Factors Affecting The Quality Of Life Of Dm t2 Patients With Diabetic Food Ulcer: A Scoping Review

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Abstract

Background; Type 2 Diabetes Mellitus (T2DM) is a metabolic disorder characterized by an increase in blood sugar levels due to lack of insulin production that occurs over a lifetime. If T2DM patients make the wrong decision, one of the complications that can be experienced is Diabetic Foot Ulcer (DFU), due to damage to peripheral nerve tissue in the foot. **Objective**; This study aims to explore the factors that influence the quality of life of T2DM patients with DFU. **Methods;** This study used a scoping review approach guided by the PRISMA framework. The literature search was conducted through Scopus, Pubmed, and Science Direct databases, with inclusion and exclusion criteria focusing on the last 10 years of articles. **Results;** Of the 155 articles, after filtering with full text searches, 110 articles were then entered into the Elicit application which was filtered based on the author's name, research country, research year, research design and research objectives, with duplication checking of articles in the Mendeley application which left 100 articles, which fit the inclusion and exclusion criteria into 8 articles. **Conclusion; The** incidence of DFU in T2DM patients is the effect of limited literacy in making medical decisions, which is influenced by factors of gender, age, educational background, employment status, marital status, economic level, surrounding environment, and the spiritual level of the patient. Thus, correct literacy is needed in the community to improve the quality of life of T2DM patients to avoid complications of T2DM, namely DFU.

Keywords: Type 2 Diabetes Mellitus; Quality of life; Diabetic Foot Ulcer (DFU)

BACKGROUND

Entering the 20th century, various chronic diseases began to increase very rapidly. This is triggered by changes in lifestyle in meeting daily needs which have greatly changed towards a more instantaneous direction, such as the rise of instant lifestyles in consuming food also followed by less activity and exercise (Sekhar et al., 2015) So that it can result in many diseases that can arise, one of which is diabetes mellitus (DM), especially in the Diabetes Mellitus variant (T2DM) (Aghakhani et al., 2020). Basically, T2DM is a metabolic disorder characterized by an increase in sugar levels of more than 200 mg / dl in a blood sugar test or fasting blood sugar level ≥ 126 mg / dl caused by a disorder of the hormone insulin, where the body is unable to produce enough insulin for its needs, or the patient is unable to produce insulin at all, or the patient is able to produce enough insulin but the cells are unable to accept the insulin because the receptors that function as insulin catchers have decreased function (Vella et al., 2017).

In 2021, data from the International Diabetes Federation (IDF) recorded 537 million adults living with diabetes worldwide. Diabetes also causes 6.7 million deaths or 1 every 5 seconds. IDF also shows that 1 in 12 people in the world suffer from DM disease, and 1 in 2 people with DM do not know that they have DM, usually the patient will only find out about their condition when the disease has been running for a long time with complications that are very clearly visible so that they carry out treatment and examination at the hospital (RISKESDAS, 2018). Indonesia is ranked fifth as the most diabetic in the world after China, India, Pakistan and the United States. And being the only representative of Southeast Asian countries. This data is reinforced by data obtained by IDF that around 19.46 million people in Indonesia have diabetes in 2021 and is expected to continue to grow to around 28.57 million in 2045. This number is 47% greater than in 2021. The number of people with diabetes in 2021 has increased rapidly in the last ten years. The number of people with diabetes has skyrocketed 167% compared to the number of people with diabetes in 2011, which reached

7.29 million. The increase is also much higher than the increase between 2000 and 2011. In that period the number of people with diabetes increased by 29% from 5.65 million in 2000 (RISKESDAS, 2018). In the province of South Sulawesi, based on data from the local Health Office, the number of people with diabetes mellitus reached 54,007 people in 2021. Whereas in 2021, the number of people with diabetes reached 41,497. This means that within a year, there was an increase of 12,510 sufferers in South Sulawesi. Especially in the city of Makassar itself in 2022, it has become the area in South Sulawesi Province with the highest number of DM cases, namely 11,619 patients (RISKESDAS, 2018). This is expected to increase if not immediately handled properly with good education to prevent various complications that often accompany this disease.

When becoming a patient with T2DM, there will be changes in lifestyle before and after illness (Macioch et al., 2017). One of them is quality of life. Quality of life is a condition where a patient feels there is happiness in realizing something desired in life during illness. However, not all patients have a good quality of life during illness, especially patients who experience T2DM disease (Macioch et al., 2017).

T2DM is a disease with a long treatment period even for life. When someone is diagnosed with T2DM, negative feelings such as anxiety, fear, apathy, and stress and even depression will emerge (Raspovic et al., 2017). This can trigger a decrease in quality of life. T2DM patients with low quality of life will result in misunderstandings in making decisions to live a lifestyle in terms of activities, information systems and most importantly treatment. So that these patients are at risk of exposure to T2DM complications (Kuang et al., 2021).

Complications of T2DM include retinopathy, renal failure, diabetic foot ulcer (DFU) and many more. DFU is a diabetic foot condition characterized by open wounds due to poor blood circulation and decreased nerve function due to uncontrolled blood sugar levels. If this is not

handled properly, it will result in the worst condition such as amputation of diabetic foot wounds (Macioch et al., 2017).

Diabetic foot ulcers are a morbidity-related complication of diabetes, caused by macrovascular (large blood vessel damage) and microvascular (small blood vessel damage) (Haryanto et al., 2023). This complication is estimated to occur in approximately 15% of all patients with diabetes, with a risk of recurrence within 5 years of 70% and being 84% of the cause of foot amputation in people with diabetes (Kizilkurt et al., 2020). This will certainly not happen if people with diabetes have sufficient knowledge about diabetic foot wound care and the principles of a healthy lifestyle. Therefore, a scoping review is needed to see the factors that influence the quality of life experience of T2DM patients with DFU.

METHODS

Protocol and registrations

The method used in this scoping review begins with searching for articles using keywords entered on each search engine Scopus, Pubmed and Science Direct, with a bolean system which is then filtered based on the inclusion and exclusion criteria of Elicit filtering, then continued with the Prisma guide to collect literature that meets the criteria for the instrument to determine the factors that affect the quality of life of T2DM patients with DFU.

Eligibility criteria

Inclusion criteria

1. Articles involving participants with diabetic foot wounds
2. Articles that include factors affecting the quality of life of T2DM patients with DFU.
3. Articles describing the patient's quality of life at the time of the study.

Exclusion criteria

1. Article in the form of a review
2. Articles with a minimum publication year of the last 10 years, namely at least 2014.
3. Articles that are in English.

Research studies

The search was conducted electronically with a search strategy preceded by the use of electronic databases such as Scopus, Pubmed and Science Direct. Search.

The study was conducted using T2DM patients as the problem, quality of life as the context and diabetic foot ulcer as the content. The keywords used in the instrument are type 2 diabetes OR diabetes mellitus AND quality of life AND diabetic foot ulcer OR diabetec foot. The article search filters the last 10 years of articles which include research studies, titles and abstracts, English articles

Data extractions, analysis and synthesis

After obtaining articles that meet the inclusion and exclusion requirements, then the articles are analyzed using the Elicit application. In this application, articles will be filtered again based on the author's name, research country, research year, research design and research objectives, sample characteristics, intervention and intervention outcomes. Furthermore, the data was exported to *Microsoft Excel to* collect data suitability for further analysis

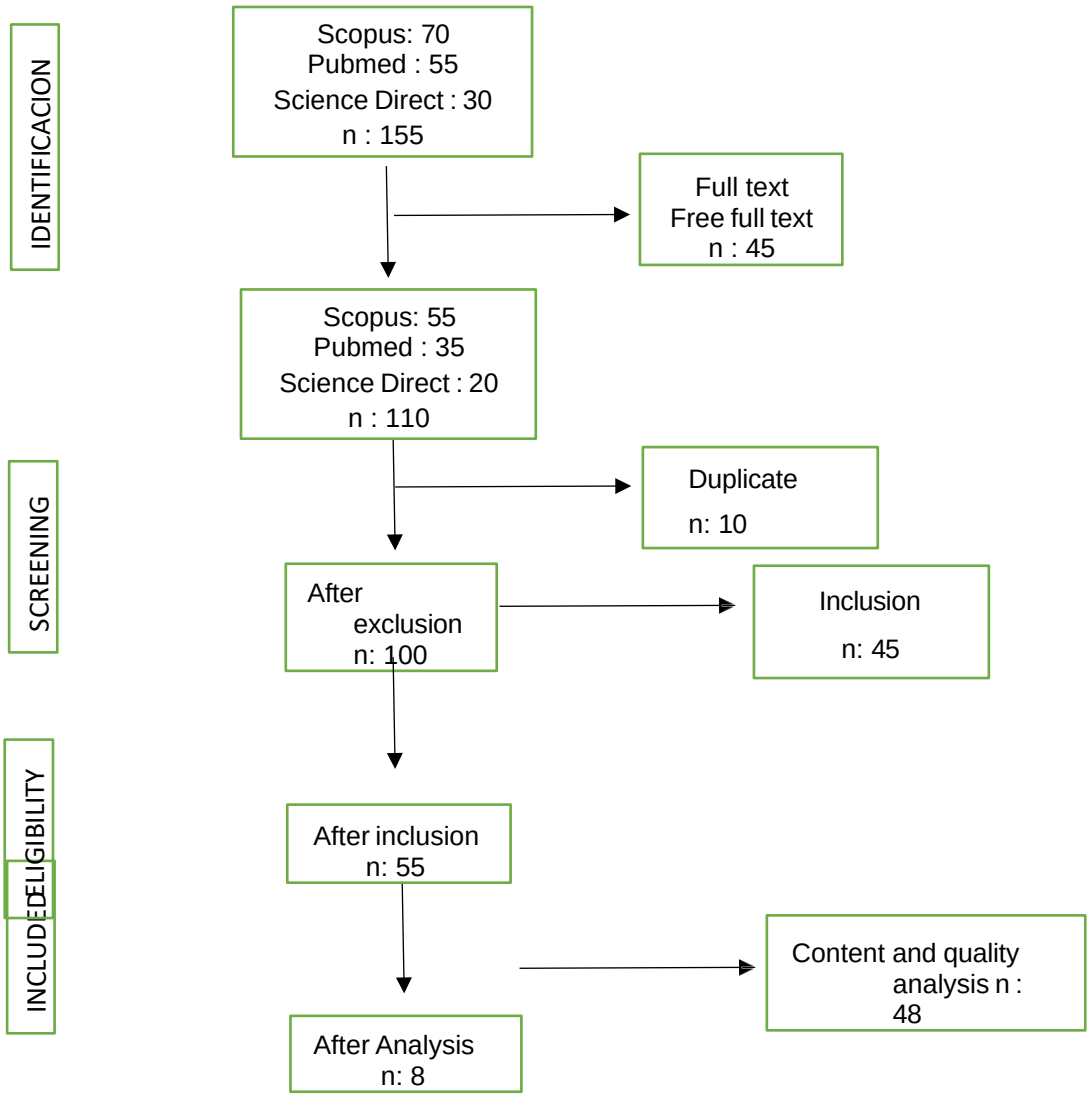

Figure 1. Flowchart of literature search

Table1.details of study design

Author, Year	Country	Study Design and Purpose	Sample Characteristic
John H Samies, Marie Gehling, Thomas E Serena, Raphael A Yaakov, 2015	United States of America	Cross sectional study. The prevalence of chronic wounds is increasing due to factors such as an aging population, obesity, diabetes, and cardiovascular disease. Lower extremity ulcers can have various causes, with venous and arterial disease being the most common. The LUNA Fluorescence Angiography System (FAS) provides a new technology to visualize blood flow and assess wound healing ability. It allows clinicians to differentiate between perfused and nonperfused tissue and provide a more objective assessment of arterial and venous flow, as well as oxygen gradients or perfusion in the wound.	People with diabetes, hypertension, hyperlipidemia, peripheral arterial disease, chronic wounds, venous disease, and arterial disease are population characteristics relevant to this study.
Sylwia Krzemińska, Anna Kostka, 2021	Poland	Observational and correlational study. Pain intensity was significantly associated with poorer quality of life (QOL) and overall QOL scores in the physical and psychological domains in the first and second stages of the study. Pain intensity was negatively correlated with disease acceptance in all three stages of the study. The occurrence of anxiety and depression was highly dependent on the severity of pain, especially in the first and second stages of the study.	Population characteristics relevant to the study were Patients with complicated diabetic foot syndrome requiring amputation, aged over 60 years, with duration of diabetes above 10 years, without cognitive impairment, able tofill out the questionnaire themselves, and give consent to Take take part in the study.
Luis López-López, Marta Elena Losa- Iglesias, Jua n Gómez-Salgado, Ricardo Becerro-De-Bengoa-Vallejo, 2022.	Spain	Retrospective descriptive case control investigation. Diabetics had reduced foot health-related quality of life, as evidenced by statistically significant differences in foot pain, foot function, footwear, and social capacity between the two groups. between group diabetes and non-diabetic groups. This suggests that foot health negatively impacts quality of life.	The characteristics of the population totaled 150 people with an average age of 71.45 ± 11.93 years, consists of 98 (41.2%) women and 52 (21,8%) males aged between 27 and 91 years old. Group diabetes consisted of 94.7% DM2 and 5.3% DM1, with most of the sample being overweight with a BMI of 26.77 kg/m2.

Jin Sothornwit, Gulapar Srisawasdi, Atchara Suwannakin, Apiradee Sriwijitka, 2015.	Thailand	Cross sectional study. Diabetic foot problems have the most negative impact on quality of life. After suffering from DF, 21% of patients lose their jobs. Foot care and foot assessment should be promoted to prevent diabetic foot problems.	Recruitment of diabetic patients aged ≥18 yearsnfrom various clinics at Siriraj Hospital, Thailand, between January 2014 and September 2016. Administration of the EQ-5D-5L questionnaire versi on Thailand to assess Health-related quality of life.
Konstantinos Spanos, Vasileios Saleptsis, Athanasios Athanasoulas, Christos Karath, 2017	Greece	Observational cross sectional. Ulcer healing, minor amputation, and major amputation rates were reported, and the study found that quality of life improved in all patients after treatment, regardless of the outcome.	Population characteristics included a majority male population with an average age of 69.7 years, most were manual laborers and had an average BMI of 28. Half of the patients were on insulin, and the average duration of diabetes among patients was 18 years. In addition, 50% of patients presente d late to the health service since onset ulcers , with an average time 24 days, and the average hemoglobin A1C was 8.1%.
Nahid Dehghan, Nasrin Samadi, | Bagher Larijani, | Leila Sayadi, 2019.	Iran	Randomized clinical trials. The nurse-led care intervention significantly improved dimensions of quality of care compared to standard care, and most participants in the nurse-led group had certain demographic and medical characteristics	Adult diabetics, the majority are obese and married, the majority have a history of diabetes of more than 5 years. year, majority have wound on the metatarsus

Roberto Lonardi, Nicola Leone, Stefano Gennai, Giulia Trevisi Borsari, Tea Co, 2019.	Italy	Randomized case trial. Injections local tissue autologous microfragmented adipose tissue significantly improved the healing rate after minor amputation of irreversible diabetic foot ulcers (DFU), with 80% healing of the treated foot within 6 months compared to 46% in the control group (p=0.0064). This study shows that this technique is a safe and valid therapeutic option, overcoming criticisms related to stem cell therapy, and its potential in wound care should be further evaluated and its therapeutic indications expanded.	Patients diabetes mellitus (type 1 and 2) of either gender, age > 18 years, and presence ofirreversible ulcers/forefoot gangrene.
Lutz Schomburg, Alejandro Sanz, Magali González-Colaço Harmand, Alicia Tejera Concepció, 2023.	Spain	Prospective observation. Key findings include the association between changes in sarcopenia and more severe pain, poorer quality of life, and poorer mobility at follow-up, as well as the relevance of malnutrition and sarcopenia in the prognosis of diabetic foot patients. This study suggests that targeted treatment to correct these factors could potentially improve quality of life in this population.	Population characteristics include patients advanced age (mean age 76.82 ± 8.08 years) predominantly male (71%) with a high prevalence of comorbidities such as hypertension, disease heart ischemic, renal disease, retinopathy, and chronic anemia. In addition, most patients had previous ever experienced DF ulcers, and most of the patients are at social risk or facing social problems (37.8%)

RESULTS AND DISCUSSION

In the initial search, 155 articles were retrieved, which included 70 articles from Scopus, and 55 articles on Pubmed, and 30 Science Direct articles. Followed by a full text search left 110 articles, each consisting of 55 articles from Scopus and 35 articles from Pubmed, and 20 articles from Science Direct. The 110 articles were then entered into the Elicit application filtered by author name, research country, research year, research design and research objectives. Steps The next step was to check the duplication of articles in the Mendeley application, which left 100 articles. The 100 articles were then filtered based on the exclusion and inclusion criteria into 55 articles. The next step was t o analyze the content and quality of the articles, which resulted in 8 articles. In general, the filtering process of the eight articles can be described in Figure 1.

Of the 8 articles found, each contains the life journey of T2DM patients ranging from prediabetic problems to complications of T2DM, especially DFU. In patients with DFU cases, it starts from stress to depression with a disease condition that does not go away due to lack of

literacy that T2DM is a long-term disease that accompanies a lifetime so that when undergoing a long treatment, namely for years, the patient feels bored so that he tries other alternatives that cause complications such as DFU and some even lead to diabetic foot amputation.

CONCLUSIONS

The incidence of DFU in T2DM patients is a follow-up that adds to the psychological burden of the disease. This is characterized by limited literacy in drawing conclusions as well as psychological support from the surrounding environment in helping patients to draw the right conclusions. The factors that affect the quality of life of T2DM patients with DFU include; gender, age, educational background, employment status, marital status, economic level, surrounding environment, and the patient's spiritual level. In addition, the types of factors above are also different for each patient influenced by different background differences. Therefore, it is important that there is follow-up from both the local government and the private sector as well as certain groups in handling this matter in order to create an improved quality of life in T2DM patients who can avoid this.

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