16. The nutrition care process (NCP)

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The Nutrition Care Process (NCP) Impact to the Dietary Behavior of Diabetes Mellitus Patients

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ABSTRACT

Background: The regulation number 24 in 2015 obliging the Community Health Center or *Pusat Kesehatan Masyarakat* in Indonesia to handle Diabetic patients affects the changing in nutritional care system including the Diabetes Mellitus management.

Objective: The purpose of the study is to know the effect of the Nutrition Care Process (NPC) on knowledge, attitude, behavior and blood glucose of patients with DM.

Method: This experimental study used the Pre and Post Test Control Groups Randomized Design to 44 diabetic patients of treatment and control groups. The treatment group was given the NCP and the data of knowledge, altitude, and behavior and blood glucose were measured twice. The independent T-Test was applied to analyze the effect of NCP.

Result: The study found that no differences between control and treatment group at the beginning of the survey. The independent T-Test showed that the NCP affect attitude and behavior of Diabetic patients significantly, but the knowledge did not produce any different result between control and treatment group. Fasting blood glucose level was significantly different while the 2-hour postprandial blood glucose level shows no difference.

Conclusion: It is concluded that NCP should be applied in the Community Health Center as one of procedures to provide the high-quality nutritional care.

Keywords: *NCP, Behavior, Diabetes Mellitus*

INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease that cannot be cured, but blood sugar levels can be stabilized to normal. Maintaining blood sugar levels require medication adherence and diet as a self-management process [(1)]. Useful independent DM management is possible if individuals have the knowledge, skills to perform DM control behaviors independently [(2), (3)]. Compliance of DM patient diet in many studies conducted was still small, for example, the research carried out in Banyumanik Sub-district of Semarang showed the high percentage of respondents who did not become obedient in the implementation of DM diet achieving 91.4% [(4)]. Another study conducted on 100 Indonesian DM patients visiting the Diabetes Polyclinic, who adhered to the implementation of diabetes mellitus diet only 37% of patients and non-adherent to the implementation of DM diet as much as 63%[(5)].

The Nutrition Care Process (NCP) is a comprehensive and individualist approach to increased awareness and behavioral change. The role of nutritionists is crucial in helping the process of healing the patient through nutritional services. Effective, efficient, and integrated nutrition services through Nutrition Care Process (NCP) are proven to reduce disease complications [(6)]. The application of NCP has so far had a positive impact on the patient's nutrition service system at the Hospital. Research at Sultan Agung Semarang Islamic Hospital showed that there was an increase of energy and protein

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intake of chronic renal failure patients after nutritional intervention following NCP procedures at 12% average. Increased intake of nutrients will positively affect improving the nutrition of patients so that it may help speed up the healing process of patients [7].

This study is to determine the effect of food treatment through NCP on changes in attitude knowledge, diet compliance and blood sugar levels in patients with Diabetes Mellitus in Community Health Centers.

METHODOLOGY

This experimental study used pre and post randomized controlled randomized design. The study was conducted at two health community centers in Genuk sub-district, Semarang city. The test was performed on forty four participants under chronic disease service program who have met the inclusion criteria of Diabetes Mellitus. The selected samples were then randomly assigned to the control and treatment groups. The data collected include identity data, knowledge, attitude, diet behavior and blood sugar level of patients taken before and after treatment by interview method. In the treatment group after the data were taken at the next stage 1, Nutrition Care Process (NCP) was given a treatment of nutritional care service. NCPs included nutrition assessment, diagnosis of food, dietary interventions based on the diagnosis of nutrition and evaluation monitoring. Nutrition intervention includes nutrition education, nutrition counseling. In the other hand, the control group only gets the standard service of chronic disease service program. Hypothesis test employed the independent t-test analysis with 0.05 confidence level.

RESULTS

Nutrition service standards at Community Health Centers, especially in patients of chronic disease service program of Diabetes Mellitus patient at Bangetayu and Genuk Health Center, include assessment of patient's nutritional status, investigation (blood pressure and blood glucose level) and nutritional counseling. Thus, the nutritional services undertaken have not been based on the nutritional problems experienced by patients but based on medical therapy. The nutrition services using Nutrition Care Process model (NCP) given to the treatment group in this study are:

1. Assessment: i.e., identification of nutritional problems related to nutrient intake and bioactive substance, clinical aspects (observing the results of nutritional status measurement, laboratory examination, and support), behavioral and environmental issues and causes.
2. Diagnosis of nutrition: determining the nutritional problems based on assessment results.
3. Interventions: given nutritional counseling according to the patient's nutritional diagnosis and nutrition education about DM diet.
4. Monitoring and evaluation: results of the interventions provided are monitored and evaluated through diet after the intervention, laboratory outcomes and changes in knowledge, attitudes, and behavior.

The treatment group of women mostly equal to 36,4% and in control group mostly women as big as 34,1% Scores of nutritional knowledge, attitudes and dietary compliance of study subjects before treatment presented in Table 1.

Table 1: Knowledge, attitudes, and adherence to treatment

Variables	Treatment (n = 22)		Control (n = 22)		p
	Mean	SD	Mean	SD	
Knowledge	8	3.8	10.6	6.0	0.095
Attitude	26.5	2.8	27.3	4.3	0.481
Dietary compliance	26.9	3.9	27.1	4.3	0.885

The mean score of knowledge before treatment in control group was higher than treatment group that was 10.6 + 6.0, but statistically there was no difference (p = 0.095). Similarly, the mean scores of attitudinal and obedience scores were also greater in the control group with the mean of 27.3 + 4.3 and 27.1 + 4.3 respectively. These results show the sample at the beginning of the study was not different between control and treatment groups (homogeneous). Blood sugar levels of the subjects of the study before treatment were presented in Table 2.

Table 2: Fasting blood sugar and blood sugar Levels before treatment

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Fasting blood sugar	186.8	62.3	150	59.9	0.060
Blood sugar 2 hours postprandial	186.5	66.7	158.4	58.8	0.145

Table 2 shows the mean fasting blood glucose level in the treatment group was higher than the control group that was 186.8 g / dl + 62.3. Similarly, the average blood glucose level of 2 hours postprandial was also greater in the treatment group with the mean of 186,5 + 66,7. However, statistically there was no difference (p = 0.060 and p = 0.145). Research subjects both in the treatment and control group were re-measured for nutritional knowledge, attitude, and diet compliance after being treated where the results were presented in Table 3.

Table 3: Knowledge, attitudes and diet compliance of study subjects after treatment

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Knowledge	10.36	3.7	10.36	5.6	1
Attitude	30.86	2.4	26.86	3.7	0.040
Dietary compliance	31.22	2.97	28.18	4.69	0.014

Table 3 shows that the mean score of knowledge was almost the same score of 10.36 + 3.7 and in the treatment group and 10.36 + 5.6 in the control group. Statistical analysis showed no difference in both groups (p = 1). The average score of attitudes and diet compliance was higher than the control group that was 30.86 + 2.4, and 31.22 + 2.97 Statistical analysis showed that there was a difference in both groups after treatment (p = 0.04 and p = 0.014).

The influence of nutrition service model NCP on group treatment knowledge increased compared to control group that decreased. There was an increase in the mean of knowledge scores in both control and treatment groups after receiving treatment of nutritional services with NCP. The result of the statistical test showed inconsistent results where the result is not significant at P-value = 1.00. These results contradict previous studies that found a significant relationship between counseling and knowledge [3]. The influence of nutrition service model NCP on the attitude of treatment group increased more than with control group. There is an increase in the normal view stance in case and control groups after receiving NCP nutritional services. The result of hypothesis test shows that there is a significant influence of attitude on control group and treatment after receiving Nutritional Care with NCP model (P Value = 0.04) Hypothesis test demonstrated a major impact of the provision of NCP with dietary compliance of DM patients in the Health Community Center with P value = 0.014. Table 4 shows the mean fasting blood glucose level and 2 hours post prandial blood glucose concentrations in the lower treatment group after being given NCP model nutrition services compared to controls that received the standard nutritional services of the Health Community Center.

Table 4: Fasting blood sugar and 2 hours postprandial blood sugar

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Fasting blood glucose	126.09	32.7	175.63	66.07	0.04
Blood glucose 2 hours postprandial	180.82	76.89	198.64	76.09	0.44

The mean fasting blood glucose level of the treatment group was 126.09 g / dl + 32.7 lower than the control group, and there was statistically different in both groups. The mean blood glucose level of 2 hours postprandial treatment group was 180,82gr/dl + 76,89 lower than the control group, and statistically, there was no difference in both groups.

The results of statistical tests showed a significant effect of NCP nutrition service on fasting blood glucose level (P Value = 0.04) while at 2-hour polyurethane postprandial level although there was a decrease in g[13] sugar statistically did not show a significant effect (p-value = 0.44).

DISCUSSIONS

The results of the study found that chronic disease service system performed in the two Health Community Centers is a medical service in the form of drug services and medical examination. Nutrition services that run in the kind of group services are counseling. Food services in the form of NCP should be applied to patients with chronic diseases that are more individual. This personal service will give positive results both on knowledge, attitude, and behavior. There is one fundamental difference between the standard of the nutritional service of the Health Community Centers and the NCP. The level of nutrition services in Health Community Centers is located on "what should be done" and is a component of care in certain diseases. Nutrition Care Process (NCP) is a standardized process, further demonstrating "how nutritional care is done." In essence, the NCP accurately displays the nutritional care spectrum that emphasizes the consistent and accurate steps of dietitians when delivering nutritional care, as well as guidelines in nutrition education and other preventive nutrition care venues.

Although the results of the study were statistically no difference betw[7]n the control group and the treatment of knowledge, there was an increase in the mean of knowledge scores between the baseline data and the final data. Experience as an individual's cognitive part is influenced by adequate information from anyone. An increase in the knowledge scores provides evidence of the development of disease-related information obtained by the sample.

The NCP which is a standardized nutrition service begins with a nutritional assessment to find nutritional problems in samples that are technically made in a nutritional diagnosis. The Nutrition intervention given is based on the etiology present in the nutritional diagnosis, so the approach is so specific and individual that it will encourage a change of attitude. According to the theoretical model of persuasion communication with the cognitive theoretical approach, that stimulus that produces cognitive responses such as nutrition education will produce behavioral changes. Inadequacy with previous studies is possible because the interventions given in NCPs depend on approaches and objectives where the emphasis is focused on behavior change rather than on knowledge change. This occurrence is in line with a finding [8] that with the NCP service can improve changes in drug-taking behavior in Diabetes Mellitus patients.

According to Theory of Reasoned Action (TRA), individual attitudes and norms towards a disease affect dietary adherence. Decision theory also mentions the patients themselves make decisions about what to do in the treatment business. This notion is related to the communication that exists between the patient and the health professional. If patients are well informed about procedures, risks, and effectiveness of the engagement as done in the NCP intervention, then they will make the right decision. In the NCP nutrition assessment carried out not only leads to the proper enforcement but also in nutritional diagnoses.

CONCLUSIONS

1. There is an increase in attitude score, knowledge, dietary behavior after being given a nutritional service model NCP. Also, there is an improved dietary adherence after being given a nutritional service of NCP model.
2. There is a decrease in fasting blood glucose levels after being given a dietary service model NCP, and also there is a reduction in fasting blood glucose levels after being given a nutritional service of NCP model.
3. There is an influence between the application of NCP in chronic Diabetes Mellitus patients with knowledge, attitude and dietary behavior as well as increased blood sugar after being given NPC model of nutrition service.

Nutrition officers of Community Health Centers are recommended to provide food services as echoed by NCP model, especially in patients of chronic disease service program because it proved to increase knowledge, attitudes and dietary compliance of Diabetes Mellitus patients. Given these changes will have an impact on the achievement of healthy blood sugar levels.

Conflict of Interest: The author has no conflict of interests related to the conduct and reporting of this research.

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Ethical Clearance: Before conduct of the study written permission was obtained from Politeknik Kesehatan Kementrian Kesehatan Semarang, Indonesia. Consent and willingness were established from all the subjects who meet inclusion criteria of this study.

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