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Relationship between Knowledge Level and Risk of Hypoglycemia in Diabetes Mellitus Patients in the Inpatient Ward

Vanni Vionita [1*], Rochmayanti[1], Novia wulansari[1], Wasis Widodo[1]

[1]*School of Nursing ,Institut Kesehatan dan Bisnis Annisa, Jawa Barat*

***Correspondence:**
Vanni Vionita
Vionitavanni207@gmail.com

Abstract

Background: Diabetes Mellitus is a metabolic disorder caused by failure of the pancreas to produce insulin, which is characterized by increased glucose levels in the blood. In Indonesia, Diabetes Mellitus ranks second in West Java Province with a total of 73,285 sufferers. The aim is to determine the relationship between the level of knowledge and the risk of hypoglycemia in diabetes mellitus patients in the inpatient room at Sentra Medika Cibinong Hospital.

Methods: The method used was a Cross Sectional approach for Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital, the sampling technique used Total Sampling with respondents asked to fill out a questionnaire regarding the Level of Knowledge and History of Hypoglycemia.

Results: Of the 50 respondents, the majority of respondents had a good level of knowledge, 39 people (78.0%), 11 people (22.0%) had sufficient knowledge. Data analysis used Chi Square with the result Pvalue = 0.589. So there is no significant relationship between Knowledge Level and History of Hypoglycemia in Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital.

Conclusions: It is hoped that future researchers can determine or select respondents with the type of Diabetes Mellitus so that they can understand attitudes and prevention of Hypoglycemia.

Keywords: Knowledge, Diabetes Mellitus, Hypoglycemia

Introduction

Diabetes Mellitus is a metabolic disorder caused by the failure of the pancreas to produce the hormone insulin adequately. This disease can be said to be a chronic disease because it can occur over years and is characterized by increased blood glucose levels. Based on the cause, diabetes mellitus is classified into three types, namely type 1, type 2 and gestational diabetes mellitus. In 2014, 422 million people suffered from diabetes mellitus, an increase from 108 million in 1980. (Indonesian Ministry of Health, 2020; WHO, 2018).

Hypoglycemia is a condition where blood glucose levels are below normal, namely ≤70 mg/dl, which occurs due to increased insulin levels which cause a decrease in blood glucose levels, for example inadequate insulin therapy. This incident is usually related to diabetes mellitus, which is a metabolic disorder that causes high blood glucose levels. (Gusti Ayu Putu, 2023; Sudoyo, 2015).

Full list of author information available at the end of the article.

According to the International Diabetes Federation (IDF), there were 463 million people in the world aged 20 to 79 years who suffered from diabetes in 2019. Diabetes ranks 7th out of 220 countries throughout the world, with the number of diabetes sufferers expected to increase from 415 million people to 642 million in 2040. IDF identified the ten countries with the highest number of diabetes patients, namely China, India and the US are in the top three with 116.4 million, 77 million and 31 million people. Indonesia ranks seventh out of 10 countries with the number of cases, namely 10.7 million. (IDF, 2019).

In the province of West Java in 2018 there were 73,285 sufferers diagnosed with diabetes mellitus. West Java is in second place, having the largest population experiencing side effects of diabetes, up to 52,511 people, which means that West Java has the potential to become the area with the largest number of diabetes sufferers in Indonesia if it is not treated immediately (Riskesdas, 2018).

Knowledge has an influence on preventing complications of hypoglycemia. Respondents who have good knowledge will have less hypoglycemia status because they can avoid the causes and control the occurrence of hypoglycemia. (Manalu, 2020)

Based on the results of an interview with the Head of the Unit at Sentra Medika Cibinong Hospital, there are 3 inpatient rooms specifically for adults at Sentra Medika Cibinong Hospital, according to calculations based on Medical Record data obtained in March 2024, there are 59 people who are male and 42 people who are female, aged 20 years to ≥61 years suffering from Diabetes Mellitus, with an incidence of Hypoglycemia of 33 cases with 17 cases in female patients and 16 people in male patients in January and February 2024.

Methods

This research uses a quantitative descriptive research design with a cross-sectional approach. This research was conducted on Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital. The population in this study were Diabetes Mellitus patients in the Inpatient Room of Sentra Medika Cibinong Hospital which was obtained from calculating the Medical Record Data of Sentra Medika Cibinong Hospital in the last month, namely March 2024, there were 101 people, with 59 people being male and 42 people being female.

The results from the population were then set at an error rate of 10% or 0.1 and calculations were carried out using the Slovin formula, then the number of samples examined was added to the sample as a reserve in case of discrepancies or not being classified to 55 respondents. Before sampling, inclusion and exclusion criteria are carried out so that the sample characteristics do not deviate from the population. The research results were divided based on characteristics including age, gender, education level, occupation and duration of diabetes.

Data collection was carried out directly by researchers through questionnaires and leaflets which were distributed to respondents. Of the 10 question items, respondents who were able to answer correctly with a score of 1-4 were in the poor knowledge level category, a score of 5-7 was in the sufficient knowledge level, and a correct score of 8-10 was in the good knowledge level category.

In connection with the large number of Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital, the author is interested in conducting research on "The Relationship between Knowledge Level and the Risk of Hypoglycemia in Diabetes Mellitus Patients in the Inpatient Room at Sentra Medika Cibinong Hospital". This research has been approved by the Cibinong Sentra Medika Hospital with letter number No. 734/Eks-Dir/RSSM-CBN/V/2024.

The validity testing technique in this research uses Pearson Product Moment in the SPSS program. In this research, a validity and reliability test was carried out based on a questionnaire obtained from previous research by (Putu, 2023) with validity and reliability test results of r alpha = 0.628.

Results

This research was conducted on Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital. The number of samples studied was 50 respondents according to the Slovin formula calculation, without recalculation the error rate was 10% or 0.1. The questionnaires that will be collected have previously been double-checked by the researcher.

Table 1. Respondent characteristics

Characteristics	Frequency	Percentage
Age		
>30 years	2	4
>40 years	10	20
>50 years	20	40
>60 years	18	36
Gender		
Man	24	48
Woman	26	52
Education		
Elementary	10	20
Junior high school	5	10
Senior high school	27	54
University	8	16
Job		
Doesn't work	28	56
Government	3	6
Employees	6	12
Self Employed	11	22
Pension	2	4
Suffering Duration		
<5 years	21	42
>5 years	29	58

The majority of respondents aged >50 years (Older), namely 20 people (40.0%), the majority gender was female, namely 46 people (51.1%), the educational level of the majority of respondents with a high school education level of 27 people (54.0%), the majority of respondents who did not work were 28 people (56.0%), the majority of respondents had long-suffered from the disease. >5 years more, namely 30 people (60.0%).

Table 2. Level of knowledge and history of hypoglycemia

Category	Frequency	Percentage
Good	39	78
Enough	11	22
History of hypoglycemia		
Once	28	56
Never	22	44

Table 2 shows that the majority of respondents had a good level of knowledge, 39 people (78.0%), apart from that, the majority of respondents had experienced hypoglycemia, 28 people (56.0%).

Table 3. Relationship between level of knowledge and risk of hypoglycemia

Level of Knowledge	Risk of Hypoglycemia					P-value
	Once		Never		Total	
	N	%	N	%		
Good	22	56,4	17	43,6	39	0.589
Enough	6	54,5	5	45,5	11	

In this study, no correlation test assessment was carried out because this study had carried out a validity test based on a questionnaire obtained based on research (Gusti Putu Ayu, 2023) with validity and reliability test results of r alpha = 0.628 so that it was reliable/trustworthy.

This research uses Chi-Square as a data analysis test when research data in the form of ordinal data meets nominal data (Hastono, 2017). The results of the Chi-Square test stated that there was no significant relationship between the level of knowledge and the risk of hypoglycemia or the hypothesis (Ha) was accepted with a P value of 0.589 from a value of 0= ≤ 0.05.

Discussion

The research results based on age were grouped into <30 years (Young) as many as (0%), >30 years (Young adults) as many as 2 people (4.0%), > 40 years (Old adults) as many as 10 people (20.0%), > 50 years (Old) as many as 20 people (40.0%), and >60 years (Seniors) as many as 18 people (36.0%). Age classification is one of the risk factors that can determine severity and prognosis because it is closely related to anatomical, physiological and chemical decline which has an impact on susceptibility to many degenerative diseases, for example Diabetes Mellitus and reduced function of the body. Type 1 diabetes generally attacks children and teenagers, while type 2 diabetes is the most common type which usually occurs in people over 40 years of age. In this study, the majority were found to be >50 years old (old), namely 20 people (40.0%) because as age increases, the risk factor for glucose intolerance also increases, because aging can reduce insulin sensitivity so that it can affect glucose levels in the blood. In line with research conducted by Gusti Ayu Putu (2023), the age category > 50 years (Older) ranks highest, namely 39 people or (43.3%).

The results of research based on gender show that the largest number of respondents in this study were female respondents, namely 26 people (52.0%) while male respondents were 24 people (48.0%). The results of this research are in line with research by Gusti Putu Ayu (2023) which showed that there were more women, namely 46 people (51.1%) compared to men, namely 44 people (48.9%). This is related to women being more physically at risk in increasing BMI (body mass index), syndrome before menstruation and after menopause, resulting in disturbed and accumulated fat

distribution, increasing the risk of diabetes mellitus. However, this is different from research conducted by Eka Yudha (2020), which stated that there were more male respondents with a result of 21 respondents (52.5%) because of the risk of fat distribution, in men the accumulation of concentrated fat around the stomach triggers central obesity which has the risk of triggering metabolic disorders.

The research results were based on the educational level of the majority of respondents with a high school education level of 27 people (54.0%), a bachelor's degree of 8 people (16.0%), an elementary school of 10 people (20.0%), a junior high school of 5 people (10.0%) and no schooling (0%). The level of education is one of the factors that determines an individual's ability to understand their health condition, and also influences a person's ability to understand the information they obtain. In line with research conducted by Artawan (2021) which stated that the majority of respondents had a high school/vocational school education level, namely 38 people (52.8%), which explains that the level of education has an influence on health. So people who have a high level of education usually have a level of knowledge about health and are aware of maintaining their health. People with a high level of education will usually have a lot of knowledge about health, with this knowledge people will have awareness of maintaining their health.

The majority of research results based on occupation were 28 respondents who did not work (56.0%), 11 respondents who were retired (22.0%), this was related to lack of physical activity, 6 respondents who were self-employed (12.0%), 3 respondents with civil servants (6.0%) and 2 respondents with other jobs (4.0%). However, this is different from research conducted by Artawan (2021), where the majority of respondents who were entrepreneurs, 30 people (41.7%) stated that work influences the risk of diabetes mellitus because people who are busy with daily activities or work and have high working hours will have irregular eating and sleeping schedules, which is a risk factor for increased disruption of the hormonal balance system.

The research results based on the length of suffering, the majority of respondents with a long-suffering illness of >5 years were more, namely 30 people (60.0%) compared to respondents with a long-suffering period of <5 years (40.0%), this is also related to a decrease in pancreatic function or damage to the pancreas. In line with research conducted by Eka Yudha (2020) which showed that the majority of respondents had suffered from diabetes mellitus for >6 years, as many as 24 respondents (60.0%). Patients who suffer from diabetes mellitus and often experience hypoglycemia tend to have the ability to identify the symptoms of hypoglycemia that they feel, then they will fight or take preventive measures and the longer they suffer, the more ability they will have.

The results of the research based on the level of knowledge showed that the majority of respondents had a good level of knowledge, 39 people (78.0%), 11 people (22.0%) had sufficient knowledge and 11 people had poor knowledge (0%). In line with research conducted by Gusti Putu Ayu (2023), respondents with good knowledge had more results (55.6%), fair (27.8%) and poor (16.7%). Even though in this study it was found that the level of good knowledge was greater, preventive efforts still need to be made in providing information to patients, especially about risk factors for hypoglycemia. Such as signs and symptoms of hypoglycemia, namely cold sweats, heart palpitations, feeling hungry, vision problems and loss of consciousness. Therefore, it is hoped that there will be a lot of outreach and information dissemination through leaflets and other media. In this case, the respondent's family or companions have an important role in reminding them about the disease they are suffering from, because the family has the potential to be given education by health workers so that they can help channel information to patients relating to how to choose food and use diabetes medication properly and correctly to avoid complications. One of the most frequently encountered complications is hypoglycemia.

The research results based on the risk of hypoglycemia, the majority of respondents who had experienced hypoglycemia were 28 people (56.0%) and respondents who had never experienced hypoglycemia were 22 people (44.0%). However, this is different from the research conducted by Anandia Nafsiah (2021) with the results of respondents with a history of never experiencing hypoglycemia, namely 64

people (81%) and those with a history of having experienced hypoglycemia, 15 people (19%), which explains that the small number of patients who have a history of hypoglycemia is caused by good cooperation between the patient and the doctor, where the patient may eat first before taking medication or take the medication according to the recommended dose or not use insulin or certain medications. who increase the risk of hypoglycemia or who already understand how to treat hypoglycemia so they don't end up being taken to the hospital.

The research results showed that there was no significant relationship between the level of knowledge and the risk of hypoglycemia in Diabetes Mellitus patients in the Inpatient Room at Sentra Medika Cibinong Hospital with the Pvalue obtained from the Chi-Square test results (0.589). In line with research conducted by Gusti Putu Ayu (2023) with the results of the majority having a higher level of good knowledge, namely (55.6%), sufficient (27.8%) and poor (16.7%). However, even though the majority of research found that the level of knowledge was good, it is still necessary to make efforts to prevent it by providing information to diabetes mellitus patients, especially about the risk of hypoglycemia. It is hoped that with more education and dissemination of information through leaflets and other social media, it can reduce the risk of hypoglycemia.

Limitations

The limitation in this research was during sampling, because we had to visit 3 inpatient rooms at Sentra Medika Cibinong Hospital and had to collect Diabetes Mellitus patients in these inpatient rooms. When the research was carried out there were several obstacles such as the patient being at rest. The limited time in sample collection also had an influence because samples were only collected in less than 1 month. Older respondents also influence sampling because they tend to have less understanding about the disease and their families are less exposed to information about the disease. The data obtained is the result of a questionnaire which was filled in directly by the respondent or the respondent's family, so the truth of the contents of the questionnaire depends on the knowledge status of the respondent and the respondent's family.

Conclusion

Based on the results of research conducted regarding the level of knowledge of the risk of hypoglycemia in diabetes mellitus patients in the inpatient ward at Sentra Medika Cibinong Hospital in March 2024, researchers can conclude that, there is no significant relationship between the level of knowledge and the risk of hypoglycemia in diabetes mellitus patients at Sentra Medika Cibinong Hospital in March 2024 with Pvalue (0.589).

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