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NUTRITION EDUCATION, PHYSICAL ACTIVITY AND DIETARY HABITS IN DIABETES MELLITUS PATIENTS

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ABSTRACT

The prevalence of Type 2 Diabetes Mellitus (T2DM) in Indonesian population aged 15 years increase based on a doctor's diagnosis, where DKI Jakarta is the province with highest prevalence of T2DM. Gorontalo Province itself experienced an increase prevalence of T2DM compared to Riskesdas 2013, the rose from 6.9%to 8.5%. This study aims to observe the effect of nutrition education on knowledge, physical activity and eating habits of Diabetes mellitus patients participating in Posbindu at Monano Health Center. This study uses a quantitative method with an analytical survey with a quasi-experimental approach.The sample of the study were diabetes mellitus patients who were participate in Posbindu. Using the total sampling technique where the population was sampled as many as 74 people then categorized 2 groups, intervention group and control group. Based on the results of bivariate analysis, obtained p value > α (α = 0.05) in the category of physical activity with test results showing p value = 0.271 > 0.05. The same thing also happened to carbohydrate intake with p value = 0.088 > 0.05. For knowledge and eating habits with fiber and protein intake, p < 0,05 was obtained. In conclusion, knowledge, eating habits with fiber and protein intake affect the provision of nutrition education to diabetes mellitus patients participating in Posbindu in the work area of Monano Health Center.

Keywords*: activity, diabetes mellitus, education, intake, knowledge*

ABSTRAK

Prevalensi penyakit Diabetes Melitus (DM) tipe 2 di Indonesia pada penduduk umur ≥ 15 tahun meningkat 0,5% (2013 – 2018) berdasarkan diagnosis dokter, sementara provinsi DKI Jakarta merupakan provinsi tertinggi kejadian DM tipe 2. Gorontalo sendiri mengalami kenaikan prevalensi diabetes jika dibandingkan dengan Riskesdas 2013, meningkat dari 6,9 persen menjadi 8,5 persen. Tujuan: Mengetahui pengaruh edukasi gizi terhadap pengetahuan, aktivitas fisik dan kebiasaan makan pasien Diabetes Melitus peserta Posbindu di wilayah kerja Puskesmas Monano. Metode: metode kuantitatif bersifat survey analitik dengan pendekatan quasi experiment (eksperimen semu). Sampel penelitian adalah pasien diabetes mellitus peserta posbindu. Menggunakan tehnik total sampling dimana populasi dijadikan sampel sebanyak 74 orang dibagi ke dalam dua kelompok yakni intervensi dan kontrol. Hasil: Berdasarkan hasil analisis bivariat, pengetahuan dan kebiasaan makan dengan asupan serat dan protein diperoleh nilai p < α (α = 0,05) sedangkan pada kategori aktivitas fisik didapatkan nilai p value = 0,271 < 0,05. Hal ini sama juga terjadi pada asupan karbohidrat nilai p value = 0,088 > 0,05. Kesimpulan: Pengetahuan, kebiasaan makan dengan asupan serat dan protein berpengaruh terhadap pemberian edukasi gizi pada pasien diabetes melitus peserta posbindu di wilayah kerja Puskesmas Monano tahun 2021.

Kata kunci: aktivitas, asupan, diabetes melitus, pendidikan, pengetahuan

INTRODUCTION

The International Diabetes Federation (IDF) explains that Diabetes Mellitus appears when insufficient insulin production in the pancreas or insulin cannot be used effectively in the body, DM exists as one of the considerable common chronic diseases in the world. Diabetes Mellitus is a degenerative disease that is tremendous concern because of part the four priority non-communicable diseases that are always increasing every year and the treatment to the world health in the current era (IDF, 2019).

Diabetes mellitus has now stepped into the global era and has evolved a world health problem issue. The incidence and prevalence of the disorder never stop flowing, especially in developing countries and countries that have already entered a culture of industrialization. Indonesia have efforts

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to achieve Universal Health Coverage (UHC) in 2030, 13,500 Integrated Development Posts (*Posbindu*) formed by the Ministry of Health to facilitate access for residents to carry out early detection of diabetes mellitus. In addition, people are encouraged to take CERDIK actions, namely regular health checks, stop smoke, physical activity at least 30 minutes a day, a balanced diet, get enough rest, manage stress well (Ministry of Health RI, 2018).

Approximately 422 million people in the world afflicted diabetes mellitus which is equal to in adult population amount increase around 8.5% that indicates the increment prevalence of DM in adult population. Estimated 2.2 million mortality cause of diabetes mellitus in age under 70 years, particularly in low middle economic countries. It is estimated will increase around 600 million people suffering with diabetes mellitus in 2035 (Ministry of Health RI, 2018). The American Diabetes Association (ADA) explains that every 21 seconds there is one person diagnosed with diabetes mellitus or nearly half of the adult population in America suffers from diabetes mellitus (ADA, 2019). Knowledge is the initial capital for respondents in carrying out a healthy lifestyle, attitudes, and practice in healthy lifestyle by implementing a strict and obedient diet diabetes. Knowledge is occurring after people sense a certain object as a result of "knowing". Knowledge about diet therapy can be obtained through consultation or education in health services (Notoatmodjo, 2012).

The prevalence of type 2 Diabetes Mellitus (T2DM) in Indonesian aged ≥ 15 years has increased from 1.5% in 2013 to 2.0% in 2018 based on doctor's diagnosis and DKI Jakarta is the highest prevalence of T2DM. The Gorontalo Province itself has experienced an increase when compared to the 2013 base on basic health survey, the increment diabetes mellitus from 6.9 percent to 8.5 percent (Riskesdas, 2018). Data from Analysis of Health Problems in North Gorontalo Regency in 2018, there were 2651 cases of T2DM out of a total of 28 diseases in North Gorontalo Regency and T2DM cases according to age were the highest at the age of 45-65 years (North Gorontalo Health Office, 2018).

Data from the Monano Public Health Center, North Gorontalo Regency in 2019 indicated that there were 74 people with diabetes mellitus, both type I and type II. According to the Monano Health Center, the number of diabetes mellitus patients continues to increase, compared to 2018 which reached 61 patients. The improving of patients DM is inseparable from the lifestyle that DM patients and their families live, considering that patients diabetes mellitus who live in rural areas have a lifestyle that majority eat a lot of sugar especially additional sugar and consume lots of carbohydrates are the dairy food consume by the societies. In addition to the lifestyle conditions of the village community, there are still diabetes mellitus sufferers who do not understand the meaning, intent and purpose of diet diabetes mellitus and lack of family support in implementing diet diabetes for patients. The aim of study was to assess effect of nutrition education on physical activity and dietary habits in diabetes mellitus patient.

METHODS

The research method used was quantitative research with an analytical survey with a quasi-experimental approach, namely an experimental research design conducted outside the laboratory to see the effectiveness nutrition education interventions programs on knowledge, eating habits and physical activity of Diabetes Mellitus Patients. In this model, before starting treatment, the two groups were given a pretest (baseline) to measure the initial conditions (O1). Furthermore, the experimental group was given treatment (X) and the control group was not given treatment. After finishing into one month the treatment, the two groups were given another test as a posttest (O2). With this scheme it can be seen that the effectiveness of the treatment was indicated by the difference between (O2 - O1) for experimental group and (O2 - O1) for control group. Intervention in the experimental group was carried out for one month. The experimental group will receive intervention with education about nutrition directly while the control group will be given brochures/ leaflets. After completion, a post test will be carried out as previously explained

The study was conducted in Monano Public Health Center, North Gorontalo Regency and carried out in February-April 2021. The population in the study was all diabetes mellitus patients who were participated in Posbindu the Monano Health Center as many as 74 T2DM respondents and the sample was taking by using total technique. The sample was categorized 2 groups, including intervention and control group. The intervention group 37 people, was given direct education and counseling interventions in the form of explanations related with diabetes mellitus and diabetes mellitus diet. Meanwhile, the control group was given brochures related to the diabetes mellitus diet. The intervention was carried out for 1 month. The research has obtained permission from the research code of ethics, the Ethics Commission Faculty of Public Health, Hasanudin University (KEPK UNHAS) with protocol number 19821041203.

RESULTS AND DISCUSSION

Table 1. Characteristics of Respondents Diabetes Mellitus Patients

Characteristics	Intervention Group		Control Group	
	n	%	n	%
Gender				
Male	5	13,5	9	24,3
Female	32	86,5	28	75,7
Level of education				
Elementary school	29	78,4	28	75,7
Junior high school	3	8,1	4	10,8
Senior high school	2	5,4	3	8,1
University	3	8,1	2	5,4
Occupation				
Yes	7	18,9	9	24,3
No	30	81,1	28	75,7
Duration suffering T2DM				
< 2 year	6	16,2	8	21,6
2 – 5 year	29	78,4	29	78,4
> 5 year	2	5,4	0	0

Table 1 was showed that percentage of the sexes of the two groups was mostly female in the intervention group of 86.5% and the control group of 75.7%. Characteristics of subject study based on education level in the intervention group were almost all in elementary school students, namely 29 people (78.4%), while in the control group, most of them were elementary school students, namely 28 people (75.7%). The characteristics of subject based on occupational in intervention group were amount 30 people (81.1%) did not work, while in the control group most did not work as many as 28 people (75.7%). Subject characteristics based on the duration of suffering diabetes melitus type 2 (T2DM) in the both groups were mostly 2-5 years as many as 29 people (78.4%).

Description of knowledge, physical activity and eating habits, namely intake of carbohydrates, protein and fiber in T2DM in the intervention and control groups before and after nutrition education was showed in Table 2. Education in this study focuses on diet/meal arrangements in T2DM which includes knowledge of the amount, type and schedule of meals or known as 3J (amount food consumption, time consumption, type of food). The results of the research presented in Table 2 was showed that in the intervention group there was sufficient increase in knowledge of 43.3% after educational intervention was carried out, increase percentage of knowledge in the control group by 16.3% after intervention. Before and after nutrition education programs, there were significant difference in knowledge p value = 0.276 before education, while after education p value = 0.000.

The physical activity and dietary intake before and after intervention was showed in Table 2. The intervention group there was an increase in moderate physical activity 7% after nutrition education, but in control group was increased also in the percentage of moderate physical activity 2% after nutrition education. The behavior change not different significant before and after intervention nutrition education which was carried out in the intervention and control groups with a p value = 0.271. The dietary intake was showed that in the intervention group there was increased in adequate food intake 10-15% after nutrition education, and there an increase in the percentage of adequate food intake in the control group 5% after nutrition education. The significant differences in food intake after nutrition education in the intervention and control groups, respectively, with p values = 0.088 (carbohydrates), 0.002 (protein) and 0.000

(fiber) after nutrition education, whereas before nutrition education was carried out in the control and intervention groups with p value = 0.713 (carbohydrate), 0.004 (protein) and 0.310 (fiber). The study indicates an increase in the score of food intake after nutrition education in T2DM. Nutrition education can increase food intake in T2DM. Table 2 was showed that nutrition education can increase knowledge about food choice in T2DM in Monano Health Center. There was a significant increase in knowledge about eating pattern in the intervention group.

Table 2. The difference before and after intervention in knowledge, physical activity and dietary intake

Variablel	Before	After	*p value*
	Mean ±SD	**Mean ±SD**	
Knowledge			
Intervention	56,75±15,68	73,78±8,77	0,000*
Control	60,54±16,06	62,29±14.26	0,002*
Physical activity			
Intervention	1,58±0,27	1,56±0,27	0,567
Control	1,54±0,15	1,51±0,15	0,156
Protein intake			
Intervention	47,45±10.48	65,73±17.84	0,000*
Control	56,56±15.67	53,71±14.91	0,389
Carbohydrat intake			
Intervention	250,40±51,03	274,41±59,63	0,063
Control	245,92±53,37	251,80±52,49	0,570
Fiber intake			
Intervention	9,62±4.48	26,29±8,96	0,000*
Control	10,60±3.72	16,94±9,89	0,001*

The age of research subject with T2DM was predominantly > 35 years old. Age is one of the factors that can affect knowledge because according to Mubarak (2017) with increasing age a person will experience changes in the physical and psychological (mentally) aspects, in this case the respondent's knowledge about diabetes mellitus diet management. The results were explained that nutrition education has a significant influence on physical activity in people with diabetes mellitus because education is an interactive process that can encourage learning process and an effort to increase attitudes, knowledge, and practice through strengthening experiences and practices (Potter & Perry, 2009).

The evaluation of results study in the counseling intervention process showed that 100% of patients did not know the schedule, type and amount of food that should be consumed, and were unable to manage food portions. Counseling accompanied by carbohydrate counting material to patients and families that cause they can able to change patient behavior and eating patterns. During the counseling process, examples of photographs of several portions of food, exchange standards, and household size were given (Agung, 2019). The successful of implementation developd nutrition education in this study can also be due to the fact that the intervention group has been given structured education about eating arrangements in patients with diabetes mellitus which was held in 4 meetings, each meeting 60 minutes, with different material, which was carried out using the group education method with lectures so that it was more frequent. discussing during the implementation of education between respondents and researchers. This was also evidenced by the answers to the knowledge score of the respondents who experienced an increase after given education. Based on a systematic review conducted by Norris, (2011) found that there was a different impact between education carried out in groups and

individually, especially those related to controlling diet and physical activity, which were considered better in the group approach.

Diabetes mellitus generally occurs when lifestyle and activity patterns have been established. Success in diabetes self-management requires the active participation of sufferers, families and communities. The health team accompanies patients in changing behavior towards daily activities. Changing activity can be made by comprehensive education and development. Education (counseling) and approach-based problem solving is the core for support behavior change (Soelistijo dkk, 2021). Behavior change is almost the same as the educational process and requires assessment, plan, implementation, documentation and evaluation. The success of education in achieving the target will be more able to ensure compliance with diabetes mellitus in carrying out the management of diabetes mellitus properly (Soelistijo dkk, 2021). Another characteristic factor was that most of the respondents age >35 years old, where with maturity a person's age can influence a person's psychology which can ultimately affect changes in attitudes for the better towards the intake they consume. The frequency of visits of people with diabetes mellitus to the Monano Health Center routinely makes them obtain information about the disease and its pharmacological and non-pharmacological management.

CONCLUSION

There was no relationship between nutrition education and eating habits (carbohydrate intake) and physical activity of diabetes mellitus patients participating in Posbindu in the Monano Health Center work area. Meanwhile, patient knowledge of eating habits (fiber, protein intake) has a relationship to nutrition education. It is necessary to carry out intensive education about diabetes mellitus in relation to its nutrition. Improving public health services, especially in nutrition programs to increase knowledge about diabetes mellitus in Posbindu participants.

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