



Levels of Depression in Type 2 Diabetes Mellitus: A Literature Review

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ABSTRACT

Due to the increase in morbidity each year, diabetes mellitus, one of the chronic non-communicable illnesses, continues to be a global health issue. Those with diabetes mellitus who change their lifestyle may have emotional disturbances including depressive symptoms. The purpose of this study is to discover risk factors for depression in people with type 2 diabetes. Using Google Scholar, Garuda, and PubMed with limits between 2018 and 2023, relevant publications are found by doing a literature review of published articles. The Beck Depression Inventory, Hamilton Depression Rating Scale, and Depression Anxiety Stress Scale were employed in the eight research that were examined to assess the severity of depression. Women with type 2 diabetes mellitus who are older than 50, have only completed secondary school, and have poor incomes are more likely to experience depressive symptoms. Family assistance is, therefore, necessary to help with psychosocial management to help individuals with type 2 diabetes mellitus avoid depressed symptoms.

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ABSTRAK

Diabetes mellitus ialah suatu penyakit kronis yang tidak menular dan masih jadi permasalahan kesehatan global, karena adanya peningkatan angka kesakitan pada setiap tahunnya. Adanya perubahan pola hidup pada penderita diabetes mellitus dapat menimbulkan gangguan emosional seperti gejala depresi. pelaksanaan riset memiliki tujuan untuk mengidentifikasi beragam faktor yang berkaitan terhadap tingkat depresi pada penderita diabetes mellitus tipe 2. Metode yang dipakai yaitu literature review artikel yang sudah terpublikasi dengan mencari artikel yang relevan melalui Google Scholar, Garuda dan PubMed dengan pembatasan antara tahun 2018-2023. Pada 8 penelitian yang dianalisis menggunakan instrumen berupa kuesioner Beck Depression Inventory, Hamilton Depression Rating Scale dan Depression Anxiety Stress Scale untuk menentukan tingkat depresi. Penderita diabetes mellitus tipe 2 yang lebih berisiko mempunyai gejala depresi adalah perempuan, berusia >50 tahun, dengan tingkat pendidikan terakhirnya sekolah menengah dan pendapatan rendah. Oleh karena itu, perlu adanya dukungan keluarga untuk membantu dalam manajemen psikososial untuk mencegah terjadinya gejala depresi pada penderita diabetes mellitus tipe 2.

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INTRODUCTION

Insufficient insulin synthesis by the pancreas or ineffective insulin uptake by the body are the causes of diabetes mellitus, a chronic medical condition. One of the four non-communicable diseases (NCDs) with the highest priority that need immediate attention is diabetes, which is a significant public health issue. (WHO, 2016).

According to the Centers for Disease Control and Prevention, type 2 diabetes mellitus affects more than 26 million Americans, or 8.3% of adults and children. Diabetes affects more than 347 million people worldwide, with men more likely to have it (9.8%) than women (9.3%). (AbdElmageed, 2022).

One condition that can be influenced by diabetes mellitus is mental health issues, such as the onset of symptoms of sadness and excessive anxiety that are common in persons with diabetes mellitus (Ascher et al., 2015). This is because diabetes mellitus patients view the condition as a chronic metabolic disease with no guarantee of recovery, difficulties managing medical care, and worries about complications and even disability that may arise. As a result, there is a strong correlation between the prevalence of depression and the risk of suicide. (Kodakandla et al., 2016).

Depression is a psychiatric disorder that affects certain persons with diabetes mellitus and is defined by abnormalities in a person’s mood, cognition, and behavior. Those who have depressive illnesses may experience melancholy, loneliness, a reduction in their sense of self, and detachment from their surroundings (Kaplan et al., 1997). A psychiatric condition called depression is characterized by bodily and cognitive symptoms as well as the outward signs of sadness, emptiness, and sensitivity. An individual’s function and capacity for performing daily tasks may be

impacted by these symptoms. (American Psychiatric Association, 2000).

According to research conducted by Eker (2018), who found a correlation between diabetes mellitus and the incidence of depression, 54 people with diabetes mellitus (31.6%) experienced mild depressive symptoms, and 46 people with diabetes mellitus (26.9%) experienced moderate depressive symptoms, patients with type 2 diabetes mellitus frequently experience two disorders in their mental health, such as symptoms of depression and anxiety.

This study aims to discover factors linked with depression in patients with diabetes mellitus in light of the issue of the prevalence of diabetes mellitus increasing every year, which is proportionate to the increase in the disruption of mental health disorders.

METHODS

The method used in this research is a literature review, where research articles are searched using several keywords and then analyzed through a review of all the search articles. Inclusion criteria are used to filter data obtained from journal databases, including the publication of articles within the last 5 years, the use of Indonesian or English language, and the relevance of the title and abstract to the topic of depression levels in type 2 diabetes mellitus patients. The study used three databases: GoogleScholar, Garuda, and PubMed. After filtering, 8 articles met the inclusion criteria and were analyzed to identify the variables influencing type 2 diabetes patients’ degrees of sadness. Future studies in this field may be guided by the findings of this study. The article screening flowchart is shown below.

Figure 1. PRISMA-LvR Research Diagram

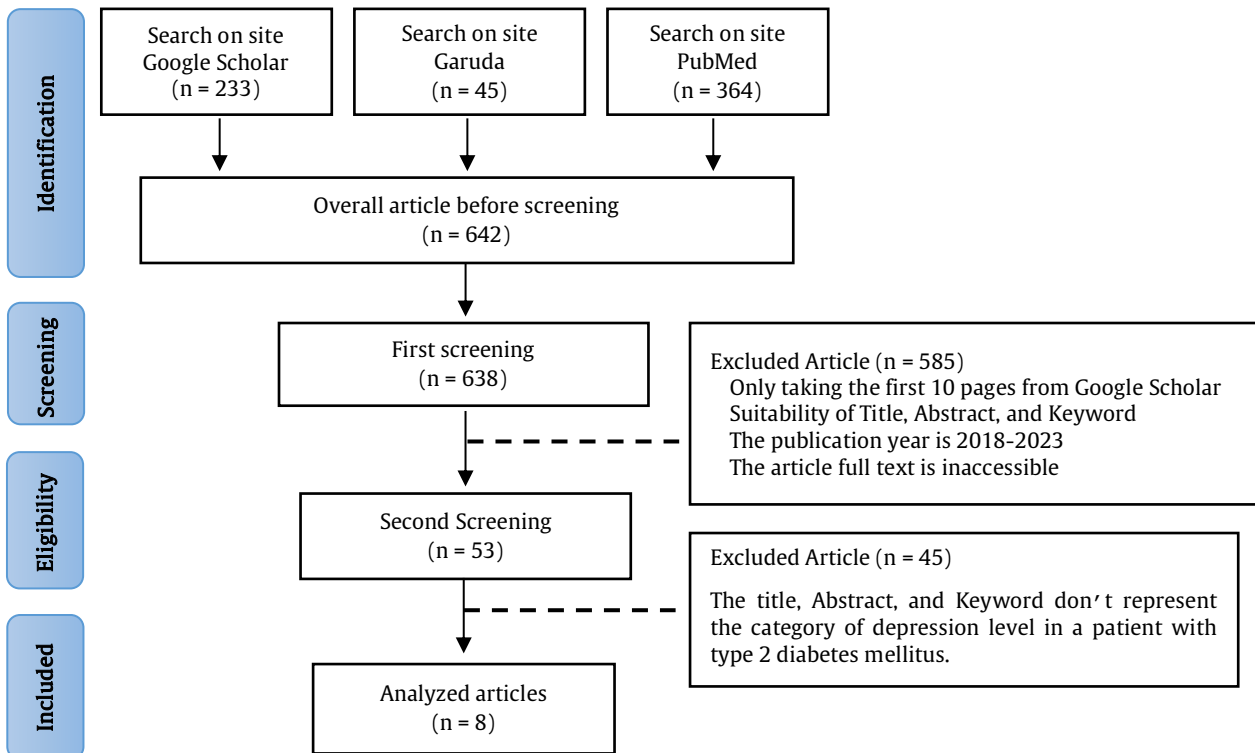


Table 1
Research Result Literature Review

No.	Author (Year)	Research Objectives	Design, Respondent	Variables Studied	Instrument, Statistical Analysis	Research Result
1	Vina et al., (2021)	“Knowing the relationship between depression level and fasting glucose levels in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 30 respondents with type 2 diabetes mellitus in the Internal Medicine Clinic of Sultan Syarif Mohamad Alkadrie Hospital, Pontianak City, Indonesia	Depression level Fasting blood glucose levels of patients with type 2 diabetes mellitus	Questionnaire with Beck Depression Inventory II (BDI II), blood glucose medical record data Statistical analysis using Kendall's Tau test B	a. Kendall's Tau B statistical test obtained a p value = 0.011 and a correlation of 0.44 indicating a relationship between the level of depression and blood glucose levels in patients with diabetes mellitus. b. Patients with high blood glucose had mild depression (26.7%), moderate depression (16.67%) and severe depression (6.67%). c. Gender characteristics were found to be mostly female (76.7%).
2	Putri et al., (2018)	“Knowing the description of the level of depression and control of fasting blood glucose levels in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 115 respondents with type 2 diabetes mellitus at Bandar Lampung Community Health Center, Indonesia	Depression level Fasting blood glucose levels of patients with type 2 diabetes mellitus	Questionnaire with Beck Depression Inventory II (BDI II), blood glucose data measured by glucometer Questionnaire validity test with Chronbach alpha 0.845 Statistical analysis with cross tabulation only	a. Patients who had uncontrolled fasting blood glucose levels were 62 respondents (53.9%). b. There were 90 respondents (78.26%) who experienced minimal depression, 11 respondents (9.57%) who experienced mild depression, 8 respondents (6.95%) who experienced moderate depression and only 6 respondents (5.22%) who experienced severe depression. c. Gender characteristics were found to be mostly female (80%) and middle age (45-60 years) as much as 57.39%.
3	Livana et al., (2018)	“Knowing the description of the level of depression in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 37 respondents with type 2 diabetes mellitus in the area of family doctor Djazariyah Kendal District, Indonesia	Depression level Type 2 diabetes mellitus patients (age, gender, education level, occupation, income, marital status, duration of DM)	Questionnaire with Depression Anxiety Stress Scale (DASS) Statistical analysis with cross tabulation only	a. In univariate analysis in type 2 diabetes mellitus patients, 21 respondents (57%) did not experience depression, 10 respondents (27%) who experienced mild depression and 6 respondents (16%) who experienced moderate depression. b. Most characteristics at the age of 25-60 years (54%), female (54%), high school education (35%), working (59%), income below the minimum wage (43%), married (62%), suffering from diabetes mellitus > 5 years (62%).
4	Handika et al., (2020)	“Knowing the description of the incidence of depression in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 46 respondents with type 2 diabetes mellitus at Sanglah General Hospital Denpasar, Bali, Indonesia	Overview of depression level Type 2 diabetes mellitus patients (gender, age, education level, marital status and occupation)	Questionnaire with Beck Depression Inventory (BDI), secondary data of medical records of patients with diabetes mellitus. Statistical analysis with cross tabulation only	a. In univariate analysis of type 2 diabetes mellitus patients, 15 respondents (32.6%) had minimal depression, 20 respondents (43.5%) had mild depression, 8 respondents (17.4%) had moderate depression and 3 respondents (6.5%) had severe depression. b. Most characteristics are age 50-59 years (45.5%), female gender (52.1%), last high school education (45.5%), Married (91.3%) and private job (21.7%).
5	Bayuningtyas et al., (2018)	“Knowing the level of depression in patients with	<i>Cross sectional</i> 56 respondents with diabetes mellitus at the	Depression level Type 2 diabetes mellitus patients	Questionnaire with Hamilton Depression Rating Scale (HDRS)	a. In the univariate analysis of type 2 diabetes mellitus patients, 9 respondents (16%) were found to have no symptoms of depression, 15 respondents (26.7%) had mild depression, 25 respondents (44.6%) had moderate depression and 7 respondents (12.5%) had severe

		type 2 diabetes mellitus”	Internal Medicine Clinic of Dr. Harjono Ponorogo Hospital, Indonesia	(age, gender, education, occupation, income and marital status)	Statistical analysis with cross tabulation only	depression.
6	Rizky et al., (2019)	“Knowing the description of the level of depression of patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 40 respondents with type 2 diabetes mellitus at Kitamura Clinic Pontianak, Indonesia	Depression level Type 2 diabetes mellitus patients (gender, age, occupation)	Questionnaire with Hamilton Depression Rating Scale (HDRS) Statistical analysis with cross tabulation only	<p>b. The most characteristics are 59-64 years old (25%), female (62.5%), high school (36%), private job (23.2%), income >1,500,000 (64.2%), married (71.4%).</p> <p>a. In univariate analysis in type II diabetes mellitus patients, 18 respondents (45%) were found to have no symptoms of depression, 11 respondents (27.5%) had mild depression, 6 respondents (15%) had moderate depression, 2 respondents (5%) had severe depression and 3 respondents (7.5%) had very severe depression.</p> <p>b. Most characteristics are female (67%), 46-59 years old (17.5%), housewife (47.5%).</p>
7	Safitri et al., (2022)	“Knowing the relationship between depression and cognitive function in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 110 respondents with type 2 diabetes mellitus in the working area of Puskesmas Sedayu, Bantul, Yogyakarta, Indonesia	Level of depression Cognitive function people with type 2 diabetes mellitus	Questionnaire with Beck Depression Inventory (BDI) Statistical analysis using Kendall's Tau test B	<p>a. In the univariate analysis of type 2 diabetes mellitus patients, 10 respondents (9.1%) were found to have no symptoms of depression, 20 respondents (18.2%) had mild mood disorders, 32 respondents (29.1%) had borderline depressive symptoms, 35 respondents (31.8%) had mild depression levels, 11 respondents (10%) had moderate depression levels and 1 respondent (0.9%) had severe depression levels.</p> <p>b. Kendall's Tau B statistical test obtained a value of $p = 0.000$ ($p < 0.05$) and a correlation of 0.44 indicates a relationship between the level of depression and cognitive in patients with type 2 diabetes mellitus.</p>
8	Eker, Salih (2018)	“Identifying symptoms of depression in patients with type 2 diabetes mellitus”	<i>Cross sectional</i> 171 respondents with type 2 diabetes mellitus in Sakarya Hospital, Turkey	Depression level Type 2 diabetes mellitus patients (gender, education, duration of diabetes and HbA1c value)	Questionnaire with Beck Depression Inventory (BDI) Statistical analysis with cross tabulation only	<p>a. In the univariate analysis, 67 respondents (39.2%) did not have symptoms of depression which were divided by gender including 29 female respondents (28.7%) and 38 male respondents (54.3%).</p> <p>b. 54 respondents (31.6%) had mild depressive symptoms including 35 female respondents (34.7%) and 19 male respondents (27.1%).</p> <p>c. There were 46 respondents (26.9%) including female 34 respondents (33.7%) and male 12 respondents (17.1%) had symptoms of moderate depression.</p> <p>d. 4 respondents (2.3%) including female 3 respondents (2.3%) and male 1 respondent (1.4%) had symptoms of severe depression.</p> <p>e. The most characteristics in women (41.5%) with $p=0.007$, the last education is elementary school (35%) with $p=0.459$, the duration of diabetes is above 11 years (45.6%) with $p=0.863$ and the HbA1c value is 6.5-7% (14.03%) with $p=0.018$.</p>

RESULTS AND DISCUSSION

All articles reviewed related to previous studies using data extraction tables include discussion related to factors associated with the level of depression in patients with type 2 diabetes mellitus. The following are the research points obtained from the 8 articles.

Due to an increased symptom burden, diabetic consequences that impair function and lower quality of life, and subsequent vascular alterations in the brain, diabetes mellitus may raise the risk of depression or exacerbate depressive symptoms. (Park et al., 2015).

According to a meta-analysis of 10 studies done by Ali et al. (2006), patients with diabetes mellitus had a considerably greater prevalence rate of depression (17.6%) than those without diabetes mellitus (9.8%). When women with type 2 diabetes mellitus are more likely to exhibit depressive symptoms due to their clinical features. According to Eker's (2018) research, which analyzed the gender characteristics of individuals with type 2 diabetes mellitus, 41.5% of women with the disease reported having mild to severe depression symptoms. This is consistent with the findings of Park and Reynold's (2015) study, which found that women with diabetes have a greater rate of depression (23.8%) than men (12.8%). Women who have diabetes mellitus are twice as likely as men to experience depressive symptoms. This can be explained by the fact that premenopausal, postpartum, and pregnant women frequently suffer major hormonal shifts. (Sartorius, 2018).

Women over 50 who are premenopausal are more susceptible to depression symptoms and at risk of developing them. According to research by Handika et al. (2020), the majority of diabetics with depression are between the ages of 50 and 59. This is because older people typically worry more about their future employment prospects, the possibility of disabilities (such as movement restrictions) brought on by aging, their own declining physical and mental health, and their lack of motivation to adhere to treatment regimens.

Risk factors for knowledge that can be seen through the patient's level of education can influence the patient's thinking in regards to implementing a healthy lifestyle, self-care, and compliance in diabetes mellitus treatment management so that blood glucose levels are always controlled so that worries about complications from diabetes mellitus can be prevented (Rizky et al., 2019). This is consistent with studies by Bayuningtyas et al. (2018) and Livana et al. (2018), which demonstrate that patients with diabetes mellitus who have completed high school are more likely to have depressive symptoms. This research contrasts with that of Eker (2018), who found that individuals with diabetes mellitus whose last educational level was an elementary school (35% of them) had the highest rates of depressive symptoms.

Because diabetes is a chronic disease that requires sufferers to take antidiabetic medications regularly even for life, it requires extensive medical expenses and treatment. Patients with diabetes mellitus who have a low level of education will directly affect their income. Economic conditions also play a role in controlling blood glucose levels and the level of depression in patients with diabetes. Patients will bear the burden of treatment and care needs if there is no social or financial support available to satisfy them (Putri et al., 2018). The same study, by Mendenhall et al. (2014), demonstrates that low-income groups in India not only have higher levels of depression and social pressure than wealthy

groups, but also a lack of knowledge about lower diabetes and limited access to health treatments.

Patients with diabetes mellitus may experience uncontrolled blood glucose levels due to long-term stressors, excessive anxiety, or a sense of worthlessness, which will have an emotional impact and interfere with treatment compliance (Rustad et al., 2011). These are just a few examples of how the presence of minimal, mild, moderate, or severe depressive symptoms can have an impact on a patient's medical conditions (Park., 2015). The metabolism of the cortisol hormone will also be affected by low self-acceptance of the sickness because the level of depression is closely correlated with the amount of cortisol hormone secreted (Bădescu et al., 2016). As a result, it will have an impact on insulin production by increasing gluconeogenesis, which raises blood glucose levels and speeds up the onset of micro and macrovascular complications (Champaneri et al., 2010). Patients will also have a two times higher risk of morbidity than people with diabetes mellitus who do not exhibit depressive symptoms. (Livana et al., 2018)

LIMITATION OF THE STUDY

This literature study only uses three databases; it is likely that more literature will be obtained if the database is more extensive used. We used eight articles for analysis with publications over the last 5 years so there are few studies that have discussed the level of depression in patients with type 2 diabetes mellitus, so further research is needed on this topic.

CONCLUSIONS AND SUGGESTIONS

This review of the literature leads to the conclusion that type 2 diabetes mellitus can affect a person's level of depression, as shown by numerous articles that have been analyzed and various measurement scales, such as the Hamilton Depression Rating Scale, Beck Depression Inventory, and Depression Anxiety Stress Scale, that have been used to gauge a person's level of depression. Age, gender, education level, and income are a few patient factors that are linked to the severity of depression symptoms in people with type 2 diabetes mellitus. The author, therefore, expects that by producing this literature review, doctors will be able to further take into account the psychological impact experienced by type 2 diabetes mellitus patients, allowing for therapy that not only addresses diabetes but also the patient's mental state. so that doctors can determine what causes patients' mental and emotional illnesses. This is anticipated to increase motivation, enhance trust, and improve communication in order to make it easier to fulfill the treatment and care management objectives.

ETHICAL CONSIDERATIONS

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Conflict of Interest Statement

The authors declared that no potential conflict of interest with respect to the authorship and publication of this article.

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