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FACTORS RELATED TO THE COMPLIANCE OF ELDERLY DIABETES MELLITUS PATIENTS WITH BLOOD GLUCOSE CONTROL

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ABSTRACT
Diabetes Mellitus is often found in the elderly. This condition causes the elderly to be in a risk group with biological risk characteristics or risks related to age, social and environmental risks and behavioral or lifestyle risks. The high number of Diabetes Mellitus sufferers that continues to increase, of course, results in many complications that occur in Diabetes Mellitus sufferers. Patients who are unable to control their blood sugar levels well are at high risk of complications and must be aware of hyperglycemia. This study aims to determine factors related to blood glucose control in the elderly. Compliance with blood glucose control in the elderly can reduce the risk of complications and early detection of health workers in handling diabetes mellitus sufferers in the elderly. The type of design in this study is quantitative with an analytical observational method. The population in this study was the elderly in the Baki Health Center work area with a total of 78 elderly respondents with a total sampling. This study uses a cross-sectional design. The population in this study was conducted on the elderly in the Baki health center work area with a sampling method, namely accidental sampling. The results of the bivariate analysis using the chi square statistical test of the related factors are the level of knowledge (P = 0.018), family support (P = 0.001), motivation (P = 0.012) and family income (P = 0.025). The results of multivariate analysis using logistic regression analysis showed that the most related factor was family support with an OR value of 0.28. The conclusion in this study is that the most related factor to blood glucose control compliance in the elderly is family support.

Keywords: blood glucose control; compliance; diabetes mellitus; elderly

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INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease that disrupts the metabolic system, characterized by an increase in blood sugar levels in the body that exceeds normal limits. (Aliffia Bingga et al., 2021). Diabetes Mellitus is a chronic disease that requires more attention, especially to lifestyle and adherence to diet, social support which is the main factor in increasing self-confidence during treatment (Arini et al., 2022). Various factors such as genetic heredity, viral infections, unhealthy lifestyles, and other physical or chemical damage cause cell destruction, impaired insulin secretion, and loss of peripheral tissue insulin sensitivity, ultimately resulting in high blood glucose levels (Sun et al., 2021).

Diabetes mellitus is a chronic metabolic disorder caused by the pancreas being unable to produce the insulin hormone or the body being unable to use the insulin hormone properly (Andalusia et al., 2023). Insulin is a hormone that regulates blood sugar levels. If blood sugar levels are high, it can cause health problems such as heart and kidney disease and can even lose a person's eyesight (Ramadhani et al., 2022). Diabetes mellitus is a disease with a high morbidity rate. This is significantly considered to be able to affect the welfare and quality of life of sufferers. (Sun et al., 2021).

Diabetes Mellitus is often found in the elderly. This condition causes the elderly to be in a risk group with biological risk characteristics or risks related to age, social and environmental risks and behavioral or lifestyle risks (Prakoso et al., 2022) Diabetes mellitus is characterized by symptoms of Polyphagia, Polydipsia and Polyuria and some people experience weight loss (Permatasari, K. D. et al., 2020). Other symptoms may include tingling, weakness, blurred vision, itching, erectile dysfunction in men, pruritus vulvae in women (Aliffia Bingga et al., 2021). The changes experienced by the elderly naturally cannot be avoided, an increasingly modern lifestyle means that unhealthy food menu choices and lifestyles can spread to all groups, causing an increase in the number of degenerative diseases (Rahmawati et al., 2024). Frequently consuming unhealthy foods such as carbonated drinks, fast food and other foods, rarely exercising and increasing stress levels can result in the emergence of dangerous diseases, one of which is Diabetes Mellitus (Febriyanti, 2021).

Based on IDF, (2021) The prevalence of Diabetes Mellitus in the world reaches 537 million adults aged 20-79 years or 9.3% living with diabetes. This number is expected to increase to 643 million (10.2%) in 2030 while in 2045 the number of diabetes sufferers is expected to continue to increase to 783 million sufferers. Based on mapping from the International Diabetic Federation (IDF, 2021) Southeast Asia ranks second with 90 million people suffering from Diabetes Mellitus, where this figure is expected to increase by 68% or around 152 million by 2045. According to IDF, (2021) Indonesia is among the 10 countries with the highest number of diabetes sufferers, where currently Indonesia is ranked 5th with the number of Diabetes Mellitus sufferers as many as 19.47 million with a prevalence of diabetes as many as 10.6%. This makes Indonesia the only country in Southeast Asia that is included in the list.

The high number of people with Diabetes Mellitus which continues to increase, of course, results in many complications that occur in people with Diabetes Mellitus. The prevalence of diabetes mellitus cases according to the Central Java health profile in 2020 was 582,559 cases or around 13.67%, in 2021 it was 467,365 or 11.0% and in 2022 it was 163,751 or 15.6% (Listiani et al., 2021). Patients who are unable to control their blood sugar levels well are at high risk of complications and must be aware of hyperglycemia. Complications of Diabetes Mellitus can cause death or disability, so it is necessary to control blood sugar levels which include diet, exercise, and medical treatment (Fikri Amrullah et al., 2020). Based on the background above, it is important for researchers to know the factors related to blood glucose control in the elderly so that they can reduce the risk of complications and early detection by health workers in handling diabetes mellitus sufferers in the elderly.

METHOD

The type of design in this study is quantitative with an analytical observational method. This study uses a cross-sectional design, namely to determine the relationship between blood glucose control compliance in the elderly. This study was conducted in August - September 2024 in the Baki Health Center work area. The population in this study was the elderly in the Baki Health Center work area with a total of 78 elderly respondents with a total sampling method using accidental sampling using inclusion criteria, namely the elderly who come to Posbindu or Baki Health Center and have a history of diabetes mellitus for 1 year. The exclusion criteria are the elderly who experience decreased cognitive function. The researcher has registered and obtained an ethical feasibility permit from the Chakra Brahmanda Lentera Institution Ethics Commission with No.301/019/I/EC/KEP/Lemb.Candle/2024.

The instruments to be used in this study are questionnaires on knowledge, family support, motivation and family income. The questionnaire is a questionnaire that has been tested for validity and reliability. Based on the results of the validity test, all items have a correlation

value (0.518 - 0.849). The results of the reliability test have a Cronbach's alpha result (α = 0.736) so it can be concluded that the data is reliable for use. Univariate analysis was carried out to explain or describe the characteristics of each research variable. In the researcher, univariate analysis data was conducted to determine the characteristics of respondents including gender and last education and factors related to compliance of diabetes mellitus patients with blood glucose control in the elderly. Bivariate analysis was conducted to test the hypothesis or test the relationship between independent variables and dependent variables, namely the relationship between compliance of diabetes mellitus patients with blood glucose control in the elderly using the Chi Square statistical test. Multivariate analysis was used to answer the question of which factors are most related to factors that can affect compliance with blood glucose control in the elderly. This study conducted a multivariate analysis using the Logistic Regression test.

RESULTS

Table 1.
Relationship of Control Compliance with Gender

Group	Male	Female	N
Compliance	13	26	39
Non-Compliance	23	16	39

Table 2
Relationship between Compliance Control and Education

Group	No School	Elementary School	Middle School	High School	College	**N**
Compliance	7	19	7	3	3	39
Non-Compliance	14	16	6	2	1	39

Table 3.
Factors related to the level of compliance with blood glucose control

	Kelompok	Baik	Buruk	N	P Value
Knowledge Level	Patuh	30 (76.9%)	9 (23.1%)	39	0.018
	Tidak Patuh	19 (48.7%)	20 (51.3%)	39	
Family Support	Patuh	33 (84.6%)	6 (14.4%)	39	0.001
	Tidak Patuh	19 (48.7%)	20 (51.3%)	39	
Motivation	Patuh	16 (41.0%)	23 (59.0%)	39	0.012
	Tidak Patuh	6 (15.4%)	33 (84.6%)	39	
Family Income	Patuh	32 (82.1%)	7 (17.9%)	39	0.025
	Tidak Patuh	23 (59.0%)	16 (41.0%)	39	

Based on the results of the study, it shows that the level of knowledge in the compliant category, there are 30 respondents (76.9%) who have a good level of knowledge and 9 respondents (23.1%) with a low level of knowledge with a value of ρ = 0.018 which means there is a significant relationship between the level of knowledge and compliance in blood sugar control. Family support shows that the respondents who are most compliant with blood sugar control (84.6%) have good family support, while (15.4%) have less family support with a value of ρ = 0.001 which means there is a significant relationship between compliance with family support. Motivation Most compliant respondents have poor motivation (59.0%), while those who are not compliant have worse motivation (84.6%) with a value of ρ = 0.012 which

means there is a significant relationship between compliance with blood sugar control and the level of respondent motivation. The income of families who comply with blood sugar control mostly comes from families with good income (82.1%), while those who do not comply mostly come from families with good income (59.0%) with a value of ρ = 0.025 which also shows a significant relationship between blood sugar control compliance and family income.

Table 4.

The Most Related Factors to Compliance with Blood Sugar Control and Family Income

	Koefisien	S.E.	Wald	df	P Value	OR	IK 95%	
							Min	Max
Knowledge Level	-1.412	0.614	5.290	1	0.021	0.244	0.073	0.812
Family Support	-1.248	0.608	4.206	1	0.040	0.287	0.087	0.946
Motivation	-1.400	0.641	4.773	1	0.029	0.247	0.070	0.866
Family Income	-1.612	0.660	5.966	1	0.015	0.200	0.055	0.727
Constanta	3.253	0.854	14.508	1	0.000	25.864		

Table 4 shows the results of the multivariate analysis process using logistic regression tests by selecting multivariate test candidates on variables from the results of bivariate tests with a p value <0.25. The results of the independent variable test in table 1.7 that meet the requirements as multivariate candidates are the level of knowledge (p = 0.018), family support (p = 0.001), motivation (p = 0.012), family income (p = 0.025). The results of the multivariate analysis showed that the factor most related to blood glucose control compliance in the elderly was family support with an OR value of 0.28 and the smallest relationship was family income with an OR value of 0.20.

DISCUSSION

Respondent Characteristics

Respondent characteristics in a study play a very important role in determining the results and interpretation of the study. Factors such as gender and education level are often used as primary indicators in describing respondent characteristics. These factors provide a more complete picture of the demographic profile of research participants and can influence how they understand and respond to interventions provided in the study. Age can influence the extent to which a person is aware of health risks and is ready to undergo treatment or health control. Age is one of the factors that influences the occurrence of DM. Generally, DM occurs at the age of >45 years. Age is closely related to increased blood glucose levels, so the higher the age, the higher the prevalence of diabetes and impaired glucose tolerance (Yuanita et al., 2018). Age is one of the factors that influences a person's level of knowledge, where the older a person is, the more their ability to grasp and think in receiving information will develop (Pebriyanti et al., 2023). However, as we approach old age, there will be changes in the ability to receive information or a decrease in memory so that the level of knowledge will also decrease. This can cause a decrease in control compliance in diabetes sufferers (Wahyu, 2021).

Gender can also influence health behavior patterns. Women are usually more susceptible to DM compared to men because women have higher levels of LDL or bad cholesterol and triglycerides compared to men (Dwi Astutik, 2016). Men who like to smoke and drink coffee can cause glucose metabolism disorders and increased insulin resistance which increases the risk of diabetes mellitus (Mertha et al., 2018).

While the level of education is often related to the level of understanding of a person regarding the importance of health management and disease control. A person who is well-informed is more mature in the process of change in himself, so that he is more receptive to positive, objective external influences and is open to various information including

information about health. Education has an influence on the incidence of DM (Isnaeni et al., 2018). Highly educated people will usually have a lot of knowledge about health. With this knowledge, people will be aware of maintaining their health. Education can broaden horizons and knowledge so that someone can know and understand more about something (Setianto et al., 2023). However, this is not absolute because someone who has a low level of education will not prevent someone from accessing various information available on social media (Kusuma & Hidayati, 2018).

Relationship between knowledge level and blood glucose control compliance in the elderly

Several studies have shown that a lack of knowledge about DM causes patients to tend to be non-compliant in carrying out blood sugar control (Rahayu & Herlina, 2021). The initial level of knowledge that must be introduced to DM patients is about the course of DM, how to control and monitor DM, DM complications, pharmacological and non-pharmacological therapy, the interaction between food intake and physical activity and exercise, how to monitor blood glucose independently, handling hypoglycemia, the importance of exercise, foot care and the use of existing health facilities (Wibisana et al., 2021).

A person's environment can influence the development of knowledge and behavior. So in general, respondents who live in the same house as DM sufferers will influence the knowledge and behavior of DM sufferers (Rahayu & Herlina, 2021). Lack of knowledge about DM causes patients to tend to be non-compliant with medication, diet and insulin (Riza et al., 2019). The high level of knowledge of diabetes mellitus sufferers about their disease can affect the level of patient compliance in undergoing treatment. This is because the higher or better the level of knowledge, the more obedient and open the patient will be to the management of the disease they suffer from. So that optimal outcomes can be obtained (Antoro et al., 2023). The high level of patient knowledge is not only limited to the level of education. Because knowledge can be obtained from anywhere. In this case, patient knowledge regarding the level of compliance can be obtained from the doctor's explanation, the nurse's explanation or the patient's family's explanation (Antoro et al., 2023).

The relationship between family support and blood glucose control compliance in the elderly

Family support is one of the factors that influence patient compliance in controlling their disease. Family can provide a role in the form of support from children, wives, husbands, or siblings through attitudes, actions, and acceptance of DM sufferers (Rochani & Pamboaji, 2022). Family support can affect psychosocial function and individual coping ability in facing a problem. Lack of support from family makes coping negative, so that it will indirectly affect the compliance of diabetes sufferers in carrying out routine checks.

Relationship between motivation and blood glucose control compliance in the elderly

Self-motivation is a drive, both from within and from outside the human self to move and encourage attitudes and behavioral changes. This motivation comes from internal factors of the individual which are psychological in nature and as a result of internalization of information and the results of observations of an object that gives rise to perceptions so that individuals can be motivated to do or perform something (Pebriyanti et al., 2023). In patients with diabetes mellitus, self-motivation is motivated by the patient's awareness of the importance of undergoing diabetes mellitus treatment. Thus, patients are motivated to comply with the treatment they are undergoing, for example by routinely taking antidiabetic drugs (Kusuma & Hidayati, 2018). The motivation of DM sufferers can fluctuate due to long-term

treatment and high costs, which can cause psychological problems in sufferers such as frustration, anxiety and depression (Riza et al., 2019).

Relationship between family income and blood glucose control compliance in the elderly
Sufficient income makes respondents more often check themselves at the consulate, because they have enough money to pay for the consulate, so they gain knowledge about how to cure diabetes mellitus. Those with low incomes have more non-compliance compared to those with high incomes (Syifa et al., 2022).

Factors most related to blood glucose control compliance in the elderly
Based on the results of the study, the factor most related to compliance with blood sugar control is family support. Good family support can provide more effective motivation and supervision, so that respondents are more likely to comply with managing their blood sugar control. Thus, family support is proven to be the most influential factor in increasing compliance with blood sugar control. Research conducted by Hidayah & Iryana,(2022) showed a significant relationship between family support and blood glucose control compliance in elderly with DM. One form of family support that is most strongly related to control compliance is emotional support. Emotional support provided by the family to elderly people with DM can encourage them to undergo regular treatment, such as managing diet, performing foot care, doing physical activity, and maintaining blood sugar control. This study emphasizes that family support has a significant positive impact on various aspects of self-management of DM patients, such as medication compliance, increasing coping mechanisms, and quality of life of the elderly. Thus, family support plays a key role in increasing the self-efficacy of the elderly in managing diabetes.

Family support for elderly people with DM is also closely related to the elderly age factor. Elderly people with DM tend to receive higher family support compared to other age groups. This is in line with research findings by Meidikayanti & Wahyuni (2019) which states that high family support in elderly DM is often influenced by sociocultural factors and family behavior. Elderly DM, in general, are highly dependent on family members for their diabetes care. This dependence leads to direct supervision and support from family members, which in turn influences lifestyle changes and diabetes self-management. This study also confirms that a close relationship between diabetics and their families can improve adherence to diet and increase motivation for diabetes care, which ultimately contributes to better disease management (Arini et al., 2022).

Another study conducted by Irmawati et al., (2018) shows that family relationships with DM sufferers have a major influence on the level of family support received. The role of husband or wife is very important as a motivator in providing encouragement and emotional support needed to achieve better life goals. Support from a spouse increases the level of family support in elderly DM, which has a direct impact on the quality of care received. Therefore, high social support from the family can improve the ability of the elderly to care for themselves, which has a positive impact on more optimal clinical outcomes. The role of community nurses in motivating and teaching families about the importance of support in caring for elderly DM is very important to improve the quality of life of diabetics (Antoro et al., 2023).

CONCLUSION
Based on the study, there are several factors related to compliance with glucose control in the elderly, namely knowledge, family support, motivation and family income. The results of bivariate analysis using chi square showed that all factors of compliance with blood glucose

control showed a significant relationship consisting of the level of knowledge (P = 0.018), family support (P = 0.001), motivation (0.012) and family income (P = 0.025). The results of multivariate analysis using logistic regression test showed that the factor most related to compliance with blood glucose control in the elderly was family support with an OR value of 0.28. So in this case the role of the family in providing support to the elderly regarding compliance with blood glucose control is very important for the elderly with diabetes mellitus.

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REFERENCES

Aliffia Bingga, I., Bingga, I. A., & Dokter, P. (2021). *The Relationship Between Sleep Quality and Type 2 Diabetes Mellitus 2*.

Andalusia, P., Banilai, S., & Sakundarno, M. (2023). Systematic Review: F Factors Related to the Incidence of Diabetes Mellitus (DM) in Tuberculosis (TB) Patients. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako*, *9*(2).

Antoro, B., Erwin Nurdiyansyah, T., & Karmila Sari, E. (2023). Family Support and the Role of Nurses in Compliance with Blood Sugar Level Control. *Media Husada Journal Of Nursing Science*, *4*(2), 63–70. Https://Doi.Org/10.33475/Mhjns.V4i2.128

Arini, H. N., Anggorowati, A., & Pujiastuti, R. S. E. (2022). Family Support for Elderly with Type II Diabetes Mellitus: Literature Review. *Nurscope: Jurnal Penelitian Dan Pemikiran Ilmiah Keperawatan*, *7*(2), 172. Https://Doi.Org/10.30659/Nurscope.7.2.172-180

Dwi Astutik, D. (2016). *Relationship Between Level of Knowledge About Diabetes Mellitus Diet and Blood Sugar Control Compliance in Type II Diabetes Mellitus Patients in the Baki Sukoharjo Health Center Work Area*. 1–13.

Febriyanti, A. (2021). *Implementation of Diabetes Mellitus Foot Exercises*.

Hidayah, Eltrikanawati Nurul, & Iryana, Ernawati Dwi. (2022). Family Support and Compliance with Type 2 Diabetes Mellitus Diet Patterns in the Elderly. *Jurnal Endurance*, *7*(1), 40–47. Https://Doi.Org/10.22216/Jen.V7i1.792

Idf. (2021). *Diabetes Around The World In 2021*. Https://Diabetesatlas.Org/

Irmawati, Kidang, Ismunandar Wahyu, & Irnawan, Sri Marnianti. (2018). *The Relationship Between Family Support and Self-Efficacy with Elderly Motivation in Controlling Blood Glucose in Elderly with Diabetes Mellitus at the Community Health Center Kinovaro The*. *7*(2), 1–23.

Isnaeni, F. N., Risti, K. N., Mayawati, H., & Arsy, M. K. (2018). T Level of Education, Nutritional Knowledge and Diet Compliance in Outpatients with Diabetes Mellitus (DM) at Karanganyar Regional Hospital. *Mppki (Media Publikasi Promosi Kesehatan Indonesia): The Indonesian Journal Of Health Promotion*, *1*(2), 40–45. Https://Doi.Org/10.31934/Mppki.V1i2.116

Kusuma, H., & Hidayati, W. (2018). The Relationship Between Motivation and Self-Efficacy in Type 2 Diabetes Mellitus Patients at Persadia Salatiga. *Jurnal Keperawatan Medikal Bedah*, *1*(2), 132–141.

Listiani, S., Muthoharoh, A., & & Prafitri, L. D. (2021). *). Evaluation of Prescribing Patterns in Elderly Outpatients with Diabetes Mellitus Regarding the Incidence Inappropriate Prescription Dan Potentially Prescription Omission Di Rsud Kraton Tahun 2019 Evaluation Of Prescription Patterns In Elderly Outpatients With Di*. *5*(2). Https://Doi.Org/10.22212/Aspirasi.V11i1.1589

Meidikayanti, W., & Wahyuni, C. U. (2019). The Correlation Between Family Support With Quality Of Life Diabetes Mellitus Type 2 In Pademawu Phc. *Jurnal Berkala Epidemiologi*, *5*(2), 253. Https://Doi.Org/10.20473/Jbe.V5i22017.253-264

Mertha, I. M., Ribek, I. N., & Widastra, I. M. (2018). Knowledge and Compliance of Diabetes Mellitus Patient Control. *Jurnal Skala Husada*, *13*, 165–176. Http://Download.Garuda.Kemdikbud.Go.Id/Article.Php?Article=2862915&Val=25375&Title=Pengaruh Kelompok Swabantu Diabetes Terhadap Pengetahuan Dan Kepatuhan Kontrol Pasien Diabetes Mellitus

Pebriyanti, D. S., Ulfah, S. M., & Nurhendriyana, H. (2023). *Compliance of Diabetes Mellitus Patient Control at Astanajapura Health Center, Cirebon Regency*.

Permatasari, K. D., Ratnawati, D., & Anggraini, N. V. (2020). *Effectiveness of Combination Therapy of Foot Exercise and Warm Water Soak on Foot Sensitivity in Elderly with Diabetes Mellitus*. *5*.

Prakoso, Adi Buyu, Irawan, A., Kurwiyah, N., Mamang, A., & Musripah. (2022). *Family Nursing Care With Elderly at Risk of Diabetes Mellitus*. 282.

Rahayu, D., & Herlina, N. (2021). Relationship Between Level of Knowledge and Compliance in Taking Medication with Blood Sugar Levels in Type 2 Diabetes Mellitus Patients: Literature Review. *Borneo Student Research*, *3*(1), 341–351.

Rahmawati, S., Sani, N. F., & Prakoso, A. B. (2024). The Relationship Between Family Support and Blood Sugar Level Control Compliance in Type 2 Diabetes Mellitus Patients. *Jurnal Penelitian Perawat Profesional*, *7*(1), 57–63. Http://Jurnal.Globalhealthsciencegroup.Com/Index.Php/Jppp

Ramadhani, N. F., Nazaruddin Siregar, K., Adrian, V., Sari, I. R., & Hikmahrachim, H. G. (2022). *The Relationship Between Physical Activity and Diabetes Mellitus in Women Aged 20-25 in Jakarta (Analisis Data Posbindu Ptm 2019)*.

Riza, T., Karim, D., & Jumaini. (2019). The Relationship Between the Level of Knowledge of Diabetes Mellitus Patients About the Disease and Diet and Compliance in Following the Diabetes Mellitus Diet. *Jurnal Online Mahasiswa Program Studi Ilmu Keperawatan Universitas Riau*, *2*(1), 606–611.

Rochani, S., & Pamboaji, G. (2022). The Effectiveness of Health Education with Flipcharts on Patient Knowledge and Compliance in Implementing Diet Programs in Diabetes Mellitus Patients. *Jurnal Wacana Kesehatan*, *7*(2), 89. Https://Doi.Org/10.52822/Jwk.V7i2.411

Setianto, A., Maria, L., & Firdaus, A. D. (2023). *Diabetes Mellitus in Adults and the Elderly*. *12*(November), 98–106.

Sun, Y., Tao, Q., Wu, X., Zhang, L., Liu, Q., & Wang, L. (2021). The Utility Of Exosomes In Diagnosis And Therapy Of Diabetes Mellitus And Associated Complications. In *Frontiers In Endocrinology* (Vol. 12). Frontiers Media S.A. Https://Doi.Org/10.3389/Fendo.2021.756581

Syifa, S. Nur, Krisna, M., & Jaya, A. (2022). The Influence of Family Support Motivation on the Level of Compliance of Diabetes Mellitus Patients. *Suparyanto Dan Rosad (2015*, *5*(3), 248–253.

Wahyu, J. T. (2021). *Hubungan Dukungan Keluarga Dengan Kontrol Gula Darah Pasien Diabetes Mellitus Di Wilayah Kerja Puskesmas Bantul*. *1*, 1–17.

Wibisana, E., Wreksagung H, H., & Chotimah, S. (2021). Relationship between Knowledge Level and Diet Compliance in Diabetes Mellitus Patients. *Jurnal Ilmu Keperawatan Indonesia (Jikpi)*, *2*(1), 8–13. Https://Doi.Org/10.57084/Jikpi.V2i1.608

Yuanita, Syaiful, Hidayati, N., & Riwahtini. (2018). Relationship between Knowledge Level and Control Compliance in Type 2 Diabetes Mellitus Clients. *Journals Of Ners Community*, *4*(1), 29–35.