THE RELATIONSHIP BETWEEN DIETARY PERCEPTIONS, PHYSICAL ACTIVITY AND TREATMENT REGULARITY ON EFFORTS TO CONTROL TYPE 2 DIABETES MELLITUS

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ABSTRAK : HUBUNGAN ANTARA PERSEPSI DIET, AKTIVITAS FISIK DAN KETERATURAN PENGOBATAN TERHADAP UPAYA PENGENDALIAN DIABETES MELLITUS TIPE 2

Latar Belakang**:** Pengendalian diabetes mellitus tipe 2 sangat dipengaruhi oleh kepatuhan penyandang diabetes mellitus dalam proses kepatuhan diet, olahraga dan kepatuhan pengobatan. Tingkat kepatuhan penyandang diabetes mellitus dalam proses diet, olahraga dan penggunaan obat dipengaruhi oleh beberapa faktor, salah satunya adalah persepsi penderita.

Tujuan**:** Untuk mengetahui hubungan antara persepsi diet, aktifitas fisik dan keteraturan berobat terhadap upaya pengendalian Diabetes Mellitus Tipe 2 di Puskesmas Sudiang.

Metode**:** Penelitian ini menggunakan penelitian kuantitatif dengan pendekatan deskriptif analitik dengan desain *cross sectional.*Populasi dalam penelitian ini adalah seluruh pasien diabetes mellitus tipe 2 sebanyak 137 penderita. Sampel ditarik dengan menggunakan teknik purposive sampling sehingga di peroleh 69 penderita. Analisis data menggunakan aplikasi SPSS versi 20 dan menggunkaan uji *chi-square.*

Hasil**:** Hasil penelitian menunjukkan bahwa terdapat hubungan antara persepsi diet terhadap upaya pengendalian penyakit diabetes mellitus tipe 2 (p=0,012) dan terdapat hubungan antara persepsi keteraturan berobat terhadap upaya pengendalian diabetes mellitus tipe 2 (p=0,006), persepsi aktivitas fisik tidak memiliki hubungan terhadap upaya pengendalian diabetes mellitus tipe 2 (p=0,225).

Kesimpulan**:** Penelitian ini dapat disimpulkan bahwa terdapat hubungan antara persepsi diet, persepsi keteraturan berobat terhadap upaya pengendalian diabetes mellitus tipe 2. Tidak terdapat hubungan antara persepsi aktivitas fisik terhadap upaya pengendalian deiabetes mellitus tipe 2.

Saran: Pemberian edukasi yang dapat mendukung usaha penderita diabetes mellitus tipe 2 untuk mengerti perjalanan alami penyakitnya dan pengendaliannya**.**

Kata kunci: Persepsi Diet, Persepsi Aktivitas Fisik, Persepsi Keteraturan berobat, Upaya Pengendalian Penyakit Diabetes Mellitus Tipe 2

ABSTRACT

Background**:** The control of type 2 diabetes mellitus is strongly influenced by the compliance of people with diabetes mellitus in the process of diet compliance, exercise and medication compliance. The level of compliance of people with diabetes mellitus in the process of diet, exercise and drug use is influenced by several factors, one of which is the perception of the patient.

Objective**:** To determine the relationship between dietary perceptions, physical activity and treatment regularity on efforts to control Type 2 Diabetes Mellitus at the Sudiang Health Center.

Methods**:** This study used quantitative research with an analytic descriptive approach with a *cross sectional* design. The population in this study were all 137 patients with type 2 diabetes mellitus. The sample was drawn using purposive sampling technique so that 69 patients were obtained. Data analysis using the SPSS version 20 application and using the *chi-square* test.

Results**:** The results showed that there is a relationship between the perception of diet on efforts to control type 2 diabetes mellitus (p=*0*.012) and there is a relationship between the perception of regularity of treatment on efforts to control type 2 diabetes mellitus (p=*0*.006), the perception of physical activity has no relationship to efforts to control type 2 diabetes mellitus (p=*0*.225).

Conclusion**:** This study can be concluded that there is a relationship between perceived diet, perceived regularity of treatment on efforts to control type 2 diabetes mellitus. There is no relationship between perceptions of physical activity on efforts to control type 2 diabetes mellitus.

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Suggestion: Providing education that can support the efforts of patients with type 2 diabetes mellitus to understand the natural course of the disease and its control.

Keywords: Perceived Diet, Perceived Physical Activity, Perceived Treatment Regularity, Diabetes Mellitus Type 2 Disease Control Efforts.

INTRODUCTION

Diabetes mellitus is the cause of damage to function disorders, failure of various organs, especially the eyes, organs, kidneys, heart, nerves and other blood vessels. There are two categories of diabetes mellitus: type 1 and type 2 diabetes mellitus. Type 1 diabetes mellitus, formerly called *insulin-dependent* or *juvenile/childhood-onset diabetes,* is characterized by a lack of insulin production(American Diabetes Association, 2018; Bernstein, 2011) . Type 2 diabetes mellitus, formerly called *non-insulin-dependent or late-onset diabetes,* is caused by the body's ineffective use of insulin. Type 2 diabetes mellitus accounts for 90% of all diabetes mellitus. While gestational diabetes mellitus is hyperglycemia obtained during pregnancy. Diabetes mellitus contributes more to mortality .(Kementerian Kesehatan Republik Indonesia, n.d.)

WHO predicts an increase in the number of people with diabetes mellitus in Indonesia from 8.4 million in 2000 to around 21.3 million in 2030. Similarly, the *International Diabetes Federation* (IDF) in 2009 predicted an increase in the number of people with diabetes mellitus from 7.0 million in 2009 to 12.0 million in 2030. Although there are differences in prevalence rates, both reports indicate a 2-3 fold increase in the number of people with diabetes mellitus by 2030 .(International Diabetes Federation, 2017; PERKENI, 2015)

The data above shows that the prevalence of type 2 diabetes mellitus is very large and is a very heavy burden to be handled alone by specialists/subspecialists or even by all available health workers. Apart from the very large prevalence, type 2 diabetes mellitus in control efforts is more emphasized on changes in physical activity, diet and regularity of treatment compared to efforts to control type 1 diabetes mellitus which are more emphasized on insulin. Therefore, the need for efforts to control type 2 diabetes mellitus (ADA, 2018)

Efforts to control type 2 diabetes mellitus based on the Indonesian Endocrinology Society(PERKENI, 2015) there are four pillars consisting of education, food regulation, exercise and medication compliance. With the aim that people with type 2 diabetes mellitus can live longer, because of the quality of life needs and in order to increase health status .(PERKENI, 2015)

The control of type 2 diabetes mellitus is strongly influenced by the compliance of people with diabetes mellitus in the process of diet compliance, exercise and medication compliance. Seeing that people's non-compliance in using drugs is not only happening in Indonesia, but also a concern for many parties, especially medical circles around the world. Various studies that have been conducted show that compliance rates are far more ideal and have been proven to cause problems such as an increase in the number of diseases and their complications, a decrease in the quality of life of people with diabetes mellitus, bloated and inefficient treatment costs and even an increase in mortality (death). The level of adherence of people with diabetes mellitus in the process of diet, exercise and drug use is influenced by several factors, one of which is the perception of people with the disease they suffer .(MEDICINUS, 2014)

Based on the description above, researchers are interested in conducting research on the relationship between dietary perceptions, physical activity and regularity of treatment on efforts to control type 2 diabetes mellitus at the Sudiang Health Center.

RESEARCH METHODS

This study used quantitative research with a descriptive analytical approach and a cross-sectional design (8). The population in this study consisted of all 137 patients with type 2 diabetes mellitus. The sample consisted of 69 patients. The sampling method used in this study was non-probability sampling with a purposive sampling approach, where the sample was selected based on considerations and criteria for inclusion, including respondents diagnosed with type 2 diabetes mellitus by healthcare professionals, aged 45–65 years, willing to participate as respondents, and exclusion criteria including severe complications, communication disorders, or severe physical limitations (9). The statistical test used was the chi-square test in the SPSS 21 computer program to examine the relationship with a significant total value ($p<0.05$) (10).

RESEARCH RESULTS

Univariate Analysis

The age of respondents was mostly aged 56-61 years, as many as 19 people (27.5%). The gender of the respondents was mostly female, 46 people (66.7%). The education of respondents was mostly high school education, as many as 21 people (30.4%).

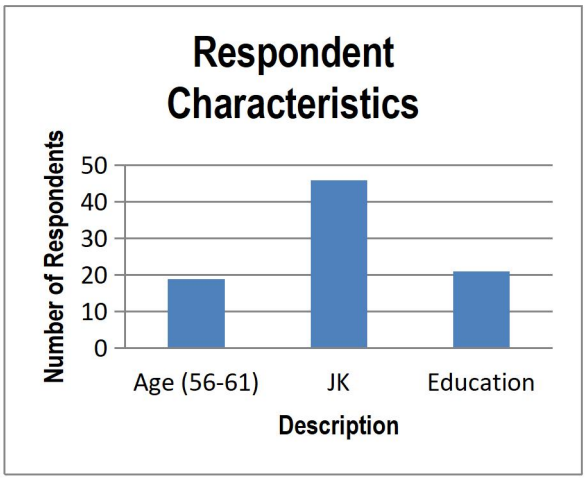

Figure 1.

Bivariate Analysis

The relationship between dietary perceptions and efforts to control Type 2 DM

The relationship between dietary perceptions and efforts to control Type 2 DM can be seen in Figure 1. Uncontrolled Type 2 DM control efforts have more negative perceptions, namely 10 people (62.5%) and the least have positive perceptions, namely 6 people (37.5%). While efforts to control Type 2 DM under control have more positive perceptions, namely 40 people (75.5%) and the least have negative perceptions, namely 13 people (24.5%).

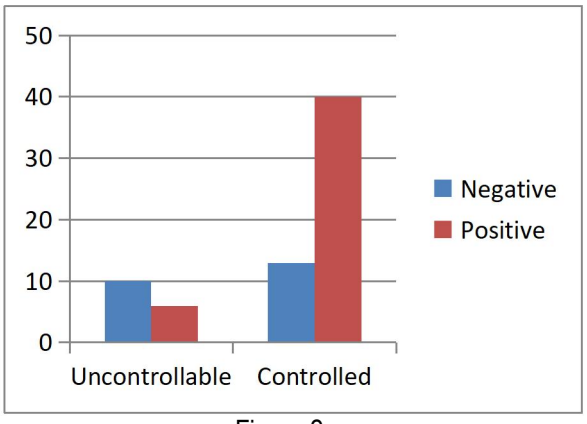

Figure 2.

The results of the analysis to see the relationship between dietary perceptions and efforts to control type 2 diabetes mellitus using the *Chi Square* statistical test, obtained a value of $p = 0.012$ ($p < 0.05$) and a prevalence ratio value of 2.388 (PR> 1), it can be interpreted that there is a significant relationship between dietary perceptions and efforts to control type 2 diabetes mellitus and the prevalence ratio value shows that positive dietary perceptions of respondents have a 2.388 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have negative dietary perceptions, can be seen in table 1.

Table 1
The relationship between dietary perceptions and efforts to control Type 2 DM

n	p-value	RP
69	0.012[a]	2.388

[a]*Chi-Square*

The relationship between perceived physical activity and efforts to control Type 2 DM

The relationship between perceptions of physical activity and efforts to control Type 2 DM can be seen in Figure 2. Uncontrolled Type 2 DM control efforts have more positive perceptions, namely 12 people (75%) and the least have negative perceptions, namely 4 people (25%). While efforts to control Type 2 DM under control have more positive perceptions, namely 47 people (88.7%) and the least have negative perceptions, namely 6 people (11.3%).

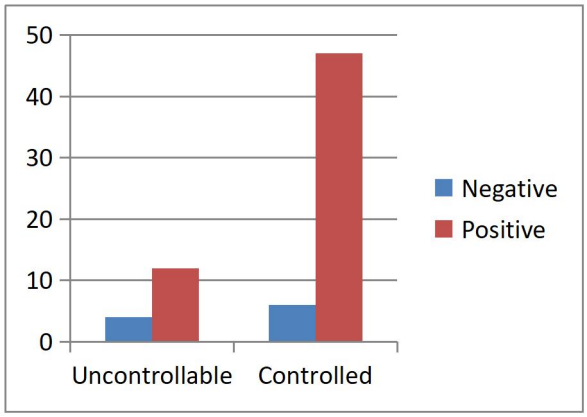

Figure 2.

The results of the analysis to see the relationship between perceptions of physical activity on efforts to control type 2 diabetes mellitus using the *Fisher* statistical test, obtained a value of p = 0.225 (p>0.05) and a prevalence ratio value of 1.333 (RP = 1), it can be interpreted that there is no significant relationship between perceptions of physical activity on efforts to control type 2 diabetes

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mellitus and the prevalence ratio value shows that the perception of positive physical activity respondents have a 1.333 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have negative physical activity perceptions, can be seen in table 2.

Table 2
The relationship between perceived physical activity and efforts to control Type 2 DM

n	p-value	RP
69	0.225[a]	1.333

[a]*Fisher*

The relationship between perceived treatment regularity and efforts to control Type 2 DM

The relationship between perceptions of treatment regularity and efforts to control Type 2 DM can be seen in Figure 3. Uncontrolled Type 2 DM control efforts have more positive perceptions, namely 11 people (68.8%) and the least have negative perceptions, namely 5 people (31.2%). While efforts to control Type 2 DM under control had more positive perceptions, namely 62 people (89.2%) and the least had negative perceptions, namely 2 people (3.8%).

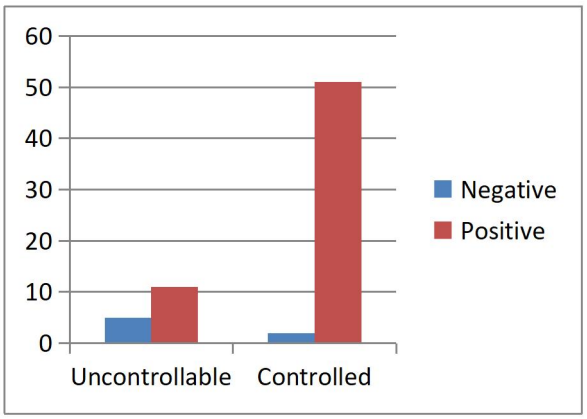

Figure 3.

The results of the analysis to see the relationship between perceptions of treatment regularity and efforts to control type 2 diabetes mellitus using the *Fisher* statistical test, obtained a *p* value of *0*.006 (*p* <*0*.05) and a prevalence ratio of 2.666 (RP>1), it can be interpreted that there is a significant relationship between the perception of treatment regularity and efforts to control type 2 diabetes mellitus and the prevalence ratio value shows that the perception of positive treatment regularity respondents have a 2.388 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have a negative perception of treatment regularity, can be seen in table 3.

Table 3
The relationship between perceived treatment regularity and efforts to control Type 2 DM

n	p-value	RP
69	0.006[a]	2.666

[a]*Fisher*

DISCUSSION

The relationship between dietary perceptions and efforts to control Type 2 DM

Good and optimal efforts to control type 2 diabetes mellitus are needed to prevent chronic complications. Efforts to control type 2 diabetes mellitus are strongly influenced by the patient's perception of disease control, namely the perception of diet.

Perception is a stimulus that is sensed by the individual, organized and then interpreted so that the individual realizes and understands what is sensed. Perception is also strongly influenced by the concepts made by patients towards control efforts, namely diet. The concept is in the form of understanding. The process of understanding means being able to interpret objects correctly(S Notoatmodjo, 2014) . From the process of understanding, so that the perception of diet is formed. This is in accordance with the results of the analysis in this study.

The results of the analysis to see the relationship between dietary perceptions and efforts to control type 2 diabetes mellitus using the *Chi Square* statistical test, obtained a value of *p* = 0.012 (*p* < *0*.05) and a prevalence ratio value of 2.388 (PR> 1), it can be interpreted that there is a significant relationship between dietary perceptions and efforts to control type 2 diabetes mellitus and the prevalence ratio value shows that positive dietary perceptions of respondents have a 2.388 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have negative dietary perceptions.

This study is in accordance with Hendro's theory (2010), a good perception will give birth to a form of "*adherence"* or compliance with instructions or recommendations to consume a balanced diet. This means that in the context of this study, people with type 2 diabetes mellitus who have positive perceptions tend to take preventive measures against bad conditions related to their disease through good food planning (diet) .(ADA, 2018; *Diabetes Melitus Tipe 2: Penatalaksanaan Dan*

Pencegahan Komplikasi., 2016; Handayani., n.d.; Kemenkes RI, 2019; Soekidjo Notoatmodjo, 2014)

This research is also supported by research by Arisandi et al, which states that there is a relationship between dietary behavior (*p-value* = 0.047 OR = 2.947), with blood sugar levels(Arisandi et al., 2020) .Based on these two tests, it shows that perception has a significant relationship with dietary compliance and is a risk factor (OR> 1). Perceptions of diet that have a relationship with adherence will influence a person to limit the amount of food and beverage intake where the amount of intake will be calculated for a specific purpose. The purpose of this diet varies, but most people do it to lose weight . (Almatsier, 2003; Bilous & Donelly, 2015; Darmawansyih, 2013)

Efforts to control Type 2 Diabetes Mellitus disease need to regulate the blood sugar levels of patients who are recommended to regulate intake patterns. Meal schedules for people with diabetes mellitus must be arranged(Garber AJ, Y, D, DA, n.d.) . This is because if people with diabetes mellitus are late or eat too often, it will affect blood sugar levels. Compliance in diet is a major component and success in the treatment of diabetes mellitus. Therefore, in this case the patient's family also needs to be involved in planning meals for people with diabetes mellitus by making meal schedule rules and implementing a food diet. Nutritional regulation in diabetics must be done to be able to control blood sugar levels. Also try to consume carbohydrates with the amount that has been recommended per day by the doctor for each day .(Khasanah, 2012; PERKENI, 2015).

The relationship between perceived physical activity and efforts to control Type 2 DM

Perception is an experience of objects, events or relationships obtained by inferring information and interpreting(Soekidjo Notoatmodjo, 2014) . Various information concluded by patients regarding physical activity which is one of the efforts to control type 2 diabetes mellitus so as to form a perception of physical activity which is then interpreted. This is in accordance with the results of the analysis in this study.

The results of the analysis to see the relationship between perceptions of physical activity on efforts to control type 2 diabetes mellitus using the *Fisher* statistical test, obtained a value of *p = 0.*225 (*p>0.*05) and a prevalence ratio value of 1.333 (RP = 1), it can be interpreted that there is no significant relationship between perceptions of physical activity on efforts to control type 2 diabetes mellitus and the prevalence ratio value shows that the perception of positive physical activity respondents have a 1.333 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have negative physical activity perceptions.

The results of this study are not in accordance with the concept of explaining that if a person's perception of risk is good, it will cause the emergence of risk prevention behavior to also be great .(Norman & Skinner, 2006)

The possible cause of the absence of a relationship between perceptions of physical activity and efforts to control type 2 diabetes mellitus is that most patients have a perception of illness in the context of society, namely the condition of illness is a condition where individuals are unable to carry out daily physical activities. So that patients feel healthy and ignore the recommendations to do physical activity / exercise that has been recommended(Bandura, 1997; Pender, N. J., Murdaugh, C. L., Parsons, 2006) .

This statement is supported by the theory put forward by Notoadmodjo, that the perception of healthy and sickness that occurs in society can be described in four areas, one of which is the concept of health in the context of society. People consider healthy people who can work or carry out daily work. Meanwhile, illness is a condition felt by a person, where the individual cannot get out of bed and cannot carry out daily activities .(S Notoatmodjo, 2014; Ummah, 2019)

This study is supported by research by Nabila (2023), that the relationship between physical activity and the incidence of type 2 diabetes mellitus (P value = 0.000; OR = 14.481; 95% CI = 3.823-54.858). Thus it can be concluded that the physical activity variable is associated with the incidence of type 2 diabetes mellitus (Lutfiah, 2023).

The relationship between perceived treatment regularity and efforts to control Type 2 DM

The perception of patient treatment regularity is very influential on efforts to control type 2 diabetes mellitus, especially in using drugs. Perception is essentially a person's assessment process of certain objects. Perception is the activity of sensing, integrating and giving assessments to physical objects and social objects and this sensing depends on the physical stimulus and social stimulus in the environment. Meanwhile, according to the concept of the health belief model, perception is an important element that shapes a person to take good and appropriate actions in maintaining their health both through the search for appropriate

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and quality treatment and through the application of all recommendations in the treatment process, including in the process of treating type 2 diabetes mellitus(Sarwono, 2004) . This is in accordance with the results of the analysis in this study.

The results of the analysis to see the relationship between perceptions of treatment regularity and efforts to control type 2 diabetes mellitus using the *Fisher* statistical test, obtained a value of $p = 0.006$ ($p < 0.05$) and a prevalence ratio of 2.666 (RP> 1), it can be interpreted that there is a significant relationship between perceptions of treatment regularity and efforts to control type 2 diabetes mellitus and the prevalence ratio value shows that the perception of positive treatment regularity of respondents has a 2.388 times greater chance of making efforts to control type 2 diabetes mellitus than respondents who have a negative perception of treatment regularity.

Several studies have shown that regularity of treatment has a close relationship with the level of treatment adherence. Patients who routinely and regularly seek treatment tend to be more compliant in undergoing treatment, so that the results of therapy are more optimal and the risk of complications decreases, such as in patients with type 2 diabetes mellitus(H.A.Mcoy, 2016; J.A.Smith, 2021; S.M.T.Y., 2020) . Patients who are routine and timely in taking medication or control to health facilities tend to be more compliant in undergoing the entire series of therapies according to medical advice. This compliance is important for effective treatment, preventing drug resistance, complications, and ensuring the achievement of recovery .(Depkes RI, 2002; Kementrian Kesehatan RI, 2015; WHO, 2001).

CONCLUSION

The relationship between perceived diet and perceived regularity of treatment has a significant relationship to efforts to control Type 2 DM. Meanwhile, perceived physical activity does not have a meaningful relationship with efforts to control Type 2 DM.

SUGGESTION

Negative perceptions of people with type 2 diabetes mellitus can be changed by providing education that can support the efforts of people with type 2 diabetes mellitus to understand the natural course of the disease and its control.

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