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The Effect of Health Education on Independent Nutrition Management of DM Patients in Tamangapa Puskesmas, Tamangapa Kelurahan, Manggala District

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Abstract

Diabetes mellitus is a metabolic disease that can result in pancreatic beta cells not being able to produce insulin effectively, resulting in a buildup of blood glucose levels. One of the control efforts is health education which aims to increase the knowledge of DM patients about independent nutrition management of DM patients. This study aimed to provide information about the effect of health education on independent nutritional management of DM patients at the Tamangapa Public Health Center, Tamangapa Village, Manggala District, Makassar City. The method of the study used a quasi-experimental approach with a pre-post test design approach. The population was all patients suffering from Diabetes Mellitus and the sample was 51 people with total sampling technique. The results of the study showed that there was an effect of health education on independent nutritional management of DM patients at the Tamangapa Health Center, Tamangapa Village, Manggala District, Makassar City. When comparing the results of the pre-test with the post-test, there was a considerable change in DM nutrition management knowledge that suggests a large range. Therefore, in order to carry out efficient health education, those who suffer from DM cannot be treated in a way that is curative. In order to solve the problems that are causing DM, there has to be an all-encompassing strategy.

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INTRODUCTION

Diabetes mellitus is a metabolic disease that can result in pancreatic beta cells not being able to produce insulin effectively, resulting in a buildup of blood glucose levels(Lamhatul Uyun, Nungki Marlian Yuliadarwati, 2019)Diabetes mellitus is a metabolic disease that is triggered by the interaction of various factors: genetics, immunology, environment and lifestyle. Diabetes mellitus is also a metabolic disease characterized by hyperglycemia that occurs due to defects in insulin secretion, insulin action, or both(Sry et al., 2020). Diabetes Mellitus is a serious problem worldwide because it tends to increase in the future(Harsari et al., 2018). Diabetes Mellitus is a disease that is not contagious but needs to be watched out for because it is a world health problem.(Wijaya & Putri, 2013). Pre-diabetes is a condition where glucose levels are higher than normal, but do not meet the criteria for diabetes. This condition is very critical, if someone does not make lifestyle modifications and pharmacological therapy, they can get diabetes(Soewondo & Pramono, 2011).

Most Diabetes Melitus Type-2 (DMT2) patients have more nutritional status (especially obesity). DMT2 patients with nutritional status are more likely to have higher blood glucose levels than patients with normal nutritional status. T2DM requires good blood glucose control to prevent complications of Diabetes Melitus (DM). In addition to diet and drug use, nutritional status can affect blood glucose(Harsari et al., 2018).According to (Poolsup et al., 2017) one of the therapies for DM patients by consuming Red Dragon Fruitproven to be very influential on prediabetes will be in the prevention of diabetes. Where the effect on T2DM is not significant but there is a tendency for a greater decrease in blood glucose with higher doses. Due to the limited available data and poor quality of clinical evidence, larger, adequately powered, and well-controlled clinical trials are needed to further evaluate the clinical benefits of dragon fruit in these patients.

Several studies have shown that diet plays a role in the prevention of cardiovascular disease in addition to that diet can protect against diabetes, high fiber intake, high intake of vegetable fats, low intake of trans fatty acids, and moderate alcohol intake, adherence to a rich diet. Monounsaturated fatty acids improve lipid profile and glycemic control in diabetics, suggesting that high intakes improve insulin sensitivity.(Martínez-González et al., 2008)In addition, several diets are carried out such as intermittent fasting (IF)because some people find this diet easier to follow than the traditional calorie restriction (CR) approach. IF involves limiting energy intake to 1–3 days/week, and eating freely on days without restriction. Alternate day fasting (ADF) is a subclass of IF, consisting of "fasting" (75% energy restriction) alternating "feeding days".(Barnosky et al., 2014)

The study conducted by Vegt et al (2001) found that the pre-progression of diabetes to diabetes was 6-10% per year. For patients carrying IGT and IFG, the cumulative incidence over a 6-year period was 65%, compared with people with normal blood glucose levels. According to the guidelines issued by the European Society for Cardiology (ESC) and the European Association for the Study of Diabetes (EASD) 8 2007, pre-diabetes is associated with several conditions, namely: old age, obesity, central obesity, lack of physical activity, lack of fruit consumption. and vegetables, family history and hypertension. According to the Pre-diabetes Consensus issued by the American College of Endocrinology (ACE) Med Indonesia and the American Association of Clinical Endocrinology (AACE) 2 in 2008, risk factors for diabetes and pre-diabetes are: family history, coronary heart disease, overweight and obesity, unhealthy lifestyle and hypertension. Every individual who carries pre-diabetes (IGT or DPPT), is at higher risk of developing diabetes.(Soewondo & Pramono, 2011)

A good diet must be understood by people with diabetes mellitus in setting their daily diet. This pattern includes setting a schedule for people with diabetes millitus which is usually 6 meals per day which is divided into 3 large meals and 3 snacks. A good diet should still be carried out by patients with diabetes mellitus, this is useful for controlling the patient's health, but controlling diet is not a factor that greatly affects the increase in blood sugar, based on this study diet has no effect on blood sugar levels because it was found that there were still patients Those with good eating patterns still experienced an increase in sugar levels and those with bad diets did not experience an increase in sugar levels. It can happen where the patient has had a good diet but lacks exercise. aging process, pregnancy, smoking and stress. People with diabetes usually tend to have uncontrolled blood sugar levels. Blood sugar levels will increase drastically after consuming foods that contain lots of carbohydrates and/or sugar. Therefore, DM sufferers need to maintain dietary regulation in

order to control blood sugar levels so that their blood sugar levels remain under control.(Sry et al., 2020)

International Diabetes Federation 2015 stated that the estimated number of people with diabetes in Indonesia was estimated at 10 million. Diabetes mellitus is one of the biggest causes of death in the world and in Indonesia. The 2014 Sample Registration Survey data shows that Diabetes is the third largest cause of death in Indonesia with a percentage of 6.7%, after stroke (21.1%) and coronary heart disease (12.9%).(Erni Setiyorini, 2017). Based on data from Riskesdas (2013) the prevalence of diabetes mellitus at the age of 55-64 years is 4.8% and at the age of 65-74 years is 4.2%. This percentage shows that the largest percentage of diabetes mellitus in Indonesia is in the elderly.(Health Research and Development Agency, 2013)The results of a survey of several urban diseases in Jakarta in 2006 showed the prevalence of pre-diabetes was 24.91% consisting of Glucose Tolerance Disorders of 17.90% in urban residents in Indonesia of 10.2%. This figure exceeds the total diabetes prevalence of 5.7%. and Fasting Glucose Disorders 7.01%. The three provinces with the highest prevalence of GIT in Indonesia are West Papua, West Sulawesi and Sulawesi, each province receiving a percentage of 21.8%, 17.6% and 7.3%.(Soewondo & Pramono, 2011)Based on non-communicable disease surveillance data in the P2PL field of the South Sulawesi Provincial Health Office in 2014, there were 27,470 new diabetes mellitus cases, 66,780 old cases with 747 deaths.Makassar City with a population in 2013 of 1,408,072 people, in 2014 increased to 1,429,242 people and statistical data continued to increase in 2015 to 1,449,401 people.(Makassar City Health Office, 2017)

Diabetes Mellitus is also known as a "lifelong disease" because this disease cannot be cured during the patient's lifetime so that people with diabetes have the risk of complications that can increase the risk of death. With a good level of understanding about diabetes mellitus and its complications, it can reduce the incidence of diabetic foot injuries in people with diabetes mellitus. So it is necessary to be provided with education about the prevention and treatment of diabetes mellitus, including the introduction of symptoms of diabetes mellitus, examinations that must be carried out regularly, how to properly care for the feet, regular glycemic control, a balanced diet and doing diabetes exercises. Education about the dangers of complications of diabetes mellitus in the form of canker sores on the feet, foot ulcers,(Savira & Widjaja, 2020)The need forregular and obedient treatment so as to minimize the occurrence of complications that can cause damage to various organs of the body. Patient compliance is a behavior carried out by people with type II diabetes mellitus to carry out their obligations to take medication on time and according to the dose(Isnaini & Ratnasari, 2018).

As a precautionary measure and management can be done in various ways. In people with type I diabetes mellitus, diet and exercise cannot cure or prevent. Therefore, it must be treated with insulin, with careful monitoring of blood sugar levels. Whereas in type II diabetes mellitus, diet and physical exercise play a major role in the treatment of type II diabetes mellitus (Smeltzer and Bare, 2008). Setting a diet like this seems easy, but if it is implemented, it turns out that many people with diabetes mellitus fail. In view of this, officers need to provide technical guidance to patients regarding eating patterns with the right amount, schedule and type with various sample menus along with the size of the number of calories.

Based on the observations of previous researchers at the Tamangapa Public Health Center, Tamangapa Village, Manggala District, Makassar City, the researchers found clients with diabetes mellitus patient conditions and during their treatment but were not able to carry out independent nutritional management. Reason (1995) previously argued that an individual's lack of information about a health condition is a contributing factor to their failure to address the issue. The same seems to be true in the researched region. In addition, Witte et al. (2019) advocate individual behavioral change for this type of health management. This proposal emphasizes the need for a comprehensive instructional strategy to assist patients in managing their daily ingestion. Furthermore, Isnaini (2018) places a strong emphasis on the need of self-management for those who have diabetes. This requires adopting preventive behaviors in both one's lifestyle and treatment in order to avoid the complications associated with diabetes in the long term. As a result, it is vital to explore the education for individuals on the influence that health education may have on the independent nutritional management of the area that is now the subject of the research.

METHOD

In this study, the researcher used a Quasy Experiment research design with a Pre-Post Test Design approach. The population in this study were all patients with Diabetes Mellitus (DM) at the Tamangapa Health Center, Tamangapa Village, Manggala District, Makassar City 51 patients. Based on the population, total sampling was carried out, so the sample was 51. In other words, data were collected from diabetic patients. Furthermore, this study includes the total population of treated diabetes patients. In addition, the data collection period for this study was for a duration of two months from March 11 – August 11, 2019. And then, participants diagnosed with type 1 or type 2 diabetes mellitus were included in the study.

The primary data in this study were profiles of participants in terms of age, gender, education, occupation, duration of diabetes mellitus, GDS test results, Nutrition Management. In addition, questions for patients with diabetes mellitus used a self-administration nutrition questionnaire for DM patients to assess knowledge about self-administration of nutrition for DM patients. Furthermore, data on blood sugar levels are from using the ACCU Check blood glucose meter. Researchers used a randomized plasma glucose test meaning that if participants had 200 mg/dl they were considered to have high blood sugar levels.

In addition, researchers used a self-administered nutrition questionnaire for DM patients to assess knowledge about self-administered nutrition for DM patients. Instructions for filling in by choosing the answer that the patient feels by giving a check list in the column provided and all questions must be answered with one choice. The number of questions in the questionnaire is 20 questions. Also, the available answers are “Yes”, “No”, and “Don't Know” answers. The score given to the answer "Yes" is given a score of "1". And the total score for the answers "No" and "Don't know" is given a score of "0". Thus, the respondent should fill it in according to the number of questions that are as many as 20 questions and provide a check list on one of the answers to these questions.

Selected patients are supplied knowledge about autonomous nutrition management. At the beginning of the process, a patient's level of understanding of their dietary requirements is evaluated. The educational and nutritional care of patients was then adapted to their existing levels of understanding. The instructional content is presented with a concentration on helping comprehend the benefits and drawbacks of engaging in certain consuming behaviors.

RESULTS

This study was conducted with a total of 51 respondents at the Tamangapa Health Center in the even semester of 2019. Data collection was carried out from March to August 2019 by interviewing, measuring blood sugar and questionnaires. The results can be reported as follows:

1. Univariate Analysis

A. Age

Table 1: Frequency Distribution of Respondents by Age in DM Patients at the Tamangapa Health Center, Tamangapa Village, Manggala District Makassar city

Age	Frequency	Percentage
≤45 years old	10	19.6
> 45 years old	41	80.4
Amount	51	100

Primary Data Sources 2019

Based on the results of the study, data obtained that respondents aged over 45 years were 41 people (80.4%), more than those aged under 45 years, more details can be seen in table 1.

B. Gender

Table 2: Frequency Distribution of Respondents by Gender in DM patients at the Tamangapa Community Health Center, Tamangapa Village Manggala District, Makassar City

Gender	Frequency	Percentage
Man	10	19.6
Woman	41	80.4

Amount	51	100

Primary Data Sources 2019

Based on the results of the study, there were 42 female respondents (80.4%), more data than male respondents.

C. Education

Table 3: Frequency Distribution of Respondents Based on Education in DM Patients at Tamangapa Health Center, Tamangapa Subdistrict, District Makassar City

Education	Frequency	Percentage
SD	20	39.2
JUNIOR HIGH SCHOOL	15	29.4
SENIOR HIGH SCHOOL	9	17.6
College	7	13.7
Amount	51	100

Primary Data Sources 2019

Based on the results of the study, data obtained that respondent had elementary education as many as 20 people (39.2%), more than other levels of education, more details can be seen in table 3.

D. Profession

Table 4: Frequency Distribution of Respondents Based on Occupation of DM Patients at Tamangapa Health Center, Tamangapa Sub-district Makassar City

Profession	Frequency	Percentage
civil servant	4	7.8
Private	4	7.8
Farmer	5	9.8
Trader	10	19.6
Other	28	54.9
Amount	51	100

Primary Data Sources 2019

Based on the results of the study, data on the work of respondents as traders were 10 people (19.6%), more than other types of work.

E. Long time suffering from DM

Table 5: Frequency Distribution of Respondents Based on Length of Suffering from DM in DM Patients at Tamangapa Health Center, Tamangapa Village Manggala District, Makassar City

Long Suffering DM	Frequency	Percentage
< 4 Years	20	39.2
≥4 years	31	60.8
Amount	51	100

Primary Data Sources 2019

Based on the results of the study, data on respondents who suffered from DM over 4 years were 31 people (60.8%), more than those who suffered from DM less than 4 years.

F. GDS Test Results

Table 6: Frequency Distribution of Respondents Based on GDS Test Results in DM Patients at the Tamangapa Health Center, Tamangapa Village, Manggala District, Makassar City

GDS Test Results	Frequency	Percentage
Normal < 200 (mg/dl)	11	21.6
Hyperglycemia > 200 (mg/dl)	40	78.4
Amount	51	100

Primary Data Sources 2019

Based on the results of the study, there were 40 people (78.4%) of hyperglycemia GDS examination results > 200 (mg/dl), more than normal < 200 (mg/dl), more details can be seen in table 6.

G. Independent Nutrition Management

Table 7: Distribution of Respondents Based on Independent Nutrition Management of DM Patients at the Tamangapa Health Center, Tamangapa Village, Manggala District, Makassar city

Nutrition Management	Pretest	Posttest
mean	9.4	12.51
median	9.0	13.0
StD	2,163	1,744
Min	4	8
Max	15	17

Primary Data Sources 2019

Based on the results of the study, data obtained the average value (mean) score of DM nutrition management knowledge of respondent's pretest 9.4 and posttest 12.51, thus there is an increase in score which is progress for DM nutrition management. The median value increased from pretest 9 to 13 posttest, meaning that it increased to a higher level. The Standard Deviation data from the pretest of 2.263 decreased to 1.77, meaning that the spread of the data that had been widen had a low value and a high value became narrowed around the mean value of 12.51 or in other words that the respondents were gathered in the highly knowledgeable group.

2. Bivariate Analysis

Table 8: Wilcoxon Statistics Test Results

	Pretest-Post Test
Asymp. Sig. (2-tailed)	0,00

Source: Primary data processed result

The data from this study were not normally distributed, so they could not be tested using the paired sample t test and replaced with the Wilcoxon Sign Rank Test and it can be concluded that there is the effect of health education on independent nutritional management of DM patients at the Tamangapa Public Health Center, Tamangapa Village, Manggala District, Makassar City with a value of = 0.00 (the value was tested using the Wilcoxon Sign Rank Test).

DISCUSSION

Independent Nutrition Management of DM Patients

The amount of glucose that is present in the blood of the patient or respondent should be somewhere in the range of 110 to 179 milligrams per deciliter (mg/dL). This scenario is really helpful for the continuous functioning of the metabolism that is already existing in the human body, so that's something that's definitely something to be thankful for. Patients who have high blood sugar will have challenges with their microvascular circulation since the blood cannot flow properly through the capillaries. This will cause the patients to have issues with their overall circulation. It is of considerable advantage because this helps to give oxygen and nutrients to essential sections of the human body. Patients have little choice but to exert significant effort in order to keep their blood sugar levels within the normal range, since there is no alternative treatment option available to them. Participants in this study who had blood sugar levels that were more than 200 mg/dL were at a larger risk of getting diabetes than those whose fasting blood sugar levels were lower than 200 mg/dL. This is as a result of the fact that each individual who took part in this study had a diagnosis of diabetes.

Independent Nutrition management of patients with DM before being given counseling Education is actually moderate. The typical patient comes from a variety of diverse groups in terms of education, age, and other factors, as was discussed above. According to the results of this study, the effect of *community health center* (Puskesmas) plays a role in the education and independent nutritional management of diabetic patients. This is the consequence of standard treatment administered by the Puskesmas, according to responders who already have a GDS that is below 200 mg/dL. This is defined as the situation. It is essential to maintain this at the same level, and even improve it, in order to allow the patient to revert to their original degree of stability. In the meanwhile, patients whose GDS

is more than 200 mg/dl should enhance the regularity of their medication and the nutritional care they obtain. Patients with a GDS of less than 100 mg/dl should not raise either factor.

In addition, the patient's willingness to control their health condition need to be reflected in the fact that patients participate in routine nutritional monitoring activities. However, the expense of purchasing foods rich in nutrients continues to be a problem in the majority of health situations (Bakr, 2015) particularly in developing nations like Indonesia, which is a significant factor in the prevalence of poor dietary patterns (Giles & Satriawan, 2015).

Patients' lack of awareness of their own health conditions, such as being obese or not understanding the benefits of fruit content for body health, especially in type 2 diabetes patients, was the cause of the low independent nutrition management in patients, according to Senadheera et al. (2016)'s findings. This was the cause of the low independent nutrition management in patients. This was particularly the case with individuals who had previously been identified as having type 2 diabetes.

The results of the current study provide credence to those of the earlier research by demonstrating a connection between inadequate nutritional management and factors such as educational background, age, and even gender. Due to the predominance of this educational independent nutritional management, it is feasible to realize an optimal glucose level in the patient's body, given the aforementioned premises. In assumption, the current research makes a contribution to the identification of key reasons that impact the nutritional treatment of individuals who have diabetes.

The effect of health education on the Independent Nutrition Management of DM Patients

According to Senadheera et al. (2016), the primary explanation for the low levels of autonomous nutrition management that patients demonstrate is the lack of knowledge that patients have about their own health difficulties. This lack of knowledge is the root cause of the low levels of autonomous nutrition management that patients demonstrate. Patients are not provided with sufficient information on their own health issues. Patients who have been diagnosed with diabetes mellitus may benefit considerably from increased information on the independent nutritional management that may be supplied by health education, as shown by the findings of this study. Diabetes patients cannot be cured with treatment; instead, the treatment must focus on helping the patient maintain a lifestyle that is as healthy as is practically possible. Even after receiving treatment, the great majority of patients leave the hospital without the knowledge necessary to control their blood sugar and keep it at a normal level. This is despite the fact that the vast majority of patients have diabetes. Even people who already have diabetes may benefit from this treatment. They are going to go on with the things that are customary for them and continue eating in the same way that they have been doing up to this point in time. in order to bring about a rise in the patient's blood sugar level, which had reduced as a direct consequence of the treatment that they had had while they were in the hospital. in order to do this, we need to raise the patient's blood sugar level back up. After a patient is discharged from the hospital, it is the responsibility of the medical staff to counsel the patient on how to make adjustments to their way of life, which may include their eating habits, the things they do for fun, and the amount of stress they allow themselves to experience. This is done to ensure that the patient's sugar levels in their blood do not reflect any abnormalities and to ensure that the patient's safety is not compromised.

Many different approaches to health education have been discussed during the course of this study. These approaches include not just the topic content but also the study hours, media, and delivery techniques to patients as well. It has been shown that increasing patient awareness utilizing these tactics for autonomous dietary management in diabetes patients may be possible. [Citation needed] As a consequence of this, it is suggested that individuals with prior experience in healthcare, students, and anybody else who may be interested in the topic take part in the study by utilizing the instrument.

This is in accordance with the findings of research carried out by Mutmainna (2018), which states that 36 respondents, which accounts for half of the percentage of respondents in 2 hospitals, were found to have low levels of food control, and 13 respondents, which accounts for 18.1 percent, had very high dietary control. This finding is in line with the findings of research carried out by Mutmainna (2018). This discovery is in line with the findings of the study conducted by Mutmainna,

therefore it shouldn't come as a surprise (2018). In addition to this, the degree of control over their diets that four of the respondents had been at a high level (5.6 percent of the total). In addition to this explanation, there were a total of 19 respondents who had intermediate diet control. These individuals were selected from the pool of total respondents. This is equivalent to 26.4 percent of the total number of respondents that participated in the poll. The fact that the total average value that was obtained was 4.7342 demonstrates that people who have diabetes mellitus have a low degree of control over their diets, as evidenced by the fact that the value was obtained. In addition, the fact that the value was obtained demonstrates that people with diabetes mellitus are more likely to be overweight. The findings of this study have led researchers to the conclusion that respondents who do not pay a great deal of attention to the quantity of sugar that they consume whenever they eat are examples of individuals who have poor dietary control. They do not place a great deal of attention on the amount of sugar that is present in the food that they put into their bodies on a daily basis, which is another way of saying that they do not worry about developing diabetes. It is the equivalent of being overweight or not appreciating the advantages that fruit content may provide for general body health, particularly for individuals who have type 2 diabetes.

CONCLUSION

Finally, the findings of the current study showed that there is an influence of health education on the independent nutritional management of diabetes patients at the Tamangapa Health Center, which is situated in Tamangapa Village, Manggala District, Makassar City. The location of this particular health center can be found in Makassar. Patients who have diabetes cannot be cured with therapy; instead, the treatment must concentrate on keeping the patient's lifestyle as healthy as is feasible. Even after getting treatment, the vast majority of patients leave the hospital without the information required to regulate their blood sugar and maintain it at a normal level. This is true even for those patients who have diabetes. They are going to go on with their typical activities and have their meals in the same manner as they have up to this point. in order to bring about a rise in the patient's blood sugar level, which had decreased as a direct result of the therapy that they got while they were in the hospital. After a patient is released from the hospital, it is the role of the medical team to advise the patient on how to make modifications to their way of life, including their diet, their activities, and their levels of stress. This is done to guarantee that the levels of sugar in the blood do not exhibit any anomalies and the safety of the patient.

SUGGESTIONS

It is recommended, for client, to be able to do a diet with the right amount, schedule, and type at home by consulting the number of calories, eating schedule and the right type of food consumed according to the size determined by the nutritionist at the Nutrition Installation, adding insight by increasing knowledge through mass media or information from the health team who will support appropriate actions to maintain DM patients in good glucose tolerance conditions. In the implementation of health education, appropriate learning media are needed, and the material used in this study has been proven to significantly increase knowledge.

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CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest with the topic or any associated objects upon the publication of this study.

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