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THE RELATIONSHIP OF KNOWLEDGE AND CONFIDENCE WITH THE BEHAVIOR OF ADDRESS TO TAKING DIABETES MELLITUS MEDICATION IN TYPE 2 DIABETES MELLITUS PATIENTS AT BHAYANGKARA BRIMOB HOSPITAL

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Abstract

Background: The incidence of DM is increasing, if not treated properly it can cause various complications in the body. DM complications can cause increased morbidity and mortality. The success of Diabetes Mellitus treatment is greatly influenced by the patient's compliance with maintaining their health Research Purpose: To determine the relationship between knowledge and belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. Research Method: The research approach used in this research is cross-sectional. The population in this study was 1410 DM patients in 2023. The sample required is 93 respondents. The sampling technique for respondents used a simple random sampling technique. The instrument in this research was to use a questionnaire. Researchers used the Chi Square test. Research Results: The results of statistical tests on the relationship between knowledge and compliance behavior obtained a P value = 0.005 and the results of statistical tests on the relationship between beliefs and compliance behavior obtained a P value = 0.001. Conclusions and Suggestions: There is a relationship between knowledge and belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. Suggestions for Hospital Management: Create educational classes for patients, especially type 2 DM sufferers, to understand medication compliance

Keywords: Confidence, Compliance, Diabetes Mellitus, Knowledge

Introduction

Diabetes Mellitus is a group of metabolic diseases characterized by an increase in blood glucose levels (hyperglycemia), which occurs due to abnormalities in insulin secretion, insulin activity and both. Diabetes Mellitus (DM) is a chronic condition that usually cannot be cured but can be controlled with appropriate treatment. Diabetes Mellitus (DM) is a disease caused by impaired insulin work, impaired insulin secretion, or both, causing an increase in glucose levels in the blood (Widodo, 2017).

Diabetes mellitus (DM) is a disease that is a serious health problem, like heart disease, therefore diabetes is often referred to as the silent killer. Diabetes mellitus comes from the Greek "diabainein" which means clear or water source, while mellitus comes from Latin which means sweet taste. In Indonesia, it is often called diabetes, which is a metabolic disorder in the body caused by many factors in the form of chronic hyperglycemia and disorders of carbohydrate, fat and protein metabolism. Long-term complications include cardiovascular disease, chronic kidney failure, retinal damage which can cause blindness, and nerve damage which can cause impotence and gangrene which raises the risk of amputation (Suryati, 2021).

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The International Diabetes Federation in 2022 reported that 537 million adults (20-79 years) were living with diabetes worldwide. This number is expected to increase to 643 million (1 in 9 adults) in 2030 and 784 million (1 in 8 adults) in 2045. Diabetes mellitus caused 6.7 million deaths in 2021. It is estimated that 44% of adults who living with undiagnosed diabetes (240 million people). 541 million adults worldwide, or 1 in 10, have impaired glucose tolerance, placing them at high risk of developing type 2 diabetes (Sutomo and Purwanto, 2023).

The Ministry of Health of the Republic of Indonesia reports that the number of diabetes mellitus sufferers in 2021 will be 19.47 million people (Ministry of Health of the Republic of Indonesia, 2022). Based on the results of Basic Health Research (Riskesdas) in 2018, the prevalence of DM in West Java reached 1.74% (estimated at 570,611 diabetes sufferers). In 2021, the West Java Health Service found 46,837 people with diabetes and 17,379 or 37.1% of them did not receive adequate health care according to government standards. The number of diabetes mellitus sufferers at Bhayangkara Brimob Hospital in the last 3 years, namely in 2021 there were 2,559 patients, in 2022 there were 3,480 patients and in 2023 there were 1,410 patients.

The incidence of DM is increasing, if not treated properly it can cause various complications in the body. DM complications can cause increased morbidity and mortality rates which can be related to damage or failure of several body organs such as the eyes and kidneys, as well as the nervous system, high blood pressure which can trigger strokes, and heart problems. including osteoporosis. The increasing number of complications that occur due to DM, the Indonesian Endocrinology Association or PERKENI has issued a consensus on the management of DM in 2011, namely by creating 4 pillars for the management of type 2 DM, namely education, physical exercise, nutritional therapy and pharmacological intervention (Perkeni, 2019).

Pharmacological management is one of the very important pillars of managing type 2 DM. Pharmacological therapy is given if after physical exercise and nutritional therapy, but blood glucose is not well controlled, then hypoglycemia medication must be given according to indications. Good and correct treatment therapy will provide benefits for the patient, in terms of health or healing of the disease they are suffering from. DM sufferers are required to implement this management as well as possible as a form of effort to treat their disease. Compliance with taking medication in diabetes mellitus patients is important to achieve treatment goals and is effective in preventing complications in diabetes mellitus, especially for patients who have to take medication for a long period of time, even throughout their lives(Eli and Soraya, 2022).

The success of Diabetes Mellitus treatment is greatly influenced by the patient's compliance with maintaining their health. High compliance means that Diabetes Mellitus treatment can be carried out optimally and health quality can remain stable. Compliance is the level at which the patient carries out the treatment methods and behavior recommended by the doctor or other medical personnel (M. Sidrotullah, 2022).

Compliance with taking medication in DM patients is important in achieving treatment targets and is effective in preventing several complications in DM disease, where good and correct treatment therapy will be very beneficial for the patient, both in terms of health or healing of the disease suffered, namely by patient compliance in consuming this medication, especially for patients who have to take medication for a long time, even throughout their life for diabetes mellitus (Diantari and Sutarga, 2019). Alqarni's research explains that medication compliance in diabetes mellitus patients was found to be less than optimal. A better approach is needed from primary health care doctors in treating each patient, taking into account their level of medication adherence, which is important for successful diabetes treatment (Alqarni *et al.*, 2019).

Compliance with taking medication in patients suffering from type 2 DM is known to be based on several factors that cause health behavior, including predisposing factors, namely knowledge, attitudes, beliefs, values and culture, enabling factors, namely the physical environment, and health

facilities, and driving factors, namely attitudes and behavior of health workers or other officers(Notoatmodjo, 2020).

Good medication knowledge has been shown to be positively associated with better quality of life, medication adherence, and achievement of desired pharmacotherapy outcomes. Therefore, it is important in disease management and in combating the frequency of adverse drug reactions. Poor patient knowledge regarding treatment can result in a decrease in the effectiveness of treatment, the emergence of other health problems, drug abuse, as well as negative outcomes related to treatment such as adverse drug reactions (Muhammad Haskani *et al.*, 2022).

Knowledge about Diabetes Mellitus is very important because not only does it help understand the disease but patients can determine the steps that need to be taken in order to reduce the severity of the disease. The success of DM treatment is very dependent on compliance with taking medication. Many previous studies on the relationship between knowledge and medication adherence have shown different results. Based on Marito's research in 2021, it is known that there is a relationship between the level of knowledge and compliance with type 2 DM treatment (Marito and Lestari, 2021). Recent research has added “digital information” to the definition of treatment literacy, which enriches the connotation of treatment literacy. Broad health knowledge and perception of similar illnesses are not a substitute for medical literacy. Medication literacy, as a comprehensive concept regarding a patient's medication ability, may be related to medication adherence in type 2 diabetes patients (Liu *et al.*, 2023).

Another factor that can determine compliance in type 2 DM treatment is belief. The patient's confidence in their medication can be related to the patient's concerns and decisions regarding the function and side effects that will arise if they take the prescribed medication (Olorunfemi and Ojewole, 2019). Diabetic sufferers who have high self-confidence will encourage and motivate themselves to grow their desire to recover so that the sufferer will be more obedient in carrying out treatment (Kawulusan, Katuuk and Bataha, 2019). Salama and Saudi's research explains that adherence to treatment is influenced by the patient's beliefs about treatment, especially the patient's concerns about the drug, and this becomes an obstacle to adherence. So it is important to consider patient beliefs about treatment, and address patient concerns to improve patient compliance and management with better interventions and education, especially regarding diabetes patient concerns and treatment side effects to reduce non-adherence (Salama and Saudi, 2020).

Based on a preliminary study at Bhayangkara Brimob Hospital on October 29 2023, it was discovered from the results of short interviews with 10 people suffering from DM at Bhayangkara Brimob Hospital that it was found that 6 out of 10 patients had forgotten to take medication, especially medication after eating.

Based on the explanation above that knowledge influences attitudes and behavior in using medication, researchers are interested in examining the relationship between knowledge and belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital.

Methods

Research Design

Research Design Research design is a scientific way to produce data with specific purposes and uses. The research approach used in this research is cross-sectional (Sugiyono, 2016).

Population And Sampling

The population in this study was 1410 DM patients in 2023. In the Slovin formula, the sample required is 93 respondents. The sampling technique for respondents used a simple random sampling

technique. Teknik pengambilan sampel untuk responden menggunakan teknik simple random sampling adalah teknik pengambilan sampel dari anggota populasi yang dilakukan secara acak tanpa memperhatikan strata yang ada dalam populasi itu.

Research Instrument

Research Instrument Research instruments are tools used by researchers to collect data to make work easier and the results better (Sugiyono, 2018). The instrument in this research was to use a questionnaire

Data analysis

The research uses univariate analysis to describe each variable studied. Researchers used the Chi Square test with a confidence level of 95% or a significance level of 5%. If the p-value is ≤ 0.05, it means that the statistical calculation results are meaningful and if the p-value is > 0.05, it means that the statistical calculation results are not meaningful.

Results

a. Frequency Distribution of Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Table 1 Frequency Distribution of Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

No	Compliance Behavior	Frequency (f)	Percentage (%)
1.	Compliant	55	59,1
2.	Non-Compliant	38	40,9
	Total	93	100%

Based on table 1, it is known that the frequency distribution of compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital was that respondents had more good compliance behavior, namely 55 out of 93 respondents (59.1%).

b. Distribution of Knowledge in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Table 2 Frequency Distribution of Knowledge in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

No	Knowledge	Frequency (f)	Percentage (%)
1.	Good	53	57,0
2.	Enough	31	33,3
3,	Less	9	9,7
	Total	93	100%

Based on table 2, it is known that the frequency distribution of knowledge in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital is that respondents have more good knowledge, namely 53 out of 93 respondents (57%).

c. Distribution of Beliefs in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Table 3 Frequency Distribution of Beliefs in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

No	Confidence	Frequency (f)	Percentage (%)
1.	Height	56	60,2
2.	Low	37	39,8
	Total	93	100%

Based on table 3, it is known that the frequency distribution of beliefs in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital is that respondents have more high confidence, namely 56 out of 93 respondents (60.2%).

d. The Relationship between Knowledge and Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Table 4: The Relationship between Knowledge and Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Knowledge	Compliance Behavior				Total		P value	OR
	Compliant		Disobedient					
	f	%	f	%	f	%		
Good	39	73,6	14	26,4	53	100	0,005	-
Enough	12	38,7	19	61,3	31	100		
Less	4	44,4	5	55,6	9	100		
Total	55	59,1	38	40,6	93	100		

From table 5.4, it was found that there was a relationship between knowledge and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. It was found that good knowledge was greater in those with compliance behavior in taking diabetes mellitus medication, namely 39 out of 53 respondents (73.6%) , there is more or less knowledge that the behavior of compliance with taking diabetes mellitus medication is non-compliance, namely 19 out of 31 respondents (61.3%) and the knowledge is more or less that the behavior of compliance with taking diabetes mellitus medication is non-compliance, namely 5 out of 9 respondents (55 .6%). The statistical test results showed that the P value = 0.005, meaning the p value $< \propto$ (0.05), so it can be concluded that there is a relationship between knowledge and the behavior of compliance with taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital.

e. The Relationship Between Beliefs and Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Table 5 Relationship between beliefs and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital

Beliefs	Compliance Behavior				Total		P value	OR
	Compliant		Disobedient					
	f	%	f	%	f	%		
Height	41	73,2	15	26,8	56	100	0,001	4,490
Low	14	37,8	23	62,2	37	100		
Total	55	59,1	38	40,6	93	100		

From table 5, it is found that there is a relationship between belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. It is found that high confidence means that compliance behavior in taking diabetes mellitus medication is more compliant, namely 41 out of 56 respondents (73.2%) , and low confidence that the behavior of compliance with taking diabetes mellitus medication is more non-compliant, namely 23 out of 37 respondents (62.2%). The statistical test results showed that P value = 0.001, meaning p value < ∝ (0.05), so it can be concluded that there is a relationship between belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. From the analysis results, the OR value is 4.490, meaning that if you have high confidence you have a 4.4 times chance of being obedient compared to low confidence.

Discussion

a. The Relationship between Knowledge and Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Based on the results of the research, it was found that there was a relationship between knowledge and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. It was found that good knowledge was greater in those with compliance behavior in taking diabetes mellitus medication, namely 39 out of 53 respondents (73.6%) , there is more or less knowledge that the behavior of compliance with taking diabetes mellitus medication is non-compliance, namely 19 out of 31 respondents (61.3%) and the knowledge is more or less that the behavior of compliance with taking diabetes mellitus medication is non-compliance, namely 5 out of 9 respondents (55 .6%). The statistical test results showed that the P value = 0.005, meaning the p value < ∝ (0.05), so it can be concluded that there is a relationship between knowledge and the behavior of compliance with taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital.

In line with Pharamita's research (2023), the aim of this research is to find out the relationship between the level of knowledge and adherence to taking medication in diabetes mellitus patients in the Sumurgung Community Health Center work area. The results of statistical tests between the level of knowledge and adherence to taking medication in diabetes mellitus patients in the working area of the Sumurgung Community Health Center obtained a p value of 0.001 and a p value < 0.05, meaning that there is a relationship between the level of knowledge and adherence to taking medication in diabetes mellitus patients in the working area of the Sumurgung Community Health Center.

Based on Marito's research in 2021, it is known that there is a relationship between the level of knowledge and compliance with type 2 DM treatment (Marito and Lestari, 2021). Recent research has added “digital information” to the definition of treatment literacy, which enriches the connotation of

treatment literacy. Broad health knowledge and perception of similar illnesses are not a substitute for medical literacy. Medication literacy, as a comprehensive concept regarding a patient's medication ability, may be related to medication adherence in type 2 diabetes patients (Liu *et al.*, 2023).

In theory, knowledge is an important domain in the formation of a person's actions. In determining a complete attitude, knowledge, thoughts, beliefs and emotions play an important role. This knowledge will lead someone to think and try to maintain their health status to remain good (Notoatmodjo, 2012). The level of knowledge is one of the factors that can influence compliance with taking medication in diabetes mellitus patients, so providing in-depth information about diabetes mellitus is very important to implement so that the level of compliance with taking medication can increase so that the risk of disease severity and diabetes mellitus complications decreases and blood sugar levels decrease. blood can be controlled (Nazriati et al., 2018).

According to the researchers' assumption, the level of knowledge of diabetes mellitus patients is very influential in compliance with taking medication. Where patients have a good level of knowledge about diabetes mellitus and its management, the level of compliance in taking medication will also be good. Knowledge about Diabetes Mellitus is very important because not only does it help understand the disease but patients can determine the steps that need to be taken in order to reduce the severity of the disease. The success of DM treatment is very dependent on compliance with taking medication.

b. The Relationship Between Beliefs and Compliance Behavior in Taking Diabetes Mellitus Medication in Type 2 Diabetes Mellitus Patients at Bhayangkara Brimob Hospital

Based on the results of the research, it was found that there was a relationship between belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. It was found that high confidence was more likely that compliance behavior in taking diabetes mellitus medication was compliant, namely 41 out of 56 respondents (73.2%) , and low confidence that the behavior of compliance with taking diabetes mellitus medication is more non-compliant, namely 23 out of 37 respondents (62.2%). The statistical test results showed that P value = 0.001, meaning p value < $\propto$ (0.05), so it can be concluded that there is a relationship between belief and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital. From the analysis results, the OR value is 4.490, meaning that if you have high confidence you have a 4.4 times chance of being obedient compared to low confidence.

In line with Ramadhini's research (2022), the research results show that a P value of 0.000 means that there is a relationship between confidence and adherence to taking oral anti-diabetic medication at the Tlogosari Semarang Community Health Center. Salama and Saudi's research explains that adherence to treatment is influenced by the patient's beliefs about treatment, especially the patient's concerns about the drug, and this becomes an obstacle to adherence. So it is important to consider patient beliefs about treatment, and address patient concerns to improve patient compliance and management with better interventions and education, especially regarding diabetes patient concerns and treatment side effects to reduce non-adherence (Salama and Saudi, 2020).

According to Kotler and Armstrong, beliefs are a person's descriptive thoughts about something. Confidence is the level of certainty consumers consider a brand to be evaluatively correct, whether the brand is good or bad. Trust is defined as a consumer's hope that a provider can be trusted or relied upon to fulfill its promises. Confidence as credibility. Credibility is the extent to which buyers believe that suppliers have the expertise to carry out activities effectively and reliably (Kotler, P & Amstrong, 2016).

According to the researchers' assumption, diabetes sufferers who have high self-confidence will encourage and motivate themselves to grow their desire to recover so that these sufferers will be more compliant in carrying out treatment. The patient's confidence in the medication can be related to the

patient's concerns and decisions regarding the function and side effects that will occur if they take the medication that has been prescribed.

Implication and Limitations

Filling out the questionnaire is filled in by the respondent himself so that there could be (information bias), namely the information conveyed by the respondent is subjective. The results of the respondent's answers depend on the respondent's honesty. Questionnaires with closed questions so that information cannot be explored in depth.

Conclusion

Based on the research results and discussions presented by the researcher, the following conclusions can be drawn:

Frequency distribution of compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital shows that respondents had more good compliance behavior

a. The frequency distribution of knowledge in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital shows that respondents had more good knowledge
b. The frequency distribution of beliefs in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital shows that respondents have more high confidence
c. There is a relationship between knowledge and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital
d. There is a relationship between beliefs and compliance behavior in taking diabetes mellitus medication in type 2 diabetes mellitus patients at Bhayangkara Brimob Hospital

Suggestions for hospitals: Create educational classes for patients, especially type 2 DM sufferers, to understand medication adherence and create posters or leaflets related to medication adherence. Suggestions: Nurses always provide education to patients regarding the belief that it is safe to take medication according to doctor's recommendations and nurses always inform them of the medication consumption schedule

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Author Contribution

Author 1 and Author 2 contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

Conflict of interest

The results of this research can be used as an additional literature for the development of nursing science, and to meet the requirements of obtaining Bachelor of Nursing Degree

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