

The relationship between education level and distress in type 2 diabetes mellitus patient at PKU Muhammadiyah Bantul Hospital

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Abstract

Purpose: To determine the relationship between education level and distress in patient with Type 2 Diabetes Mellitus

Method: This research employed a quantitative approach with a cross-sectional design. The sample was taken using an accidental sampling technique with Slovin's formula for calculation. The data were analysed using a contingency correlation with SPSS software.

Results: The majority of patients experienced a high level of distress, with a percentage of 75.5%. The distribution of education levels included 32.1% with a low level, 45.3% with a medium level, and 22.6% with a high level. The contingency correlation test showed a significant relationship between education level and distress Diabetes Mellitus patients, with a value of 0.016 or <0.05.

Keywords: diabetes mellitus; distress; education level

1. Introduction

Diabetes Mellitus (DM) is a chronic metabolic disease caused by the pancreas producing suboptimal insulin or the body's inability to utilize the available insulin, leading to elevated blood sugar levels, or hyperglycemia. DM is a chronic disease that occurs when blood sugar levels rise because the body cannot produce insulin, has insufficient insulin levels, or cannot use insulin effectively (Pranata C Sari, 2021).

International Diabetes Federation (IDF) in 2021 there were 537 million adults living with diabetes, 537 million adults (20-79 years) living with diabetes 1 in 10. This number is expected to increase to 643 million in 2030 and 783 million in 2045. More than 3 out of 4 adults with diabetes live in low- and middle-income countries, diabetes is responsible for 6.7 million deaths in 2021 1 death every 5 seconds. Diabetes causes health expenditure of at least USD 966 billion to an increase of 316% over the past 15 years, 541 million adults suffer from impaired glucose tolerance (IGT), which puts them at high risk of developing type 2 diabetes (IDF, 2022).

By 2024, Indonesia is estimated to have more than 20 million people with diabetes mellitus. The prevalence of diabetes in Indonesia is increasing, and the country is among the top five countries in the world for the highest number of diabetes cases. And by 2023, according to the Ministry of Health, the prevalence rate will continue to rise, reaching 11.7 million. This situation is alarming and could threaten Indonesia's efforts to achieve the Golden Indonesia 2045 (Litha, 2024).

Information from the Yogyakarta provincial health profile indicates that in 2023, the number of type 2 diabetes mellitus patients receiving standard health services was

high, with 14,595 in 2023 and a low number in 2018, with 7,467. Standard health services for diabetes mellitus patients include blood sugar measurements, education, and pharmacological therapy. The number of type 2 diabetes mellitus patients in Yogyakarta City in 2023 was 15,595 (99.6%), an increase from 13,676 (86.6%) in the previous year (Emma et al., 2024).

Diabetes burden encompasses patient concerns about self-management, support from immediate family, psychological distress, and patient perceptions of access to quality healthcare. Diabetes burden refers to concerns about complications, particularly concerns about support from those closest to them (Sari C Zahro, 2024). The majority of diabetes patients (4,444 people) experienced symptoms of diabetes distress, with 73.3% of women and 61.4% of men. Fifty-two percent of type 2 diabetes patients experienced symptoms of diabetes with elevated HbA1c levels (Rahmi et al., 2020).

Data from three hospitals in Yogyakarta yielded the highest results when examining five inpatients with diabetes. Four patients (80%) experienced distress. Diabetic patients with lower education levels were 2.143 times more likely to experience diabetes distress (Kafil, 2019).

After conducting a preliminary study at PKU Muhammadiyah Bantul Hospital and interviewing a nurse in the internal medicine clinic, it was found that more than 50 patients were diagnosed with type 2 diabetes mellitus, and eight out of ten experienced diabetes distress due to constant preoccupation with their illness.

2. Methods

This type of research is quantitative correlation to determine the factors related to the occurrence of distress in patients with type 2 diabetes mellitus. This study uses a quantitative approach with a cross-sectional design, in this study using univariate analysis, namely distress and education level (Sukma Senjaya et al., 2022). Data analysis used in this study uses a contingency correlation test. Sampling was carried out using an accidental sampling technique (Fauzy, 2019), using calculations from the Slovin formula. With a 90% confidence level from a population of 112 patients for 1 month, the sample that has been calculated using the Slovin formula is 53 respondents (Hermawan, 2019). Researchers distributed questionnaires to 53 respondents at the polyclinic in PKU Muhammadiyah Bantul Hospital with the following inclusion and exclusion criteria.

The inclusion criteria for this study were:

1. Type 2 DM patients with a duration of <10 years.
2. Willingness to participate in the study.
3. Aged 20 to 75 years.
4. Respondents were conscious or compos mentis.

5. Respondents were able to communicate well.

The exclusion criteria for this study were:

1. Type 2 DM patients with a duration of ≤ 10 years.
2. Age < 20 years.
3. Unclear educational history.
4. Diagnosed with something other than type 2 diabetes mellitus.
5. Respondents were unconscious.
6. Unwillingness to participate.

3. Results

3.1. Respondent Characteristics

In this study there were 53 respondents presented in Table 1:

Table 1. Characteristics based on gender, age, education level and level of distress of type 2 diabetes mellitus patients at PKU Muhammadiyah Bantul Hospital.

No	Category	Group	Frequency (f)	Percentage (%)
1.	Gender	Man	28	52.8%
		Woman	25	47.2%
2.	Age	36 – 50 years	9	17.0%
		51 – 65 years	27	50.9%
		66 – 75 years	17	32.1%
3.	Level Education	Low	17	32.1%
		Currently	24	45.3%
		Tall	12	22.6%
4.	Distress Level	Low	12	22.6%
		Currently	1	1.9%
		Hight/Weight	40	75.5%

Based on the data from the table above shows the characteristics of respondents based on the classification of respondents' gender, totaling 53 respondents who met the inclusion and exclusion criteria. So it is concluded that the most common gender is male with a total of 28 respondents (52.8%). The characteristics of the age of respondents that have been studied with the age of respondents diagnosed with type 2 diabetes mellitus are mostly over 35 years old, and the highest value is 51-65 years old, totaling 27 respondents (50.9%). The characteristics of the length of education are the same as the largest value, namely with a moderate level or equal to the level of junior high school (SMP) and high school (SMA) totaling 24 respondents (45.3%). The characteristics of the level of distress experienced by respondents with the highest level value are the heavy/high level with a total of 40 respondents (75.5%).

4. Discussion

4.1. The relationship between education level and distress in patients with type 2 diabetes mellitus

The results of the study showed a relationship between education level and distress in type 2 diabetes mellitus patients at PKU Muhammadiyah Bantul Hospital, as presented in Table 2:

Table 2. Results of the contingency correlation test of the relationship between education level and distress in type 2 diabetes mellitus patients

Level Education	Distress Level				Correlation Coef	P. Value
	Low	Currently	Weight/Hight	Total		
Low	4	0	17	13	0.433	0.016
Currently	2	0	24	22		
Tall	6	1	12	5		
Total	12	1	40	53		

Based on the results of the table above shows the results of the correlation test of the variable level of education and the level of patient distress. From the results of the data shows that most of the patients in the internal medicine clinic of PKU Muhammadiyah Bantul Hospital were diagnosed with type 2 diabetes mellitus. The majority of these patients experienced a severe level of distress. Where it has been explained in the table above the data on the level of education with a low level of distress with a total of 12, with a moderate level of 1, with a high or severe level with a total of 40. The relationship between the level of education and the level of patient distress in patients of the internal medicine polyclinic of PKU Muhammadiyah Bantul Hospital there is a relationship between the level of education and the level of distress, the results of the correlation coefficient there is a positive relationship between the level of education and the level of distress, with the information of the results of the P value of 0.016 or <0.05 meaning it concludes there is a significant relationship between the Distress variable and the level of education. The results of the correlation coefficient value that has been written are 0.433 which can be interpreted that the strength of the relationship between the variables is moderate or sufficient, with a positive or unidirectional relationship in accordance with the reference/guidelines for the degree of correlation coefficient relationship. From the contingency correlation test, it means that the null hypothesis (H_0), (H_a) is accepted.

The results of this study showed a significant relationship between education level and distress levels in patients with type 2 diabetes mellitus. The results showed that the majority of patients had moderate education levels and experienced severe distress levels. This study aligns with research (Rahmi et al., 2020), which found a relationship between education level and diabetes distress levels. This finding is reinforced (Kafil, 2019), who stated that education level is one of the factors influencing a person's

adherence to treatment for type 2 diabetes mellitus.

The psychological way an individual deals with a problem depends on five factors that influence distress in patients with type 2 diabetes mellitus. The first factor is the duration of diabetes. The longer a person has diabetes, the greater their likelihood of experiencing complications and psychological stress, regardless of their education level. The second factor is economic status. Patients with low levels of education tend to have lower incomes, which can lead to difficulties in accessing health care and increase distress. The third factor is social support. Patients with good social support (for example, from family or community) may experience lower distress, regardless of their education level. The fourth factor is adherence to treatment. Patients with higher education may better understand the importance of adherence to diabetes therapy, but other factors such as access to medication and motivation can also influence distress. The fifth factor is comorbidities (concomitant diseases/history of other diseases).

Patients with comorbidities such as hypertension or heart disease may experience higher distress, thus influencing the relationship between education and distress (Andreani, 2022).

Research Atuh et al., (2024) found that those with lower levels of education also have lower levels of health knowledge, leading to a lack of sensitivity in recognizing the disease. Education level influences the occurrence of diabetes distress because individuals with a high level of education are more likely to have awareness and knowledge about maintaining their health. This can increase patient self-awareness in healthy living and minimize complications from type 2 diabetes mellitus.

Table 3. Diabetes Distress Scale in Respondents

Diabetes Distress Scale	Mild/no distress there is (< 2.0)	Moderate distress (2.0-2.9)	Severe distress (>2.9)
Diabetes distress	12 (22.6%)	1 (1.9%)	40 (75.5%)
Domain interpersonal	12 (22.6%)		41 (77.4%)
Domain emosional burden	8 (15.1%)	5 (9.4%)	40 (75.5%)
Domain regimen distress	41 (77.4%)	11 (20.8%)	1 (1.9%)
Domain physician ditress	6 (11.3%)	6 (11.3%)	41 (77.4%)

Table 3 shows that the majority experienced severe distress with a percentage of 75.5%. This change in distress level is clearly visible in changes in each domain of diabetes distress. Diabetes distress consists of four domains: interpersonal distress, emotional burden, physician distress, and regimen distress. Interpersonal distress is the feeling that those closest to you are not sufficiently supportive of self-care efforts and

do not understand the difficulties of living with diabetes. Closest people, such as family, need to provide emotional support for people with type 2 diabetes mellitus to increase their self-confidence in carrying out self-care activities (Hu et al., 2020). Interpersonal distress was seen as moderate in this study, where many patients experienced a lack of confidence and some received insufficient support from those closest to them. From this study, it was measured with a domain score of 77.4%, included in the severe category. Another study stated that patients experienced moderate distress with a score (47.7%) in the interpersonal domain, some of whom complained about their interpersonal problems (Rahmi et al., 2020).

Emotional burden is a state of emotional distress due to the demands of living with diabetes. This study found that the emotional burden score was higher than the four domains, with 75.5% in the severe category. This suggests that many patients experience stress due to living with type 2 diabetes mellitus. Another study reported that patients experienced moderate distress, with a score of 52.3% in emotional distress (Vionna M, Rika Sabri, 2023).

The regimen distress domain also showed a high level of distress, with a score of 77.4% in the low category. Another study found that patients experienced moderate distress (45.5%) in the regimen domain. This suggests that patients still felt guilty and lacked confidence in their treatment. Some patients have begun to accept and gain confidence in their treatment. This may be due to family support. Families exhibit a high level of empathy for their family members with diabetes mellitus (Arifin et al., 2021).

Physician distress was lower, with a score of 77.4% in the severe category. Another study found that patients experienced mild distress (45.5%), suggesting that many of them had gained significant knowledge from healthcare professionals who explained and administered therapy. The results of this study show that the level of education is one of the main factors related to the occurrence of distress in type 2 diabetes mellitus patients, however, there are still other factors that cause distress in type 2 diabetes mellitus patients, such as support from those closest to them, colleagues, and also from professional healthworkers (Anita, 2020).

5. Conclusion

The conclusions of this study, "The Relationship Between Education Level and Distress in Type 2 Diabetes Mellitus Patients at PKU Muhammadiyah Bantul Hospital," are as follows:

1. The highest level of education was high school (senior high school), with 24 patients (45.3%) having a high level of education.
2. Distress was found to be high in Type 2 Diabetes Mellitus patients, with 40 patients (75.5%).
3. There was a significant relationship between education level and distress in Type 2 Diabetes Mellitus patients at PKU Muhammadiyah Bantul Hospital, with a P-value

of 0.016.

6. Acknowledgment

6.1. Respondents

It is hoped that they can further improve care and treatment, and minimize factors that influence the high level of distress experienced by patients diagnosed with type 2 diabetes mellitus. Respondents are also expected to expand their knowledge by seeking more information about factors related to high levels of diabetes mellitus distress through easily accessible social media, so that information is not limited to information from treating doctors at the hospital.

6.2. Research Location

It is hoped that PKU Muhammadiyah Bantul Hospital, especially the internal medicine clinic, can improve and provide the best care and treatment for patients. They can also assist with outreach and other health promotion activities for patients and their families, encouraging them to cooperate during treatment with the support of their families.

6.3. Future Researchers

It is hoped that this research can be developed by future researchers, such as by developing qualitative research methods with a focused discussion setting, allowing respondents more freedom to answer questions and fill in the questionnaires according to their circumstances.

7. Author Contributions

a. Lead author (Nisa 'ur Rohmah) Designed the research methodology

- Collected and analyzed data
- Wrote the initial draft of the article

b. Second author (Widiastuti)

- Oversaw the overall research and writing process
- Contributed to the research concept and design

c. Third author (Hamudi Prasestiyo)

- Oversaw the overall research and writing process
- Contributed to the research concept and design

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