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Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

Factors Related to Diabetic Distress in Diabetes Mellitus Patients

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ARTICLE INFORMATION

Received: 06 January 2025
Revised: 26 January 2025
Accepted: 28 February 2025
Available online: 31 march 2025

KEYWORDS

diabetic distress
diabetes mellitus patients
powerlessness
negative social perceptions
family distress

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ABSTRACT

Diabetes distress also known as diabetes related distress in an emotional response with extreme fear, discomfort or disappointment felt due to the innability to cope with the challenges and dependencies of life with diabetes. Diabetes distress if left untreated will often persist and develop into more severe conditions such as depression, sleep disturbances and increased risk of suicide. The study aims to identify factors related to diabetes distress in people with diabetes melitus in work area of the Kampung Teleng Health Centre, Sawahlunto City in 2024. The study used a quantitative method with correlative descriptive research design and a sampel size of 126 respondents. The sampling technique use was purpossive sampling and quota sampling technique. The inclusion criteria in this study are as follows: Diabetes mellitus sufferers who are willing to be respondents, diabetes mellitus sufferers who live with their families, have suffered from diabetes mellitus for at least 1 year, patients can communicate well, patients residing in the health center work area and have a complete recorded address. The variable studied were powerlessness, negative social perceptions, family distress, hypoglicaemia distress, management distress, eating distress as independent variables and diabetes distress as dependent variables. Data collection using the DDS-17, PAT, GAD-7, HDFSS, HFS-II, PAID, dan DEPS-R questionnaires. Data processing using the spearman rank test. The result of the study showed the factors related to diabetes distress were negative social perceptions with p value (a) = 0,007 and correlation (r) = 0,241 and hypoglicemia distress with p value (a) = 0,049 and correlation (r) = 0,176. The conclusion of this study shows that factors correlated to diabetes distress are negative social perceptions and hypoglicemia distress. It is expected that the Kampung Teleng Health Center in Sawahlunto City can develop a program to preverent diabetes distress with health service, espicially doctors, so that they can provide direction, advice, respond to concerns from diabets melitus suffers and provide education about the impact of diabetes distress.

INTRODUCTION

Diabetes Mellitus, simply known as DM, is a serious long-term or chronic condition that occurs when a person's blood sugar (glucose) levels increase because their body cannot produce enough insulin or cannot produce enough insulin effectively and use the insulin it produces. According to the World Health

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

Organization, it says that around 422 million people worldwide suffer from diabetes, especially in low- and middle-income countries and the number of cases and prevalence of diabetes has continued to increase over the past 3 decades with the prevalence of type 2 diabetes increasing dramatically in countries with all income levels (1), (2), (3).

According to the report (IDF, 2021) it says that cases of diabetes in Indonesia have increased in all adults in all age groups with a prevalence of 10.6% in 2021 to 11.7% in 2045. In Indonesia, a report from (4) shows that the national prevalence of Diabetes Mellitus based on blood sugar examination results has increased from 6.9% in 2013 to 8.5% in 2018. According to a report it is known that the increase in the prevalence of diabetes mellitus in West Sumatra was from 0.7% in 2007 to 1.15% in 2018.

Based on the results (4) it is proven that Sawahlunto City also experienced an increase in diabetes mellitus sufferers from 0.6% in 2007 to 1.78% in 2018. Diabetes Mellitus is not only a global, national and provincial problem, but also a health problem at the Kampung Teleng Health Center 184 sufferers in 2023. With the occurrence of modernization in Indonesia, such as eating habits with an unbalanced diet, it can have a negative impact on public health today, increasing the incidence of diabetes with various complications (5), (6).

Diabetes not only has an impact on physical illness, but there are also comorbid mental health illnesses. Psychological pressure on mental health in DM patients can be in the form of anxiety, stress, depression, and sleep disorders, and increase the risk of suicide (7). Diabetes Distress refers to a collection of negative emotional states that arise from living with diabetes mellitus and self-management behaviors in managing DM (8). Based on research conducted by Fisher L et al (2015) analytically concluded that the sources of diabetes distress can vary seven main sources of distress in diabetes patients, namely powerlessness, negative social perceptions, friend/family distress, hypoglycemia distress, management distress, and eating distress (7).

Meanwhile, the results of research from Gahlan D et al (2018) found that 5.6% experienced distress related to therapy regimens, 16.1% of patients experienced emotional distress, 1.5% interpersonal distress and 1.2% experienced distress related to doctors/health workers (9). With a high prevalence of distress related to therapy regimens, it is psychologically influenced by chronic diseases. Research conducted by (10) also shows that the factors causing diabetes distress are influenced by family support given to patients with type II diabetes mellitus, which has proven effective in reducing the level of diabetes distress.

Based on a preliminary study (initial survey) that researchers have conducted, when interviews were conducted with 10 people with type I and type II diabetes mellitus at the Kampung Teleng Health Center. The results of the interview can be seen that the community only considers diabetes distress to be a common thing and not a threat. This is supported by the work of the community in the work area of the Kampung Teleng Health Center, the majority of whom work as employees and traders and the lack of information related to diabetes distress in the community results in diabetes distress still being a hidden problem in the general public (11).

Based on the above phenomenon in an effort to reduce the prevalence of Diabetes Mellitus which is increasing in the future and reduce the level of diabetes distress in diabetes mellitus sufferers, the role of various related parties is very important, one of which is nurses. Therefore, researchers are interested in researching “Factors Related to Diabetes Distress in Diabetes Mellitus Patients in the Work Area of the Kampung Teleng Health Center, Sawahlunto City in 2024”.

METHOD

The research method used is correlative descriptive, this study aims to find the strenght correlation between independent variables and dependent variables. The approach used is a cross-sectional study (12). This

 DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

study aims to see the relationship between Powerlessness, negative social perceptions, family distress, hypoglycemia distress, management distress, and eating distress with diabetes Distress in DM patients. This study was conducted in the working area of the Kampung Teleng Health Center, Sawahlunto City in 2024. The research time will be carried out in June-August 2024.

Sampling in this study was carried out using purposive sampling and quota sampling techniques. Purposive sampling technique is a sampling technique whose strategy is based on certain deliberate considerations such as population characteristics or previously known characteristics (13). Quota sampling technique is a non-random sampling technique where participants are selected based on previously determined characteristics (exclusion criteria and inclusion criteria) so that the total sample will have the same distribution as the population with a wider scope (14). The research sample is 126 respondents.

Inclusion and Exclusion Criteria

The inclusion criteria in this study are as follows:

a. Diabetes mellitus sufferers who are willing to be respondents.
b. Diabetes mellitus sufferers who live with their families.
c. DM sufferers have suffered from diabetes mellitus for at least 1 year.
d. Patients can communicate well.
e. Patients residing in the health center work area and have a complete recorded address.

The exclusion criteria in this study are:

a. Diabetes mellitus sufferers who are not willing to be respondents and are not willing to follow the procedure.
b. Diabetes mellitus sufferers who are not cooperative when the study is conducted.
c. Diabetes mellitus sufferers who experience mental disorders.
d. Patients who are not cared for by their families

Research Instrument

Research instrument is a tool used to collect research data (13). In this study, there is a questionnaire sheet containing statements related to the research variables that must be answered by diabetes mellitus patients as respondents and all instrument is full translate with researcher also no one has used a indonesian version except researcher.

1. Powerlessness Instrument, the questionnaire used is the Powerlessness Assessment Tool for adult patients (PAT) questionnaire adopted from Braga and Cruz (2009) and is a standard measuring instrument. The measurement result score category; <30 indicates minimal/non-severe helplessness, 31-40 indicates low helplessness, 41-50 indicates moderate helplessness and 51-60 indicates severe helplessness. The questionnaire is valid r-0.05 and reable with Cronbach'ch Alpha test 0,799.
2. Negative social perception instrument. The questionnaire used is the Generalized Anxiety Disorder Seven (GAD-7) questionnaire from the American Diabetes Association (2021) which was adopted from Spitze R., et al (2005) and is a standard measuring too. The measurement result score category; 0-4 indicates mild/minimal anxiety, 5-9 indicates low anxiety, 10-14 indicates moderate anxiety, 15-19 indicates quite high anxiety, 20-21 indicates high anxiety. To determine the total, add the two items and if the total score is ≥10, it is possible to have an anxiety disorder that must be followed up. The questionnaire is valid r- 0,75-0,85 and reable with Cronbach'ch Alpha test 0,92.
3. Family Distress Instrument. The questionnaire used is the family support questionnaire adopted from the Hensarling Family Support Scale (HDFSS) developed by Hensarling (2009) and is a standard measuring tool. HDFSS includes 4 dimensions. The measurement result score category shows good family support in the range of 76-100, shows sufficient family support in the range of 56-75 and shows poor family support in the range of ≤55. The questionnaire is valid r -0,395 to 0,856 and reable with Cronbach'ch Alpha test 0,940.
4. Hypoglycemia distress instrument. The questionnaire used is the Hypoglycemia Fear Survey-II (HFS-II) questionnaire adopted from the American Diabetes Association (2021). The measurement score

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

category 0-60 indicates low fear of hypoglycemia, 61-72 indicates moderate fear of hypoglycemia and 73-132 indicates severe fear of hypoglycemia. The questionnaire is valid r- 0,74 (positive correlated between HFS-B with HFS-W) and Cronbach'ch Alpha test 0,94.

5. Management distress instrument. The questionnaire used is the Problem Area In Diabetes Scale (PAID) questionnaire from the American Diabetes Association (2021) which was adopted from Wit et al (2022) and is a standard measurement tool. To determine the total, add all responses and then multiply by 1.25. The measurement result score category 0-16 indicates low distress management, 17-39 moderate distress management and ≥40 severe distress management. The questionnaire is valid r- 0,51 to 0,59 and Cronbach'ch Alpha test 0,94.
6. Eating distress instrument. The questionnaire used is the Eating Problem Survey Revised (DEPS-R) questionnaire from the American Diabetes Association (2021) which was adopted from Ntisdel (2010). To determine the total, add up all responses. The measurement score category 0 indicates low eating disorders, <20 indicates normal eating disorders and ≥ 20 indicates high eating disorders. The questionnaire is valid r- 0,85 and Cronbach'ch Alpha test 0,86.

RESULTS AND DISCUSSION

RESULT

Univariate analysis was conducted to describe the characteristics of each research variable presented in the form of a frequency distribution table. The variables in this study were powerlessness, negative social perception, family distress, hypoglycemia distress, management distress, eating distress as independent variables and diabetes distress as the dependent variable.

1. Powerlessness/Helplessness

Table 1 Frequency Distribution of Powerlessness in the Work Area of the Health Center Teleng Village, Sawahlunto City, August 2024

Powerlesness	*f*	%
Minimum	11	8.7
Low	92	73.0
Moderate	17	13.5
Severe	6	4.8
Total	**126**	**100.0**

Based on Table 1. only 4.8% respondents from diabetes mellitus patients showed a level of helplessness in the severe category, meaning that sufferers feel helpless.

2. Negative Social Preceptions/Anxiety about other people's perceptions

Table 2 Frequency Distribution of *Negative Social Preceptions* in the Work Area of the Health Center Teleng Village, Sawahlunto City, August 2024

Negative Social Preceptions	*f*	%
Minimum	81	64.3
Low	28	22.2
Medium	10	7.9
Quite High	4	3.2
High	3	2.4
Total	**126**	**100.0**

Based on Table 2. only 2.4% respondents from diabetes mellitus patients showed a high level of anxiety towards other people's perceptions, meaning that patients feel anxiety towards other people's perceptions.

 DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

3. Family Distress/Family Difficulties (Family Support)

Table 3 Frequency Distribution of *Family Distress* in the Work Area of the Teleng Village Health Center, Sawahlunto City, August 2024

Family Distress	*f*	%
Good	67	53.2
Enogh	50	39.7
Poor	9	7.1
Total	**126**	**100.0**

Based on Table 3. only 7.1% respondents from patients with mellitus showed a level of family difficulties/family support in the less category, meaning that patients felt difficulties in the family.

4. Hypoglycemia Distress/Fear of Hypoglycemia

Table 4 Frequency distribution/fear of hypoglycemia distress in the work area Public Health Center Kampung Teleng Kota Sawahlunto August 2024

Hypoglicaemia Distress	*f*	%
Low	122	96.8
Medium	2	1.6
High	2	1.6
Total	**126**	**100.0**

Based on Table 4. only 1.6% respondents from patients with mellitus showed a high level of Hypoglycemia Distress/Fear of Hypoglycemia in the low category.

5. Management Distress/Difficulty of Disease Management

Table 5
Frequency Distribution of Management Distress in the Work Area Public Health Center Kampung Teleng Sawahlunto City August 2024

Management Distress	*f*	%
Light	94	74.6
Medium	22	17.5
Heavy	10	7.9
Total	**126**	**100.0**

Based on Table 5. only 7.9% respondents from diabetes mellitus patients showed a level of difficulty in managing the disease in the severe category, meaning that patients felt difficulty in managing their disease.

6. Eating Distress / Eating Disorders

Table 6 Distribution of Eating Distress Frequency in the Work Area Public Health Center Kampung Teleng Sawahlunto City August 2024

Eating Distress	*f*	%
Low	3	2.4
Normal	98	77.8
High	25	19.8
Total	**126**	**100.0**

Based on Table 6. only 9.8% respondents from diabetes mellitus patients showed a high level of eating disorders, meaning that sufferers felt eating disorders.

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

7. Diabetes Distress

Table 7 Frequency Distribution of Diabetes Distress in the Work Area Public Health Center Kampung Teleng Kota Sawahlunto August 2024

Diabetes Distress	*f*	%
Light	73	57.9
Medium	44	34.9
Heavy	9	7.1
Total	**126**	**100.0**

Based on Table 7. only (7.1%) respondents from diabetes mellitus patients showed a level of diabetes distress in the severe category, meaning that patients felt diabetes distress

Bivariate analysis is carried out to analyze the correlation between 2 or more variables that are suspected of being related to each other. In this study, bivariate analysis was carried out to determine the relationship between diabetes with powerlessness, negative social perception, family distress, hypoglycemia distress, management distress and eating distress with diabetes distress in the Work Area of the Teleng Village Health Center, Sawahlunto City in 2024

1. Relationship between Powerlessness and Diabetes Distress

Table 8 Relationship between Powerlessness and Diabetes Distress in the Work Area Public Health Center Kampung Teleng, Sawahlunto City in 2024

Powerlessness	**Diabetes Distress**									
	Low		**Medium**		**Heavy**		**Total**		***r***	***p-value***
	f	**%**	***f***	**%**	***f***	**%**	***f***	**%**		
Minimum	4	3.2	7	5.6	0	0.0	11	8.7		
Low	62	49.2	25	19.8	5	4.0	92	73.0	0,159	0,076
Medium	4	3.2	10	7.9	3	2.4	17	13.5		
Heavy	3	2.4	2	1.6	1	0.8	6	4.8		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**7.1**	**126**	**100.0**		

Based on the table above, the results of statistical analysis using the Spearman rank test obtained a p value = 0.076 (p>0.05) and the value of the closeness of the relationship obtained r = 0,159, meaning that there is no significant relationship and the closeness of the relationship variables is very weak between powerlessness/powerlessness and diabetes distress in diabetes mellitus sufferers in the work area of the Kampung Teleng Health Center, Sawahlunto City

2. Relationship between Negative Social Perception and Diabetes Distress

Table 9 Relationship between Negative Social Perception and Diabetes Distress in the Work Area of the Kampung Teleng Health Center, Sawahlunto City in 2024

Negative Social Perception	***Diabetes Distress***									
	Low		**Medium**		**Heavy**		**Total**		***r***	***p- value***
	f	**%**	***f***	**%**	***f***	**%**	***f***	**%**		
Minimum	55	43.7	21	16.7	5	4.0	81	64.3		
Low	10	7.9	16	12.7	2	1.6	28	22.2		
Medium	5	4.0	4	3.2	1	0.8	10	7.9	0,241	0,007
Quite High	1	0.8	2	1.6	1	0.8	4	3.2		
High	2	1.6	1	0.8	0	0.0	3	2.4		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**71**	**126**	**100.0**		

Based on the table above, the results of statistical analysis using the Spearman rank test obtained a p value = 0.007 (p ≤0.05) and the value of the closeness of the relationship obtained r = 0.241, meaning that there is a significant relationship between negative social perception and

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City, but the closeness of the relationship between variables is weak.

3. Relationship between Family Distress and Diabetes Distress

Table 10 Relationship between Family Distress and Diabetes Distress in the Working Area of the Kampung Teleng Health Center, Sawahlunto City in 2024

Family Distress	*Diabetes Distress*								*r*	*p-value*
	Low		Medium		Heavy		Total			
	f	%	*f*	%	*f*	%	*f*	%		
Good	41	33.3	21	16.7	4	3.2	67	53.2		
Enough	26	20.6	20	15.9	4	3.2	50	39.7	0,099	0,271
Less	5	4.0	3	2.4	1	0.8	9	7.1		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**7.1**	**126**	**100.0**		

Based on the table above, the results of statistical analysis using the Spearman rank test obtained a p value = 0.271 (p> 0.05) and the value of the closeness of the relationship obtained r = 0,099 meaning that there is no significant and the closeness of the relationship variables is very weak between family distress and diabetes distress in diabetes mellitus patients in the working area of the Kampung Teleng Health Center, Sawahlunto City.

4. Relationship between Hypoglycemia Distress and Diabetes Distress

Table 11 Relationship between Hypoglycemia Distress and Diabetes Distress in the Working Area of the Kampung Teleng Health Center, Sawahlunto City in 2024

Hypoglicemia Distress	*Diabetes Distress*								*r*	*p-value*
	Low		Medium		Heavy		Total			
	f	%	*f*	%	*f*	%	*f*	%		
Low	72	57.1	43	34.1	7	5.6	122	96.8	0,176	0,049
Medium	1	0.8	0	0.0	1	0.8	2	1.6		
High	0	0.0	1	0.8	1	0.8	2	1.6		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**7.1**	**126**	**100.0**		

Based on the table above, the results of statistical analysis using the Spearman rank test obtained a value of p = 0.049 (p ≤0.05) and the value of the closeness of the relationship obtained r = 0.176, meaning that there is a significant relationship and the closeness of the relationship variables is very weak between hypoglycemia distress and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City, but the closeness of the relationship between variables is very weak.

5. Relationship between Distress Management and Diabetes Distress

Table 12 Relationship between Distress Management and Diabetes Distress in the Working Area of the Kampung Teleng Health Center, Sawahlunto City in 2024

Management Distress	*Diabetes Distress*								*r*	*p- value*
	Low		Medium		Heavy		Total			
	f	%	*f*	%	*f*	%	*f*	%		
Low	57	45.2	29	23.0	8	6.3	94	74.6		
Medium	10	7.9	12	9.5	0	0.0	22	17.5	0,059	0,509
Heavy	6	4.8	3	2.4	1	0.8	10	7.9		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**7.1**	**126**	**100.0**		

Based on the table above, the results of the statistical analysis using the Spearman rank test obtained a p value = 0.509 (p> 0.05) and the value of the closeness of the relationship obtained r = 0,059, meaning that there is no significant relationship and the closeness of the

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

relationship variables is very weak between management distress and diabetes distress in diabetes mellitus sufferers in the work area of the Kampung Teleng Health Center, Sawahlunto City**.**

6. Relationship between Eating Distress and Diabetes Distress

Table 13 Relationship between Eating Distress and Diabetes Distress in the Work Area of the Kampung Teleng Health Center, Sawahlunto City in 2024

Eating Distress	*Diabetes Distress*								*r*	*p- value*
	Low		Medium		Heavy		Total			
	f	%	*f*	%	*f*	%	*f*	%		
Low	1	0.8	2	1.6	0	0.0	3	2.4		
Medium	59	46.8	32	25.4	7	5.6	98	77.8	0,036	0,688
High	13	10.3	10	7.9	2	1.6	25	19.8		
Total	**73**	**57.9**	**44**	**34.9**	**9**	**7.1**	**126**	**100.0**		

Based on the table above, the results of statistical analysis using the Spearman rank test obtained a p value = 0.688 (p> 0.05) and the value of the closeness of the relationship obtained r = 0,036, meaning that there is no significant relationship and the closeness of the relationship variables is very weak between eating distress/eating disorders and diabetes distress in diabetes mellitus sufferers in the work area of the Kampung Teleng Health Center, Sawahlunto City

DISCUSSION

UNIVARIATE ANALYSIS

1. Powerlessness in Diabetes Mellitus Patients

Based on the results of the study, it shows there were (4.8%) which means that sufferers felt powerless in the severe category, and (13.5%) which means that sufferers felt powerless in the moderate category, while (73.0%) which means that sufferers powerless in the low category and (8.7%) which means that sufferers felt powerless in the minimal category.

This is in line with the research of Ahmad & Abdelwareth (2023) which found (20.8%) which means that sufferers felt powerless in the severe category, and (17.6%) which means that sufferers felt powerless in the moderate category, while (46.4%) which means that sufferers felt powerless in the low category and (15.2%) felt powerless in the minimal category.

Based on the results of the study, it was found that the results of low powerlessness, one of the characteristics that influences this factor is the duration of suffering ≥ 1 year as many as (75.4%) respondents. Because the longer you suffer from a disease, the more you are able to control your body and it is obtained with experience.

The results of the study found that high school education levels (43.7%) were associated with minimal or low helplessness because someone who has extensive knowledge can think more positively. The learning process builds self-confidence and self-belief, even if the things learned have no practical value. However, those things often have practical value. The most disadvantaged life course control trajectory is among people who did not complete high school. In fact, the sense of control begins to decline earlier, remains low, showing a slight increase around retirement.

Then the results of the study found that housewife jobs (49.2%) were associated with minimal or low helplessness. Low-status jobs produce a sense of empowerment because the job, and the opportunities and income it provides, are seen as obstacles to achieving life goals, and job disruptions such as being laid off, demoted, fired, or leaving a job due to illness reduce workers' sense of mastery. However, not all jobs are the same, and not all housework contexts are equally demanding of family.

 DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

Furthermore, the results of the study found that the routine control status of 59.5% of respondents was related to minimal or low helplessness. Because feelings of helplessness can reduce patient motivation to follow the treatment plan, such as diet, exercise, and regular blood sugar checks.

2. Negative Social Perception in Diabetes Mellitus Sufferers

Based on the results of the study, it shows there were (2.4%) which means that sufferers felt anxiety about other people's perceptions high, and (3.2%) which means that sufferers felt anxiety about other people's perceptions in a fairly high category, then (7.9%) which means that sufferers felt anxiety about other people's perceptions in a moderate category, then (22.2%) which means that sufferers felt anxiety about other people's perceptions in a low category and (64.3%) which means that sufferers felt anxiety about other people's perceptions in a minimal category.

Furthermore, diabetes mellitus sufferers with female gender as many as (74.6%) respondents. Women are often raised with the expectation to be more sensitive to the feelings of others. This can make them more likely to feel anxiety when they feel they do not meet these social expectations. Women are also often involved in social comparisons that can cause anxiety about how they are perceived by others. Women may use different approaches to dealing with anxiety than men, such as seeking emotional support, which can affect how they manage anxiety about the perceptions of others.

Then, the length of suffering ≥ 1 year as much as (75.4%) was related to minimal anxiety about perceptions of others. Because the longer a person suffers from the disease, they may be more aware of the stigma associated with their condition. After years of struggling with the disease, the hope for healing or improvement can make individuals not feel anxious if they feel they do not meet these expectations, either from themselves or from others.

The routine control status of (59.5%) respondents is related to minimal anxiety about the perception of others. Routine disease control can give patients a sense of control over their health. When patients feel more in control of their condition, anxiety about the perception of others tends to decrease. Conversely, lack of control can increase anxiety.

Based on the results of interviews and questionnaires, researchers found that the majority of diabetes mellitus sufferers in the working area of the Kampung Teleng Health Center, Sawahlunto City showed minimal anxiety about other people's perceptions, namely that diabetes mellitus sufferers did not experience anxiety about other people's stigma and were able to remain calm if they experienced problems.

3. Family Distress in Diabetes Mellitus Patients

The results of the study showed that as many as (7.1%) respondents from patients in the less category meaning that patients feel family difficulties while (53.2%) respondents were found in the good category meaning that patients do not feel family difficulties (Fisher L, et al., 2016). The results of the study found that the high school education level of (43.7%) respondents was not related to good family distress. High school graduates often have limited access to better jobs, compared to those with higher education. Education can affect communication skills and conflict resolution. High school graduates may have more limited skills in managing family conflict, which can increase family distress.

Furthermore, the results of the study also found that work as a housewife (49.2%) of respondents was related to good family distress/good family hardship. Because emotional and practical support from a partner can reduce family distress. Housewives who feel supported tend to experience less stress than those who feel they do not have support from their partners and family members. Then, suffering for ≥ 1 year as many as (75.4%) of respondents were not related to good family distress/good family hardship. Because prolonged illness can drain the emotions and energy of family members. This burden can cause tension and conflict in family dynamics and the cost of treatment and care for chronic illnesses can burden family finances. This financial uncertainty can add to family distress, creating additional stress in relationships. Family members may face stigma or judgment from outsiders regarding prolonged health conditions which can add to the emotional burden and increase family distress.

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

Based on the results of interviews and questionnaires, researchers found that the majority of diabetes mellitus sufferers in the working area of the Kampung Teleng Health Center in Sawahlunto City showed good family distress or good family difficulties, namely diabetes mellitus sufferers did not experience family distress/family difficulties and communication within the family to understand each other, especially couples living together. Family support is the main thing to prevent family distress.
Although the percentage of respondents with family difficulties in the less category is much lower when compared to the percentage of family difficulties in the good low category, this is a psychological health condition that should be considered by a family in supporting sufferers so that they do not experience distress in the family. With family support, sufferers will be enthusiastic about routinely dieting, managing stress and regulating their eating patterns.

4. Hypoglycemia Distress in Patients with Diabetes Mellitus

The results of the study found that the results of low fear of hypoglycemia were not related to age in the range of 19-59 years as many as (65.1%) respondents. Because older individuals often have more experience in managing diabetes and may better understand the risks of hypoglycemia. However, as people age, cognitive decline can make them more anxious about the possibility of hypoglycemia. Furthermore, female diabetes mellitus sufferers (74.6%) respondents were not associated with low fear of hypoglycemia. Because, women tend to have stronger social support networks, which can help in managing anxiety related to hypoglycemia. However, dependence on this support can also increase anxiety if they feel they do not want to burden others. If women have experienced hypoglycemia, this negative experience can increase their fear. This fear can be stronger in women who feel more physically or emotionally vulnerable.

The results of the study also found that work as a housewife (49.2%) of respondents was not related to low fear of hypoglycemia. Because by focusing on housework, mothers may feel they have less time to pay attention to their own health. Housewives may feel more anxious about the risk of hypoglycemia when they feel tired. Then, long suffering ≥ 1 year as many as (75.4%) respondents were not related to fear of low hypoglycemia. Because after dealing with the disease for a long time, they usually get more information and understanding about how to maintain stable blood sugar levels. Then, routine control status as many as (59.5%) respondents were related to fear of low hypoglycemia. This sense of control can reduce anxiety and fear of hypoglycemia. Routine controls can create opportunities for interaction with medical personnel and get social support. This support is important to build a sense of security and reduce fear.

Based on the results of interviews and questionnaires, researchers found that the majority of diabetes mellitus sufferers in the working area of the Kampung Teleng Health Center, Sawahlunto City showed low fear of hypoglycemia, namely that diabetes mellitus sufferers did not experience fear of hypoglycemia and were able to remain stable in maintaining their blood sugar.

5. Management Distress in Diabetes Mellitus Patients

The results of the study found that the high school education level of (43.7%) respondents was not related to difficulties in managing their mild disease. Because individuals who have high motivation to maintain health and awareness of the importance of disease management tend to be successful, regardless of their educational background. Some individuals may have a positive and strategic approach that makes it easier for them, even though their education is limited.

The length of suffering ≥ 1 year as many as (75.4%) of respondents was not related to difficulties in managing their mild disease. Because individuals who have suffered from the disease for a long time may have learned to manage their condition well. Motivation to maintain health can arise regardless of the length of suffering. Some individuals may be more proactive and committed to disease management, which reduces the difficulties they face.

 DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

Then, the status of routine control as many as (59.5%) of respondents was related to difficulties in managing their mild disease. Because regular check-ups provide an opportunity to receive support and guidance from healthcare professionals, which can help individuals cope with difficulties and improve management strategies. It can serve as a reminder to adhere to treatment plans and maintain a healthy lifestyle. This can reduce the likelihood of difficulties in disease management.

Based on the results of interviews and questionnaires, researchers found that although the percentage of respondents with severe disease management difficulties was much lower when compared to the percentage of low disease management difficulties, this was a psychological health condition that should be considered by all parties, especially local health services.

6. Eating Distress in Diabetes Mellitus Patients

To measure the difficulty in managing the disease, researchers used the DEPSR questionnaire. Based on the results of the questionnaire, the reasons why the level of eating disorders is normal are that sufferers sometimes miss their snack time as many as (24.6%), never vomit their food as many as (91.3%), and sometimes feel that their eating patterns are out of control as many as (71.4%).

Then the length of suffering ≥ 1 year as many as (75.4%) of respondents were not related to normal eating disorders. Because the adaptation strategy that individuals have developed and effective coping is not significantly affected by the problems faced. Social environment and family support can help individuals maintain normal eating patterns. Despite challenges, some people are able to maintain healthy eating habits.

Based on the results of interviews and questionnaires, researchers found that although the percentage of respondents with high category eating disorders was much lower when compared to the percentage of low category eating disorders, this is a psychological health condition that deserves attention for all parties, especially the family as an effort to minimize irregular dietary patterns of diabetes mellitus sufferers.

7. Diabetes Distress in Diabetes Mellitus Patients

The results of this study are not in line with the research of Ummu Muntamah (2022), showing that (6.4%) experienced severe diabetes distress, then (57.6%) experienced moderate diabetes distress and experienced mild diabetes distress. Diabetes distress is a feeling of worry experienced by patients regarding health care which is characterized by the loss of hope for recovery, lack of self-confidence, and lack of ability to meet the lifestyle needed to manage their diabetes (15). The difficulty and inability of DM patients to adjust to the demands caused by their illness will cause tension within themselves and result in unhealthy, negative and destructive stress. Therefore, there is an imbalance in the patient's biology, psychology, and spirituality which has an impact on the lives of patients and their families, the amount of medical care, lifestyle, and continuous self-management (16), (17).

Then, suffering for ≥ 1 year as many as (75.4%) of respondents were related to mild diabetes distress. Because after one year, individuals may begin to feel more burdened by their condition, especially if they face difficulties in diabetes management. Continuous diabetes management can be tiring, increasing the risk of distress, even if it is only mild. If there is a development of complications during this one year, it can add stress and concerns about long-term health.

Then, the status of routine control as many as (59.5%) of respondents were related to mild diabetes distress. Because routine control helps individuals better understand their condition and take proactive steps, which can reduce distress. With routine control, individuals can detect and address problems early, reducing the possibility of stress caused by diabetes complications. Through regular check-ups, patients receive new information and strategies to manage diabetes, which can increase self-confidence and reduce distress. A clear control plan can provide motivation to follow a healthy lifestyle, thereby reducing feelings of distress. Based on the results of interviews and questionnaires, researchers found that although the percentage of respondents with severe diabetes distress was much lower when compared to the percentage of mild

DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

diabetes distress, this is a psychological health condition that deserves attention from all parties, especially health service providers as an effort to maximize efforts to prevent distress in health services, one of which is community health centers.

BIVARIATE ANALYSIS

1. Relationship between Powerlessness and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been conducted, it can be seen that the results of the Spearman rank test show that the p value between Powerlessness and Diabetes Distress is p value = 0.076 (p> 0.05) and the correlation value is r = 0.159, which means that in this case Ha is rejected, there is no significant relationship between powerlessness/helplessness and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (18), (11) which stated that the results of the p value = 0.87 and r = 0.84.

According to the researcher's analysis, there is no significant relationship between powerlessness/helplessness and diabetes distress, where there is a tendency for diabetes mellitus patients with mild powerlessness to indicate that they do not experience diabetes distress.

2. The Relationship between Negative Social Perception and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been done, it can be seen that the results of the Spearman rank test show that the p value between Negative Social Perception and Diabetes Distress is p value = 0.007 (p> 0.05) and the correlation value is r = 0.241, which means that in this case Ha is accepted and there is a significant relationship between Negative Social Perception and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (10), (11) which stated that the results of the p-value = 0.84 and r = 0.70.

According to the researcher's analysis, there is a significant relationship between Negative Social Perception and diabetes distress, where there is a tendency for diabetes mellitus patients with mild Negative Social Perception to indicate that they experience mild diabetes distress.

3. Relationship between Family Distress and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been done, it can be seen that the results of the Spearman rank test show that the p value between Family Distress and Diabetes Distress is p value (□) = 0.271 (p> 0.05) and the correlation value is r = 0.099, which means that in this case Ha is not accepted and there is no significant relationship between Family Distress and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (10), (19), (20) which stated that the results of the p-value = 0.80 and r = 0.66.

According to the researcher's analysis, there is no significant relationship between Family Distress and diabetes distress, where there is a tendency for diabetes mellitus patients with Family Distress to show that they experience moderate diabetes distress.

4. Relationship between Hypoglycemia Distress and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been done, it can be seen that the results of the Spearman rank test show that the p value between Hypoglycemia Distress and Diabetes Distress is p-value = 0.049 (p> 0.05) and the correlation value is r = 0.176, which means that in this case Ha is accepted and there is a significant relationship between Hypoglycemia Distress and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (10), (15), (21) which stated that the results of the pvalue = 0.79 and r = 0.64.

 DOI: http://dx.doi.org/10.35730/jk.v16i1.1270

According to the researcher's analysis, there is a significant relationship between Hypoglycemia Distress and diabetes distress, where there is a tendency for diabetes mellitus patients with low Hypoglycemia Distress to indicate that they experience low diabetes distress.

5. Relationship between Management Distress and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been conducted, it can be seen that the results of the Spearman rank test show that the p value between Management Distress and Diabetes Distress is p-value = 0.509 (p> 0.05) and the correlation value is r = 0.059, which means that in this case Ha is not accepted and there is no significant relationship between Management Distress and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (10), (22), (23) which stated that the results of the p-value = 0.76 and r = 0.68.

According to the researcher's analysis, there is no significant relationship between Management Distress and diabetes distress, where there is a tendency for diabetes mellitus patients with low Management Distress to indicate that they experience moderate diabetes distress.

6. Relationship between Eating Distress and Diabetes Distress in Diabetes Mellitus Patients

Based on the results of the research that has been conducted, it can be seen that the results of the Spearman rank test show that the p value between Eating Distress and Diabetes Distress is p-value = 0.688 (p> 0.05) and the correlation value is r = 0.036, which means that in this case Ha is not accepted and there is no significant relationship between Eating Distress and diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City. This study is not in line with the study conducted by (10), (24), (25) which stated that the results of the p-value = 0.78 and r = 0.73.

According to the researcher's analysis, there is no significant relationship between Eating Distress and diabetes distress, where there is a tendency for diabetes mellitus patients with normal Eating Distress indicating that they experience moderate diabetes distress.

Conclusion

Based on the results of the study and discussion on Factors Related to Diabetes Distress in Diabetes Mellitus Patients in the Work Area of the Kampung Teleng Health Center, Sawahlunto City, it can be concluded that:

1. The results of the study showed that (57.9%) respondents with diabetes mellitus had mild diabetes distress
2. There is a significant relationship between negative social perception with diabetes distress in diabetes mellitus patients in the work area of the Kampung Teleng Health Center, Sawahlunto City, statistically obtained a p value = 0.007 ($p \leq 0.05$).
3. There is a significant relationship between hypoglycemia distress and diabetes distress in patients with diabetes mellitus in the work area of the Kampung Teleng Health Center, Sawahlunto City, statistically obtained a p value = 0.049 ($p \leq 0.05$)

Author Contributions

This study has some processes, with each role ranging from conception and design of the work of study, finding the appropriate questionnaire, and conducting validity and reliability tests for the questionnaire to data collection, data analysis, and interpretation, drafting of the article, critical revision, and final approval of the version to be published. We collaborated on each part of the process. All authors contributed to the process.

ACKNOWLEDGEMENT

researcher would like to thank all parties who supported and helped during this research.

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