THE EFFECT OF HEALTH EDUCATION ABOUT HYPOGLYCEMIC EMERGENCY ON PREVENTION BEHAVIOR OF HYPOGLYCEMIA IN DIABETES MELLITUS PATIENTS

Yuni Sharoh*, Ahmad Farhan Putratama, Ahmad Fauzi, Anggriyani Nayunda Dewi

Bachelor of Nursing Study Program, Wijaya Husada Health Institute
Jl. Letjend Ibrahim Adjie, No. 180, Sindang Barang, Bogor, West Java, Indonesia
***corresponding author:** wijayahusada@gmail.com

ABSTRACT
Hypoglycemia is an acute complication of diabetes mellitus which often occurs repeatedly which is characterized by immediate treatment of hypoglycemia emergencies. The first step in preventing hypoglycemia is carried out by providing health education. Good and appropriate health education can increase awareness of people with Diabetes Mellitus to want to change behavior in undergoing a given treatment program so that sugar levels can be controlled and prevent various acute complications, especially complications of hypoglycemia. The aim of this study was to determine the effect of health education about emergency hypoglycemia on behavior prevention of hypoglycemia in diabetes mellitus patients at Rs. Bogor City in 2022. This type of research is quantitative, using a pre-experimental research method with a one group pre-post test design approach. Sampling by purposive sampling as many as 21 respondents. Data collection was obtained through a questionnaire sheet. The data analysis used was univariate and bivariate (Wilcoxon signed rank test). Results Analysis of data from 21 respondents, obtained the effect of patient knowledge on hypoglycemia prevention behavior as many as 19 respondents (90.5) in the sufficient category. The results showed that there was a significant influence between health education about hypoglycemia emergencies and hypoglycemia prevention behavior with the results of statistical tests using the Wilcoxon signed rank test p value $0.000 \leq 0.05$. So it can be concluded that there is an influence of health education about emergency hypoglycemia on hypoglycemia prevention behavior in diabetes mellitus patients at the hospital. Bogor City in 2022. Researchers hope that this research can increase knowledge and be more proactive in participating in health education outreach activities regarding hypoglycemia prevention behavior.

Keywords: Health Education, Hypoglycemia, Behavior, Patients

INTRODUCTION

Hypoglycemia is one of the complications faced by people with Diabetes Mellitus. Where a state of glucose levels in the blood below normal (<70mg/dl). Hypoglycemia is often caused by side effects due to blood glucose lowering therapy in patients with diabetes mellitus and intensive blood glucose control which can increase the risk of severe hypoglycemia.[1]

Data from the World Health Organization (WHO) states that there are 422 million people in the world suffering from diabetes mellitus or an increase of around 8.5% in the adult population and it is estimated that there are 2.2 million deaths with a percentage due to diabetes mellitus that occurs before the age of 70 years. , especially in countries with low and middle economic status. In fact, it is estimated that it will continue to increase by around 600 million people in 2035.[2]

The prevalence of diabetes mellitus in Indonesia in 2013 was (6.9%) and increased in 2018 to (8.5%). In 2018, based on age category, the largest number of diabetes mellitus sufferers were in the age range of 55-64 years (6.4%) and 65-74 (6.03%) years. In addition, there are more DM sufferers in Indonesia (1.8%) than men (1.2%). based on data on diabetes mellitus in West Java in 2018 with age ≥ 15 years, namely 1.7%, this data was more predominantly suffered by women, namely 1.8%, while according to age group, it was more suffered by the elderly with an age range of 55-64 year, namely 6.3%. Meanwhile, in Bogor City, the number of diabetes mellitus cases continues to increase from 1,621 cases in 2014 to 13,710 cases in 2018.[3]

Hypoglycemia occurs due to blood sugar below normal <70mg/dl. Symptoms that appear when hypoglycemia occurs can be categorized as neuroglycopenic and neurogenic (autonomic) symptoms. Neuroglycopenic symptoms are a direct impact of glucose deficit on the central nervous system neuron cells, including changes in behavior, dizziness, weakness, seizures, loss of consciousness, and if hypoglycemia lasts longer it can result in death. Meanwhile, neurogenic (autonomous) symptoms include palpitations, tremors, and anxiety (adrenergic symptoms) and sweating, hunger, and paresthesia (cholinergic symptoms).[4]

Treatment for emergency hypoglycemia is immediate. The first step in preventing hypoglycemia is carried out by providing health education. Health education is an activity or effort to convey health messages to communities, groups or individuals in the hope of gaining better knowledge about health. Good and appropriate health education can increase awareness of people with Diabetes Mellitus to want to change behavior in undergoing a given treatment program so that sugar levels can be controlled and prevent various acute complications, especially complications of hypoglycemia. Patients with diabetes mellitus who do not receive health promotion have a four times higher risk of developing complications than those with DM who receive health education.[5]

A preliminary study conducted by researchers at the Bogor City Hospital, from the results of interviews with the head of the Pangrango Room, obtained total data on hypoglycemia rates in Type I and Type II Diabetes Mellitus patients from the last 3 months (June - August 2022) as many as 42 people. Based on the researcher's interviews with the patients, some patients said that they had been given health education about how to prevent hypoglycemia but had not implemented it properly in their daily lives. Based on the background above, the researcher is interested in researching the Effect of Health Education About Hypoglycemia Emergencies on Hypoglycemia Prevention Behavior in Diabetes Mellitus Patients at Bogor City Hospital.

The purpose of this study was to determine the effect of health education about hypoglycemia emergencies on hypoglycemia prevention behavior in diabetes mellitus patients at Bogor City Hospital in 2022.

RESEARCH METHODS

The research design used pre-experimental designs with a research design, namely the One-group pre-post design. 11 This research was conducted in the Pangrango inpatient room, Rs. City of Bogor on September 26 to October 16 with a population of 41 by collecting data using a purposive sampling technique where the sample determination technique is based on certain considerations

using inclusion and exclusion criteria that have been determined by researchers to make it easier to determine the number of samples (respondents). This researcher used a sample of 21 respondents.

The instruments used were leaflet sheets and pre-post test questionnaire sheets to find out before and after being given treatment, namely health education. Data analysis used the SPSS for Windows series 25 computer program. The analysis consisted of a prerequisite test which consisted of a normality test, and a hypothesis test in which the hypothesis test analyzed the effect of health education about hypoglycemia emergencies on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. Bogor City in 2022.

RESEARCH RESULT

Table 1. Distribution of characteristic frequencies based on the age of diabetes mellitus patients at Bogor City Hospital in 2022

No	Age	Frequency (f)	Percentage (%)
1	30 - 39 Years	4	19.0
2	40 - 49 Years	6	28,6
3	50 - 59 Years	5	23,8
4	60 – 70 Years	6	28,6
	Total	21	100

The table above shows the results of the frequency distribution of respondents' characteristics based on the age of diabetes mellitus patients at Rs.Medika Dramga Bogor, from 21 respondents, the results obtained were 6 respondents (28.6) aged 40-49 years and 60-70 years.

Table 2.Frequency Distribution of Respondent Characteristics Based on Gender of Diabetes Mellitus Patients at Bogor City Hospital in 2022.

No	Gender	Frequency (f)	Percentage (%)
1	Man	7	33,3
2	Woman	14	66, 7
	Total	21	100.0

The table above shows the results of the frequency distribution of the characteristics of respondents based on the sex of diabetes mellitus patients at Rs. Bogor City from 21 respondents, 14 respondents (66.7) were female.

Table 3.Distribution of Respondent Characteristics Based on Last Education of Diabetes Mellitus Patients at Bogor City Hospital in 2022

No	Last education	Frequency (f)	Percentage (%)
1	SD	6	28,6
2	JUNIOR HIGH	2	9,5
3	SCHOOL	13	61.9
	SENIOR HIGH SCHOOL		
	Total	21	100

The table above shows the results of the frequency distribution of respondents' characteristics based on the last education of diabetes mellitus patients at Rs. Bogor City from 21 respondents, 13 respondents (61.9) had high school education.

Table 4. Distribution of Respondent Characteristics Based on Occupation of Diabetes Mellitus Patients at Bogor City Hospital in 2022

N0	Work	Frequency (f)	Percentage (%)
1	Farmer	4	19.0
2	Self-employed	3	14,3
3	IRT	14	66,7
	Total	21	100.0

The table above shows the results of the frequency distribution of the characteristics of respondents based on the work of diabetes mellitus patients in Bogor City Hospital, from 21 respondents the results obtained were 14 IRT respondents (66.7) working.

Table 5. Distribution of Respondent Characteristics Based on Patients with a History of Diabetes Mellitus in Bogor City Hospital in 2022.

No	DM history	Frequency (F)	Percentage (%)
1	< 1 year	16	76,2
2	> 1 Year	5	23,8
	Total	21	100.0

The table above shows the results of the distribution of the frequency of history of diabetes mellitus in Rs. Bogor City obtained 21 respondents, the results obtained were 16 respondents (76.2%) with a history of diabetes mellitus.

Table 6. Distribution of Pre-Test Frequency on Hypoglycemia Prevention Behavior in Diabetes Mellitus Patients in Bogor City Hospital in 2022

Category	Frequency (f)	Percentage (%)
Enough	6	28,6
Not enough	15	71.4
Total	21	100.0

The table above shows the resultsPre Test frequency distribution Before being given health education on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 15 respondents (71.4) most of the knowledge categories were lacking.

Table 7. Distribution of Post Test Frequency on Hypoglycemia Prevention Behavior in Diabetes Mellitus Patients at Bogor City Hospital in 2022

Category	Frequency (f)	Percentage (%)
Good	2	9,5
Enough	19	90.5
Total	21	100.0

The table above shows the results of the Post Test frequency distribution after being given health education on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 19 respondents (90.5%), most of the categories of knowledge were sufficient.

Table 8. Shapiro Wilk Normality Test Results

	Shapiro-Wilk		
	Statistics	Df	Sig.
Pre_Test	0.570	21	0.000
Post_Test	0.341	21	0.000

The table above shows the results that it is known that the results of the normality test using the Shapiro Wilk formula are seen from the Sig. (significant) that is when the pre-test p-value is 0.000 and the post-test value is 0.000 if the significant value is <0.05, which means that the data is not normally distributed.

Table 9. Wilcoxon test results

Statistics test	
	Post Test - Pre Test
Z	-3,690b
asymp. Sig. (2-tailed)	,000

Results of the Wilcoxon Rank Test Hypothesis Test The Effect of Health Education on Hypoglycemia Prevention Behavior in Diabetes Mellitus Patients at Rs. Bogor City in 2022.
Based on the table above, it is known that the results of the Wilcoxon signed rank test hypothesis test seen from Sig. (significant) that is the value of 0.000. So if the p value ≤ 0.05 means that Ha is accepted so it can be concluded that there is an influence of health education about hypoglycemia emergencies on hypoglycemia prevention behavior in DM patients at Rs. Bogor City in 2022.

DISCUSSION

1. Univariate Results Level of Knowledge Before Given Health Education on Hypoglycemia Prevention Behavior

Knowledge and understanding of hypoglycemia provide the basis for recognition, interpretation of early symptoms of hypoglycemia and decision making in the form of interventions both independently and with others.

The results of this study before (pre-test) given health education on hypoglycemia prevention behavior in patients with diabetes mellitus at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 15 respondents (71.4) most of the knowledge categories were lacking.

The results of this study are in line with Artini's research, Ni Putu Tamara Suci with the title "The Influence of Health Promotion on Hypoglycemia Prevention Behavior in Type 2 Diabetes Mellitus Patients in the Work Area of UPT Public Health Gianyar 1". The method of this type of research is pre-experimental with a one group pre-post test approach. With the results of the analysis showing that of the 66 respondents before being given health promotion about the prevention of hypoglycemia, it was found that 22 respondents had less knowledge of 33.3%.

2. Univariate Results Level of Knowledge After Given Health Education on Hypoglycemia Prevention Behavior

Knowledge is a guide in shaping one's actions. Knowledge itself is influenced by several internal factors such as education, employment, age, external factors such as environmental and socio-cultural factors, these two factors greatly influence the increase in one's knowledge.

Good and appropriate health education increases awareness of hypoglycemia sufferers in diabetes mellitus to want to change behavior in carrying out the treatment program so that blood sugar levels can be controlled and prevent various acute complications.

The results of this study after (post-test) given health education on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 19 respondents (90.5%), most of the categories of knowledge were sufficient.

The results of this study are in line with research conducted by Arnis Prilli Dharmastuti and Dewi Ariani Sulistyowat with the title "The Influence of Health Education on Efforts to Prevent Hyperglycemia in Diabetes Mellitus Patients in the Intensive Room of RSUD DR. Moerwardi Surakarta. The results of the analysis after being given health education showed that of the 32 respondents, the majority were in the good category, 93.8%, which meant that there was an increase in knowledge.

3. Results of Bivariate Analysis

Increasing knowledge is the basic principle of managing hypoglycemia in diabetes mellitus patients independently and intensively. The first treatment for hypoglycemia is immediate and appropriate, namely giving sweet drinks, giving sugar tablets, consuming carbohydrate foods and immediately taking them to the nearest hospital. Hypoglycemia in people with diabetes mellitus usually occurs due to excess medication or drug doses, (insulin, oral drugs), the body's need for insulin is relatively decreased, inadequate food intake (the number of calories or meal times is not on time), and excessive physical activity or disorganized.

Based on the research results obtained from bivariate analysis. the normality test was carried out with a sig value that is, when the pre-test p-value is 0.000 and the post-test value is 0.000 if the significant value is <0.05, which means that the data is not normally distributed. And it is known that the results of the Wilcoxon Signed Rank Test Hypothesis are seen from the sig. (significant), namely 0.000, if the p value ≤ 0.05 means that Ha is accepted so that there is an influence of health education about hypoglycemia emergencies on hypoglycemia prevention behavior in DM patients at Bogor City Hospital in 2022.

The results of this study are in line with research conducted by Arnis Prilli Dharmastuti and Dewi Ariani Sulistyowat with the title "The Influence of Health Education on Efforts to Prevent Hyperglycemia in Diabetes Mellitus Patients in the Intensive Room of RSUD DR. Moerwardi Surakarta. This study consisted of 32 respondents who were treated with diabetes mellitus patients who were treated in the intensive care unit at RSUD dr. Moewardi's research results showed that the results of the Parametric Hypothesis test showed a P value of 0.000, which means that Ho is rejected and Ha is accepted, meaning that there is an influence of health education on efforts to prevent hypoglycemia in diabetes mellitus patients in the Intensive Room of RSUD Dr. Moewardi Surakarta.

CONCLUSION

Based on the results of the study entitled The Effect of Health Education About Hypoglycemia Emergencies on Hypoglycemia Prevention Behavior in Diabetes Mellitus Patients at Bogor City Hospital in 2022 Researchers can draw the following conclusions:

1. Frequency distribution of results before being given health education on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 15 respondents (71.4) most of the knowledge categories were lacking.
2. Frequency Distribution of Post Test Results after being given health education on hypoglycemia prevention behavior in diabetes mellitus patients at Rs. The city of Bogor was obtained from 21 respondents, the results obtained were 19 respondents (90.5%), most of the categories of knowledge were sufficient.
3. It is known that there is an effect of health education about hypoglycemia emergencies on hypoglycemia prevention behavior in DM patients at Bogor City Hospital in 2022. The statistical test results obtained p value = 0.000 ≤ 0.05 (Ho rejected, Ha accepted).

SUGGESTION

1. For STIKes Wijaya Husada Bogor Education Institutions
   It is recommended for educational institutions to use this research as reference material specifically for emergency nursing courses so that this research is useful for adding insight to other students.
2. For Respondents
   It is recommended to minimize the level of knowledge about the disease and be more proactive in participating in health education counseling activities so that they can know and apply it in everyday life.
3. For Further Researchers
   It is suggested for future researchers to look for variables related to hypoglycemia prevention behavior such as using a control group.

BIBLIOGRAPHY

1. Shela's daughter Diana. 2016.*Hypoglycemia Incidence in Patients with Diabetes Mellitus Type II Outpatient at Endocrine Metabolic Polyclinic RSUP. Padang.*http://scholar.unand.ac.id/5050/2/BAB 1 Introduction.pdf. (Thesis)
2. Indonesian Ministry of Health. 2018.*Ministry of Health Data and Information Center*.Jakarta
3. Risdianti. 2022.*The Influence of Health Education on Knowledge of Hypoglycemia First Aid in Patients with Diabetes Mellitus.*https://jurnalwijaya.com/index.php/jurnal/article/view/157
4. Ristanto, Riki. 2016.*Prevention of Hypoglycemia in Type 2 Diabetes Mellitus Patients.* https://jurnal.poltekkes soepraoen.ac.id/index.php/HWS/article/view/113
5. Santoso, Pugu., & Setyowari, Novita. 2020.*Hypoglycemia Education on the Incidence of Hypoglycemia in DM Sufferers at the Balowerti Elderly Posyandu, Kediri City.* https://doi.org/10.5281/j nurses community.v11i1.924
6. Zamrodah, Yuhanin. 2016.*Health Education Concept.*https://eprints.umm.ac.id/79381/2/BAB%20II.pdf
7. Purwantoro, Kiky. 2019.*The Effect of Futures Health Education on Changes in Diet, Activity and Blood Glucose Levels in Type 2 Diabetes Mellitus Patients.*(Thesis)
8. Dewanti & Weda, Dewa Ayu Putri. 2021.*Nursing Care of Instability of Blood Glucose Levels*

in Patients with Type 2 Diabetes Mellitus at the Emergency Room at Sanjiwani Hospital, Gianyar.http://repository.poltekkes-denpasar.ac.id/7541/
9. Rohemah. 2020.*Diabetes Mellitus Etiology. (*Thesis)
10. Sugiyono. 2014.*Educational Research Methods Quantitative Approach, Qualitative.*Bandung: Alphabet
11. Lailia. 2019.*Chapter IV Research Results A. Analysis Requirements Test 1. Normality Test.*http://repo.iain-tulungagung.ac.id/10003/7/BAB IV.pdf.