



FACULTY OF HEALTH AND OCCUPATIONAL STUDIES
Department of Caring Sciences



NURSING DEPARTMENT,
MEDICINE AND HEALTH COLLEGE
Lishui University, China

Persons' experiences of having type 2 diabetes

A descriptive review

Hang Lin (Dale) & Gu Jiaying (Janine)

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Supervisor: Zhao Lei (Charlie)
Examiner: Annakarin Olsson

Abstract

Background: Type 2 diabetes accounts for 90% of people diagnosed with diabetes, which is a major public health problem. This chronic disease inevitably affects their lives which may be physical or psychological. And people have complex feelings and experience about living with type 2 diabetes.

Aim: To describe the experience of person having type 2 diabetes.

Methods: Scientific articles on qualitative methods are searched from PubMed and Cinahl databases, and limited terms are given. Then, filter the articles according to inclusion and exclusion criteria. Based on the aim and research question, this paper makes an objective analysis of 10 articles.

Results: Four main themes resumed from persons' experiences of having type 2 diabetes from 10 studies. Themes were: emotion change (Attitudes after diagnosis of diabetes, living with diabetes), behavioral change (Daily life behavior change, medical seeking behavior change, social behavior change), support provides the ability to cope with the disease, management of diabetes (Self-management of the diabetes, challenges to self-management).

Conclusions: After having type 2 diabetes, different people may have different attitudes. Negative attitude and the influence of emotional distress can affect the patient adapt to their change well and can't deal with diabetes well by themselves. Besides, the support provided can enhance the effect of self-management. And the nurse and other medical staffs should provide personalized and detailed care to them to help them adhere to their self-management.

Keywords: Diabetes mellitus, Type 2, Experience

摘要

背景：2 型糖尿病占被诊断患有糖尿病的人的 90%，这是一个主要的公共健康问题。这种慢性病不可避免地影响了他们的生活，可能是身体上的，也可能是心理上的。人们对患有 2 型糖尿病有着复杂的感受和体验。

目的：描述 2 型糖尿病患者的经历。

方法：从 PubMed 和 Cinahl 数据库中检索关于定性方法的科学文章，并给出有限的术语。然后，根据包含和排除标准过滤文章。基于研究目的和研究问题，本文对 10 篇文章进行了客观分析。

结果：四个主题从 10 项研究中归纳了 2 型糖尿病患者在诊断后的经历。主题是：情绪变化(糖尿病诊断后的态度、糖尿病患者)、行为变化(日常生活行为变化、就医行为变化、社会行为变化)、支持提供应对疾病的能力、糖尿病管理(糖尿病自我管理、自我管理挑战)。

结论：患有 2 型糖尿病后，不同的人可能会有不同的态度。消极态度和情绪困扰的影响会影响患者很好地适应自己的变化，而不能自己很好地应对糖尿病。此外，支持可以增强自我管理的效果。护士和其他医务人员应该为他们提供个性化和细致的护理，帮助他们坚持自我管理。

关键词：2 型糖尿病，经历

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Figure 2. The themes and subtitles of the results

1. Introduction

1.1.1 Epidemiology of type 2 diabetes

Type 2 diabetes is the main type of DM, which is a chronic disease occurs when the pancreas cannot produce enough insulin or when the insulin can't be used effectively by the body (WHO, 2018; Su *et al.*, 2019). Hyperglycemia is a common symptom of uncontrolled diabetes, which will seriously damage many systems of the body, especially nerves and blood vessels, with the passage of time (WHO, 2018). Researchers use the WHO's definition for type 2 diabetes.

At present, diabetes mellitus (DM) has become a worldwide epidemic disease. Diabetes is one of the main causes of death in the world. It is estimated that there are 422 million people around the world have diabetes (WHO, 2018). Especially, the type 2 diabetes is one of the most common type, which is due to the ineffective use of insulin by the body (WHO, 2018). Type 2 diabetes mellitus is the third major health risk factor after cancer and cardiovascular disease (Su *et al.*, 2019). According to the articles in 2013, the population of type 2 diabetes in China has reached to 11.6% (Su *et al.*, 2019). As a chronic disease, type 2 diabetes has a lasting impact on the life of the people. This disease will accompany with them along their life due to it can't be cured and will influence them both mentally and physically. So people may have complex experiences.

1.2.1 Pathophysiology

Type 2 diabetes is characterized by two major defects, that is, insulin resistance, which is produced by increasing the use of glucose in the liver and reducing the use of glucose in the tissue, mainly from the muscle, and decreasing insulin secretion from cells (Haddad &Haddad 2018). Insulin resistance is the core pathophysiological defect in patients with type 2 diabetes (Mishriky *et al.*, 2018). In patients with type 2 diabetes secondary to over-nutrition and energy balance, relative (but not absolute) insulin deficiency plays a key role in the development and progression of the disease (Mishriky *et al.*, 2018).

1.2.2 Complications from type 2 diabetes

Type 2 diabetes can cause many complications including acute and chronic diseases. Chronic complications includes vascular complication which includes microvascular, large vessels complications and diabetic neuropathy. ①Microvascular: nephropathy, renal disease and/or proteinuria, retinae thy and neuropathy (Kosiborod *et al.*, 2018). ②

Large vessels: coronary heart disease, cerebrovascular disease, peripheral arterial disease, heart failure and implantable cardioverter defibrillator use (Kosiborod *et al.*, 2018). ③
Diabetic neuropathy: with a prevalence of about 60%, it is the most common form of neuropathy in developed countries, and the most common form is symmetrical diabetic peripheral neuropathy (DPN). It mainly affects the lower extremities and affects the risk of subsequent ulcers, amputations and disabilities (Ghavami *et al.*, 2018).

1.2.3 Risk factors

Type 2 diabetes has many risk factors. There are some risk factors listed as follows. To optimize blood glucose levels and prevent diabetes complications, drugs are essential for most type 2 diabetes patients, which is the first choice (Wang *et al.*, 2019). Drug includes pioglitazone, metformin, saxagliptin and so on. But with the use of the hypoglycemic drugs, the side effect of the drugs will affect diabetics. In the result of pioglitazone treatment, the patient reported side effects of nasopharyngitis and headache and some also cause bladder cancer (Riaz *et al.*, 2018). Also, nasopharyngitis can increase hospitalization due to hearing failure (Haddad &Haddad 2018). So far, human epidemiological studies have consistently shown that patients with diet-related obesity and/or type 2 diabetes have an increased risk of cancer, more aggressive cancers and poor response to current treatments (Warr *et al.*, 2018). Using insulin also have risks, although, the treatment of type 2 diabetes with insulin can reduce microvascular complications, insulin can induce and aggravate hyperinsulinemia (Mishriky *et al.*, 2018). This hyperinsulinemia can cause side effects such as insulin resistance, weight gain, hypoglycemia, hypertension and dyslipidemia (Mishriky *et al.*, 2018). The resulting low blood sugar and weight gain can lead to a vicious cycle (Mishriky *et al.*, 2018). Low blood sugar and the fear of it can lead to increased carbohydrate intake, which can lead to weight gain (Mishriky *et al.*, 2018).

1.2.4 Nursing interventions

The intervention of type 2 diabetes includes reducing blood sugar, increasing physical activity, weight loss and proper foot care (Ghavami *et al.*, 2018). These intervention can help patients lose weight and prevent diabetes complications. Also, nurse should educate the patient to enable them self-management. Self-management like exercise and control diet which can increase physical activity and reduce body fat by limiting the amount of calories in the diet (Zubrzycki *et al.*, 2018). Low-calorie diets include a 25 to 30 percent reduction in daily calorie intake (Zubrzycki *et al.*, 2018). Such as the "mediterranean diet"

refers to the eating habits traditionally followed by people living along the mediterranean coast (Domínguez *et al.*, 2019). It is characterized by a large consumption of vegetables, monounsaturated fatty acids (mostly from olive oil), fruits, whole grains, beans and fish, moderate consumption of dairy products, fish and red wine, and low-consumption red or processed meat (Domínguez *et al.*, 2019). The Mediterranean diet is considered one of the healthiest dietary patterns (Domínguez *et al.*, 2019).

1.2.5 Pharmacological and non-pharmacological Treatments

The treatment of type 2 diabetes focuses on reducing hyperglycemia and managing associated vascular risk factors such as hypertension, dyslipidemia and proteinuria (Lee *et al.*, 2017). Proper understanding of diabetes management goals is associated with better blood glucose control and improved self-care for diabetes (Gopalan *et al.*, 2018). Until the 1990s, the treatment options for type 2 diabetes were insulin, sulfonylureas and biguanides (Mishriky *et al.*, 2018). In addition, new non-insulin drugs can improve the morbidity and mortality of cardiovascular diseases (Mishriky *et al.*, 2018). In the study of early short-term intensive insulin therapy, insulin therapy is helpful for rapid blood sugar control and reversal of glycototoxicity. But long-term insulin use seems to be neutral (Mishriky *et al.*, 2018). Intensive non-insulin therapy may be more effective than insulin in patients with overweight or mild obesity and poor control of type 2 diabetes mellitus, and gain less weight (Mishriky *et al.*, 2018). In addition, weight-loss surgery may be a better option for patients who have failed several times in non-insulin therapy than insulin supplements (Mishriky *et al.*, 2018). Therefore, reducing nutritional load through lifestyle changes and/or non-insulin medications may be more beneficial for patients with insulin resistance (Mishriky *et al.*, 2018).

1.3 Roy's Adaptation Model

Adaptation model are put forward by Roy (Jennings, 2017). Roy sees the man as a whole and person's functioning may be enhanced or reduced by internal or environmental stress (Flanagan, 2018). The basic content of the mode includes stimuli, adaptive level, coping mechanism, adaptive mode and output (Jennings *et al.*, 2017). Three stimuli (i.e., context, focus, and residual) constitute the adaptive level and are constantly changing in response to the interaction between humans and the earth (Jennings 2017). Stimuli include context, focus, and residual stimulus (Jennings 2017). Focal stimulus is the direct and obvious cause of this problem (Roy, 2009). Contextual stimuli are other causal factors, residual

stimuli related to one's past experiences, and how those experiences affect one's current predicament (Roy, 2009). Residual stimuli are internal or external environmental factors that may affect the status quo, but the effects of these variables are unknown or unclear (Jennings 2017). Residual stimuli change as individuals interact with a changing environment (Jennings 2017).

Adaptation level: a person's ability to effectively adapt to stimuli depends on his level of adaptation, situational needs, and preexisting life processes. Coping mechanism: coping processes: are "innate or acquired ways of interacting with a changing environment." Innate coping mechanisms: are determined by genes or Shared by species and are often seen as automatic processes. Humans don't have to think about them. Acquired coping mechanisms: Coping mechanisms are developed through strategies such as learning.

The experience of one's life contributes to the habitual response to a particular stimulus adaptive modes: are manifested in four key adaptive patterns: interdependence, physiology, role function and self-concept. Roy's model proposes four concepts called adaptive models: physiology, self-concept, role function and interdependence (Flanagan, 2017). Four adaptive modes are the ways in which human systems respond to stimuli from the environment (Flanagan, 2017).

1.4 The nurse's role

The nurse's four basic responsibilities are promoting health, preventing diseases, relieving suffering and keeping health (International Code of Nurses (ICN, 2010)).

Diabetes specialist nurses play an important role in providing self-management support and diabetes education for patients and their families (Boström *et al.*, 2013). Diabetes patients might suffer mental burden and have physiological change and social fear (Moayedi, 2015). Nurse can provide initial education about diabetes, sick day management, hypoglycemia management and glucose self-monitoring and inform them of injection technique (Kenealy *et al.*, 2004). Nurse can give diabetics dietary suggestions and help obese people to lose weight (Kenealy *et al.*, 2004). Nurses can assist the patients to adapt to the disease, understand the feelings and assist them overcome the mental obstacles. Thus, nurses are like a manager, guider, educator, researcher, and so on for patients (International Code of Nurses (ICN, 2010)). They can guide and support them by means of understanding the experience they encounter.

1.5 Earlier reviews

The earlier reviews focus on the treatment of type 2 diabetes such as medicine and insulin treatment (Ajuwon *et al.*, 2018; Li *et al.*, 2019; Mishriky 2018; Ku & Liang 2018; Lee *et al.*, 2018; Haddad& Haddad 2018) including the effect of South African Herbal (Ajuwon *et al.*, 2018), the effect of hypoglycemic drugs (Li *et al.*, 2018) and the effect of insulin using (Mishriky 2018; Ku & Liang 2018). The new development of diabetes treatment (Lee *et al.*, 2018). Haddad's review introduce the past decade's diabetes treatment and future challenges (Haddad& Haddad, 2018). Besides, the earlier reviews focus on the nursing intervention of type 2 diabetes such as control (Yamada *et al.*, 2018; Mandecka & Ilow , 2018) and self-management (Stephani *et al.*, 2018) .

1.6 Problem description

Diabetes is a worldwide epidemic disease with serious complications. And it has a negative impact on the life of the people. The health of the people with type 2 diabetes has attracted much attention. However, the inner thoughts of the people with diabetes should also attach our attention, diabetes can influence people's quality of life. After reading many reviews about the people with type2 diabetes, the most of the articles are treatment ways about the medicine' s effect used in the diabetes people or the nursing interventions to control the diabetes like diet control and self-management. There are few articles are about patient's experience. However, our article focuses on the people's experience about the changes that caused by type 2 diabetes. Studying on people's experience has great research significance. For nurse, they should know about the patients' feelings so that can provide mental nursing to them and improve nursing quality. For patients, it can let them have a positive mentality for future's life. For future's research, it can fill in this research areas blank.

1.7 Aim and research questions

The aim of the literature review was to describe persons' experiences of having type 2 diabetes.

- How do persons describe the experiences of having type2 diabetes?

2. Method

2.1 Design

The study was a descriptive review (Polit & Beck, 2012).

2.2 Search strategy

The following search terms was used when searching for articles for the study: Experience (free text) and Diabetes Mellitus, type2 (MeSH). Relevant terms were used MeSH (PubMed) and Headings (Cinahl). First, terms were searched separately and then combined them together to search again. The results we found were limited by using the Boolean search operator 'AND' (Polit & Beck, 2012).

Limits were used so as to gain a related outcome of the aim. In PubMed, limits included 5 year (Publication date 2013-6-01 – 2018-6-30), language in English and assess from HIG and in Cinahl the limit terms is 5 years (Publication date 2013-6-01 – 2018-6-30), language in English (see table 1). For the sake of making the search process more clearly, see table 1.

Table 1. The results of database searches

Database (search data)	Limits and search data	Search terms	Number of hits	Possible articles (excluding doubles)
Medline via PubMed 2018.6.30	5year, English, assess from HIG	Experience (free text)	123052	
Medline via PubMed 2018.6.30	5year, English, assess from HIG	Diabetes Mellitus, Type 2 (MeSH)	27309	
Medline via PubMed 2018.6.30	5years,English, assess from HIG	Diabetes Mellitus, Type 2 (MeSH) and Experience (free text)	502	9
Cinahl 2018.6.30	5years, English	Diabetes Mellitus, Type 2 (free full text)	21,025	
Cinahl 2018.6.30	5years, English	Experience (free full text)	109,400	
Cinahl 2018.6.30	5years, English	Diabetes Mellitus, Type 2 AND Experience (free text)	641	1
				Total: 10

2.3 Selection criteria

For the sake of making the selection process more clearly, we made the flow chart according to inclusion and exclusion criteria (see Figure 1).

The inclusion criteria:

- ① Should be related to the purpose of reviewing research (that is, experience of the people who have type 2 diabetes).

- ② Empirical scientific articles using qualitative methods.
- ③ Articles include all ages (include children but children are very few in the articles)

The exclusion criteria:

- ① The articles involve only the nurses' experience and treatment of diabetic patients, and other review studies and articles about type 1 diabetes.
- ② Articles don't conform to the aim of the article and articles are not following IMRAD including Introduction, Method, Results and Discussions are also excluded.
- ③ Articles exclude one person having other diseases other than type 2 diabetes.

2.4 Selection process and outcome of potential articles

First, browse the title and abstract of the article to decide whether they may be useful to answer the aim and research question of the literature review. Subsequently, these articles will be read more carefully to determine whether they are related to literature review. Each step will be explained carefully. The articles were selected for 30 from PubMed and were selected 5 from Cinahl after reviewing the titles. Then, after reading the results of articles were chose from PubMed and articles were chose from Cinahl.

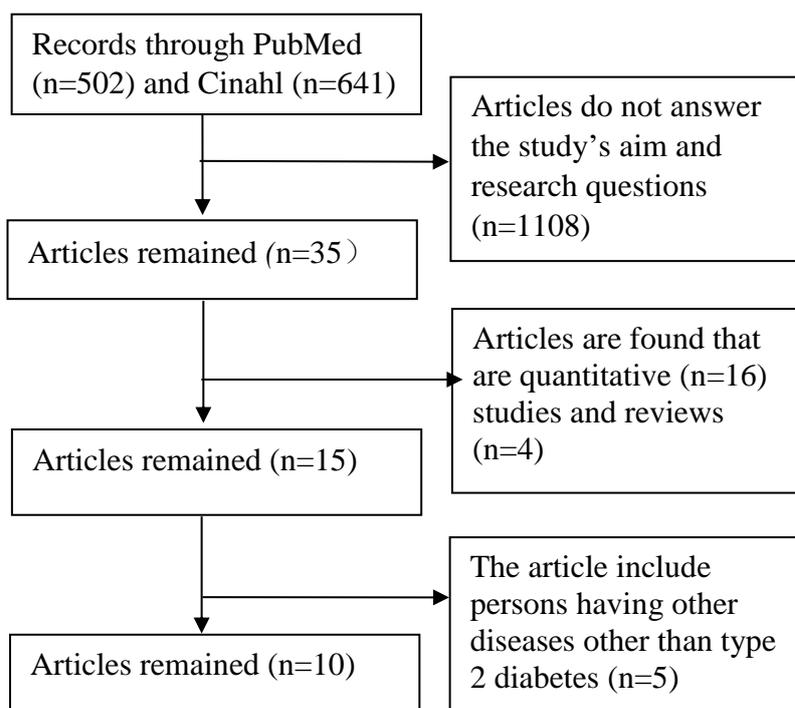


Figure 1: The selection process of articles

2.5 Data analysis

According to the research question, the results of the selected articles are dealt with. All of the articles are read by each authors and then read together several times. It was found that the articles related to research question are sort by the initials of the author's last name and are coded in letters in order to be easily analyzed. In order to fully understand the articles included, the author uses different tables including Appendix table 2, table 3, table 4 and table 5 and makes it easier to analyze the materials. In Appendix, table 2, it summarizes the authors, titles, design, data collection and data analysis of the selected articles. Then, concentrating the information further and forming into study findings which is the main idea of the researchers, which can be seen in Appendix, table 3. What's more, the researchers conclude the study findings and classify them and come into being categories which is the subtitles of the result (please see figure 2), the produced categories are subjected to a meta-synthesis to produce a comprehensive set of synthesized findings, which can be found in Appendix, table 5. The synthesized findings is the theme of the result (Lommi *et al.*, 2015).

2.6 Ethical considerations

The authors objectively read and comment on articles without being influenced by their own views and attitudes. The results are presented completely and the content of the article is presented objectively. The results were not changed according to the author's subjective wishes.

3. Results

This review is based on studies conducted in many different countries: Singapore, Bangladesh, England, Indonesia, Denmark, Sweden, Vietnam and Canada. This strengthens the global transferability of research. The literature review shows that type 2 diabetes is a global issue in different cultures. None of these studies has been conducted in China, which is a limitation that may limit the transferability of nurses in clinical practice in the country. However, three of these studies were conducted in Vietnam, Bangladesh and Singapore, a country in Asia with a similar medical system and social structure to China, which may increase transferability to some extent.

The results are based on 10 qualitative articles and these articles introduce the themes and sub-themes are presented in figure 2. The results are presented in text and as tables (Appendix).

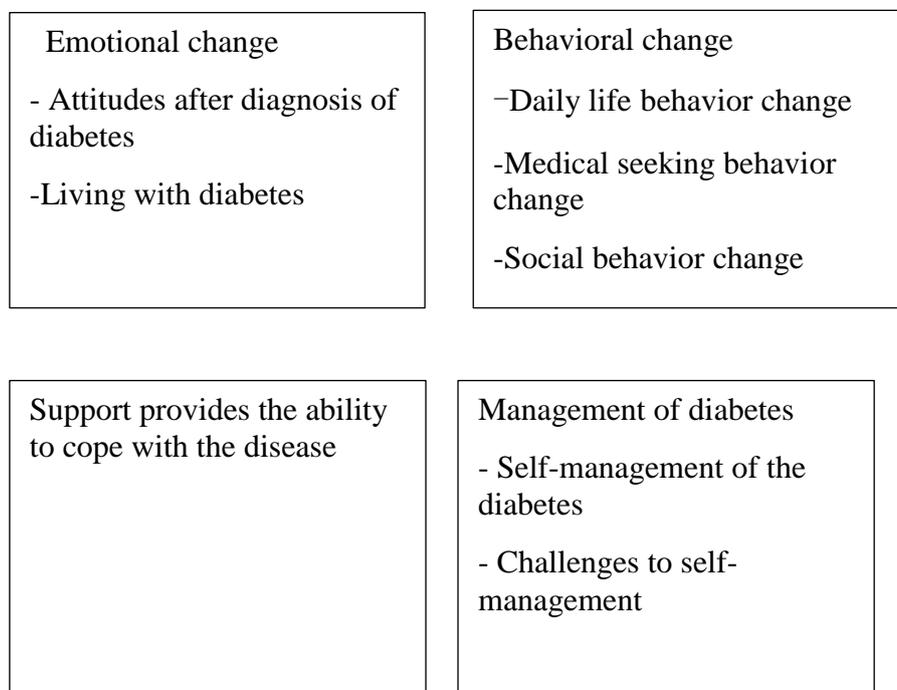


Figure 2: The themes and sub-themes of the results.

3.1 Emotional change

3.1.1 Attitudes after diagnosis of diabetes

People express attitudes towards diabetes, for example, they wasn't surprised and worried about the diabetes and some people think their life is normal like before (Li *et al.*, 2013; Wallace *et al.*, 2016; Wilkinson *et al.*, 2013) .

Some people felt a transient relief after diagnosis of diabetes because they can define their diabetes and restored their dignity (Ekong *et al.*, 2013). Some people thought the life was same as the life before if they controlled their disease well (Li *et al.*, 2013). Some people wasn't surprised about the diagnosis of diabetes because of the irregular life style (Wallace *et al.*, 2016). Some people thought they can forget it and adapted to it when they were occupied with the job and some people didn't worry about it (Wilkinson *et al.*, 2013). These all indicate that they have a positive attitude toward diabetes. Some people reported the feelings of shock, fear, disbelief, helplessness, denial and anger (Ekong *et al.*, 2013; Murphy *et al.*, 2017; Wilkinson *et al.*, 2013). Some people experienced emotion burden including denial and anger and described this disease as “dirty” and “binding” (Ekong *et*

al., 2013). It expressed that their fear of death and was afraid of losing the normal life before (Ekong *et al.*, 2013). What's more, the collapse for the poor were heavy because the expenditure of the disease can increase their economic burden (Ekong *et al.*, 2013). Sometimes the experience in the childhood can influence them, the people felt bad because in the childhood she or he always heard that someone was dead because of type 2 diabetes (Ekong *et al.*, 2013). So when he or she was diagnosed with diabetes, she or he just felt the life was collapsing (Ekong *et al.*, 2013). Also, they may have difficulty in eyesight and can't carrying out many family responsibilities, one patient said "*I am a person with an independent personality, and now I have to depend on others for everything. I feel bad! I feel very bad!*" and one patient were disturbed by foot pain and can't sleep well so she felt depressed and another patient said "*My knee pain was very annoying and I was feeling very bad. I could not eat and sleep* (Ho *et al.*, 2018) !" After diagnosis of diabetes, they didn't want to accept this situation and felt guilty (Murphy *et al.*, 2017). They refused, "*No this is not possible, how did I get this disease? Where did I get it? Did she give me this disease* (Murphy *et al.*, 2017)?" Some people expressed that they were unexpected, surprised, upset and disappointed (Wilkinson *et al.*, 2013). Some people denied the diagnosis and appeared emotional breakdown, they don't have enough knowledge of managing their disease (Graffigna *et al.*, 2014).

3. 1.2 Living with diabetes

When they are diagnosis of diabetes, this disease will accompany with them. One aspect is negative. Some people felt having diabetes was like a slave and loss of freedom (Graffigna *et al.*, 2014). For one person said, it influenced him for 4 years and would along them all the time and it was like a shadow which influenced him all the time (Graffigna . , *et al* 2014). A sense of helplessness due to unpredictable blood sugar led participants to feel out of control of their lives, leading to a loss of motivation and hope (Li *et al.*, 2013). Diabetes-related psychological stress tends to have a negative impact on maintaining the rigor of recommended treatment and care (Islam *et al.*, 2017). Psychological stress caused by diabetes often causes them to express anger and frustration toward family members, neighbors and other acquaintances (Islam *et al.*, 2017). Medicine adherence had a deep influence on patient (Wallace *et al.*, 2016). One person was sober for 6 years due to he didn't use drugs to treat pain and he is afraid of being addicted to drug medicine again (Wallace *et al.*, 2016). Some people lived with diabetes positively. Some adapted to diabetes and thought it as a common disease which didn't have

immediate threat to life (Pitaloka & Hsieh., 2015). Some people started to mediate their emotion to adjust themselves and accept their disease (Li *et al.*, 2013). People saw diabetes as a part of their life and they did not view diabetes as part of their suffering. For example, they thought diabetes as a common illness like a common cold and they felt nothing because it can't affect them (Pitaloka & Hsieh 2015). Many participants thought that a person had an ordinary disease if he or she can still actively performed their duties as a mother, a wife, a worker, and many other roles (Pitaloka & Hsieh, 2015).

3.2 Behavioral change

3.2.1 Daily life behavior change

Managing type 2 diabetes had an impact on patient's daily life in terms of dietary restrictions, blood sugar testing, exercising, remembering to take their medications and attending doctor's appointments, like "*Test blood sugar many times a day*", "*Eating and drinking must be limited. Fatty and sweet food must be avoided*" (Carolanolah *et al.*, 2013). Due to the patient don't understand the reason of the abstract guide, so they expressed the behavioral disorganization and can't conform to the doctor's order, like "*When you travel, it is very difficult to take the drug, it is also embarrassing*" and another patient say she or he took a lot of pills because she or he forgot take drugs yesterday (Graffigna., *et al* 2014). All of these led to lifestyle change. Also the side effect of diabetes medicines and adherence to medicine were also challenges (Islam *et al.*, 2017). Except for mental influence, some people experienced physical disturbance such as experienced frequent urination, lethargy and insomnia, this symptom would impact them along their life (Li *et al.*, 2013). Others experience complications such as felt weak, dryness in the mouth and a frequent sense of hunger (Islam *et al.*, 2017). Some patient were scared of hypoglycemic drugs since they had taken it many years and were addicted to this medicine which trouble them a lot (Wallace *et al.*, 2016).

3.2.2 Medical seeking behavior change

Participants valued what they considered expert advice, such as advice from doctors, diabetes educators and nurses, and used that information to decide how to take care of themselves. Most people were dismissive of other sources of information and take their doctors' advice at face value, as follows: "*...if there's anything that I want to know, I will ask my doctors.*", "*Patients must follow the doctor's guide carefully, do exercise and go swimming. If not, they will have complications of eyes, heart and kidneys.*" (Carolan-Olah

et al., 2013). Some hope to establish a good doctor-patient relationship in order to receive better treatment, which expressed their desire to reduce the symptom of diabetes (Graffigna *et al.*, 2014). Even the doctor-patient relationship can be challenging at times, with patients often avoiding contact with a diabetes doctor and "forgetting" clinical tests and doctor appointments (Graffigna *et al.*, 2014).

Health professionals provided participants with diabetes care, including family physicians, medical professionals, diabetes educators, podiatrists, ophthalmologists and dietitians. In most cases, participants were satisfied with the care and information they received. Nevertheless, some suggestions for improvement are put forward: (1) hope to be respected; (2) provide information in their own language; (3) appointment and reminder requests before important tests. Patients had high expectations for services, especially doctors, and expected guidance, advice, notification and respectful treatment (Carolan-Olah *et al.*, 2013).

3.2.3 Social behavior change

People with diabetes had negative emotions, and they may vented such emotions on their families and committed domestic violence against them. (Islam *et al.*, 2017). Social behavior change include financial struggles which was barrier to identify their disease and disrupted relationships in their social network (Pitaloka *et al.*, 2015). For example, “*My children never entrust their children to me. . .*” and they also experience challenges for their households’ support (Pitaloka *et al.*, 2015). For example, they never received support from their family members and they need to manage diabetes by themselves and some people even experienced violent acts and so on (Pitaloka., *et al* 2015). Some of them avoided social events or refused to attend events because they didn’t want to eat, had difficulty doing things spontaneously or find it troublesome. Some of them led others and rely on others for support (Engström., *et al* 2016).

3.3 Support provides the ability to cope with diabetes

Patients wanted to be listened to and they thought the diabetes nurse and physician were knowledgeable so they want to seek support from them and they felt satisfied to receive support because they learned something every time when they go to clinic (Engström., *et al* 2016). When they sought support, they came up with some requirement, like receiving information to be tailored to individual needs and they wanted to share experience with other diabetics (Engström *et al.*, 2016). Diabetics sought support from other diabetics can

empower them adhere to and accept their treatment and fellow-up appointments (Murphy *et al.*, 2017). Some people they didn't know adequately answer to the physician prescriptions but they can't emotionally accept their lifestyle changes so they need an adequate motivation to help them to insist on their goals (Graffigna *et al.*, 2014). These patients need to be empowered by focusing on small goals and helping them feel "successful" again, which encourage them to achieve greater success (Graffigna *et al.*, 2014).

When they listened to the doctor's suggestion, they had belief to cure their disease and they thought they must be cured or control it (Murphy *et al.*, 2017). Some people began to understand the importance of health and they valued 'health is gold' (Carolanolah *et al.*, 2013). Some people desired to be healthy because their expectation for future and the experience of their acquaintances encouraged them and they started to take care of themselves, they wanted to 'live longer with offspring' and some want to "protect their health", all these expressed that their strong desire to be cured (Carolan-Olah *et al.*, 2013). Also, some people prayed and insisted on religious faith to adjust themselves (Li *et al.*, 2013).

3.4 Management of diabetes

3.4.1 Self-management of diabetes

For most of the respondents, diet, medication and exercise are the three most important components for self-management of diabetes (Islam *et al.*, 2017). Some patient are active to take actions to control their diabetes like restricting food, exercising and seeking advice on the best way to control blood sugar levels (Carolan-Olah *et al.*, 2013). Some patient started to learn from others and adjusted diet by themselves (Li *et al.*, 2013). Some people adjusted daily things they eat by themselves (Li *et al.*, 2013). For example, they eat rice less and drink water instead of sugar drink and some integrated traditional Chinese approaches to disease management into their live (Li *et al.*, 2013). And some people ate lots of fruits, chicken and fish (Islam *et al.*, 2017). Some people emphasized their self-reliance and rejected other people's control (Pitaloka & Hsieh, 2015). Some patients emphasized on self- reliance because they thought they should have their own ability like economic independence so that they can avoid others' scrutiny and judgment (Pitaloka & Hsieh, 2015).

3.4.2 Challenges related to self –management of diabetes

Challenges related to self-management of diabetes from many aspects. One aspect was lack of knowledge about diet, physical activity and pharmaceutical treatment (Graffigna *et al.*, 2014). For some people, they often had abstract knowledge on diabetes and they can't manage their disease better (Graffigna *et al.*, 2014). For diabetic patient, controlling diet and exercising on time was also challenge and the challenge for exercise was physical limitations, pain, family commitment and lack of motivation (Engström *et al.*, 2016). And the challenge for ineffective blood glucose monitoring was due to fear of needles, the cost of the reagent strips and the loss of empathy from health-care providers (Li *et al.*, 2013). Challenges also came from self-management of diet and exercise due to lack of time and suitable place for such activity (Islam *et al.*, 2017). It can also bring challenges for their family members, they need to create a separate meal for them (Murphy *et al.*, 2017). In urban Settings, economic constraints were common in our sample of African American seniors, who were sometimes forced by lack of money to forgo healthier food choices, one of the challenges of managing diabetes (Wallace *et al.*, 2016).

4. Discussion

4.1 Main result

Four main themes resumed person with type 2 diabetes' experiences after diagnosis from 10 studies. Themes were: emotion change (Attitudes after diagnosis of diabetes, living with diabetes), behavioral change (Daily life behavior change, medical seeking behavior change, social behavior change), Support provides the ability to cope with the disease, Management of diabetes (Self-management of the diabetes, challenges to self-management).

4.2 Results discussion

4.2.1 The influence of diabetes patients' emotions to live with diabetes

According to "Roy's Adaptation model", different people have different adaptive level when facing stimuli. Some people have higher level of adaptive level can adapt to diabetes better after diagnosis and can manage their disease more positively and well. Result showed that some people who adapted to diabetes expressed emotions towards diabetes like they wasn't surprised and worried about the diabetes and some people thought their

life was normal like before (Li *et al.*, 2013; Wallace *et al.*, 2016; Wilkinson *et al.*, 2013). While people who have lower level of adaptive level cannot adapt well to diabetes after diagnosis and cannot manage their disease well. Result showed that some people who cannot adapt well to diabetes reported the negative feelings of shock, fear, disbelief, helplessness, denial and anger (Ekong *et al* 2013; Murphy *et al.*, 2017; Wilkinson *et al.*, 2013). Some people who don't care about diabetes and have a negative attitude towards diabetes can't manage their diabetes positively. They experienced emotion burden including denial and anger and described this disease as "dirty" and "binding" (Ekong *et al.*, 2013). And some people living with diabetes with physical and mental burden can't manage their diabetes effectively. The same result can be found in Schinckus *et al.*,(2017)'s quantitative research, it has found that since diabetes treatment requires extensive self-care activities, the ability of patients to manage their disease is a key factor in determining treatment outcomes (Schinckus *et al.*, 2017). These abilities are influenced by cognitive and emotional factors. Studies have shown that health literacy level (that is, the ability of individuals to obtain, understand, evaluate and apply health-related information) and self-efficacy have a positive impact on self-care behavior of reported diabetes (Schinckus *et al.*, 2017). For health literacy, however, this positive effect disappears when patients suffer from depression or diabetes-related pain. These results provide new evidence for the role of cognitive and emotional factors in diabetes self-management (Schinckus *et al.*, 2017). The same result can be found in Li *et al* (2013), Woman's attitudes towards diabetes also play an important role in their ability to effectively control diabetes. Women who believe that diabetes is not a concern do not change their lifestyle and therefore do not effectively control diabetes. In addition, these women did not understand the relationship between lifestyle and diabetes. Therefore, it is necessary to emphasize the importance of effective diabetes management to women, including prevention of complications. In addition, women need to receive effective education on the causes of diabetes. Nurse can give patient diabetes self-management education (Hailu *et al.*, 2018).

4.2.2 The need for health career's personalized care

The result shows after having type 2 diabetes, some people have medical seeking behavior change. Participants valued what they considered expert advice, such as that provided by doctors, diabetes educators and nurses, and relied on that information to decide how to take care of themselves (Carolanolah *et al.*, 2013). Most people even turn a blind eye to

other sources of information and trust the doctor's advice (Carolanolah *et al.*, 2013). They begin to hope to gain concrete guide from their nurse and doctor. However, due to insufficient understanding of the underlying causes of abstract prescriptions and lifestyle changes, patients exhibit chaotic behavior, which usually does not guarantee therapeutic efficacy (Graffigna *et al.*, 2014). Some patient say that the nurse always guide them as they have planned before but don't take care of them and give guide according to their individualized situation (Engström *et al.*, 2016). Participants expect information to be tailored to individual needs, repeated to update memory, and updated to keep up with changing needs and/or diabetes research (Engström *et al.*, 2016).

The same result can be found in Mulder *et al.* (2015)' s study that nurses often don't know how to develop action plans that explicitly state behavioral goals, barriers, and strategies, which are core characteristics of effective self-management support. Instead, nurses typically provide general information and impersonalized advice, using unsupported communication styles. Nurses rarely seek cooperation or shared control, and thus show a tendency to control communication. Nurses try to help, but often from their perspective as medical experts. This may indicate that they experience role conflict when they combine experts and consultants.

In Lopez *et al.*, (2016) quantitative study, doctors, nurses and dietitians were the preferred source of support for diabetes. In the result that some diabetics are satisfied with the services of health providers, but they also put forward some requirements: (1) hope to be respected; (2) provide information in their own language; (3) request for appointments and reminders before important tests (Carolan Olah *et al.*, 2013). Patients had high expectations for services, especially doctors and were expected to receive guidance, advice, notification and respect for treatment (Carolan Olah *et al.*, 2013). The same result can be found in Li *et al* (2013) review, when women are dissatisfied with health care providers, effective management of diabetes is impeded, especially when they experience a lack of respect, support and lack of access to a doctor. Women cite threats, lack of relevant information, and little care and compassion as examples of unsupported and disrespectful counseling. Clearly, doctors need to show respect and compassion for women with diabetes if they are to help and support them in managing their disease.

So as a nurse, we need to give them concrete information and individualized according to their situation and treat them with respect.

4.2.3 The importance of support to self-management

The support including internal spiritual support and external support, which including social support, spouse support, peer support, medical staff support and so on. According to “Roy’s adaptation model”, support may be the stimuli which can help people to adapt to their diabetes. Result showed that some people never receive support from their spouse and they are always alone so that they can’t adapt to their role as a diabetic because their family member asks them to assume all the roles (Pitaloka *et al.*, 2015). This can influence them manage their diabetes.

The support maybe the stimuli that help them to increase internal control and insist on their management of diabetes, which is the output. In Nagelkerk, Reick, & Meengs (2006) 's study can be found that in positive situations, spouses can help patients comply with the provider's recommendations, especially given the opportunity for spouses to provide encouragement and promote good diabetes self-management .

They seek help from other people can help them adjust their treatment and adjust their mentality. And they also rely on religious faith supporting them to live with diabetes with a positive mentality (Li *et al.*, 2013). This was in line with the result in Black *et al* (2016), as it mentioned that patients rely heavily on informal social networks for disease management (Black *et al.*, 2016). Spouses are important and sometimes manage the illness in a "team" way with the patient (Black *et al.*, 2016). Sons and daughters also play an important supporting role, particularly as interpreters in counselling and interpreting health information (Black *et al.*, 2016). In some cases, informal support was provided by neighbors and local community organizations (Black *et al* 2016). Similar result can be found in Lopez *et al.*, (2016) quantitative study, diet/weight loss support is the most popular type of support (Lopez *et al.*, 2016). Doctors, nurses and dietitians were the preferred source of support for diabetes (Lopez., *et al* 2016). In whitehead *et al.*, (2017) study, there are two outcome models demonstrating the effectiveness of support in improving diabetes self-management and mental health. The first was to observe the pain and self-management measures caused by diabetes. Participants showed significant improvement measures in pre-release. There was a significant reduction in the payment of diabetes-induced pain, and a significant improvement in the level of diabetic self-managed.

4.3 Methods discussion

According to Polit & Beck (2012), literature review is a good way to critically review and summarize previous studies. The authors of this study used explicit and specific inclusion and exclusion criteria, which enhanced the replicability of the study. One of the criteria chosen by the author is that articles must be written in English, which may be regarded as an advantage and limitation. The limitations are that literature in other languages may be missed in English and that English is not the author's first language, which means misunderstand of the articles' content. To avoid misunderstanding, the author uses a dictionary, which may be regarded as an advantage. To limit search results, articles should be published between *2013-06-01* and *2018-06-30*. This may lead the author to miss the early research, which is the limitation of the current literature review. However, it may also be seen as a strength because it ensures a more timely and modern outcome (Polit & Beck 2012).

The author works in a systematic way and records every step of the research process, which is recommended by Polit & Beck (2012) to ensure effective search and improve the reproduction of the research. The author chose a descriptive design as the purpose of the study to describe the experience of type 2 diabetics' experience after diagnosis. The articles selected for result are all related to person's experiences of having diabetes type 2, which was consistent with the purpose of this review. According to Polit & Beck (2012), the results of this is a good choice. Its purpose is to describe an individual's experience of something and in this case it is person with type 2 diabetes.

The authors used two databases: PubMed and Cinahl to search articles to ensure the credibility of the results. The authors also used MeSH and the Boolean search operator AND, as well as used free text searches in order to have more articles related to the aim.

According to Polit & Beck (2012), this is an advantage, because the results of the article will be smaller, but more relevant to the goals and research issues, and the results will be more credible. Using MeSH can have more relevant articles, while it didn't use in the articles may lead to some important articles missed and this is a limitation.

The two authors read the selected articles separately as the first step. This is Polit & Beck (2012)' recommendation, because it ensures that authors do not interfere with each other's interpretation of the text, thereby possibly losing important information. After this step, the author obtains the result through discussion. In the process of document retrieval, a

large number of articles were carefully examined and processed by reading headlines and abstracts and applying the selected restrictions. It can be said that this means that the material has not been thoroughly processed and the related items may be ignored. However, the author believes that a large number of articles have been censored to the best of their ability, constituting a force. With this in mind, the author has made a positive choice not to complete the search strategy with further restrictions, because it is considered to increase the risk of losing related materials.

4.4 Clinical implications

The result of this review indicates that the importance of nurse having knowledge about the experience of people with type 2 diabetes. Because it can influence patient's intervention and effect of treatment. Negative emotion may influence treatment so nurse should know of their inner distress and help them adjust their mentality and actively manage diabetes. Also, the patient need nurse's guide especially personalized and concrete guide and suggestion to help them to adhere to their self-management. So nurse need to accumulate more knowledge in order to come up with more suggestion according to patient's situation. With the help of this research, the influence of the mood on self-management will reduce and awareness of the importance of support for self-management will increase. And in the long run, the external support network will be enhanced in the worldwide and psychological care and personalized care will be enhanced in the future.

4.5 Suggestions for further research

Through the study of the existing literature review materials, we confirm that there is no research published in China that can well answer the research questions of this study. In order to further improve nurses' specific and personalized care for individuals with type 2 diabetes, we can do many researches in the future. Firstly, it is interesting to research the effects of emotional distress to prove their relationship with self-management in diabetic patients in the future research. Early studies have shown that emotional distress can affect self-management and health literacy in type 2 diabetes mellitus. If partners, nurses, doctors and friends support them, their self-management ability will increase. In the future, we can also study on this aspect. Secondly, the patient's support of religious beliefs for his adaptation to disease in this study is a question worthy of further study, as it is not a form of treatment recommended in China today. Therefore, it is interesting to

find evidence of this form of treatment. Thus, we can study on religious beliefs for adaptation to their diabetes in the future study. Thirdly, we can research on the effect of external support to diabetes patient. Also, the study about the social impact of this disease on patients is also interesting.

4.6 Conclusions

After diagnosis of type 2 diabetes, different people may have different attitudes. Negative attitude and the influence of emotional distress can affect the patient adapt to their change well and can't deal with diabetes well by themselves. Besides, the support can enhance the effect of self-management. And the nurse and other medical staffs should provide personalized and detailed care to them to help them adhere to their self-management.

5. References

The results of articles are marked with asterisks (*) in the reference list.

Ajuwon, O.R., Ayeleso, A.O., & Adefolaju, G.A. (2018). The Potential of South African Herbal Tisanes, Rooibos and Honeybush in the Management of Type 2 Diabetes Mellitus. *Molecules*, 23(12). DOI: 10.3390/molecules23123207.

Alonso-Domínguez, R., García-Ortiz, L., Patino-Alonso, M.C., Sánchez-Aguadero, N., Gómez-Marcos, M.A., & Recio-Rodríguez, J.I. (2019). Effectiveness of a Multifactorial Intervention in Increasing Adherence to the Mediterranean Diet among Patients with Diabetes Mellitus Type 2: A Controlled and Randomized Study (EMID Study). *Nutrients*, 11(1). DOI: 10.3390/nu11010162.

Black, S., Maitland, C., Hilbers, J., & Orinuola, K. (2016). Diabetes literacy and informal social support: a qualitative study of patients at a diabetes centre. *Journal of Clinical Nursing*, 26(1-2), 248 – 257. DOI:10.1111/jocn.13383 .

Boström, E., Hörnsten, Å., Lundman, B., Stenlund, H., & Isaksson, U. (2013). Role clarity and role conflict among Swedish diabetes specialist nurses. *Primary Care Diabetes*, 7(3), 207 – 212. DOI:10.1016/j.pcd.2013.04.013

*Carolan-Olah, M.C., Cassar, A., Quiazon, R., & Lynch, S. (2013). Diabetes care and service access among elderly Vietnamese with type 2 diabetes. *BMC Health Services Research*, 13:447. DOI: 10.1186/1472-6963-13-447.

Dunning, T., Sinclair, A., & Colagiuri, S. (2014). New IDF Guideline for managing type 2 diabetes in older people. *Diabetes Res Clin Pract*, 103(3):538-40. DOI: 10.1016/j.diabres.2014.03.005.

*Ekong, J.I., Russell-Mayhew, S., & Arthur N. (2013). Optimizing Diabetes Literacy: Lessons from African Canadians in Calgary about Type 2 Diabetes Diagnosis. *BMJ Open*, 37(4):231-236. DOI: 10.1016/j.jcjd.2013.05.003.

*Engström, M . S., Leksell, J., Johansson, U.B., & Gudbjörnsdottir, S. (2016). What is important for you? A qualitative interview study of living with diabetes and experiences of diabetes care to establish a basis for a tailored Patient-Reported Outcome Measure for the Swedish National Diabetes Register. *BMJ Open*, 6(3), e010249. DOI:10.1136/bmjopen-2015-010249

Experience. (n.d.). In Oxford Living Dictionaries. (8th.). Retrieved from : <https://en.oxforddictionaries.com/definition/experience>.

Experience. (n.d.). In Wikipedia. Retrieved May 26, 2018, from: [https://en.wikipedia.org/wiki/ Experience](https://en.wikipedia.org/wiki/Experience).

Flanagan, N.M. (2018). Persistent Pain in Older Adults: Roy's Adaptation Model . *Nurs Sci Q*, 31(1):25-28. DOI: 10.1177/0894318417741095.

Fisher, L., Skaff, M.M., Mullan, J.T., Arean, P., Glasgow ,R., & Masharani, U. (2008). A longitudinal study of affective and anxiety disorders, depressive affect and diabetes distress in adults with Type 2 diabetes. *Diabet Med*, 25(9):1096-101. DOI: 10.1111/j.1464-5491.2008.02533.x.

*Graffigna, G., Barello, S., Libreri, C., & Bosio, C. A. (2014). How to engage type-2 diabetic patients in their own health management: implications for clinical practice. *BMC Public Health*, 14:648. DOI: 10.1186/1471-2458-14-648.

Graves, H., Garrett, C., Amiel ,S.A., Ismail, K., & Winkley , K. (2016). Psychological skills training to support diabetes self-management: Qualitative assessment of nurses' experiences. *Prim Care Diabetes*, 10(5):376-82. DOI: 10.1016/j.pcd.2016.03.001.

Grigsby, A.B., Anderson, R.J., Freedland, K.E., Clouse, R.E., & Lustman, P.J. (2002). Prevalence of anxiety in adults with diabetes: a systematic review. *J Psychosom Res*, 53(6):1053-60.

Gopalan, A., Kellom, K., McDonough, K., & Schapira, M.M. (2018). Exploring how patients understand and assess their diabetes control. *BMC Endocrine Disorders*, 18(1):79. DOI: 10.1186/s12902-018-0309-4.

Ghavami, H., Radfar, M., Soheily, S., Shamsi, S.A., & Khalkhali, H.R. (2018). Effect of lifestyle interventions on diabetic peripheral neuropathy in patients with type 2 diabetes, result of a randomized clinical trial. *Agri*, 30(4):165-170. DOI: 10.5505/agri.2018.45477.

Haddad, J.L., & Haddad, A.N. (2018) The past decade in type 2 diabetes and future challenges. *Hormones (Athens)*, 17(4):451-459. DOI: 10.1007/s42000-018-0080-y.

Hailu, F. K., Hjortdahl, P., Moen1, A., (2018). Nurse-Led Diabetes Self-Management Education Improves Clinical Parameters in Ethiopia. *Frontiers in Public Health*, 6(602), 1-11. DOI: 10.3389/fpubh.2018.00302.

*Islam, S.M., Biswas, T., Bhuiyan, F.A, Mustafa, K., & Islam, A. (2017). Patients' perspective of disease and medication adherence for type 2 diabetes in an urban area in Bangladesh: a qualitative study. *BMC Res Notes*, 10(1):131. DOI: 10.1186/s13104-017-2454-7.

Jennings, K. M. (2017) . The Roy Adaptation Model: A Theoretical Framework for Nurses Providing Care to Individuals with Anorexia Nervosa. *ANS Adv Nurs Sci*, 40(4):370-383. DOI: 10.1097/ANS.000000000000175.

Kenealy, T., Arroll, B., Kenealy, H., Docherty, B., Scott, D., Scragg, R., & Simmons, D. (2004). Diabetes care: practice nurse roles, attitudes and concerns. *Journal of Advanced Nursing*, 48(1), 68 – 75. DOI:10.1111/j.1365-2648.2004.03173.x

Kosiborod, M., Gomes, M.B., Nicolucci, A., Pocock, S., Rathmann, W., Shestakova, M., Watada, H., Shimomura, L., Chen, H., Cid-Ruzafa, J., Fenici, P., Hammar, N., Surmont, F., Tang, F., & Khunti, K. (2018). Vascular complications in patients with type 2 diabetes prevalence and associated factors in 38 countries (the DISCOVER study program): *Cardiovascular Diabetology*. 17(1). DOI:10.1186/s12933-018-0787-8.

Ku, H.C., & Liang, Y.J. (2018). Incretin-based therapy for diabetic ulcers: from bench to bedside. *Expert Opin Investig Drugs*, 27(12):989-996. DOI:10.1080/13543784.2018.1548607.

Kalra, S., & Sharma ,S.K.(2018).Diabetes in the Elderly. *Diabetes Ther* ,9:493–500.

Lee, P.C., Hare, M.J.L., & Bach, L.A. (2018). Making sense of newer treatment options for type 2 diabetes. *Internal Medicine Journal*, 48(7), 762-769. DOI:10.1111/imj.13947.

*Li, J., Zhang, P., Fan, B., Guo, X., & Zheng, Z. (2019). The efficacy of saxagliptin in T2DM patients with non-alcoholic fatty liver disease: preliminary data. *Rev Assoc Med Bras*, 65(1):33-37. DOI:10.1590/1806-9282.65.1.33.

Li, J., Drury, V., & Taylor, B. (2013). A systematic review of the experience of older women living and coping with type 2 diabetes. *International Journal of Nursing Practice*, 20(2), 126 – 134. DOI:10.1111/ijn.12135.

Li, J.J., Zhang, P., Fan, B., Guo, X.L., & Zheng, Z.S. (2019). The efficacy of saxagliptin in T2DM patients with non-alcoholic fatty liver disease: preliminary data. *Revista Da Associação Médica Brasileira*, 65(1), 33 – 37. DOI:10.1590/1806-9282.65.1.33.

Lommi, M., Matarese, M., Alvaro, R., Piredda, M., & De Marinis, M. G. (2015). The experiences of self-care in community-dwelling older people: A meta-synthesis. *International Journal of Nursing Studies*, 52(12), 1854-1867. DOI:10.1016/j.ijnurstu.2015.06.012 .

Lopez, J.M.S., Katic, B. J., Fitz-Randolph, M., Jackson, R. A., Chow, W., & Mullins, C. D. (2016). Understanding preferences for type 2 diabetes mellitus self-management support through a patient-centered approach: a 2-phase mixed-methods study. *BMC Endocrine Disorders*, 16(1):41. DOI:10.1186/s12902-016-0122-x .

Mandecka, A., & Regulska-Ilow, B. (2018). Dietary interventions in the treatment of metabolic syndrome as a cardiovascular disease risk-inducing factor. A review. *Rocz Panstw Zakl Hig*, 69(3):227-233.

Marriner-Tomey, A., & Alligood, M.R. *Nursing theorists and their work* [J]. Mosby, 1997.

Mishriky, B.M., Cummings, D.M., Tanenberg, R., & Pories, W.J. (2018). Re-examining insulin compared to non-insulin therapies for type 2 diabetes: when in the disease trajectory is insulin preferable? *Postgraduate Medicine*, 130(8), 653-659. DOI:10.1080/00325481.2018.1533381.

Moayed, F., Zare, S., & Nikbakht, A. Anxiety and depression in diabetic patient referred to Bandar Abbas diabetes clinic. *Hormozgan Medical Journal*. 2015; 18(1): 65-71.

Mulder, B.C., van Belzen, M., Lokhorst, A.M., & van Woerkum, C. M. (2015). Quality assessment of practice nurse communication with type 2 diabetes patients. *Patient Education and Counseling*, 98(2), 156-161. DOI:10.1016/j.pec.2014.11.006 .

*Murphy, A., Biringanine, M., Roberts, B., Stringer, B., Perel, P., & Jobanputra K. (2017). Diabetes care in a complex humanitarian emergency setting: a qualitative evaluation. *BMC Health Serv Res*. 2017 Jun 23;17(1):431. DOI: 10.1186/s12913-017-2362-5.

Nagelkerk, J., Reick, K., & Meengs, L. (2006). Perceived barriers and effective strategies to diabetes self-management. *Journal of Advanced Nursing*, 54(2), 151-158. DOI:10.1111/j.1365-2648.2006.03799.x

*Pitaloka, D., & Hsieh, E. (2015). Health as Submission and Social Responsibilities: Embodied Experiences of Javanese Women with Type II Diabetes. *Qual Health Res*, 25(8):1155-65. DOI: 10.1177/1049732315577607.

Polit, D.F., & Beck, C.T. (2017). *Nursing Research. Generation and Assessing Evidence for Nursing Practice* (10th ed.). Wolters Kluwer/ Lippincott Williams & Wilkins.

Riaz, A., Khan, K., Afreen, B., & Kazmi, I. (2018). Bladder Cancer In Patients With Type 2 Diabetes Treated With Pioglitazone, A Comparative Study. *J Ayub Med Coll Abbottabad*, 30(3): 356-359.

Rombopoulos, G., Hatzikou, M., Latsou, D., & Fantopoulos, J. (2013). The prevalence of hypoglycemia and its impact on the quality of life (QoL) of type 2 diabetes mellitus patients (The HYPO Study). *Hormones*, 12(4):550-558.

Roy, C., & Andrews, H. (1999). *The Roy adaptation model* (2nd ed.). Upper Saddle River, (NJ): Pearson.

Schinckus, L., Dangoisse, F., Van den Broucke, S., & Mikolajczak, M. (2018). When knowing is not enough: Emotional distress and depression reduce the positive effects of health literacy on diabetes self-management. *Patient Education and Counseling*, 101(2), 324 – 330. DOI:10.1016/j.pec.2017.08.006 .

Stephani, V., Opoku, D., & Beran, D. (2018). Self-management of diabetes in Sub-Saharan Africa: a systematic review. *BMC Public Health*, 18(1):1148. DOI:10.1186/s12889-018-6050-0.

Su, N., Zhao, N., Wang, G., Wang, L., Zhang, Y., Li, R., Liu, Y., Yang, X., Li, C., & Hou, M. (2019). The Effects of Adiponectin and Adiponectin Receptor 1 Levels on Macrovascular Complications Among Patients with Type 2 Diabetes Mellitus. *Cellular Physiology and Biochemistry*, 52(2):225-231. DOI:10.33594/000000016.

The ICN code of ethics for nurses (ICN) (2010)

<http://www.ncbi.nlm.nih.gov.webproxy.student.hig.se>. May 26, 2018.

*Wallace, B.H., Reese, A.M., Chard, S., Roth, E.G., Quinn, C., & Eckert, J.K. (2017). Understanding the Subjective Experience of Medication Adherence for Older Urban African Americans with Type 2 Diabetes and a History of Illicit Drug Addiction. *J Aging Health*, 29(3):489-509. DOI: 10.1177/0898264316636840.

Wang, X., Cao, Y., Wu, Y., Yang, C., Song, J., Tian, Y., Wang, M., Li, M., Wu, Y., Hu, Y. (2019). The prescription pattern of initial treatment for type 2 diabetes in Beijing from 2011 to 2015. *Medicine*: 98(8): e14370. DOI:10.1097/MD.00000000000014370.

Warr, C.G., Shaw, K.H., Azim, A., Piper, M.D.W., & Parsons, L.M. (2018). Using Mouse and Drosophila Models to Investigate the Mechanistic Links between Diet, Obesity, Type II Diabetes, and Cancer. *International Journal of Molecular Sciences*, 19(12). DOI:10.3390/ijms19124110.

Whitehead, L.C., Crowe, M.T., Carter, J.D., Maskill, V.R., Carlyle, D., Bugge, C., & Frampton, C.M.A. (2017). A nurse-led education and cognitive behaviour therapy-based intervention among adults with uncontrolled type 2 diabetes: A randomised controlled trial. *Journal of Evaluation in Clinical Practice*, 23(4), 821 - 829. DOI:10.1111/jep.12725.

*Wilkinson, E., Randhawa, G., & Singh, M. (2014). What's the worry with diabetes? Learning from the experiences of white European and South Asian people with a new diagnosis of diabetes. *Prim Care Diabetes*, 8(3):181-6. DOI: 10.1016/j.pcd.2013.11.006.

World Health Organisation (WHO). (2018). Diabetes. Retrieved May 25 from: <http://www.who.int/news-room/facts-in-pictures/detail/diabetes>.

World Health Organisation(WHO). (2010). Diabetes. Retrieved March 22, 2013, from: <http://www.who.int/mediacentre/factsheets/fs312/en/>.

World Health Organisation (WHO). (2017). Diabetes. Retrieved May 25, 2018, from: <http://www.who.int/news-room/fact-sheets/detail/diabetes>.

World Health Organisation (WHO). (2017). Mental health of older adults. Retrieved May 25, 2018, from:<http://www.who.int/en/news-room/fact-sheets/detail/mental-health-of-older-adults>.

World Health Organisation (WHO). (2018). Ageing and health. Retrieved May 26, 2018, from:<http://www.who.int/news-room/fact-sheets/detail/ageing-and-health>.

World Health Organisation (WHO). (2018). Diabetes. Retrieved June 1, 2018, from <https://www.who.int/diabetes/en/>.

Yamada, S., Kabeya, Y., & Noto, H. (2018). Dietary Approaches for Japanese Patients with Diabetes: A Systematic Review. *Nutrients*, 10(8), 1080. DOI:10.3390/nu10081080.

Zubrzycki, A., Kmiec, K.C., Kmiec, Z., & Wronska, A. (2018). The Role of Low – Calorie Diets and Intermittent Fasting In THE Treatment of Obesity and Type-2 Diabetes. *Journal of Physiology and Pharmacology*, 69(5), 663-683. DOI: 10.26402/jpp.2018.5.02.

APPENDIX

Table 2. Overview of selected articles.

Authors+ Year of publication+ Country	Title	Design and approach	Sample	Data collection method	Method of data analysis
Carolanolah, M.C <i>et al.</i> ,+2013+Vietnam	Diabetes care and service access among elderly Vietnamese with type 2 diabetes	An explorative study with qualitative approach	Number: 15 Age: 60 to >70 years of age Form: Three focus groups with 15 Vietnamese participants with type 2 diabetes mellitus	Unstructured interviews qualitative interview approach	Thematic analysis
Ekong, J.I <i>et al.</i> , +2013+Canada	Optimizing Diabetes Literacy: Lessons from African Canadians in Calgary about Type 2 Diabetes Diagnosis	A descriptive study with qualitative study	Number: 11 Age: Older than age 18 and at least 1-year post-diagnosis. Form: Posters and in-person presentations at churches, community centres,community events and African Canadian ethnic salons	Semi-structured qualitative interview	Hermeneutic phenomenology
Engström, M .S., <i>et al.</i> ,+2016+Swedish	What is important for you?A qualitative interview study of living with diabetes and experiences of diabetes care to establish a basis for a tailored Patient-Reported outcome measure for the Swedish National Diabetes Register	A descriptive study with qualitative approach	Number: 14 Age: Over 18 years old having type 2 diabetes more than 5years Form: Hospital-based outpatient clinics and primary healthcare clinics in Sweden.	Audio recorded semistructured face-to-face individual interviews .	Capability approach
Graffigna , G., <i>et al</i> +2014+England	How to engage type-2 diabetic patients in their own health management: implications for clinical practice	An explorative study with qualitative approach	Number: 29 participants Age: Over 18 years old	Semi-structured qualitative interview	Qualitative narrative approach

			Form: Through a snowball sampling strategy		
Islam, S .M .S <i>et al.</i> , +2017 +Bangladesh	Patients' perspective of disease and medication adherence for type 2 diabetes in an urban area in Bangladesh: a qualitative study	An explorative study with qualitative approach	Number: 12 (5 males and 7 females) Age: Female : 48,51,61,49,60,38,52 years old Male:53,59,44,63,48 years old Form: the outpatient department of the Bangladesh Institute of Health Science (BIHS) hospital in Dhaka, Bangladesh	Semi-structured interviews.	Methodological approach
Li , J <i>et al.</i> ,+ 2013+ Singapore	'Diabetes is nothing': The Experience of older Singaporean women living and coping with type 2 diabetes	A descriptive study with qualitative approach	Number: 10 Age: Age between 60-69 years old Form: Patients were recruited from a major outpatient clinic in Singapore	Semi-structured interviews	Manual thematic data analysis method
Murphy, A <i>et al.</i> , +2017+Eastern Democratic Republic	Diabetes care in a complex humanitarian emergency setting: a qualitative evaluation	An explorative study with qualitative approach	Number: 17 Age: over 16 years old (16,70, 46,54,58,60 years old) Form: in Mweso Hospital in eastern Democratic Republic of Congo	Semi-structured qualitative interview	Inductive thematic approach
Pitaloka, D & Hsieh, E +2015+ Indonesia	Health as Submission and Social Responsibilities: Embodied Experiences of Javanese Women With Type II Diabetes	An explorative study with qualitative approach	Number: 30 female participants Age: Don't mention the age range	Semi-structured in-depth qualitative interview	Grounded theory

			Form: Were from urban cities in Central Java, Indonesia.		
Wallace, B. H <i>et al.</i> ,+ 2016 +America	Understanding the Subjective Experience of Medication Adherence for Older Urban African Americans With Type 2 Diabetes and a History of Illicit Drug Addiction	An explorative study with qualitative approach	Number: 2 Age: 73,58 years old Form: African American	Semi-structured qualitative interview	Ethnographic
Wilkinson, E., <i>et al</i> +2013+ UK	What's the worry with diabetes? Learning from the experiences of White European and South Asian people with a new diagnosis of diabetes.	An explorative study with qualitative study	Number: 47 (28 South Asian and 19 White European.) Age: over 16 years old having less than 1 year of type 2 diabetes From: European or South Asian ethnicity and diagnosed with T2DM	Semi-structured qualitative interview	Thematic approach

Table 3. Overview of selected articles' aims and main results.

Authors	Aim	Results
Carolanolah, M. C., <i>et al</i>	To explore the patient experience of diabetes care and self-management	A1: The value of being healthy/the importance of being healthy A2: Controlling diabetes A3: A desire to stay healthy A4: Want medical staff to improve services and information access A5: Valuing medical personnel's advice and guide A6: Impacting on their daily lives
Ekong, J. I., <i>et al</i>	To describe how African Canadians experience type 2 diabetes	B1: Shock, fear, disbelief and helplessness B2: Denial and anger B3: Relief after diagnosis
Engström, M. S., <i>et al.</i> ,	To describe important aspects in life for adults with diabetes.	C1: Challenges in mastering management C2: Support from diabetes care in managing diabetes C3: Self-management related to diabetes C4: The negative impact of diabetes on social life
Graffigna, G. , <i>et al</i>	To explore the subjective experience of uncontrolled type-2 diabetic patients in their care process	D1: Lack of knowledge on diabetes D2: Emotional burden-Feeling like a slave.and loss of freedom D3:Behavioral disorganization D4: Need emotional support for adhesion .D5: The blackout phase-Don't accept this disease D6: Need for some aspects of care D7: Doctor-patient relationship challenging D8: Hope to establish a better relationship with doctors
Islam. S . M., <i>et al</i>	To explore patients' perspective of diabetes, their experience of taking oral hypoglycemic medications and explore factors that contribute	E1: Psychological impact of diabetes E2: Self-management of diabetes E3: Experiences of adverse effects of medication

	to medication adherence in patients with type 2 diabetes in Bangladesh	E4: Challenges of medication adherence E5: Physical impact of diabetes E6: Social impact of diabetes
Li, J <i>et al.</i> ,	To describe the experiences and ways of coping of older Singaporean Chinese women with type 2 diabetes.	F1: Psychological impact worried and helpless F2: Physical impact-experience frequent urination, lethargy and insomnia F3: Social support F4: Managing the problem F5: Coping with emotions F6: Diabetes is nothing F7: Conventional management to manage diabetes F8: Challenges in managing diabetes F9: Alternative remedies F10: Drawing on religious faith to cope with diabetes
Murphy, A <i>et al.</i> ,	To explore patient and provider perspectives on the model in order to identify factors that may support or impede it.	G1: Community awareness, knowledge, and family support:empowerment, acceptance, and adherence to DM treatment G2: Feel weak G3: Don't want to accept this disease G4: Feel guilty G5: Refuse this disease G6: A desire to be cured G7: Challenge diabetics bring for family
Pitaloka, D& Hsieh , E 2015	To examine women 's experiences with diabetes in Javanese cultural contexts. Because illness narratives give coherence, symbolism, and meaning to the distinctive events of long-term conditions	H1: Diabetes as part of everyday life. H2: Normalizing disrupted relationships H3: Self –management of the disease H4: Emphasize the self-reliance and (passive-) aggressive behaviors H5: Accepting fate
Wallace, B . H <i>et al.</i> ,	To explore subjective experiences with drug use and how that influences their ability or willingness to adhere to a medication regimen.	I1: Wasn' t surprised after diagnosis of diabetes I2:Being scared of drugs treating type 2 diabetes I3: Economic limitations to manage diabetes
	To explore diabetic 's perspective after diagnosis of diabetes.	J1: Surprised and unexpected J2: Upset and disappointed J3: Don't worry and think about diabetes J4: Denial

Table 4. Overview of categories of selected articles.

Articles	Emotional change		Behavioral change			Support provides the ability to cope with diabetes	Management of diabetes	
	Attitudes after diagnosis of diabetes	Living with diabetes	Living with diabetes	Medical seeking behavior change	Social behavior change		Self-management of diabetes	Challenges related to self management of diabetes
Carolanolah, M. C <i>et al.</i> , 2013			Impacting on their daily lives (A6)	Valuing medical personnel's advice and guide(A5) Want medical staff to improve services and information access(A4)		The value of being healthy/the importance of being healthy (A1) A desire to stay healthy (A3)	Controlling diabetes(A2)	
Ekong, J. I <i>et al.</i> , 2013	Shock, fear, disbelief and helplessness(_B1) Denial and anger(B2) Relief after diagnosis(B3)							
Engström ,M. S., <i>et al.</i> ,+2016					The negative impact of diabetes on social life(C4)	Support from diabetes care in		Challenges in mastering

						managing diabetes(C2)		management (C1) Barriers related to diabetes(C3)
Graffigna ,G. , <i>et al.</i> ,2014		Emotional burden-Feeling like a slave. (D2) The blackout phase-Don't accept this disease (D5)	Behavioral disorganization (D3)	Doctor-patient relationship challenging (D7) Hope to establish a better relationship with doctors(D8)		Need emotional support for adhesion.(D4) Need for some aspects of care(D6)		Lack of knowledge on diabetes(D1)
Islam, S. M S <i>et al.</i> , 2017		Psychological impact of diabetes (E1)	Experiences of adverse effects of medication (E3) Physical impact of diabetes (E5)		Social impact of diabetes (E6)		Self-management of diabetes (E2)	Challenges of medication adherence(E4)
Li, J <i>et al.</i> , 2013	Diabetes is nothing(F6)	Psychological impact worried and helpless (F1) Coping with emotions (F5)				Social support(F3) Drawing on religious faith to cope with Diabetes (F10)	Managing the problem(F4) Conventional management to manage diabetes(F7) Alternative remedies(F9)	Challenges in managing diabetes(F8)
Murphy, A <i>et al.</i> , 2017	Feel weak(G2) Don't want to accept this disease(G3)					A desire to be cured (G6)	Community awareness, knowledge, and family support:empowermen	Challenge diabetics bring for family(G7)

	Feel guilty (G4) Refuse this disease(G5)						t, acceptance, and adherence to DM treatment (G1)	
Pitaloka, D& Hsieh ,E 2015	Accepting Fate(H5)	Diabetes as part of everyday life. (H1)			Normalizing disrupted relationships(H2) Emphasize the self-reliance and (passive-) aggressive behaviors. (H4)		Self –management of the disease(H3)	
Wallace, B . H., <i>et al</i> 2016	Wasn't surprised after diagnosis of diabetes(I1)	Being scared of drugs treating type 2 diabetes (I2)						Economic limitations to manage diabetes(I3)
Wilkinson, E <i>et al.</i> , 2013	Surprised and unexpected(J1) Upset and disappointed (J2) Don't worry and think about diabetes (J3) Denial (J4)							

Table 5. Synthesized finding, categories and study findings from the included studies.

Synthesized finding	Categories	Study findings
	Living with diabetes	Emotional burden-Feeling like a slave. (D2) The blackout phase-Don't accept this disease (D5) Psychological impact of diabetes (E1) Psychological impact worried and helpless (F1) Coping with emotions (F5) Diabetes as part of everyday life. (H1) Being scared of drugs treating type 2 diabetes (I2)
Behavioral change	Daily life behavior change	Impacting on their daily lives (A6) Behavioral disorganization (D3) Experiences of adverse effects of medication (E3) Physical impact of diabetes (E5) Physical impact -experience frequent urination, lethargy and insomnia (F2)
	Medical seeking behavior change	Want medical staff to improve services and information access(A4) Valuing medical personnel's advice and guide(A5) Doctor-patient relationship challenging(D7) Hope to establish a better relationship with doctors(D8)

	Social behavior change	<p>The negative impact of diabetes on social life(C4)</p> <p>Social impact of diabetes (E6)</p> <p>Normalizing disrupted relationships(H2)</p> <p>Emphasize the self-reliance and (passive-) aggressive behaviors. (H4)</p>
Support provides the ability to cope with diabetes		<p>The value of being healthy/the importance of being healthy (A1)</p> <p>A desire to stay healthy (A3)</p> <p>Drawing on religious faith to cope with Diabetes (F10)</p> <p>A desire to be cured (G6)</p> <p>Support from diabetes care in managing diabetes(C2)</p> <p>Need emotional support for adherence.(D4)</p> <p>Need for some aspects of care(D6)</p> <p>Social support(F3)</p> <p>Community awareness, knowledge, and family support:empowerment, acceptance, and adherence to DM treatment (G1)</p>
Management of diabetes	Self-management of diabetes	<p>Controlling diabetes(A2)</p> <p>Self-management of diabetes(E2)</p> <p>Managing the problem(F4)</p> <p>Conventional management to manage diabetes(F7)</p> <p>Alternative remedies(F9)</p> <p>Self –management of the disease(H3)</p>

	Challenges related to self – management of diabetes	Challenges in mastering management (C1) Barriers related to diabetes(C3) Challenges of medication adherence(E4) Lack of knowledge on diabetes(D1) Challenges in managing diabetes(F8) Challenge diabetics bring for family(G7) Economic limitations to manage diabetes(I3)
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