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PUBLIC KNOWLEDGE ABOUT DIABETES MELLITUS IN THE WORKING AREA OF PUSKESMAS PUCANG SEWU SIRABAYA CITY

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Abstract

Diabetes Mellitus is a chronic metabolic disease characterized by increased levels of sugar in the blood. Knowledge about Diabetes Mellitus is fundamental in efforts to handle diabetes mellitus and can affect people's behavior in their lifestyle and activities. The purpose of this study is to determine public knowledge and factors related to public knowledge about Diabetes Mellitus in the working area of Pucang Sewu health center Surabaya. Method: Analytical descriptive research with a sample of 110 people. Data collection using interview method using questionnaire, descriptive and analytical data analysis using Q-Square test. Results: The results showed 39.1% had less knowledge, 16.4% had good knowledge, and 44.5% had enough knowledge. There was a significant relationship between the level of education and public knowledge about diabetes mellitus and there was no significant relationship between gender, age and occupation with public knowledge about diabetes mellitus. Conclusion: Almost half of the people in the working area of Pucang Sewu health center in Surabaya have less knowledge about Diabetes Mellitus, the level of education is related to public knowledge about diabetes mellitus, while the factors of gender, age and occupation are not related to public knowledge about diabetes mellitus. Recommendation: The need to involve various parties including the community in increasing knowledge about diabetes mellitus by using various methods and paying attention to the age, gender and work of the community.

Keywords: Knowledge, Disease, Hypertension

1. INTRODUCTION

Diabetes Mellitus is a metabolic syndrome characterized by impaired carbohydrate, fat and protein metabolism (PERKENI, 2015) in (Putra et al., 2021) . Diabetes Mellitus is one of the non-communicable diseases that is increasing rapidly throughout the world and is characterized by hyperglycemia in the body. Indonesia is one of the countries with the seventh highest number of people with diabetes mellitus after China, India, USA, Pakistan, Brazil and Mexico (Safitri et al., 2021). In 2018, Basic Health Research (Riskesdas) has collected data on people with diabetes mellitus in residents aged ≥15 years. The results obtained showed that the prevalence of diabetes mellitus in Indonesia based on a doctor's diagnosis at the age of ≥15 years was 2% and the prevalence of diabetes mellitus in East Java province was 2.02%. This figure shows an increase compared to the prevalence of diabetes mellitus in the population of ≥15 years in the results of Riskesdas 2013 of 1.5% (Kemenkes RI, 2018). Based on data from the Surabaya City Health Office, as many as 94,076 people suffer from diabetes mellitus. Data at the Pucang Sewu health center, the number of Diabetes Mellitus cases in 2019 amounted to 1,803 people. Knowledge is fundamental in efforts to handle diabetes mellitus in the community. Lack of knowledge about diabetes mellitus can affect people's behavior in their lifestyle and activities. Some surveys show that lack of knowledge about diabetes mellitus results in people not knowing that they suffer from the disease so that previous monitoring and prevention cannot be done. Studies conducted in Brazil suggest that good knowledge about diabetes mellitus can change behavior, improve the quality of life and health of sufferers. Measurement of public knowledge is needed to improve efforts to prevent and treat diabetes mellitus correctly (Widyastuti & Wijayanti, 2021).

The results of other studies suggest that high HbA1c values correlate with low levels of knowledge of diabetes mellitus patients. It is said that HbA1c values and fasting blood sugar levels were lower in study subjects who had high knowledge scores (Larasati et al., 2019). Knowledge of diabetes mellitus is information or understanding of a person about diabetes mellitus including symptoms, causes, risk factors, complications and treatment. A person's knowledge is influenced by factors such as gender, age, education level, occupation, family with diabetes and experience of diabetes (Kilkeny, et al, 2017) in (Irawan, 2018) (Irawan, 2018). Based on the data and description above, research was conducted on public knowledge about diabetes mellitus and related factors in the working area of the Pucang Sewu Surabaya health center. The purpose of this study was to identify the level of knowledge and factors related to public knowledge about diabetes mellitus in the working area of Pucang Sewu health center Surabaya.

2. RESEARCH METHODS

Descriptive research design with survey research methods is a design used to provide information related to the prevalence, distribution and relationship between variables in a population. Surveys collect information from a person's actions, knowledge, will, opinions, behaviors and values (Nursalam, 2016) . The survey method in this study collects information in the form of public knowledge about Diabetes Mellitus at Pucang Sewu Health Center Surabaya. The sample in this study is all visitors at the Pucang Sewu Surabaya Health Center in May 2023 totaling 110 people. Data collection by direct interviews using questionnaires that have been tested for validity and reliability

3. RESULTS AND DISCUSSION

A. General Data

Tabel 1. Distribution of visitor characteristics in the working area of Pucang Sewu Health Center Surabaya City.

Characteristic	Category	F	%
Gender	Male	20	18,18%
	Female	90	81,82%
Age	17-25 years	8	7,27%
	26-45 years	25	22.73%
	46-65 years	62	56,36%
	>65 years	15	13,64%
Education level	Primary school	34	30,91%
	Junior High School	38	34, 55%
	High School	26	23,63%
	College	12	10,91%
Work	Self employed	10	9,10%
	Civil servants	4	3,64%
	Private Employees	26	23,63%
	Not Working	70	63,63%
Total		110	100%

The results of the study of 110 visitors in the working area of Pucang Sewu Health Center Surabaya, almost all (81.82%) respondents were female, a small number aged 17-25 years (7.27%) and those aged 26-45 years (22.73%), most aged 46-65 years (56.36%) and (13.64%) aged 65 years and over. In the education category, a small number of people in the Pucang Sewu Health Center work area have high school / vocational education (23.63%) and tertiary education (10.91%), almost half of whom have elementary school education (30.91%) and junior high school (34.55%). In the employment category, most (63.63%) are not employed and a small number work as civil servants (3.64%), self-employed (9.10%) and private employees (23.63%).

B. Custom Data

Table 2. Distribution of community knowledge in the working area of Pucang Sewu Health Center in Surabaya City in May 2023

Knowledge	F	%
Good	18	16,4%
Sufficient	49	44,5%
Less	43	39,1%
Total	110	100%

The results showed that almost half (39.1%) of the people in the Pucang Sewu Surabaya Health Center work area had insufficient knowledge, a small percentage (16.4%) had good knowledge, and almost half (44.5%) had sufficient knowledge.

Table 3. Distribution of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023 by gender.

Gender	Knowledge Level			Total
	Good	Sufficient	Less	
Male	2 (10%)	10 (50%)	8 (40%)	20 (100%)
Female	16 (17,8%)	39 (43,3%)	35 (38,9%)	90 (100%)
Total	18 (16,4%)	49 (44,5%)	43 (39,1%)	110 (100%)

Source : Primary Data May 2023

Descriptively, the results showed no significant difference between men and women, because both in men and women, the highest percentage was found at the level of sufficient knowledge, namely 50% in men and 43.3% in women.

Table 4. Distribution of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023 by age group

Age Group (Years)	Knowledge Level			Total
	Good	Sufficient	Less	
17-25	3 (37,5%)	4 (50%)	1 (12,5%)	8 (100%)
26-45	7 (28%)	9 (36%)	9 (36%)	25 (100%)
46-65	6 (9,6%)	28 (45,2%)	28 (45,2%)	62 (100%)
>65	2 (13,3%)	8 (53,4%)	5 (33,3%)	15 (100%)
Total	18 (16,4%)	49 (44,5%)	43 (39,1%)	110 (100%)

Source : Primary Data May 2023

The results showed the highest level of good knowledge in the age group of 17-25 years (37.5%), the highest level of knowledge in the age group over 65 years (53.4%) and the highest level of knowledge less in the age group of 46-65 years (45.2%).

Table 5. Distribution of public knowledge about diabetes mellitus in the working area of Pucang Sewu Ko ta Surabaya Health Center in May 2023 based on education level

Education Level	Knowledge Level			Total
	Good	Sufficient	Less	
Elementary School	3 (8,82%)	13 (38,24%)	18 (52,94%)	34 (100%)
Junior High School	4 (10,52%)	17 (44,74%)	17 (44,74%)	38 (100%)
Senior High School	6 (23,08%)	13 (50,00%)	7 (26,92%)	26 (100%)
College	5 (41,67%)	6 (50,00%)	1 (8,33%)	12 (100%)
Total	18 (16,4%)	49 (44,5%)	43 (39,1%)	110 (100%)

Source : Primary Data May 2023

Table 6. Distribution of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023 based on work

Work	Knowledge Level			Total
	Good	Sufficient	Less	
Self employed	2 (20%)	2 (20%)	6 (60%)	10 (100%)
Civil servants	2 (50%)	1 (25%)	1 (25%)	4 (100%)
Private Employees	6 (23,08%)	12 (46,15%)	8 (30,77%)	26 (100%)
Not Working	8 (11,43%)	34 (48,57%)	28 (40%)	70 (100%)
Total	18 (16,4%)	49 (44,5%)	43 (39,1%)	110 (100%)

Sumber : Source : Primary Data May 2023

The results showed the highest level of good knowledge in the civil servant group (50%), the highest level of knowledge in the non-working group (48.57%) and the highest percentage of less knowledge in the self-employed group (60%). Based on statistical analysis using the Chi Square test, the results showed that there was a significant relationship between the level of education and the level of public knowledge about Diabetes Mellitus and there was no significant relationship between gender, age and occupation with the level of public knowledge about Diabetes Mellitus in the working area of the Pucang Sewu Health Center in Surabaya for the period of May 2023.

4. DISCUSSION

Based on the results of public knowledge research on Diabetes Mellitus conducted in the working area of Pucang Sewu Health Center, Surabaya City found that almost half (39.1%) had less knowledge, a small part (16.4%) had good knowledge, and almost half (44.5%) had sufficient knowledge. The results of this study are different from the research conducted by Angelina F and Herwanto V (2022) in the productive age group where the level of knowledge about Diabetes Mellitus is mostly good (Angelina & Herwanto, 2022). Different results were also shown in another study conducted on a group of adolescents where almost half (45.7%) of adolescents had good knowledge about diabetes mellitus (Silalahi, 2019). Meanwhile, in research conducted on the elderly group, different results were obtained from this study, namely there were 78% of the elderly who had good knowledge about Diabetes Mellitus (Paulina Damanik, 2022). This study also showed different results from the research conducted by Letta S, et al (2023), namely almost half of the respondents had adequate knowledge about Diabetes Mellitus (Letta et al., 2023). Other studies have shown similar results to this study where almost half of respondents have less knowledge about Diabetes Mellitus (Phoosuwan et al., 2022). Public knowledge, especially people with Diabetes mellitus, plays an important role in the management of Diabetes Mellitus. This is mainly related to the prevention of complications both long-term complications and short-term complications. It is said that effective management of diabetes mellitus cannot be achieved only under the supervision of professional health workers. People with Diabetes Mellitus play a central role in the effectiveness and self-management of their health care process (Ferreira et al., 2023). Knowledge is everything that is known based on human experience and knowledge will increase according to the process of experience experienced. Knowledge is also a term used to describe the results of a person's experience of a particular object. According to WHO theory, one of the objects described by knowledge gained from one's own experience is the object of health (Darsini et al., 2019). Knowledge of Diabetes Mellitus includes knowledge of identifying early signs of diabetes mellitus and taking quick and appropriate action to prevent the occurrence of more severe conditions. If someone does not have adequate knowledge about diabetes mellitus, resulting in a person not being able to recognize the early signs of diabetes mellitus, causing delays in diagnosing the disease so as not to get proper treatment at the beginning of the disease (Erika, 2023). In general, a person does not realize that he suffers from diabetes mellitus, therefore knowledge about diabetes mellitus is an important thing that must be known by every individual. Knowledge about diabetes mellitus for sufferers and society in general has an important role, especially in recognizing the early signs of disease, making quick and appropriate decisions to overcome diabetes mellitus and actively participating in managing diabetes mellitus so as to prevent complications and reduce mortality due to diabetes mellitus. A person's knowledge can be related to several factors, including social demographic factors including gender, age, education level, occupation (Guzman et al., 2023). This has an impact on the different levels of knowledge possessed by each individual. The relationship between social demographic factors and public knowledge about diabetes mellitus studied in this study obtained the following results:

Gender and level of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023

Based on statistical analysis using the Chi-Square test, the results of this study showed no significant relationship between gender and the level of public knowledge about diabetes mellitus. The results of this study showed the same results as other studies on knowledge about complications of diabetes mellitus, namely there was no significant relationship between sex and knowledge about complications of diabetes mellitus (Kifle et al., 2022). Meanwhile, the results of a study conducted in Saudi Arabia

showed that there was a significant relationship between gender and public knowledge about diabetes mellitus (Alkhaldi et al., 2023). Likewise, research conducted in Thailand showed different results from this study where the results of the study showed a significant relationship between gender and patient knowledge about type 2 diabetes mellitus(Sangruangake et al., 2022). The results of this study are also different from research conducted on student groups where female students have broader knowledge about diabetes mellitus than male students (Chen et al., 2022). In addition, this study also showed different results from research conducted in Qatar in 2021 which showed that there was a significant relationship between gender and the level of knowledge about diabetes mellitus (Al- et al., 2022). In general, the level of knowledge in women is higher than in men due to differences in interest and the level of interest that women have in obtaining information (Nito et al., 2021). Women also have a higher level of worry than men, which has an impact on higher curiosity about something, including Diabetes mellitus and results in a higher level of knowledge of women than men, although this is not proven in this study.

Age group and level of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023

Statistical analysis conducted on the results of this study showed no significant relationship between age groups and the level of public knowledge about diabetes mellitus. Similar results were shown by another study conducted on caregivers of young adults in South Asia, where there was no significant relationship between age and the level of knowledge about diabetes mellitus (Koipuram et al., 2020). Meanwhile, the study in Qatar showed different results from this study where there was a significant relationship between age groups and the level of knowledge about diabetes meilitus (Al- et al., 2022). Age is one of the factors that influence a person's knowledge and awareness of health. This is related to one's comprehension and mindset where as age increases, the mindset and comprehension power increase so that knowledge will also increase (Nengah et al., 2020). Age is one of the factors contained in a person that affects the behavior of the person including the knowledge possessed. The higher the age of a person causes the person to have a lot of experience that will affect the level of knowledge he has.

The level of education and level of public knowledge about diabetes mellitus in the working area of the Pucang Sewu Health Center in Surabaya City in May 2023

Statistical analysis using the Chi-Square test, the results showed a significant relationship between the level of education and the level of public knowledge about diabetes mellitus. The same results as this study were shown in a study conducted in Saudi Arabia where there was a significant relationship between the level of education and the level of knowledge about diabetes mellitus (Alkhaldi et al., 2023). Meanwhile, different results were shown by other studies conducted at RSU Buleleng, namely there was no significant relationship between the level of education and the level of knowledge of patients about diabetes mellitus (Yuliawati et al., 2022). Knowledge is closely related to education, where it is expected that someone who has a high education will also have high knowledge. Education is needed for a person to get information that affects the quality of his life. By taking formal education, a person will be accustomed to thinking logically in dealing with problems and being able to find solutions to these problems (Darsini et al., 2019). Someone who has a high level of education, is expected to be able to think logically in finding useful information for himself and the community regarding diabetes mellitus. In addition, by having a high formal education, a person is also expected to have broad insight into various methods and media that can be used in obtaining information about diabetes mellitus.

Work and level of public knowledge about diabetes mellitus in the working area of Pucang Sewu Health Center Surabaya City in May 2023

Based on statistical analysis using the Chi-square test, the results showed no significant relationship between work and the level of public knowledge about diabetes mellitus. The same results were shown in a study conducted in 2018 where there was no significant relationship between work and public knowledge about diabetes mellitus (Irawan, 2018). Meanwhile, other studies show different results from this study, where there is a significant relationship between work and the level of public knowledge about diabetes mellitus (Almousa et al., 2023). Likewise, research conducted in Thailand, showed different results from this study where a person's work affects the level of knowledge about diabetes mellitus (Phoosuwan et al., 2022). Differences in employment status lead to differences in the knowledge a person has. Those who work outside the home have more opportunities and experience to get information about something, including information about diabetes mellitus. The difference in knowledge possessed by a worker is also caused by interaction and exchanging information on the job so that it can increase the knowledge possessed (Nursa'iidah & Rokhaidah, 2022)

5. CONCLUSION

The knowledge of the community in the Pucang Sewu Health Center work area about diabetes mellitus is almost half of them have sufficient and less knowledge and only a small part have good knowledge. The results showed a significant relationship between the level of education and public knowledge about diabetes mellitus, while there was no significant relationship between gender, age and occupation with the level of public knowledge about diabetes mellitus. It is recommended to policy makers that increasing public knowledge about diabetes mellitus be carried out by involving the entire community and using various methods and media according to age, education level and occupation.

6. REFERENCES

Al-, K. A., Farghaly, A. H., Nasir, R., Loares, A. M., Skaroni, I., & Al-, M. (2022). Level of knowledge , attitude and practice towards diabetes among nationals and long- - term residents of Qatar : a cross- - sectional study. https://doi.org/10.1136/bmjopen-2021-052607

Alkhaldi, G., Aljohani, N., Hussain, S. D., Alfawaz, H. A., Hameidi, A., Saadawy, G. M., Elsaid, M. A., Alharbi, M., Sabico, S., & Al-daghri, N. M. (2023). General Public ' s Knowledge of Diabetes and Physical Activity in Saudi Arabia over Time : The Need to Refresh Awareness Campaigns.

Almousa, A. Y., Hakami, O. A., Qutob, R. A., Alghamdi, A. H., Alaryni, A. A., Alammari, Y. M., Al Harbi, K. M., Alyousef, M. A., Amlih, M. F., Althnayan, Mohammad A, & Almutairi, Mohannad B. (2023). Knowledge, Attitude, and Practice Toward Diabetes Mellitus and Their Association With Socioeconomic Status Among Patients With Type 2 Diabetes Mellitus in Saudi Arabia. 15(5). https://doi.org/10.7759/cureus.39641

Angelina, F., & Herwanto, V. (2022). Hubungan Antara Pengetahuan Dengan Sikap Dan Perilaku Pencegahan Diabetes Mellitus Tipe-2 Pada Kelompok Usia Produktif. Jurnal Muara Medika Dan Psikologi Klinis, 02(02), 120–126.

Chen, R. K., Hossen, M. M., Luna, J., Paz, D., & Arjona, E. (2022). Diabetes Knowledge: What Do College Students Know. 53(2).

Darsini, Fahrurrozi, & Cahyono, E. A. (2019). Pengetahuan ; Artikel Review. Jurnal Keperawatan (Journal of Nursing), 12(1), 97.

Erika, E. (2023). Meningkatkan Pemahaman Masyarakat Pentingnya Deteksi Dini Diabetes Melitus Melalui Penyuluhan Dan Pengukuran Gula Dan Tekanan Darah. EJOIN : Jurnal Pengabdian Masyarakat (Journal of Community Service), 1(7), 685–697. https://doi.org/10.55681/ejoin.v1i7.1228

Ferreira, P. L., Morais, C., Pimenta, R., Ribeiro, I., Amorim, I., & Alves, S. M.

(2023). Empowerment and Knowledge as Determinants for Quality of Life: A Contribution to a Better Type 2 Diabetes Self-Management. International Journal of Environmental Research and Public Health, 20(5). https://doi.org/10.3390/ijerph20054544

Guzman, D. F.-, Caira-, B., Calderon-, P. M., & Cisneros-, S. (2023). Sociodemographic factors associated to knowledge and attitudes towards dengue prevention among the Peruvian population : findings from a national survey. https://doi.org/10.1136/bmjopen-2022-071236

Irawan, E. (2018). Faktor-Faktor Yang Berhubungan Dengan Pengetahuan Masyarakat Tentang Diabetes Mellitus Tipe II. Jurnal Keperawatan BSI (BSI Journal of Nursing), 4(2), 115–121.

Kemenkes RI. (2018). Laporan Riskesdas 2018 Kementrian Kesehatan Republik Indonesia. In Laporan Nasional Riskesdas 2018 (Riskesdas National Report 2018) (Vol. 53, Issue 9, pp. 154–165). http://www.yankes.kemkes.go.id/assets/downloads/PMK No. 57 Tahun 2013 tentang PTRM.pdf

Kifle, Z. D., Adugna, M., Awgichew, A., Chanie, A., Sewnet, G., & Asrie, A. B. (2022). Knowledge towards diabetes and its chronic complications and associated factors among diabetes patients in University of Gondar comprehensive and specialized hospital , Gondar , Northwest Ethiopia. Clinical Epidemiology and Global Health, 15(March), 101033. https://doi.org/10.1016/j.cegh.2022.101033

Koipuram, A., Carroll, S., Punthakee, Z., & Sherifali, D. (2020). Diabetes knowledge, risk perception, and quality of life among South Asian caregivers in young adulthood. BMJ Open Diabetes Research and Care, 8(2). https://doi.org/10.1136/bmjdrc-2020-001268

Larasati, L. A., Andayani, T. M., & Kristina, S. A. (2019). Relationship of Knowledge Level to Clinical Outcome in Type 2 Diabetes Melitus Patient. Journal of Management and Pharmacy Practice, 9(2), 101–108.

Letta, S., Goshu, A. T., Sertsu, A., Nigussie, K., Negash, A., Yadeta, T. A., Bulti, F. A., Geda, B., & Dessie, Y. (2023). Diabetes knowledge and foot care practices among type 2 diabetes patients attending the chronic ambulatory care unit of a public health hospital in eastern Ethiopia: A cross-sectional study. BMJ Open, 13(11). https://doi.org/10.1136/bmjopen-2022-070023

Nengah, B. S. ., Ahmad, F. A., Chrysella, R., Devi, A. S., Farah, K., Fitria, H. N. E. S., Hieronimus, A. N. U., Safiinatunnajah, N., Wahyu, A. D., Yunita, A., & Abdul, R. (2020). Hubungan usia dengan pengetahuan dan perilaku penggunaan suplemen pada mahasiswa institut teknologi sepuluh nopember. Jurnal Farmasi Komunitas (Journal of Community Pharmacy), 7(1), 2.

Nito, P. J. B., Tjomiadi, C. E. F., & Manto, O. A. D. (2021). Hubungan Jenis Kelamin dengan Tingkat Pengetahuan Comprehensive Sexuality Education (CSE) pada Mahasiswa. Dinamika Kesehatan: Jurnal Kebidanan Dan Keperawatan (Health Dynamics: Journal of Midwifery and Nursing), 12(2), 396–405. https://doi.org/10.33859/dksm.v12i2.736

Nursa'iidah, S., & Rokhaidah. (2022). Pendidikan, Pekerjaan Dan Usia Dengan Pengetahuan Ibu Balita Tentang Stunting. Indonesian Jurnal of Health Development, 4(1), 9–18.

Nursalam. (2016). Metodologi Penelitian Ilmu Keperawatan (4th ed.). Salemba Medika.

Paulina Damanik, J. (2022). Gambaran Pengetahuan Lansia Tentang Diet Diabetes Melitus di Puskesmas Sarimatondang Kecamatan Sidamanik Tahun 2021. Jurnal Sosial Sains, 2(3), 433–439. https://doi.org/10.36418/sosains.v2i3.370

Phoosuwan, N., Ongarj, P., & Hjelm, K. (2022). Knowledge on diabetes and its related factors among the people with type 2 diabetes in Thailand: a cross-sectional study. BMC Public Health,

22(1), 1–13. https://doi.org/10.1186/s12889-022-14831-0

Putra, O. N., Hardiyono, H., & Pitaloka, E. D. P. (2021). Evaluasi Konversi Sputum dan Faktor Korelasinya pada Pasien Tuberkulosis Paru Kategori I dengan Diabetes Melitus. Jurnal Farmasi Dan Ilmu Kefarmasian Indonesia, 8(1), 38. https://doi.org/10.20473/jfiki.v8i12021.38-45

Safitri, A. Z., Fajariyah, R. N., & Astutik, E. (2021). Risk Factors of Diabetes Mellitus in Urban Communities in Indonesia (IFLS 5). Periodic Epidemiology Journal, 9(2), 184. https://doi.org/10.20473/jbe.v9i22021.184-191

Sangruangake, M., Srisuwan, P., Ruangsuksud, P., & Solikhah, S. (2022). The Factor of Association of Diabetes Knowledge in Diabetes Mellitus type 2 Patients. 16(1), 70–78.

Silalahi, L. (2019). Hubungan Pengetahuan dan Tindakan Pencegahan Diabetes Mellitus Tipe 2. Jurnal PROMKES, 7(2), 223. https://doi.org/10.20473/jpk.v7.i2.2019.223-232

Widyastuti, I., & Wijayanti, A. C. (2021). Hubungan Pengetahuan dan Sikap dengan Kualitas Hidup Penderita Diabetes Melitus Tipe 2 di Surakarta. Jurnal Kesehatan Masyarakat Indonesia, 16(3), 136. https://doi.org/10.26714/jkmi.16.3.2021.136-147

Yuliawati, A. N., Made, P., Ratnasari, D., & Rosalina, P. R. (2022). Knowledge and Quality of Life in Type 2 Diabetes Mellitus Patients also its Related Factors. 12(1), 14–27.