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Submission date: 12-Mar-2019 12:15AM (UTC+0800)

Submission ID: 1091462804

File name: 26.pdf (2.24M)

Word count: 3600

Character count: 19900

The Effect of Theory of Reasoned Action Implementation on Dietary and Physical Activity Adherence in Patients with Diabetes Mellitus Type 2

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Abstract—Most of patients with type 2 diabetes failed to follow the dietary recommendation due to lack of motivation, memory and intention. Thus, level of obedience still low. Being physically active requires a combination of difficult tasks such huge expenditure of effort, and continued persistence (McAuley & Blissmer, 2011). There is needed any health related program to increase client's motivation and to improve intention to adhere dietary suggestion throughout the application of Theory of Reasoned Action. The purpose of this study was to analyze the influence of Theory of Reasoned Action on the dietary and physical activity adherences in patient with Diabetes Type 2. The population were patients with type 2 diabetes mellitus in one of medical wards at RSI Jemursari Surabaya in November 2016 as many as 23 respondents. 20 respondents were gained by using purposive sampling technique according to inclusion and exclusion criteria, and divided into two groups, control and treatment group. The independent variable was the implementation of the Theory Of Reasoned Action. The dependent variables were (1) dietary adherence, (2) physical activity adherence, and (3) blood glucose levels. The dietary and physical activity adherence were identified by using questionnaires, and blood glucose monitoring devices was used to identified blood glucose level. Wilcoxon Signed Rank Test showed the differences between pre and post intervention in all dependent variables in treatment group. In addition, Mann Witney U test also showed the differences between control and treatment gorup in all dependent variables. Implementation of Theory of Reasoned Action can improve dietary and physical activity adherence in patients with Diabetes mellitus type 2. Further studies are expected to place more number of samples and measure all variables in the Theory of Reasoned Action.

Keywords— theory of reasoned action; adherence; physical activity; diet; blood glucose; diabetic mellitus

I. INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia due to defects in insulin secretion, insulin action or both.[1] Type 2 diabetes is a type of diabetes most often occurs and the number is increasing every year.[2][3] Diabetes mellitus requiring lifelong management.[4] Diabetes management could deliver maximum results when coupled with client adherence to

therapy is recommended by health professionals. Research conducted by reference [5] about the compliance of patients with DM in diet and physical activity, showed that 64.4% of patients with DM was not better adherence to regular physical activity and 63.3% of people with diabetes do not obey the diet. Although knowledge of the patient is good, because the patient is often get counselling, but the submission of the patients are still lacking, so patients need to be motivated again to be more obedient in the treatment of diabetes.[6]

Reference [7] showed the survey results the prevalence of Diabetes mellitus in Indonesia increased by 1.1% compared to 2007. East Java province has increased the proportion of patients with DM of 1.3% in 2007 to 2.5% in 2013. Surabaya still ranked first with the highest diabetes cases in East Java that reached 12 thousand cases per year, followed by Bangkalan.[8] Preliminary study showed that there were 460 cases Diabetes Mellitus Type 2 from January – October 2016 with an average of 35 cases every month in one of medical ward in RSI Jemursari, Surabaya, Indonesia.

Ajzen and Fishbein's Theory of Reasoned Action, assume the behavior is determined by the individual's will or intention to perform or not perform a specific behavior or vice versa. The desire is determined by two independent variables including attitudes and subjective norms.[9] Theory of Reaosned Action has the advantage of other behavioral theory because it has been used extensively to predict and explain the desire to act and actual behavior in social psychology.[10][11]

Obedience is a positive attitude so that the disease's healing process is faster and controllable.[12] There are several factors that affect adherence to treat diabetic mellitus client namely demographic factors, psychological, social. Demographic factors include ethnic tribe, economic and educational status. Psychological factors include the level of stress and social factors include family support.[13][14] Diabetes mellitus client tends to have adherence problems in disease treatment so that the risk of complications rose. People with diabetes still do not comply in physical activities enough, though physical activity have a beneficial impact in controlling blood sugar levels, which when physical activity occurs will raise the use of glucose by the active muscles,

causing a decrease in blood glucose. The diet in patients with diabetes is not easy, because patients with diabetes will feel the saturation in implementing diabetes mellitus diet because food intake is severely restricted.[15] Theory of Reasoned Action is considered by researchers a model to improve diabetic mellitus patients compliance in the management of the disease so that therapeutic efficacy can be achieved. application of the Theory of Reasoned Action against Diabetes Mellitus client can not be explained so that researchers intends to conduct research by applying the Theory of Reasoned Action to increased compliance of diet and physical activity in patient with type 2 diabetes mellitus.

II. METHOD

This type of research is use the type of quasy Experimental research with pre and post pattern control one group design. Dependent variables in the study are diet and physical activity adherence. Independent Variables Application of Theory of TRA (Theory Of Reaction Action). The population in this study are patients with type 2 diabetes in one of medical ward RSI Jemursari, Surabaya, Indonesia in November 2016 as many as 23 people. Sampling techniques in this study using a non-probability sampling, which is purposive sampling. The sample in this study were 20 respondents based on inclusion criteria:

1. Age > 35 years
2. History of Diabetes Mellitus for > 2 years
3. Able to read and write
4. Able to communicate and have fully consciousness
5. Actively mobilize

Exclusion Criteria:

1. Patients with mental disorder

Sample amount which used in the control group are 10 respondents and 10 respondents are used for treatment groups. The instrument used in this study is an Unit Activity Event, the application of Theory of Reasoned Action by using booklet as a media. Data analysis using statistical test of Wilcoxon signed rank test and the Mann Whitney U with significant value ≤ 0.05 .

III. RESULT

Demographic data Showed that most of the respondents were female, the majority education are primary school and junior high school or primary education, age range of respondents entirely in adulthood end toward the elderly that is more than 35 years and all respondents classified as chronic patients suffering from, or detected have Diabetes Mellitus over 2 years.

Most respondents of treatment group experienced an increase in dietary compliance. Pre-test results showed that diabetic patients who have poor dietary adherence level of 70% or as much as 7 and the remaining 30% (3 respondents) have adequate dietary adherence level. After did intervention to all respondents, post-test questionnaires study conducted to

understand their dietary compliance to notice a change in dietary adherence level of every respondents. The results of the post-test was all of the respondents which is 10 (100%) had a good level of compliance diet entirely. The control group, indicating that most respondents control group remained unchanged at the level of dietary compliance or still the same as before. Pre-test results using dietary compliance questionnaire to 10 patients with diabetes showed that patients with diabetes who have poor dietary adherence were 100% or completely. The results of the post-test has been done is 9 people (90%) still have a bad diet and the level of compliance by 1 person (10%) have a good dietary compliance.

Most respondents from treatment group experienced an increase in physical activity. Pre-test results showed that diabetic patients who have poor physical activity were 100% or all of the respondents still have poor compliance. After did intervention to all respondents post-test study of physical activity was conducted with adherence questionnaire to see any changes in the compliance level of physical activity of respondents. The results of the post-test were 10 respondents (100%) had a good level of physical activity.

Whereas in the control group, indicating that most respondents of control group remained unchanged at the level of physical activity or permanent adherence. Pre-test results using a questionnaire of physical activity adherence to 10 patients with diabetes showed that patients with diabetes who have poor adherence levels of physical activity were 100% or all of them. The results of the post-test which has been done were 9 respondents (90%) still don't have physical activity adherence and the level of compliance by 1 person (10%) had good physical activity adherence.

Most respondents of treatment group experienced decreasing in fasting blood glucose (FBG). The pre-test using blood sugar stick to the 10 patients with diabetes showed that patients with diabetes who have poor FBG were 80% or as much as 8 people and the remaining 20% (2) has moderate fasting blood glucose level. The results of the post-test were 6 respondents (60%) had good FBG levels, 3 respondents (30%) had moderate FBG, and 1 (10%) still have bad FBG levels.

While the control group showed that 6 (60%) had poor blood sugar levels and 4 persons with moderate blood sugar levels. After that, the control group respondents were conducted post-test blood glucose sticks to see the change in FBG. The results of the post-test which has been done were 5 respondents (50%) had bad FBG levels, 3 respondents (30%) with moderate FBG, and 2 respondents (20%) had good FBG levels.

IV. DISCUSSION

There is effect of applying TRA (Theory of Reaction Action) against the client dietary compliance. This is due Theory of Reaction Action has several components including attitudes, subjective norms, and intentions that are applied researchers through health education using the media booklet with methods of sharing brainstorming with clients and also demonstrations. According to reference [16], health education is an activity or effort to tell about health with the aim to gain knowledge of better health. Such knowledge is ultimately

expected to affect the behavior. This is reflected in the respondents answers to the questionnaire dietary compliance indicating that respondents always apply the principle of 3J. This is supported by researchers media booklets provide health education to increase knowledge about dietary compliance. These respondents are always excited when following the intervention. An increase in dietary compliance among respondents age is influenced by factors which in middle age healthy awareness and motivation to increase after receiving health education.

Based on the sharing of respondents after the implementation of the previous TRA, respondents have the will, enthusiasm and motivation to change their diet that does not comply with the diabetes mellitus diet recommended so blood glucose levels can be controlled and avoid the complications of diabetes. Reference [17] said that the intention of the individual to show a behavior is a combination of gesture to show that behavior and subjective norm. Individual attitudes toward behaviors include beliefs about a behavior, evaluation of the results of the behavior, subjective norm, normative beliefs and motivation to comply. If one perceives that displays a result of the positive behavior it will have a positive attitude to such behavior. The opposite can also be stated that if a negative behavior contemplated. The increasing lifespan will also increase the maturity of a person in thinking and working. In contradiction, increasing age can also occur decreasing of person's memory. A decrease in a person's memory will lead to problems of non-compliance diet DM. Along with increasing age can affect a person's cognitive abilities, while the cognitive level has an influence on dietary compliance.

A. Clients Physical Activity Adherence

The results showed no effect of applying theory of reasoned action to adherence of physical activity, which in this case physical activity that researchers assessed is diabetic foot gymnastics. Researchers conducted a demonstration and teach to respondents how to do diabetic foot gymnastics. Control skills such as planning and scheduling, inhibition, memory, attention, and switch tasks necessary to change behavior. Cognitive function, to be precisely executive function, it may have the potential to affect an individual's ability to successfully launch and maintain, physical activity behavior change. Cognitive control is very important during the early stages of behavior change when new behaviors, such as physical activity, was adopted.

Post-test Results obtained indicate respondent no.5 treatment group scored the highest compliance level of physical activity, the respondents were female at the age of 51 years, junior high school education, live at home with her child and husband, long-suffering classified as chronic namely from 2012. Based on sharing between respondents and researcher, the respondents told the reason why she entered hospital was half of her body, down to the feet felt weak she could not walk and felt dizzy. According to reference [18] because it depends on glucose, the brain begins to stop working properly and begin to show symptoms such as leg weakness, blurred vision, confusion until the headache. Respondents have enthusiasm in following the intervention of

researchers through diabetic foot gymnastics demonstration are included in the booklet media. When confidence in the ability of a strong personal influence themselves bring the desired results, assuming one has the motivation and skills to perform the behavior. Respondents have the motivation to do diabetic foot gymnastics because researchers explain the benefit from these exercises. Diabetic foot exercises can be an alternative for patients with diabetic mellitus to improve blood flow and improving blood circulation, it makes more capillaries meshes open so more insulin receptors are available and active. This will facilitate the nerves to receive nutrients and oxygen which can improve nerve function (Guyton & Hall, 2006).[19]

Based on the experience of researchers from share with clients, obtained that client feel lazy to do exercises that have been demonstrated by researchers, client said prefers a diet alone rather than doing diabetic foot gymnastics. Clients also said they wanted to go home and back to work. According to the researchers this is because of the attitude that has not been fully formed from the client so that the client confidence about diabetic foot gymnastics training is not executed.

B. Blood Glucose Level

The results showed there are effect of applying Theory of Reasoned Action towards compliance diet and physical activity, which with embossed adherence behavior will result in decreasing sugar levels. This is consistent with the significant value in Table 5.4 statistical Mann Whitney U test = 0.650, indicating that at the time of the pre-test the two groups are identical and the value of significance are 0.038 during the post-test, which means there are differences in adherence of physical activity between the treatment group and the control group. So that the statistics show that the application of the Theory of Reasoned Action provides a significant difference between the treatment group and the control group.

There was a decrease in blood sugar levels in patients with type 2 diabetes before and after the intervention in the treatment group. The result of this decreasing in blood sugar levels as a parameter of the successful application of Theory of Reasoned Action with health education through the media booklets and diabetic foot gymnastics demonstration of compliance with diet and physical activity on the respondent groups. Most respondent treatment groups experienced a decrease in blood sugar levels. Compliance is an extent to which the behavior of the patient in accordance with the provisions given by health professionals. There are several factors that support compliance, education, accommodation, modification of environmental and social factors, changes in therapeutic models and increase the interaction between professional health provider with the patient's. Similarly, client compliance in an effort to control the blood sugar is very dependent and supported by various things. The importance of knowing the blood glucose levels for people with diabetes in order to ensure that the blood glucose is in a state close to normal. If blood glucose is not controlled properly, can cause diabetic mellitus patient at more severe stage. Mortality in patients with diabetic mellitus occurs indirectly as a result of hyperglycemia, but dealing with the complications that occur. Compliance clients by feeling forced

or lack of knowledge about such behaviour cannot guarantee that the client will comply onwards. Compliance clients will certainly affect the health condition of the client, for example, if the client is not obedient then it would be bad for his health it can cause serious complications. However, it can be prevented if clients adhere to exercise, diet and therapy. The results of the post-test have been done, there are 6 respondents who have good score of fasting blood glucose levels, 3 respondents have moderate blood glucose levels, and 1 respondent still have bad blood glucose levels. In the treatment group 1 respondent who did not experience a significant blood glucose decline or remain in the bad category was the respondent no. 2. The respondents are female, late adult age categories, her last education was junior high school education. Based on current experience of researchers, the respondents have difficulty applying the principle 3J. Sharing that conducted between respondents and researchers it was known that the respondents are accustomed to ate more than the portion scheduled by the hospital, she admitted that she got bored to be always adhere to the hospitals food menu because it was less tasty, clients were also said to do gymnastics just for a while not until completed the order, the client said she wanted to go home and back to work but still had to undergo treatment. In accordance with the characteristics of respondents and experience as the researchers proceeds, the absence of a significant reduction in fasting blood glucose level of respondents is due to the diet, activity and stress factors.

V. CONCLUSION

Theory of Reasoned Action can improve dietary adherence, adherence to physical activity as well as decline blood glucose levels significantly through health education with media booklet. Application of the Theory of Reasoned Action is able to change individual attitudes toward behaviors include beliefs about a behavior, evaluation of the results of the behavior, subjective norm, normative beliefs and motivation to comply. Thus the intention in diabetic patients regarding positive results to do diet and physical activity properly

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