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Factors Affecting The Quality of Life of Diabetes Mellitus Type 2 Patients: Literature Review

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Abstract

Objectives: Patients with type 2 diabetes mellitus (T2DM) had experienced physical and psychological complications that affect their daily life, and contribute to poor the quality of life. This study aims to determine the factors that affect the quality of life of people with T2DM based on the SF-36 questionnaire, to improve the factors that can be changed to improve the quality of life of people with T2DM.

Methods: This literature review search from 3 databases used including google scholar, PubMed, and the Garuda portal with the year of publication of the article in 2015-2021. Some of the literature states similar factors that affect the quality of life of people with T2DM.

Results: Factors that affect the quality of life of people with T2DM, include age, gender, education, complications, and duration of diabetes. Influence is given aspect or the overall value of quality of life

Conclusion: The education factor can be improved with the intervention given by peers, so that they can manage T2DM well, and have an impact on improving the quality of life of T2DM patients.

Key words: Type 2 Diabetes Mellitus, Short form survey, questionnaire, literature review



INTRODUCTION

Diabetes Mellitus is a chronic degenerative disease characterized by an increase in blood sugar levels. Type 2 Diabetes Mellitus (T2DM) is a common disease among other types of DM, with prevalence in the last three decades increasing sharply in all countries (1). The majority of T2DM are adults and occurs as a result of the body's resistance to insulin or ineffective use of insulin (2). Patients with T2DM usually experience physical complications such as neuropathy, retinopathy, cardiovascular disease, and diabetic foot disease. In addition, patients also experience psychological complications such as anxiety and depression that have an impact on daily life. The impact that occurs is in the form of physical and mental health and contributes to a poor the quality of life(3).

Diabetes hurt on physical well-being in four main ways, including leading to long-term and short-term complications, demands for treatment, and affecting psychological functioning conditions that have an impact on mood. In addition, patients also experience social welfare disorders that affect the patient's social relationships with people around them (4). The quality of life of people with T2DM is influenced by many factors including gender, occupation, duration of suffering, and the presence of complications due to neuropathy and nephropathy(5).

The quality of life becomes an individual's understanding regarding their position in life. Both regarding the value system and culture around them, as well as regarding expectations, goals, standards, and concerns(6). Meanwhile, according to the Centers for Disease Control and Prevention (CDC), the term quality of life is defined as a broad, multidimensional concept that includes subjective evaluations of positive and negative aspects of life (7). Efforts to measure quality of life began in 1937, to assess functional health in adults as the

ability to perform self-care and basic physical activity. The concept of Health-related quality of life (HRQoL) and its determinants developed in the 1980s. It covers aspects of overall quality of life and can be demonstrated to affect physical and mental health (7). The HRQoL assessment is useful for clinicians and policymakers to provide an overview of an individual's health status(7).

This literature review has the aim of summarizing the empirical or theoretical literature that has been carried out in the past to provide a more comprehensive understanding of the factors that affect the quality of life of people with T2DM. Factors that affect the quality of life of people with T2DM vary both based on demographic and clinical characteristics. Past research has stated that demographic characteristics that affect the quality of life of people with T2DM include age, gender, employment status, education level, and marriage (8,9, 10). Meanwhile, the clinical characteristics consisted of length of stay, comorbidities, complications, GDA > 200/ml, HbA1c, and insulin therapy (8, 9, 11). This study uses a generic instrument type health profile, namely the Short Form Survey (SF-36) questionnaire. According to (7) the SF-36 instrument is one of the most widely used health profiles and covers eight domains and can be summarized into two domains.

METHOD

The literature search was carried out in March and September 2021. The literature searches in this literature review utilized three databases, namely Garuda Portal, Google Scholar, and PubMed. The library used is in the form of journals or published articles that can be accessed free of charge. This research is not limited in one area, so it covers all countries with published articles using Indonesian and English introductions. The search is carried out with several keywords that are tailored to the research objectives, keywords can be different in each



database. Researchers followed the guidelines for preferred reporting items for systematic reviews and meta-analyses (PRISMA). Exclusion criteria: 1) the study population is patients with DMT1 or gestational diabetes; 2) T2DM patients have been given diet therapy or physical

exercise; 3) measure sleep or dental quality; 4) use other quality of life questionnaires or test the validity of the SF-36 questionnaire; 5) review studies; 6) articles published with full free access.

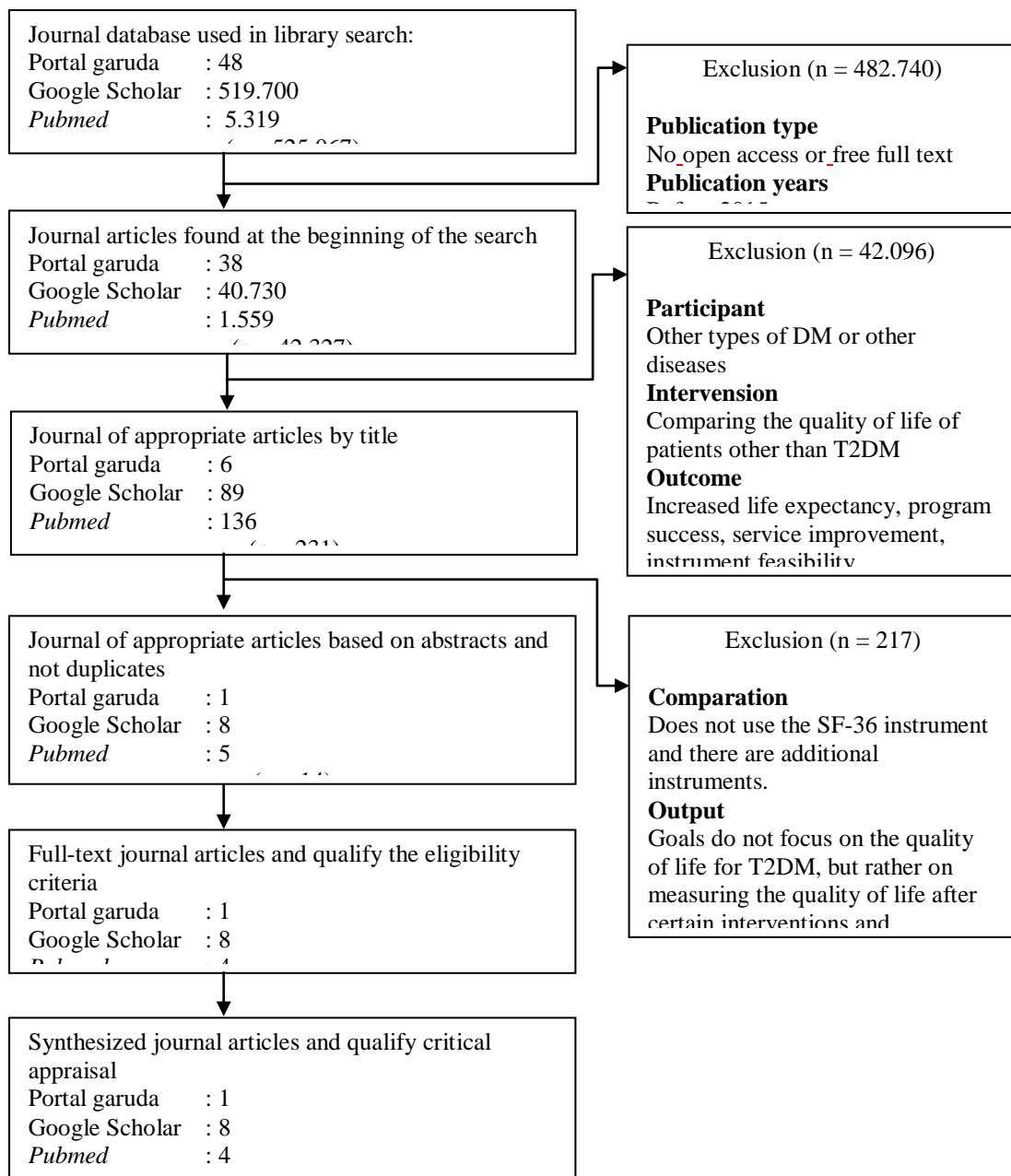


Figure 1 Flow of Narrative Review



Literature search results in the database, with keywords that have been adjusted. Found as many as 525,067 consisting of articles, journals, proceedings, and books. Researchers re-examined the articles found such as open access and year of publication, thus obtaining 482,740 articles that needed to be issued. Then the article was excluded and the remaining were 42,327 articles. The remaining articles were then screened based on title (n= 231), abstract and no duplicates (n= 14), and full text and eligibility criteria (n=13). In addition, 13 articles have been critically reviewed by referring to the Joanna Briggs Institute (JBI) Critical Appraisal and overall have high scores of more than 50%

RESULTS

The articles used were 13 journals with 12 journals having a cross-sectional type of research and 1 cohort. The article conducted the research directly, using the SF-36 questionnaire and interviews, with the research sites spread across the Asian continent and the European continent. However, for a cohort study using data from the Dutch Lifelines Cohort Study. The age range of the research respondents ranged from 18-96 years, with the majority being female. The eight articles that conducted the assessment stated that the majority of respondents were married and had secondary education. In addition, of the nine articles that measure employment status, five articles state that the majority of respondents are employed. These results can be seen in Table 1.

Clinical information was obtained from thirteen studies of them, duration of T2DM of the respondents varied. Eight studies stated that the majority of respondents had suffered from > 5 years. The comorbid that often suffered was hypertension from four articles that assessed the types of comorbidities suffered by the respondents. Five study articles conducted an assessment

of complications, three of which the majority of respondents did not have complications. In addition, the majority of patients used OHA therapy and the results of glycemic control were variable. Some do it regularly, some don't, and don't measure regularity. Rather, it is the type of glycemic control examination performed. These results can be seen in Table 1.

The factors that affect the quality of life of people with T2DM, based on the SF-36 questionnaire, are the same as previous theories and studies. The results of the identification of respondent characteristics that affect the quality of life of people with T2DM including gender, age, and education, respectively, are factors that are often found in study articles. These results can be seen in Table 2.

DISCUSSION

Gender

Ten out of thirteen study articles stated that gender significantly affects the quality of life of people with T2DM. Five of the ten study articles stated that women with T2DM tend to have a poor quality of life in the aspect of BP. The decrease in quality of life that occurs in women with T2DM is caused by the nature of women who are easy to express opinions or are more expressive. For example, it is easy to complain due to discomfort with their health conditions(12, 13) In addition, female T2DM patients also feel tired easily when carrying out daily activities(14). Research conducted by (15) supports this statement, that there is a relationship between female sex and decreased quality of life in T2DM sufferers and male patients may be more receptive to the illness than women so there are fewer complaints. A similar statement was also obtained from the results of research conducted by (16), which stated that female patients had a worse quality of life in all aspects of quality of life compared to male



patients. This situation is supported by the differences in social roles, functional structures, and hormones between the two.

Age

Eight out of thirteen articles stated that age affects the quality of life of people with T2DM. The influence given of age on the quality of life of people with T2DM varies, some affecting the overall and some aspects of the quality of life-based on the SF-36 questionnaire, and adjusted to how old the patient is. Six of the eight study articles stated that age affected aspects of BP based on the SF-36 questionnaire. Patients with T2DM who are elderly have a lower quality of life in all aspects of quality of life based on the SF-36 questionnaire. This is due to several reasons, including the elderly having lower physical and mental health control compared to younger ages(12). More than one chronic disease, so that they can undergo various treatments at one time(13). Cognitive complications are also experienced by the elderly who suffer from T2DM, such as dementia and Alzheimer's (25).

The elderly have a decrease in anatomical, physiological, and biochemical

parts, so it is easy to complain of body pain (27). T2DM disease in the elderly is associated with decreased quality, mass, and muscle strength, so they have difficulty walking and will be more severe if they have long suffered from T2DM. In addition, treatment is also difficult due to hypoglycemia and the ability to overcome drug side effects(28). Research conducted by (16) supports this statement. Those T2DM sufferers are grouped by age (young adults, adults, and the elderly) have a significant difference in aspects of PF and GH.

Differences in the findings were found in a study conducted by (14). The results of the study stated that the elderly had a better quality of life, especially in the aspects of RP, BP, and VT compared to young people in the same population. Meanwhile, when compared to the general population, the elderly (age > 60 years) have a better quality of life in most aspects, except for BP and SF aspects. This situation is caused by the research respondents residing in rural areas, most of whom have a livelihood as farmers, and retirees also carry out farming activities to fill their spare time, so they remain active in physical activities.

Table 1 Identification of Demographic and Clinical Characteristics

Author, Year	Study Design	Age (year). Average \pm SD	Female (%)	Marital Status (%)	Level of Education (%)	Occupation (%)	Duration (average \pm SD)	Comorbid	Complication	Therapy	Glycemic Control
Teli, 2017	Cross-Sectional	40-65	70,8 %	N/A	N/A	N/A	64,6% < 10 years	75,96% hypertension 32,48% of chronic heart disease 23,3% of kidney failure 23% polyneuropathy 19,76% dyslipidemia 15,54% retinopathy	92% leg pain 43,1% hypercholesterolemia 7,7% stroke 1,5% heart failure	N/A	90,8% teratur



								6,73% of chronic obstructive pulmonary disease			
Slagter <i>et al.</i> , 2015	Kohort	18-80 Men: 48 ± 11 Female: 47 ± 12	62%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Test blood sugar, total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, and blood pressure
Almogbel, 2020	Cross-Sectional	30-70 (53,9 ± 10,2)	31,2%	88,2% married	49,1% of high school	59,1% non-working	49,7% >10 years	74,1% No	73,5% No	75% no insulin therapy	N/A
Basir <i>et al.</i> , 2016	Cross-Sectional	30-79 (57,45 ± 8,88)	54,2%	83% married	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Haslinda <i>et al.</i> , 2016	Cross-Sectional	51,96 ± 7,28	55,4%	93,6% married	72,7% of secondary education	44,2% employee	45,7% <5 years	84,3% Yes	79,8% No	68,5% OHA	76% poor
Kumsari <i>et al.</i> , 2019	Cross-Sectional	45,61 ± 10,05	63,6%	88,4% married	70,2% of primary education	57,9% non-working	5,62 ± 5,25 years	N/A	N/A	32,2% insulin	GDP
Levertova <i>et al.</i> , 2016	Cross-Sectional	32-88 (63 ± 0,96)	53%	74,3% married	45,7% of secondary education	55,7% retired	61,4% >5 years	75,7% hypertension 41% dyslipidemia	44,3% ischemic heart 17,1% neuropathy 12,9% retinopathy 4,3% nephropathy	80% OHA	N/A
Sumardiono <i>et al.</i> , 2019	Cross-Sectional	52,3% ≤ 43 years old	78,5%	N/A	N/A	employee	N/A	N/A	N/A	N/A	N/A
Singh <i>et al.</i> , 2016	Cross-Sectional	57,4 ± 11,1	53,6%	87,7% married	43,5% of primary education	48,6% home makers	36,2% 1-5 years	N/A	N/A	N/A	N/A
Hu <i>et al.</i> , 2015	Cross-Sectional	33-96 (67,1 ± 10,2)	67,7%	85,1% married	43,1% of illiterate	50,7% farmer	N/A	N/A	N/A	N/A	N/A



Tran Kien et al., 2021	Cross-Sectional	67,04 ± 8,52	59,4 %	N/A	48,4% secondary education	63% retired	8,03 ± 6,47 years	74,2% yes 55,3% hypertension 37,0% dyslipidemia 4,6% kidney illness 2,9% heart disease	N/A	N/A	N/A
Sharma et al., 2021	Cross-Sectional	52,5 ± 11	79,2 %	87,4% married	37,2% bachelor	50,2% employed	7,82 ± 6,0 years	63,3% No hypertension 24,6% arthritis 6,9% typhoid dysfunction 5,6% dyslipidemia 1,4% tuberculosis	91,6% No neuropathy 6,1% coronary arteries	80,5% OHA and lifestyle modification	N/A
Morales et al., 2015	Cross-Sectional	71,3	52%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Education

Six of the thirteen study articles used stated that the level of education significantly affects the quality of life in people with T2DM, especially aspects of MH. The level of individual education reflects the patient's knowledge and understanding of the disease he suffers so that it has an impact on the quality of life they have (20). However, low education levels may have a positive impact on quality of life, such as better RP aspects in patients with low education (26). Research conducted by (16), supports most of the findings regarding the effect of education level on the quality of life of people with T2DM. That the level of education significantly affects all aspects of quality of life, except the SF aspect. In addition, (29) added that the level of education affects physical roles, patients with low education tend to limit physical roles more than patients with higher education. In contrast to the research conducted by (30), there is no influence between the level of education and

the quality of life at the Sukoharjo City Health Center.

Complications

Six of the thirteen study articles stated that complications that occur in people with T2DM, affect the quality of life of people with T2DM. Complications hurt on all aspects, especially the RE aspect which is the aspect that dominates the quality of life for T2DM patients based on the SF-36 questionnaire. Complications experienced by T2DM patients without or accompanied by comorbidities cause limitations in carrying out physical activities (20). Patients who experience complications and comorbidities at the same time, limit themselves more from the environment and socialize both with family and friends due to their illness. Another study article stated that complications of polyneuropathy cause the duration of suffering to be longer and lead to comorbidities(13). Some of these study articles, in line with the results of research conducted by (16), stated that patients with



more than 1 complication had a lower quality of life in aspects of PF, RP, GH, and VT compared to patients with only 1 complication. In contrast to research

conducted by (30), there is no influence between complications and quality of life at the Sukoharjo City Health Center.

Table 2 Factor of Quality of Life Type of Diabetes Mellitus Patients

Respondent Characteristics	Author, Year	Number of Studies /Total of Studies	Persentase
Gender	(Teli, 2017; Slagter <i>et al.</i> , 2015; Almogbel, 2020; Haslinda <i>et al.</i> , 2016; Kumsar <i>et al.</i> , 2019; B. Levterova <i>et al.</i> , 2016; Singh <i>et al.</i> , 2016; Tran Kien <i>et al.</i> , 2021; Sharma <i>et al.</i> , 2021; Morales <i>et al.</i> , 2015)	10/13	76,92%
Age	(Almogbel, 2020; Haslinda <i>et al.</i> , 2016; Kumsar <i>et al.</i> , 2019; B. Levterova <i>et al.</i> , 2016; Sumardiyono <i>et al.</i> , 2019; Tran Kien <i>et al.</i> , 2021; Sharma <i>et al.</i> , 2021; Morales <i>et al.</i> , 2015)	8/13	61,54%
Education	(Almogbel, 2020; Haslinda <i>et al.</i> , 2016; Kumsar <i>et al.</i> , 2019; B. Levterova <i>et al.</i> , 2016; Singh <i>et al.</i> , 2016; Tran Kien <i>et al.</i> , 2021; Sharma <i>et al.</i> , 2021)	7/13	46,15%
Complication	(Teli, 2017; Almogbel, 2020; Basir <i>et al.</i> , 2016; Haslinda <i>et al.</i> , 2016; B. Levterova <i>et al.</i> , 2016; Sharma <i>et al.</i> , 2021)	6/13	38,46%
Duration of T2DM	(Teli, 2017; Almogbel, 2020; Haslinda <i>et al.</i> , 2016; B. Levterova <i>et al.</i> , 2016; Sharma <i>et al.</i> , 2021)	5/13	38,46%

Duration of Type 2 Diabetes Mellitus

Five of the thirteen study articles stated that the length of the illness significantly affects the quality of life of people with T2DM. The PF aspect is the dominant aspect that affects the quality of life value of the five study articles found. Patients who have long suffered from T2DM for < 2 years have a better quality of life, compared to patients who have suffered for > 5 years (26). This is because patients who have suffered for < 5 years have a lower risk of experiencing limitations in physical activity and have comorbidities and complications compared

to patients who have suffered for > 5 years (20). Patients who have suffered for > 5 years have higher anxiety and reduced confidence in the treatment they are undergoing (17).

These findings are not in line with research conducted by (30) which states that there is no effect between the duration of T2DM and quality of life at the Sukoharjo City Health Center. However, in another study, it was found that a good quality of life or the results of the calculation of scores from moderate to high occurred in patients with a duration of suffering < 5 years, while patients with a length of suffering > 10 years



had moderate to poor scores (31). This situation is thought to be due to the long duration of suffering resulting in patients being more surrendered and tending to despair in undergoing treatment, and patients feeling tired due to years of drug consumption.

CONCLUSIONThe quality of life of T2DM patients is influenced by various factors. The results of this literature study state that age, gender, education, complications, and length of suffering significantly affect the quality of life of people with T2DM. Both affect one aspect of quality of life-based on the SF-36 questionnaire, as well as affect the overall quality of life value. Five factors can be improved, namely the education factor. Education is an important factor in continued self-care management and perceptions of self-worth. People with T2DM with higher education will find it easier to read and understand the impact of diabetes that they can increase better awareness about the disease, such as medication adherence and management to avoid complications.

Interventions can be carried out through peers who have been given diabetes self-management guidance which includes physical activity, diet compliance, monitoring and care. Peer coaching will later be given to individuals or groups of T2DM, in the short or long term, as well as through different modalities. Cadres who come from residents are expected to know more about the condition of the community, both its culture, and characteristics and avoid social inequalities due to the educational hierarchy.

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