



Connection Level Glucose Blood Fast With Blood Pressure Values in Patients Prolanis Diabetes Mellitus Type II In Clinic Pratama Pradhana

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ABSTRACT

Diabetes mellitus is a chronic disorder of carbohydrate metabolism (glucose) in the body with an increasing prevalence. DM sufferers often experience complications to other diseases such as heart attacks, strokes, severe foot infections. Hypertension is one of the factors causing diabetes mellitus. Hypertension is defined as a condition of systolic blood pressure > 140 mmHg or diastolic > 90 mmHg. This study aims to determine whether there is a relationship between fasting blood glucose levels and blood pressure in patients with type II diabetes mellitus. The method in this study uses a quantitative method with a cross-sectional design. The data used are secondary data from the results of fasting blood glucose levels and blood pressure in patients with prolanis type II diabetes mellitus. The research sample was 31 respondents. The results of the study with characteristics based on female gender were higher than men with a percentage of 67.7%, then characteristics based on age showed that adults were higher with a percentage of 87.1%. The results of fasting blood glucose levels showed high results, namely patients with diabetes as many as 80.6%. The results of systolic and diastolic blood pressure examinations showed high results, namely prehypertension of 54.8% for systolic and 61.3% for diastolic. The results of the correlation test using the Spearman Rho Rank showed that there was no significant relationship between fasting blood glucose levels and blood pressure.

INTRODUCTION

Diabetes mellitus (DM) is a Wrong One disease No increasingly contagious Lots suffered by society . This disease is characterized with height level glucose blood that exceeds normal limits, which can cause complications in various organs of the body after disease develop for five to fifteen year (1). Diabetes mellitus sufferers need arrange level sugar blood they For prevent more complications serious . Based on data obtained from the International Diabetes Federation (IDF), it is estimated that amount DM sufferers will increase from 10.0 million in 2015 to 16.2 million in 2040 , while the World Health Organization (WHO) predicts amount DM sufferers in Indonesia will increase from 8.5 million to 14.1 million in 2035. Indonesia itself be in the rankings 7th as a country with amount most diabetes sufferers after China , India, America United States , Brazil, Russia , and Mexico (2).

In the Province Banten , as many as 56,560 people were reported suffering from DM, and this disease is also recorded as Wrong One disease the largest in Tangerang City . Factors that influence the onset of DM includes factor environment , unhealthy lifestyle healthy , and factor heredity . Hypertension is also a factor the main risks that can occur increase level glucose blood through mechanism insulin resistance . WHO said hypertension as a " spreading epidemic " wide ", with prevalence the highest in Southeast Asia by 25% and 1.5 million death every year . In Indonesia, the prevalence hypertension at age ≥ 18 years recorded by 25.8%, which means around 65 million people in Indonesia suffer from hypertension (3,4)

In effort overcome improvement number DM and hypertension sufferers , Management Program Disease Chronic (PROLANIS) was launched as an integrated system service health with active communication between participants , facilities health , and the Body Organizer Guarantee Social (BPJS) Health (5). This program aims to For prevent complications continued , especially in patients with type II DM and hypertension , through approach proactive involving activity like consultation medical , club prolanis , home-visit, and screening health (6).

A number of study previously show connection significant between level sugar blood with blood pressure in type II DM patients . As example , research conducted by Habib Fatah Roniawan (7) revealed existence strong relationship between level sugar high blood pressure with high blood pressure in type II DM patients . On the other hand , research by Gravinda Widyaswara (8) shows no connection significant between level sugar blood and blood pressure in the limbs climate change Village Purbayan . Based on findings this study aims to For know is there a relationship between level glucose blood fast with blood pressure values in patients prolanis diabetes mellitus type II in Clinic Pratama Pradhana .

objective of this research is For knowing there is or whether or not connection between level glucose blood fast with blood pressure values in patients prolanis diabetes mellitus type II in Clinic Pratama Pradhana . Besides that , this research also aims For know level glucose blood fast as well as blood pressure values in patients who participated in the prolanis program at the clinic said . With Thus , it is hoped results This research can provide more information

deep about connection between these two variables , which can used For increase understanding in treatment and prevention complications in type II DM sufferers.

METHODS

This research uses design quantitative with cross-sectional approach to know connection between level glucose blood fast with blood pressure values in patients prolans diabetes mellitus type II in Clinic Pratama Pradhana . Variables in This research consists of independent variables , namely patient prolans diabetes mellitus type II, and the dependent variable , namely level glucose blood fast as well as blood pressure values . Definition operationalization of these variables has explained with clear use tool measuring such as EasyTouch GCU Meter for measure level glucose blood and aneroid tensiometer for measuring blood pressure . Results measurement categorized in several levels such as " decreased ", "normal", and " increased " for each variable, which is measured with ordinal and nominal scales .

Population this research is all over patient prolans who are outpatients at the clinic Pratama Pradhana between January until July 2024. Sample taken with criteria inclusion in the form of patient with diagnosis of diabetes mellitus type II that does inspection level glucose blood fasting and blood pressure . Criteria exclusion covering patient with diabetes mellitus type I, type III, and diabetes mellitus gestational , as well as absence of outcome data necessary examinations . This research was conducted at the Clinic Pratama Pradhana which is located in Tangerang City , with secondary data collection from records medical patient . Data collected Then analyzed use the SPSS program for do analysis univariate and bivariate .

Technique data collection was carried out with search for result data inspection glucose blood fasting and blood pressure in patients from records medical . The data Then noted in form data collection and analysis in a way univariate For describe characteristics of the variables. Next , the analysis bivariate used For test connection between level glucose blood fasting and blood pressure use test Pearson or Spearman correlation , depending on the results test normality . Procedure inspection level glucose blood fast use POCT method with EasyTouch tool , while blood pressure check done with aneroid tensiometer . Interpretation results measurement follow categories that have been determined based on mark references For each variable.

RESULT S

Univariate Analysis

Table 1. Respondent Characteristics Based on Gender and Age

Characteristics		Sample (n)	Percentage (%)
Gender	Woman	21	67.7
	Man	10	32.3
	Total	31	100
Age	Teenagers (25-44 years old)	1	3.2
	Adults (44-59 years old)	27	87.1
	Elderly (>60 years)	3	9.7
	Total	31	100

The data in Table 1 shows that there are more female respondents than male respondents, namely 21 respondents or 67.7%, while there are 10 male respondents or 32.3%. Respondent groups based on age with characteristics of teenagers (25-44 years) as many as 1 respondent or 3.2%, adult age group (44-59 years) as many as 27 respondents or 87.1% and elderly group (>60 years) as many as 3 respondents or 9.7%.

Table 2. Results of GDP Level Examination with Blood Pressure

Examination Result Categories		Sample (n)	Percentage (%)
Fasting Blood Glucose Levels	GDP level result <100	0	0
	GDP100-125 level results	6	19.4
	GDP level results >126	25	80.6
	Total	31	100
Systolic Blood Pressure Value	Normal <120	9	29.0
	Prehypertension 120-139	17	54.8
	Hypertension 1 140-159	2	6.5
	Hypertension 2 >160	3	9.7
	Total	31	100
Diastolic Blood Pressure Value	Normal <80	4	12.9
	Prehypertension 80-89	19	61.3
	Hypertension 1 90-99	6	19.4
	Hypertension 2 >100	2	6.5
	Total	31	100

Table 2 shows the results of fasting blood glucose examination in patients with type II diabetes mellitus prolans. 25 respondents (80.6%) had GDP levels >126 and 6 respondents (19.4%) had GDP levels of 100-125. 9 respondents (29.0%) had normal systolic blood pressure, 17 respondents (54.8%) had prehypertension, 2 respondents (6.5%) had grade 1 hypertension, and 3 respondents (9.7%) had grade 2 hypertension. 4 respondents (12.9%) had normal diastolic blood pressure, 19 respondents (61.3%), 6 respondents (19.4%) had grade 1 hypertension, and 2 respondents (6.5%) had grade 2 hypertension.

Bivariate Analysis

Table 3. Kolmogorov-Smirnov Test Results.

Variables	Kolmogorov-Smirnov P-Value
Fasting Blood Glucose Levels	0.008
Blood Pressure Value	0.006

Table 3 shows that the calculation for the normality test shows that the fasting blood glucose level and blood pressure data are less than 0.05 ($p < 0.05$), meaning that the fasting blood glucose level and blood pressure data are not normally distributed. These results indicate that the data do not meet the normality assumption test, because both data are not normally distributed, and therefore, the Rank test was continued. Spearman rho .

Table 4. Correlation Test Results

	Sample (n)	Correlation Strength (r)	Spearman rho (p)
Systolic blood pressure (mmHg)	31	0.137	0.462
Diastolic blood pressure (mmHg)	31	0.101	0.588

Table 4 shows the results of the correlation test between fasting blood glucose levels and systolic and diastolic blood pressure greater than 0.05 ($p > 0.05$). This means that H_0 is accepted and H_1 is rejected, where H_0 is there is no relationship between fasting blood glucose levels and blood pressure in prolans patients suffering from type II diabetes mellitus, while H_1 is there is a relationship between fasting blood glucose levels and blood pressure in prolans patients suffering from type II diabetes mellitus , so it can be concluded that there is no relationship between fasting blood glucose levels and blood pressure in prolans patients with type II diabetes mellitus at the Pratama Pradhana Clinic .

DISCUSSION

Characteristics respondents explained that of the 31 sufferers , one type was found sex Woman more Lots compared to the other types sex men . These results are in line with research conducted by Iin Mutmainah in 2013 with 30 respondents or 54% of diabetes mellitus sufferers type II is woman , (43) I Dewa Putra 2019 also said that type sex more women dominant compared to male , (44) and results Habib Fatah Roniawan's 2021 research also shows that of the 46

respondents, the patients were of the type sex Woman as many as 33 respondents or 71.7% and the type sex man as many as 13 respondents or 28.3%. (8) This is due to by a number of factor risk like obesity, lack of activities physique or exercise physical, and history of DM at the time pregnant, causing height incidence of DM in women. Woman own risk more big For suffer from Diabetes Mellitus, than men, because in a way physique woman own opportunity improvement higher body mass index big, syndrome cycle monthly (premenstrual syndrome). Post menopause that makes distribution fat body become easy accumulated as a result of the hormonal process so that woman more risky suffering from DM. (9)

Characteristics based on known age diabetes mellitus patients type II is the most common is group age adults (44-59 years), namely as much as 87.1% while group age elderly (>60 years) as much as 9.7% and the group age teenagers (25-44 years) as much as 3.2%. Results This research is in line with results study Suyono 2011, who said that prevalence of diabetes mellitus type II in developing countries most aged 45-60 years, where groups that still productive. (10) D'adamo 2024, added that factor risk of DM appears after the age of 45 years. (11) This is because people at this age are less active, heavy body increase muscle mass decreases, and as a result of the resulting aging process depreciation progressive β cells. In addition that, in line with modernization of lifestyle individual era Now make they more prone to suffering from DM since a young age, for example too often consume food fast serving and lack of exercise, then DM a lot found at a young age. (11)

In Table 2 the results inspection level glucose blood fast show presentation level glucose blood fast respondents with GDP results >126 mg/dl as much as 80.6% and obtained results examination of the results GDP levels of 100-125 mg/dl, namely as much as 19.4%. This research is in accordance with with results Iin Mutmainah's 2013 research, which showed results level sugar blood with category bad that is as much as 80%, then with medium category, namely as much as 18% and category Good that is as much as 2%. (9) This shows that diabetes mellitus sufferers type II who are treated as outpatients in the polyclinic general clinic pratama pradhana majority own control glucose blood bad fasting. This is based on by each individual's awareness in maintain a healthy lifestyle so that glucose levels his blood still controlled with good. (12)

Results blood pressure check systolic blood pressure obtained as much as 29.0% entered in normal category, then category prehypertension as much as 54.8%, category hypertension level 1 as much as 6.5%, and category hypertension level 2 as much as 9.7%. The results varied Can caused by various factor such as age, gender gender, length of experience hypertension, consumption medication and low blood pressure controlled. Blood pressure values systolic influenced by the presence of diabetes mellitus type II, because happen remodeling vascular in patients hyperglycemic, which can cause increased blood pressure systolic. Relationship between diabetes mellitus type II and increased blood pressure also begins with existence factor risk to patients. Factors genetics, obesity central factor environment, patterns eating, activities physical, stress oxidative and insulin resistance increases in body. (13)

Results blood pressure check show blood pressure percentage diastolic the highest respondents contained in the category prehypertension as much as 61.3%, category hypertension level 1 as much as 19.4%, category hypertension level 2 as much as 6.5% and deep normal category as much as 12.9%. This result is in line with with study Mutmainah in 2013 , the results blood pressure research diastolic enter in category highest that is category prehypertension as much as 37%, category hypertension level 1 as much as 32%, category hypertension level 2 as much as 29% and normal category as much as 2%.(9) Blood pressure disorders diastolic to diabetes mellitus sufferers type II is form development disease Where can ended in failure heart . This is related with sugar blood diabetes mellitus patients type II, when hyperglycemia damage myocyte DNA heart and causes remodeling left ventricle . This process increases stress oxidative and precipitation collagen , which can cause dysfunction structural heart .(13)

Results test normality in Table 4.3 data values level glucose blood fast No follow pattern normal distribution with p_Value value is more smaller than the value level significant or <0.05 , which is 0.008 . Likewise with data on blood pressure values p_Value value is more small <0.05 , namely 0.006 , which means the blood pressure value data abnormal . Results the concluded that the data is not fulfil test assumptions normality , due to both data are not normally distributed .

Results with test Spearman's rank correlation rho in Table 4 is not there is connection between level glucose blood fast with blood pressure systolic , p value = 0.462 (>0.05), obtained r value = 0.137 shows very close relationship weak between level glucose blood fast with blood pressure systolic in patients prolans diabetes mellitus type II. From the results test correlation obtained mark positive Where show one- way relationship but connection very weak . No there is connection between blood pressure diastolic with level glucose blood fasting , p value =0.588 (>0.05). Obtained r value = 0.101 shows very close relationship weak between level glucose blood fast with blood pressure diastolic in patients prolans diabetes mellitus type II. From the results test correlation positive which indicates one- way relationship but very close relationship weak . Results this study compares backwards with research conducted by Iin Mutmainah 2013, and the results study by Habib Fatah 2021, which states that there is a significant relationship between level sugar blood and blood pressure in Type 2 DM patients .(7) This can indicates that level glucose blood in DM sufferers can cause existence fluctuations in blood pressure .(14)

Results This research is in line with results study Caliph Leni 2019, which shows No there is significant relationship between level glucose with blood pressure with r value = -0.061 and p = 0.728.(14) Results research conducted by Gravinda 2022, obtained p value >0.05 which shows that there is no significant relationship between level glucose blood and blood pressure in the limbs proklam in the village Purbayan , Baki, Sukoharjo .(8) No existence connection between blood pressure with level glucose blood show that sufferers the can control level glucose with good , so No happen compilation that can increase blood pressure values . Benefits of controlled blood pressure DM sufferers , namely can reduce

risk death in DM sufferers and heart failure heart until triples compared to with excessive blood pressure normal threshold.(14)

Decreased blood pressure systolic happen caused by by existence relaxation of endorphin cells which can pressing system nerve autonomous . These endorphin cells can stimulate system parasympathetic , so it will cause condition calm (relax). With existence stimulated system nerve parasympathetic will cause late pulse dilated heart diameter vessels blood arteries , so that in diastolic associated with circulation coronary , if coronary arteries will experience atherosclerosis , which will affect blood pressure systolic .(15) Ma society with DM disease is recommended For can maintain diet/ sports pattern eating , election activity proper physical / exercise , as well as compliance in carry out diabetes self-management so that the levels glucose can still controlled .(16)

Arrangement guard pattern functional food For pressing intake carbohydrates , excess fat to keep levels glucose in blood can balanced with Work insulin hormone , activity physical / sports help control heavy body , so that glucose in blood burned become internal energy body that causes cells body become more sensitive to insulin, treatment self / feet can help guard foot health as well minimize risk emergence foot wounds in DM patients that can develop become ulcer diabetic , the content of the drug anti-diabetic like type drug derivatives sulvunilurea can help absorption glucose in blood as well as type biguanide For inhibit the formation process glucose , whereas sugar monitoring behavior blood routine can used as reject measuring For see the success of diabetes management that has been done , and can made into as motivation For can guard level glucose blood to remain within normal limits.(16)

CONCLUSIONS

Based on results this research , can concluded that level glucose blood fasting in patients prolanis diabetes mellitus type II in Clinic Pratama Pradhana show highest result in the category GDP level >126 , which was recorded as much as 80.6%. Meanwhile results GDP level in range 100-125 recorded as much as 19.4%. For blood pressure values , some big respondents experience prehypertension , with blood pressure systolic as much as 54.8% and diastolic as much as 61.3%, while those who have normal blood pressure are only 29.0% for systolic and 12.9% for diastolic . Some respondents were also recorded experience hypertension levels 1 and 2, with systolic pressure as much as 6.5% and 9.7%, and diastolic as much as 19.4% and 6.5%. However , this study shows No existence significant relationship between level glucose blood fast with blood pressure values systolic and diastolic , with p-Value respectively of 0.462 and 0.588, which indicates results more greater than 0.05.

As a suggestion, Clinic Pratama Pradhana should No only focus on inspection level glucose blood fast patient prolanis diabetes mellitus type II, but also involves blood pressure check in a way routine For monitoring better health comprehensive . Share researchers Next , it is suggested that this research be used as a reference reference with enter other factors that can influence level glucose blood in patients with diabetes mellitus type II, such as variation in age and

number more respondents big , useful get more results representative and in-depth .

ADVANCED RESEARCH

It is hoped that the results of this study can be used as reference material for subsequent research by including factors that can influence blood glucose levels in type II diabetes mellitus patients, such as varying ages and a large number of respondents.

REFERENCES

- Mehta, dan Hoffbrand A V, Pettit JE, Moss PAH. Kapita Selekta Hematologi Edisi 7. Jakarta Penerbit Buku Kedokt EGC. 2018;38-41.
- Annisa MP. Hubungan Jumlah Leukosit Dengan Kadar Glukosa Darah Pada Penderita Diabetes Melitus Tipe 2. Sekolah Tinggi Ilmu Kesehatan Nasional; 2020.
- Dinkes Tangerang Selatan. Profil Kesehatan Dinas Kesehatan Muara Enim Tahun 2022. Tersedia pada: www.dinkes.acehprov.go.id.
- WHO. Diabetes Mellitus. Geneva-Switzerland. Klasifikasi Hipertensi. International Society Oh Hypertension. 2009.
- Perpres. nomor 2019 Tentang Jaminan Kesehatan. 2016;139-41.
- Sitompul, S., Suryawati, C., & Wigati P. Analisis Pelaksanaan Program Pengelolaan Penyakit Kronis (Prolanis) Bpjs Kesehatan Pada Dokter Keluarga Di Kabupaten Pekalongan. 2016;(Jurnal Kesehatan Masyarakat Universitas Diponegoro,);4(4), 145-153.
- Habib Fatah Roniawan, Octaviani DM P, Prabandari R. Hubungan Kadar Gula Darah Dengan Tekanan Darah Pasien Diabetes Melitus Tipe 2 Di Puskesmas Sokaraja 1. J Farm Sains Indones. 2021;4(2):74-8.
- Gravinda Widyaswara, Wulandari T, Candra Putri A. Hubungan Kadar Glukosa Darah Dan Tekanan Darah Pada Anggota Proklm Di Desa Purbayan, Baki, Sukoharjo. Avicenna J Heal Res. 2022;5(1):19-26.
- Mutmainah I. Hubungan Kadar Gula Darah dengan Hipertensi Pada Penderita Diabetes Melitus Tipe 2 di Rumah Sakit Umum Daerah Karanganyar. Univ

- Muhammadiyah Surakarta Fak Kedokt. 2013;(Nefropati Diabetik):1-23.
- Sitepu, Ade M, Djafar, Dewi U, dan Panda AL 2016. Gambaran jumlah leukosit pada pasien infark miokard akut di RSUP Prof. Dr.R.D.Kandou Manado Periode Januari Desember 2015. *J e-Clinic (eC1)*, Vol 4, Nomor 2, Juli Desember 2016.
- D'adamo P. Diet Sehat Diabetes Sesuai Golongan Darah [Internet]. Perpustakaan Nasional Ri; 2024. Tersedia pada: <https://opac.perpusnas.go.id/DetailOpac.aspx?id=382557>
- Chodijah S, Nugroho A, Pandelaki K. Hubungan Kadar Gula Darah Puasa Dengan Jumlah Leukosit Pada Pasien Diabetes Mellitus Dengan Sepsis 2013. *J e-Biomedik [Internet]*. 2018;1(1). Tersedia pada: <http://jurnal.wima.ac.id/index.php/JFST/article/view/2053>
- Dewi Gusti Ningsih S, Mutiara Br Saragi E, July Arta Simamora G, Laia Y, Nababan T, Keperawatan dan Kebidanan F. Hubungan Kadar Gula Darah Dengan Tekanan Darah Pada Penderita Diabetes Tipe 2 Di Rsu. Royal Prima Medan. 2024;4:4195-208.
- Khafifah Leni Ashary. Kadar Glukosa Darah dan Tekanan Darah pada Anggota Prolanis di Puskesmas Somagede Kabupaten Banyumas. *Jar Lab Medis [Internet]*.2019;01(02):91-7. Tersedia pada: <http://ejournal.poltekkes-smg.ac.id/ojs/index.php/JLM>.
- Sherwood L 2011. Fisiologi manusia: dari sel ke sistem edisi 6. [Internet]. Jakarta:Penerbit Buku Kedokteran EGC.;Tersedia pada:<https://repo.poltekkesmedan.ac.id/xmlui/bitstream/handle/123456789/5639/KTITerifena.pdf?sequence=1>
- Susilawati E, Nurrika D, Haryati J, Effendi DP. Self Management Dan Perubahan Kadar Glukosa Darah Pada Penderita Diabetes Mellitus Di Wilayah Tangerang Tahun 2021. *J Kesehat*. 2023;14(1):1-7.