difficult to medically treat. The only way of combating such neuropathies are through symptom reliefs. (Hill 2009).

Additionally, autonomic neuropathy is an exceptional kind of diabetes complications. Specifically, it promotes infection by causing a reduction in sweating, leading to dryness and cracking of the skin. Apart from the specificity of the neuropathy dangers, further resultants of neuropathy pose dangers to sympathetic nerves. These dangers in forms of damages cause the shunting of arterio-venus and facilitate bypassing of capillary beds found in the foot. The dangers of neuropathy don't just end at the foot of the affected body. It degenerates to the reduction of bone density and bone fractures. In the severity of cases, the reduction of bone density and bone fractures may further result in a condition known as Charcot's arthropathy. Charcot's arthropathy is a medical complication which occurs from diabetes, and it is characterized by deformation of the foot, which has a high possibility of suffering ulcerous infections. More so, the possibility of Charcot's arthropathy also indicates a possible loss of sensation to the foot of diabetes infected body. The loss of sensational feelings of touch is an aftermath of the damages caused to the nerves creates bodily repositioning, an abnormal foot positioning. The abnormality of the positions of the foot build up pressures on the areas that are vulnerable which then leads to the formation of callus. The stagey formation of callus with underneath necrosis further causes deterioration of the foot which leads to the formation of an ulcer (Hill 2009).

Nephropathy is a diabetes complication which is renowned for causing renal failures. It is an incremental basis; nephropathy is the most commonly certified cause of renal failure. Morbidity and mortality in diabetic patients are also medical disorders which are often caused by the complicated resultants of nephropathy (Hill 2009). On the second hand, the diseases and conditions that affect large blood vessels as a result of diabetes are primarily caused by macrovascular diabetes complications. The complications of macrovascular diabetes are felt majorly in the heart. They cause diseases in the heart and peripheral arterial parts of the body. The macrovascular complications also cause body stroke as a result of the heart malfunctions. As its name implies, the macrovascular diabetes complications are far more dangerous than the microvascular diabetic complications. The biological nature of the macrovascular diabetes complications shows how dangerous they are to the human body. The complications can

occur in body vessels, the vessels that convey blood from one part to all parts of the body. This occurrence also depicts that macrovascular complications can occur in any or whatsoever part of the body the blood gets to (Thompson & Lau 2015).

The following are indicators of the body that can instrumentally influence the levels of macrovascular complications: resistance to insulin, high levels of blood sugar and high cholesterol levels. Other possible contributors include abnormal blood clotting, smoking and high levels of blood pressures. Recent studies have shown that medical professionals including doctors are unable to explain why diabetes complications vary in different diabetic people categorically. Some diabetic people show various levels of macrovascular complications while some do not record any form of diabetic complications. It remains unclear how some people's body tissues and unknown factors can resist the damages that result in complications (Thompson & Lau 2015).

Cheiroarthropathy in type 1 diabetes has been studied in previous researches, during those researches, it was discovered that certain factors worsen the degree of macrovascular complications which further results in cheiroarthropathy. These conditions observed as risk factors include advancement in the age of the patients, long duration of diabetes, the presence of existent macrovascular complications and worse levels of glycemic control. These disorders are characterized to cause limitations of body functionalities and pains. Nevertheless, the treatable complications of macrovascular diabetic complications are unknown to people with diabetes and some healthcare providers due to the guidelines which are given by medical associations and regulatory agencies. The medical bodies tend to enjoin regular assessments and frequent examinations of diabetic people to monitor complications before the latter begins to show symptoms of cheiroarthropathy (Larkin et al. 2014).

The studies, DCCT carried out 1983-1993 showed the beneficial purposes of medical researches about diabetes. During this period of research, it was discovered that long-term complications of type 1 diabetes are preventable and delayable. The studies showed how INT insulin therapeutic approach was useful in curbing and slowing down the long-term diabetic effects. Higher prevalence of frozen shoulder and stiff hand syndrome were detected during a study of the epidemiology of diabetic people. The discovery was somewhat different when compared to the general survey population. The scholarly review showed how certain conditions, for instance, joint movements and limited joint mobility were responsible for the

stiff hand syndrome and frozen shoulders suffered by people with diabetes (Larkin et al. 2014).

The management of diabetes by medical institutions and healthcare practitioners has explicitly set out objectives. These objectives are to possibly prevent the growth and development of diabetes complications for diabetic patients and to marginally reduce the financial burdensomeness of treating diabetes by the young type 1 diabetic child, their family members, and NHS. These set out objectives are achievable in stagey processes which begin from with identification and knowledgeable treatment of factors. In as much as diabetes treatment is concerned, it is also a paramount thing for the healthcare providers to monitor, detect, possibly prevent and treat diabetes complications as they arise in diabetic people (Hill 2009).

In healthcare provisioning, education and continuous learning are necessities. This necessity is why the National Service Frameworks for Diabetes enjoins empowerment of individuals and caregivers, especially people with diabetes to have the adequate information towards self-care. One can successfully self-manage diabetes if one possesses the right knowledge and information. These knowledge-based educations or orientations include knowing how to identify, treat and multi-agency care of themselves or patients with long-term diabetes complications. Another postulate from the reviews of the National Service Frameworks for Diabetes said that all diabetic people should be given the annual diabetes review to help them in their checks, monitoring, and detection of early signs of diabetes complications. The study contains information on diabetes indicators, acceptable blood sugar and glucose levels, cholesterol levels and how to screen for other possible medical disorders that are related to diabetes (Hill 2009).

7 Critical Review

This work will be reviewed critically by looking into the reason for the study, its credibility, the method of collecting data as well as analyses. The topic of this work is the role of nurses as educators in preventing the complications of type 1 diabetes among young children. The study furthermore explored how nurses can uphold the well being of these young children. Based on the reviewed articles, it became apparent that the study of the role of nurses in preventing the complication of type 1 diabetes is fragmented. On the one hand, some

reviewed studies appear to be focusing exclusively on the personal development of the nurses relating to the treatment of diabetic complications while neglecting the complication and consequences of type 1 diabetes. On the other hand, some articles were focused on the actual complication and symptoms of diabetes with little or no information about the role of nurses or treatment process. Therefore this current study attempt to present a holistic view of both diabetes complication and the role of nurses in the treatment process by combining the two aspects of the study with the hope of expatiating more on how not only the patients but the nurses can acquire continuous education in preventing diabetes complication.

This study also has its limitations. For instance, by utilizing content analysis as the sole method of data collection and analysis, this study produced an outcome with limited empirical validation. The research would have benefited from real life experiences of nurses practicing in Finland as well as conducting a direct observation of type 1 diabetes patient in a selected geographical area. However, such empirical studies would require a considerable amount of time and resources. For example, the extended duration of time needed to follow the caregiving process which may be too tedious for a bachelor degree thesis. It is therefore recommended that the limitation of this study should be taken into consideration in future studies.

Although the study relied only on content analysis, two categories of the result were obtained that could potentially have a useful application for nurses which is already discussed in the result section. Underpinning these results is the Dorothea Orem self-care deficit theory of nursing which posits that "*nursing is a **response** of human groups to one recurring type of incapacity for action to which human beings are subject. Namely, the incapacity to care for oneself or one dependence when action is limited because of one's health state or the healthcare need of the care recipient"* (Orem 2001, p.149). Unlike the recommendation of the Dorothea theory, which tends to suggest a **responsive or reactive** approach to caregiving, the roles identified in the literature review instead indicate that caregiving should be more **proactive**. In this way, patients can be empowered and thereby reduce the limit of their deficiency through the **active** role of nurses in continuously educating them as well as educating themselves.

Since this work is based on literature review, the data were therefore analyzed using content analysis as it is the most appropriate method to analyze the materials collected for this study. Making use of the search engine FINNA and databases such as EBSCO, CINAHL and

Google scholar, articles which were essential for this study were compiled together. The information's which the author gathered together was then deductively analyzed because this study was established on preceding knowledge from theories, as well as literature review.

Polit and Beck (2012; 584-585) explain how Lincoln and Guba proffers four criteria used to check the trustworthiness of the data used in the study. These criteria include credibility, dependability, confirmability, and transferability.

Credibility refers to an assertion in the accuracy of the data collected and its analysis. Dependability and credibility are related. Therefore, dependability necessitates a consistent approach that findings match up to supporting data. Confirmability evaluates how neutral the respondent was, by doing away with bias and personal motivation while transferability involves the shifting to other contexts such as settings or people, when the qualitative findings in a study are relevant (Polit & Beck 2012; 584-585).

The author had systematically done the content analysis by reading all the 12 articles thoroughly and excluded the materials which did not meet the inclusion criteria. Nevertheless, these 12 articles were a combination of articles from the United States and Finland. Existing relevant literature was used for data collection, and Dorothea Orem's theory was found suitable for this work. Nevertheless, this study is far from being conclusive in that further studies should continue from here; thereby supporting that transferability criterion applies to other contexts.

8 Discussion

This study focuses on understanding the central role of nurses in educating young diabetic patients on how to prevent the complication of the type 1 diabetes disease, because the challenges posed by the disease in the healthcare industry, particularly in Finland are significant. Hence the interest to investigate how to prevent the complication of type 1 diabetes and the roles of nurses in preventing the complication of type 1 diabetes among young children. Research findings indicate that Finland has the highest rate of diabetes incidence in the world (DEHKO 2001).

However, this study found that there are two major types of preventive strategies to handle the disease. The first is a more generic strategy in which general guidance is provided to the patients and their families irrespective of the specific details of the type of complications. The goal of the generic strategy is to engender self-empowerment of the patient. The second preventive strategy is more customized to the specific type of complication than the generic approach.

The qualitative research design was used for this study. The use of the qualitative method of research was to reflect on what has already been known or learned. This type of research design was helpful in providing answers to the research questions: 1) what are the roles of nurses in preventing the complication of type 1 diabetes among young children.

Research findings show that there is no way to prevent type 1 diabetes, the condition has nothing to do with diet or lifestyle. The disease happens when the secreting insulin cells which are the pancreatic cells are destroyed thereby abating the production of insulin in the body (DEHKO 2001). Without insulin, the hormone needed to get energy from food, blood sugar levels become higher than usual, and that causes health problems. Type 1 diabetic people need to take insulin for the rest of their lives. Studies finding indicate that preventing diabetes complications by type 1 diabetic people can help in the prevention or delaying of its development by placing to a target range their blood sugar. They as well need regular medical checkups to detect early signs of complications. If complications are treated early, studies suggest, the damage may be stopped, slowed, or possibly reversed. Research results show that

diabetes can cause other health problems which can affect the heart, eyes, nerves, and kidneys and increase the risk for complications from type 1 diabetes (Hill 2009; Larkin et al. 2014).

Study findings show that treatment of diabetes aims to alleviate the symptoms, maintain the quality of life and slow the advancement of specific and non-specific complications. Nurses play a pivotal role in pursuance of this objective through educating diabetic patients on self-management. Therefore, if not appropriately educated on self-management, it can lead to self-assumption as well as affecting the self-esteem and confidence, promoting reasoning that is absurd (Cooke & Plotnick 2008). Additionally, self-management skills are the essential part of diabetes care, and with the help and support of nurses, the condition can be managed to help people stay healthy and prevent complications (Kenny & Corkin 2013).

Notwithstanding, continuous education of nurses is a noteworthy part to augment care of the type 1 diabetes people as seen in the results. Nurses should have a proven capacity in skills and knowledgeable in the promotion and production of recommendations that are standard for the care and management of diabetic people. However, evidence-based display of proof, open discussion and follow-ups through phone calls should continue to prevent tedious repetition and routine (Larkin et al. 2014).

9 Conclusion

The study aimed to expatiate on the role of nurses as educators in preventing the complications of type 1 diabetes among young patients. This study was determined because of the interest the author has in pediatric nursing as a future career option.

In this study, type 1 diabetes is seen as a health condition whereby the pancreas is not able to produce insulin which then brings about sugar levels in the blood which is higher than how the normal levels should be in the blood. As seen, the treatment for this type 1 diabetes is mainly insulin. Even though it cannot be prevented, yet, to avoid or delay the progress of its complications, some steps can be taken, which is by keeping blood glucose level at the targeted level. The use of education to educate as well as inform the people with type 1 diabetes or their family members on self-care should be utilized by the nurses to enable the prevention of type 1 diabetes complications. The importance of this is that it helps in the

reduction of diabetes complications occurrences amongst young children and as well, helps to do away with the psychological trauma that comes with it and the burden of so much cost in the treatment of its complication.

The method which was chosen for this study by the author proved to be a little harder than as initially envisaged. This difficulty is because, when reading the summary of the articles searched which gave lots of results, it was disappointing to find out that most of the materials were not in any way fit for this study. More so, the search results had a lot of duplicates, and some of the ones which I could have found suiting for my research is in Finnish. Conducting interviews with the nurses, the careers or the parents, including the children with type 1 diabetes could have been more interesting, but since such empirical studies would require a considerable amount of time and resources as I have explained previously. Hence, I am content with the choice taken to do a review of other articles.

In the curriculum of nursing degree at Novia, University of Applied science, there is so very little information on type 1 diabetes and especially, nurse's role as educators to people with type 1 diabetes. Therefore, to other interested students in this area, this study could be of good value. A future study could be conducted to look into why there is confusion between type 1 diabetes and type 2 diabetes. Is there lack of proper equipment to check, or are the symptoms alike or is it that they are not aware of the differences? The author would further recommend studies on the psychological impact of treatment of type 1 diabetes complication among children.

In my opinion, this study could be useful as it shows how important it is to give proper information before an intervention because the emotions patients are feeling can be relieved by providing helpful information on how to salvage the situation to avoid escalation. Nevertheless, nurses should do their best to be role models themselves to children with type 1 diabetes, through continuing education to update their knowledge more at all time about the disease.

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Table 1: Summary of Articles used in this study

Bibliographical data	**Aim**	**Research Method**	**Result**
Peate, I. (2012) What Makes a Good Nurse? *British Journal of Nursing 21 (10).*	To understand if one can make a good nurse or if the attributes are innate.	Conceptual paper.	Presentation of the complexities associated with clearly defining the specific characteristics of a good nurse.
Sy, V. (2016) Empowering Staff Nurses As Primary Educators To Children With Type 1 Diabetes. *Pediatric Nursing 42 (5).*	Goes to highlight the method adopted by clinical nurse specialists in providing support to staff nurses who get saddled with the task of giving primary education to child patients who have type 1 diabetes and their caregivers.	Qualitative study. (An intervention program).	Staff nurses got equipped with the knowledge and skills required to educate their pediatric type 1 diabetes patients effectively. A new sense of confidence was gained, and dependence on the clinical nurse practitioners for practical support diminished significantly. The continuing education that clinical nurse practitioners provided to staff nurses proved to be sufficient.
Burke et al. (2014) Partnering With Diabetes Educators To Improve Patient Outcomes. *Diabetes, Metabolic Syndrome, and Obesity: Targets and Therapy Journal, volume 7.*	An examination of the place of collaboration between diabetes patients and credentialed diabetes educators in achieving overall efficient self-management levels of the disease.	Qualitative descriptive and exploratory design with an inductive approach.	Findings that show that the role of education and training (DSME) for achieving a patient-centered approach to self-management of diabetes cannot be over emphasized. DSME programs must be tailored to suit individual needs of patients with the view of guiding them towards attaining lifestyle changes that help keep diabetes-related complications at bay.

Chase et al. (2015) Nurses As Educators: A Critical–Thinking Acronym for Diabetes Care. *MEDSURG Nursing Journal 24 (6).*	To make the work of clinical nurses easier by developing a comprehensive acronym that would assist in making accurate diabetic patients' assessment. This way, nurses will not miss any components in the assessment process vital to making critical decisions on a routine basis.	Interviews with clinical nurses.	The acronym TAPIT has been a successful venture, and it made clinical nurses more open to engagement. They found it very practical that and helpful in dealing with the patients. In all, more competence levels have been achieved.
Larkin et al. (2014) Musculoskeletal Complications in Type 1 Diabetes. *Diabetes Care Journal, volume 37.*	To delineate the pervasiveness of cheiroarthropathy in the typical diabetes control and complications trial/epidemiology of diabetes interventions and complications (DCCT/EDIC) and to appraise risk factors, complications of the macrovascular system and the impact of impact of DCCT therapy on its development.	Quantitative cross-sectional analysis.	Cheiroarthropathy found in 66% of the sample. 64% of the INT group and 68% of the CONV group; P= 0.1640) linked with age, sex, diabetes, duration, skin intrinsic fluorescence, HbA1c neuropathy, and functional retinopathy (P< 0.005 for each) DASH functional disability scores were worse among subjects with cheiroarthropathy. (P< 0.0001)
Gubitosi-Klug, R. (2014) The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications Study at 30 Years: Summary and Future Directions	To tackle the missing links with knowledge around type 1 diabetes and the implication of intensive therapy to complications in the long term.	Mix of quantitative and qualitative research methods.	The DCCT/EDIC are still very relevant for making advances in research around type 1 diabetes and its many long-term complications.

Diabetes Care Journal, volume 37			
Hill, J. (2009) Reducing The Risk of Complications Associated With Diabetes. *Nursing Standard 23 (25)*	To shed more light on essential facts, nurses need to pay attention to in managing diabetes and its associate long-term complications.	Qualitative study: inductive content analysis.	Diabetes can potentially damage the microvascular and macrovascular circulation systems. The damage can lead to retinopathy, neuropathy, and nephropathy. Further, cardiovascular, cerebrovascular and peripheral vascular diseases are not uncommon. With the view to achieving consistent improvement in the overall standard of living, disciplined regulation of glucose levels, blood pressure, and cholesterol remains one central task of the nurse which the patient equally needs to own.
Sue & Ramesh (2008) Ocular Complications Associated With Diabetes Mellitus. *Nursing Standard 22 (27)*	An evaluation of treatment models for addressing diabetes-induced ocular complications. An exposition of the nurse's pivotal position in preventing deterioration of the patient's eyesight and improving the general quality of life.	Qualitative study: inductive content analysis	The following routines are indispensable in the successful management of diabetes and prevention of ocular complexities. * Close and regular monitoring of blood sugar. * Thorough education of the patient on how to effect and maintain lifestyle changes. * Regular consultation with the optician at the diabetes eye clinic. * Nurses' constant self-development and onward education of patients on best self- management routines and referral to

			relevel support groups.
Dart et al. (2014) Earlier Onset of Complications in Youth With Type 2 Diabetes. *Diabetes Care Journal, volume 37*	An assessment of the dangers associated with convolutions of type 2 diabetes in young people.	Quantitative data analysis.	Higher risks of emergence of complications among youth with Type 2 diabetes were recorded. Rates at which these complications arose soon after diagnosis were higher among young patients with type 2 diabetes over their counterparts who suffered from type 1 diabetes. Increased predisposition to renal and neurologic complications, dialysis, blindness, and amputation.
Varjus et al. (2011) Professional autonomy of nurses in hospital settings. *Scandinavian Journal of Caring Science, volume 25*	To provide clarification of the concept of autonomy as it concerns nurses in the context of the hospital and nursing practice generally. An elucidation of several previous studies on the autonomy of nurses.	A qualitative content analysis.	Many definitions of the concept have been loose, lacking complete clarity and intelligibility. The same has been the case with its measurement. There have been somewhat narrow approaches taken in broaching the topic. However, on a theoretical level, the concept has generally been consistent but might vary in practice from country to country as the health systems differ. There is a need for further research to obtain more comparable data and widen knowledge.
Thompson, Gregory. & Lau. David, (2015). Macrovascular Diabetes Complications-	Providing professional education for diabetes patient on the complication of diabetes especially the macrovascular diseases.	A qualitative analysis based on professional experiences of the authors.	A table showing different complications of diabetes, consequences as well as symptoms.

Topic Overview. *Electronic Medical Journal - WebMD*			
Kenny & Corkin (2013). A children's nurse's role in the global development of a child with diabetes mellitus. *Journal of Nursing Children & Young People.*	To discuss the developmental stages of a child with type 1 diabetes and how the glycaemic control is productive for their general progress.	A mix of quantitative, qualitative reasearch methods.	The result showed how crucial it is to carry out a precise control of the type 1 diabetes condition to achieve all-round normal development.

Table 2: Matrix of Data Collection

Search Term	**Database**	**Hits**	**Downloaded**
Diabetes	Google scholar	90	3
Nurse care taker	EBSCO Host	35	1
Diabetes patients' educators	EBSCO Host	40	1
Diabetes prevention	EBSCO	70	2
Diabetes Complications	CINAHL	85	2
Role of nurses in healthcare	EBSCO	30	1
Characteristics of a good nurse	EBSCO Host	30	1
Factors causing diabetes	EBSCO Host	35	1