THE CORRELATION BETWEEN KNOWLEDGE OF DIET OBEDIENCE ON DIABETES MELLITUS (DM) PATIENTS AT KEDUNGTUBAN HEALTHCARE CENTER

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Abstract. The prevalence of Diabetes Mellitus in Indonesia, based on the Regional Health Research (Riskesdas) showed a 1.5% increment in 2013. Then, in 2018, the percentage increased to 2% found on individuals aged older than 15 years old. Efforts of preventing and controlling the increased diabetes mellitus prevalence have been promoted. For individuals with risk factors, they must monitor themselves to stay healthy. Then, for individuals suffering from the disease, they must monitor themselves to prevent further complications. The diet for DM patients is useful as a management effort. Blora is the eighth rank city with diabetes mellitus prevalence. The data from Blora's health agency showed 2.567 cases of diabetes mellitus in 2020. The prevalence increased in 2021 with 2.680 cases (Dinkes Blora, 2021). At Kedungtuban healthcare center, the prevalence of diabetes mellitus patients in 2020 was 657 patients. In 2021, the number of patients increased to 616 patients. In 2022, the number of patients increased to 970 patients. From the data, the prevalence increment in the Kedungtuban health care Center, Blora Regency, was visible. The applied method was analytical research with a cross-sectional design. The researchers took 58 respondents as the sample with accidental sampling. The researchers analyzed the data with Spearman rank. The results showed most respondents had low knowledge, 33 respondents (56.9%). The same result was found in the patients' obedience, and low obedience was found in 34 respondents (58.6%). The Spearman rank test obtained a p-value of 0.000 lower than 0.05. Thus, the result showed a significant correlation between diet obedience and the type-II diabetes mellitus patients at Kedungtuban health care center. The results showed a significant correlation between knowledge and diet obedience of type-II diabetes mellitus patients at Kedungtuban health care.
Keywords: [Knowledge, Obedience, Diabetes Mellitus]

INTRODUCTION

The estimated diabetes mellitus prevalence will increase with the age of the community. The increment is predicted to be 19.9% or 111.2 million people aged between 65 and 79 years old. This rate is predicted to increase to 578 million in 2030 and 700 million in 2045. The data of the Health Agency of Central Java Province, there were 652.822 individuals suffering from diabetes mellitus as shown in Central Health Profile (Profil Kesehatan Jateng, 2019).

Blora is the eighth rank city with diabetes mellitus prevalence. The data from Blora's health agency showed 2.567 cases of diabetes mellitus in 2020. The prevalence increased in 2021 with 2.680 cases (Dinkes Blora, 2021). At Kedungtuban healthcare center, the prevalence of diabetes mellitus patients in 2020 was 657 patients. In 2021, the number of patients increased to 616 patients. In 2022, the number of patients increased to 970 patients. From the data, the prevalence increment in the Kedungtuban health care Center, Blora Regency, was visible.

Diabetes Mellitus is a degenerative disease type that cannot be cured. The patients can still live normally if they obey four principles of DM management, such as education, diet management, physical exercise, and anti-diabetic medicine consumption (Perkeni, 2015). Excellent knowledge for individuals about diabetes Mellitus brings positive knowledge and makes the implementation of the four management pillars efficient. Wardhani (2021) explains the correlation between diet obedience of DM patients with a p-value of 0.0000. Handayani, Anesti & Irwan (2017) found excellent knowledge of diet led to diet implementation obedience.

These matters, monitoring the blood glucose, are assessable from a dietary pattern and diet management, physical activity and exercise, and therapy. Indrawati (2012) explains that monitoring blood glucose rate refers to the obedience of DM patients to keep their dietary patients. DM patients with disciplined dietary patterns based on diet principles can control their blood glucose excellently and normally. The triggering factors of DM include genetics, age, and dietary pattern. The genetic factor becomes the dominant trigger of DM if this factor exists without excellent healthy life. A percentage of 56% of DM patients did not obey the suggested dietary pattern and consumed any menu they found.

Lack of education about diabetes mellitus, physical activities, discipline to consume medicine, and routine blood glucose control also worsen the condition (Rahayu et al., 2014).

The preliminary study found recent three-month data in 2022. The data showed 55 patients in August, 70 patients in September, and 105 patients in October at Kedungtuban health care. The researchers also interviewed three patients. They explained that they did not know the dietary management, lifestyle, schedule of drinking medicine, and boredom of drinking medicine. Two patients stated they had difficulties controlling and applying dietary patterns. These situations worsened their blood glucose. From the statement, the researchers found that most DM patients in health care might have a low knowledge level which was important to study. Knowledge about dietary matters is important for dietary obedience. The objective was to make the DM patients at Kedungtuban health care could control their blood glucose properly.

METHODS

This analytical research used a cross-sectional design. The design studied the correlation between independent and dependent variables. This research is also known as observational research by analyzing the collected data of the variables within a certain time on a sample population. This research examined the variable of knowledge toward dietary patterns at the same time. The research population came from the DM patients found in recent three months, from August to October 2022. They were 230 patients. The researchers took the sample with non-probability sampling. The applied sampling type was accidental sampling. The sample consisted of 58 respondents.

RESULTS AND DISCUSSION

The Respondent's Characteristics based on the Ages

Table 1. The Frequency Distribution based on the Respondent Ages at Kedungtuban Health Care (n=58)

Age	Numbers	Percentage (%)
30-40 years old	8	13.8
41-50 years old	21	36.2
51-60 years old	19	32.8
61-70 years old	10	17.2
Total	58	100

Table 4.1 shows most respondents are aged between 41 and 50 years old, with 21 respondents (36.2%). Then, only 8 respondents, 13.8%, are aged between 30- and 40 years old.

The Characteristics of the Respondents Based on Sex Types

Table 2. The Frequency Distribution Based on Sex Types at Kedungtuban Health Care (n=58)

Sex Types	Numbers	Percentage (%)
Male	12	20.7
Female	46	79.3
Total	58	100

Table 4.2 shows most respondents, 46 respondents or 79.3%, are female. On the other hand, only 12 respondents, 20.7%, are male.

The Respondent's Characteristics based on the Latest Education

Table 3. The Frequency Distribution based on the Latest Education of the Respondents at Kedungtuban Health Care (n=58)

Latest Education	Numbers	Percentage (%)
Primary School	23	39.7
Junior High School	9	15.5

Senior High School	22	37.9
First Degree or Bachelor	4	6.9
Total	58	100

Table 4.3 shows most respondents graduated from primary schools, 23 respondents or 39.7%. Then, only 4 respondents, 6.9%, graduated from first-degree education.

The Respondents' Characteristics based on the Occupations

Table 4. The Frequency Distribution based on the Occupation of the Respondents at Kedungtuban Health Care (n=58)

Occupation	Numbers	Percentage (%)
Entrepreneurs	3	5.2
Civil Servant	1	1.7
Private Employees	7	12.1
House Wife	34	58.6
Others	13	22.4
Total	58	100

Table 4.4 shows most respondents are housewives, with 34 respondents (58.6%). The table shows only 1 respondent is a civil servant, 5.2%.

The Respondents' Characteristics Based on the Years of Suffering from DM

Table 5. The Frequency Distribution based on Years of the Respondents Suffering from DM at Kedungtuban Health Care (n=58)

Years of suffering from DM	Numbers	Percentage (%)
Less than a year	8	13.8
1-5 years	21	36.2
6-10 years	19	32.
Total	58	100

Table 4.5 shows most respondents have been suffering from DM for 1-5 years, 21 respondents (36.2%). The table also shows only 8 respondents suffer from the disease for less than a year, 13.8%.

The Knowledge of DM Patients at Kedungtuban Health Care

Table 6.The DM Knowledge of the Patients at Kedungtuban Health Care (n=58)

Knowledge	Numbers	Percentage (%)
Excellent	4	6.9
Adequate	21	36.2
Low	33	56.9
Total	58	100

Table 4.6 shows 33 respondents, 56.9%, have low knowledge; 21 respondents, 36.2%, have adequate knowledge, and 4 respondents, 6.9%, have excellent knowledge level.

The DM Patient Dietary Obedience at Kedungtuban Health Care

Table 7. The DM Patients' Dietary Obedience at Kedungtuban Health Care (n=49)

Obedience	Numbers	Percentage (%)
High	3	5.2
Moderate	21	36.2
Low	34	58.6
Total	58	100

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Table 4.7 shows 34 respondents, 58.6%, have low dietary obedience; 21 respondents, 36.2%,

with moderate obedience; and 3 respondents, 5.2%, with high obedience.

The Correlation between Dietary Obedience of DM Patients at Kedungtuban Health Care

Table 8. The Correlation between Dietary Obedience of DM Patients at the Health Care (n=58)

Knowledge	Obedience						Total		P value
	High		Moderate		Low				
	f	%	f	%	F	%	f	%	
Excellent	3	75.0 %	1	25.0 %	0	0.%	4	100%	0.000
Adequate	0	0%	14	66.7 %	7	33.3%	7	100%	
Low	0	0%	5	15.2 %	28	84.8%	28	100%	
Numbers	3	5.2%	20	34.5 %	35	60.3%	58	100%	

Table 4.8 shows the Spearman rank statistic test obtains p-values of 0.000, lower than 0.05. The values indicated that the results accepted Ha and denied Ho. Thus, the DM knowledge of the patients was significantly correlated to the dietary pattern obedience of DM patients in the working area of Kedungtuban health care.

The results showed most respondents had low knowledge about diabetes mellitus. The results showed 31 respondents, 56.9%, had low DM knowledge; 21 respondents, 36.2%, had adequate knowledge; and 4 respondents, 6.9%, had excellent knowledge level. The analysis results showed the influential factors in patients' DM knowledge were sex types, age, and education.

The results showed most respondents were females, with 46 respondents (79.3%). Only 12 respondents, 20.7%, were male. Rahayu (2020) also found most DM patients were female, with 81 respondents (60.4%). Both research results showed higher DM prevalence in females than the prevalence in males. These results indicate that physically women have a greater risk of suffering from DM than men because they have a high possibility of increasing their body mass indices. Women during the menopause period have more fat due to decreased hormones (Setyorogo & Trisnawati, 2013). Lack of physical movements or activities also increases carbohydrate and glucose levels. The other influential factors were insulin resistance while pregnant. These situations make women have a higher risk of suffering from diabetes mellitus than men.

The disease mostly occurs when individuals are older than 45 years old due to degenerative factors. At these ages, the body suffers from decreased functions in terms of beta-cell production. Thus, insulin production for blood glucose metabolism gets lower (Hari Nugroho, 2019). Some studies found 21 respondents aged between 41 and 50 years old. 19 respondents were aged between 51 and 60 years old, 32.8%. Susanti 92018) found that most DM patients were aged between 40 and 60 years old. In the study, the researcher found 30 respondents or 78.9%.

In this research, education level also influenced the DM knowledge of the patients. From the analysis, the researchers found 23 respondents graduated from primary school, 39.7%. The researchers only found 4 respondents were graduated with a first degree, 6.9%. Higher education levels led to higher thinking, information reviewing, and information-seeking skills in individuals. The educational level also determines how individuals think rationally and easily about new information. Individuals with higher education levels could elaborate new problem easily than those with lower education. Habibillah (2022) also found most respondents, 16 respondents or 32%, with primary school background.

In this research, 34 respondents had low obedience, 58.6%; 21 respondents with moderate obedience, 36.2%; and 3 respondents with high obedience, 5.2%.

From the results, 34 respondents, 58.6%, had low dietary obedience. This situation was influenced by the patients' occupations. Most patients were housewives, with 34 respondents (58.6%). Individual occupation influenced individual income. The earning of this individual influenced the individual dietary pattern. Widyarni & Setiandari (2020) and Fitriana & Salviana (2021) found DM patients with low income disobeyed the dietary pattern compared to those with high income. Individuals with high incomes could afford adequate meals for DM patients compared to individuals with low incomes. The

same thing goes for the dietary pattern principle with high carbohydrate domination.

Moderate dietary obedience, in the Kedungtuban health care working site, was observable in 21 respondents (36.2%). These respondents did not know the types of dietary patterns. They were also bored with their current suffering situation. The other influential factor was - the lack of people who could remind them about dietary control. Wati (2018) found that the dietary obedience of DM patients at Prambanan health care was categorized as moderate, 58.7%, due to a lack of DM knowledge and family support.

Moderate dietary obedience was influenced by the respondents' ages. Most respondents were aged between 41 and 50 years old with moderate dietary obedience. In this research, older individuals seemed to be wiser in seeking, gaining, and processing the given information. These actions led to positive behaviors of the respondents to determine countermeasures, such as regulating dietary patterns. Wardhani (2021) also found that older individuals had mature psychology and the mentality to think. Thus, they would behave better than young people.

The obtained analysis results showed a significant correlation between DM knowledge and dietary obedience of type-II DM patients. The evidence was the obtained p-value, 0.000 lower than 0.05. Muhammad, Nelfa & Nurlela (2022)also found a significant correlation between DM knowledge and the dietary pattern of DM patients at Wolter Mongsidi TK II Manado Hospital with a p-value of 0.001.

In this research, 3 respondents, or 5.2% respondents had excellent knowledge with high dietary obedience. Putri (2021) also found the influence of DM knowledge on the dietary behavioral pattern of DM patients. Nutrition intake also influenced DM control success (Ramadhan et al., 2018). A successful dietary plan depends on the DM patients' obedience to consume the recommended meals (Handayani, Nuravianda & Haryanto, 2017).

In this research, 14 respondents had adequate knowledge and moderate dietary obedience, 66.7%. Then, only one respondent with a high knowledge level and moderate dietary obedience was 25.0%. Wardhani (2021) found the influence of experience on DM dietary obedience. The perceived and believed experience motivated the patients to promote certain behaviors. Thus, DM patients must have perceptions about vulnerability. This perception is useful to motivate dietary obedience behaviors. DM patients with high vulnerability perception would act better than those with low vulnerability perception (Nurhidayati, Suciana & Zulcharim, 2019). A study in Surabaya also found the implication of DM patients with high vulnerability perception toward the side effects of the disease (Fitriani, Pristianty & Hermansyah, 2019).

In this research, the researchers found 7 respondents, 33.3%, with low dietary obedience. DM knowledge is an important component to manage the disease and to succeed the DM management (Wardhani, 2021). The dietary program becomes a factor in recovering and preventing further complications (Ubaidillah et al., 2021). A study at Public Regional Hospital Abdul Moloek found most respondents disobeyed dietary obedience. The results showed low motivation of DM patients due to a lack of DM dietary patterns. Thus, the respondents did not trust the recommended dietary pattern by the health officers (Bertalina & Purnama, 2016).

In this research, 5 respondents had low DM knowledge and moderate dietary obedience (15.2). Lack of knowledge led to low dietary obedience. Thus, the DM patients' control would be low (Rahayu & Herlina, 2021). Generally, individuals with low knowledge would have high risk due to their disobedience. Azmiardi (2020) found that DM knowledge was useful to inform patients about specific actions to manage the disease. In this research, 28 respondents had low knowledge with low obedience (84.8%). DM knowledge was an important matter to facilitate the patients' manage their life (Srikartika, Akbar & Lingga, 2019). These results showed that dietary disobedience of DM patients occurred due to illiteracy of the recommended dietary pattern. Lack of DM information also became the core of the problems. Bertalina & Purnama (2016) found a correlation between knowledge, patient motivation, and family support toward the dietary obedience of DM patients.

CONCLUSION

1. The results found 33 respondents, 56.9%, had ow knowledge; 21 respondents, 36.2%, had adequate knowledge, and 4 respondents, 6.9%, had excellent knowledge level.

2. In this research, 34 respondents had low obedience, 58.6%; 21 respondents with moderate obedience, 36.2%; and 3 respondents with high obedience, 5.2%.
3. The obtained analysis results showed a significant correlation between DM knowledge and dietary obedience of type-II DM patients at the Kedungtuban health care center. The evidence was the obtained p-value, 0.000 lower than 0.05.

Suggestions

1. For the patients
   The researchers suggest that patients obey the recommended dietary pattern by the health officers. Thus, they can control blood glucose and prevent further complications.
2. For the healthcare
   The researchers suggest the health care unit promote routine health education about DM and dietary pattern obedience. The health care unit can apply this education by promoting outdoor activities, such as *posbindu, posyandu,* and home visits.
3. For nurses
   The researchers recommend that nurses apply nursing care activities, such as dietary patterns and physical exercise education for DM patients.
4. For future researchers
   The researchers suggest that future researchers examine or investigate the correlation between family support and dietary obedience of DM patients.

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