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Development Of Community Empowerment Intervention Model Through Diabetes Millitus Cades And The Effect On Mellitus Diabetes In Medan City

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Abstract

Diabetes mellitus is a metabolic disease that causes death, insulin, or insulin, which is characterized by increased blood sugar levels or hyperglycemia (Kim, 2007). The prevalence of people affected by diabetes mellitus reached 366 million in 2011 and is expected to increase to 552 million by 2030. Diabetes mellitus, higher levels of hyperglycemia in patients with diabetes mellitus will experience financial difficulties such as retinopathy, nephropathy, and neuropathy. This will burden patients and families associated with health, psychological, and financial problems that cause long-term illnesses. The general objective of this study is to develop a model of community empowerment intervention through cardiology of diabetes mellitus and coordination of its influence on the safety protection of patients with diabetes mellitus. This study used a pseudo experiment, by designing the Pretest-posttest Separate Sample Control Group, which was conducted in 2 groups namely the intervention group and the control group. While the intervention group consisted of education The form of DM cadres with pretest and posttest, while the control group was a check of blood sugar levels. In the study were all people with diabetes mellitus in the Mulio Rejo District Health Center, Sunggal District, Deli serdang that was attended by 200 people.And a sample of 67 people was taken purposively. Data analysis was performed in unuvariate and bivariate using chi-square test, and multivariate using multiple logistic regression at the trust level 95% (a = 0.05)

Keywords: *Development of intervention models, Community Empowerment, Through health cadres, Against Diabetes mellitus*

1. INTRODUCTION

One non-communicable disease that epidemiologically continues to increase from year to year and is a global problem today is diabetes mellitus. Diabetes mellitus is a chronic metabolic disease caused by failure of insulin production, insulin action, or both (ADA, 2008), which is characterized by high blood sugar levels or hyperglycemia (Kim, 2007). The prevalence of people affected by diabetes mellitus reached 366 million in 2011 and is expected to increase to 552 million by 2030 (Olokoba et al., 2012). According to Shaw et al., (2010) and Whiting et al., (2011) an increase in the prevalence of diabetes mellitus will be more common in developing countries, one of which is Indonesia.

The trend of increasing prevalence of diabetes mellitus also occurs in Indonesia. According to the Ministry of Health of the Republic of Indonesia (2013) through Basic Health Research the prevalence of diabetes increased by 1.1% in 2007 to 2.4% in 2013 and the prevalence of diabetes mellitus in North Sumatra province by 2.3%. Meanwhile, according to Sachdev (2009) of all people with diabetes mellitus, the prevalence of type 2 diabetes mellitus is greater than that of type 1 diabetes mellitus which is 95%. The high prevalence of type 2 diabetes mellitus is due to unhealthy lifestyles such as lack of physical activity and obesity.

Chronic hyperglycemia is a gateway for various complications that arise in people with diabetes. Three typical complications occur in diabetes mellitus, namely retinopathy, neuropathy, and nephropathy. Retinopathy occurs due to excess glucose that attacks the lens or damage to blood vessels in the retina. Nepropathy is caused due to damage to blood vessels in the kidneys due to excess glucose accumulation. Besides diabetes mellitus can also cause atherosclerosis and cardiovascular disorders such as cerebrovascular insufficiency, ischemia, vascular disease, and gangrene (Tortora and Derickson, 2006).

Complications of diabetes mellitus can be prevented through management of glucose control through lifestyle and behavior changes such as regular physical activity, healthy eating patterns, and glucose monitoring (Islam et al., 2013; Mcdermott et al., 2015; Norris et al., 2006). According to Smalls et al. (2015), the implementation of glucose control management often experiences obstacles

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that occur in patients and the provision of health services. Obstacles in patients are usually caused by a lack of knowledge related to diabetes mellitus, low self-management abilities, and low motivation to change behavior. Meanwhile, barriers to health care providers are usually caused by low numbers of medical personnel and lack of screening for diabetes mellitus patients. Norris et al. (2006) emphasize that lack of access to the provision of health services is one of the factors causing the failure of glucose control management for patients with diabetes mellitus. Intervention by empowering the community is one of the strategies in improving individual health. Society has an influence in changing an individual's health behavior (Norris et al., 2006). The manifestation of community empowerment is the formation of health cadres. Health cadres are community members who act as liaison between health service providers and the community. Health cadres become the main solution to overcome the limited human resources in the health sector, especially in carrying out health promotion activities such as community education, informal counseling, social support, and advocacy (Albright et al., 2009). Health cadres can be easily accepted by patients because they have similarities in culture, language, and are familiar with the characteristics of the local community so that communication is more effective than health workers (Rothschild et al., 2014).

Various studies have shown that health cadres have an important role in glucose control management. Research conducted by Mcdermott et al. (2015); Rothschild et al. (2014); and Smalls et al. (2015), proved that involving health cadres in glucose control management is effective in maintaining controlled glucose levels in diabetic patients. Further other research by Depue et al. (2013), collaboration between nurses and health cadres in glucose control management interventions can significantly improve glycemic control in diabetic patients.

2. LITERATURE REVIEW

2.1.1. Type 2 Diabetes Mellitus

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia together with carbohydrate, fat, and protein metabolism disorders caused by defects in insulin secretion and insulin action (Alberti, 2010). According to Boron and Boulpaep (2009), diabetes mellitus is characterized by high blood glucose concentrations, but this abnormality is only one of the many biochemical and physiological disorders that occur in this disease. Based on Guyton and Hall (2011), diabetes mellitus is a syndrome of failure of carbohydrate, fat, and protein metabolism caused by a lack of insulin secretion or a decrease in tissue sensitivity to insulin. According to Boron and Boulpaep (2009), diabetes mellitus is characterized by high blood glucose concentrations, but this abnormality is only one of the many biochemical and physiological disorders that occur in this disease. According to Guyton and Hall (2011), in general, there are two types of diabetes mellitus, namely:

1) Type 1 diabetes mellitus, also known as insulin-dependent diabetes mellitus (IDDM), is caused by a lack of insulin secretion.
2) Type 2 diabetes mellitus, referred to as non-insulin-dependent diabetes mellitus (NIDDM), is caused by decreased sensitivity of the target tissue to the metabolic effects of insulin. Reduced insulin sensitivity is usually referred to as insulin resistance.

According to Boron and Boulpape (2009), type 1 diabetes mellitus is caused by damage to pancreatic β cells mediated by the immune system. The consequence of the absence of insulin, associated with glucagon, is that hunger quickly occurs. According to Guyton and Hall (2011), type 2 diabetes mellitus is more common than type 1 diabetes mellitus, ranging between 90-95% of all cases of diabetes mellitus. In most cases, the incidence of type 2 diabetes mellitus occurs after the age of 30 years, more often between the ages of 50-60 years.

2.1.2. Signs and Symptoms

Many self-meals are caused by calories from food consumed, after being metabolized into sugar in the blood it cannot be fully utilized, so sufferers always feel hungry. Other complaints from diabetes include tingling, vision problems, ulcers, and others (Subekti, 2005).

2.1.3. Complications

Angiopathy itself is twofold, namely macroangiopathy which includes the kidneys and retina of the eye and macroangiopathy which covers coronary heart disease, leg veins and cerebral blood

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vessels, although this does not mean that each other is separate and does not occur all at once (Fulor, 2020).

2.1.4. Management

Nutritional therapy is usually done by way of dietary food by taking into account calorie requirements to match and be able to maintain an ideal body weight with an energy composition of 60% - 70% from carbohydrates, 10% - 15% from protein and 20% - 25% from fat (Borges, 2020).

a. Drugs

In pharmacological treatment, usually used insulin therapy or oral hyperglycemic drugs. The goal of this treatment is to maintain blood sugar levels still close to normal limits (Howner, 2020).

b. Counseling

Counseling is considered important because diabetes is a lifestyle-related disease. So that diabetes treatment is considered to be going well if DM sufferers have sufficient knowledge about diabetes (Williams, 2020).

c. Physical training

Physical exercise is physical activity that involves repetitive body movements that aim to improve and maintain physical fitness. Physical activity is the use of energy by contracting skeletal muscles to produce body movements (Angulo, 2012). With regular physical exercise, diabetics actively move, resulting in liver glycogen used to meet the needs of sugar as the main ingredient of metabolism and this causes blood levels to remain in balance (Campbell, 2020).

2.2. Community Development

Empowerment is a concept that is oriented towards reducing formal and informal barriers, as well as efforts to provide power to the community, institutions and government (Keleher et al., 2007, Sunartiningsih, 2004, Tarmizi et al., 2017, Muda et al., 2018 and Pohan et al, 2018), states that empowerment is an effort to help the community in developing their own abilities so that they are free and able to overcome problems and make decisions independently. Based on the London Civic Forum (2008), empowerment is an effort to help individuals in the community to gain confidence, skills and abilities to influence environmental conditions directly or through community institutions.

According to Suharto (2005), empowerment emphasizes that people acquire sufficient skills, knowledge and power to influence their lives and the lives of others they care about. According to Sadan, (2004), empowerment is managing individuals to gain better control of their lives, both with their own abilities and with the help of others. Furthermore, WHO states that individual processes gain great control over decisions and actions that affect their health. The Ministry of Health of the Republic of Indonesia (2007) states that community empowerment in health care is an effort to grow the ability of the community so that they have the power or strength to live independently (in the health sector).

2.2.1. Purpose

Community empowerment aims to increase the potential of the community, so as to be able to improve a better quality of life for all citizens, through self-help activities, educate the community to be able to educate themselves, be able to adopt innovation and have a cosmopolitan mindset (Tampubolon, 2001). According to Purwanti (2011) the purpose of empowerment is to increase the capacity and capability of the community in order to be able to recognize the problems faced, be able to explore and utilize available resources, and be able to express themselves clearly. Meanwhile, according to Sunartiningsih (2004), the purpose of community empowerment is to encourage the creation of strength and ability of community institutions to independently be able to manage themselves based on the needs of the community itself, and to be able to overcome the challenges of problems in the future. Furthermore Arneson and Ekberg (2006), empowerment aims to mobilize individuals and groups by strengthening basic life skills and their control of the social and economic conditions that affect their lives. The occurrence of empowerment in these four aspects (affective, cognitive, psychomotor and conative) will be able to contribute to the creation of the independence of the people they aspire to. Because with that in society there will be sufficient insight, which is equipped with skills, adequate skills, reinforced by a sense of need for development and aware of these needs (Sulistiyani, 2004).

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2.2.2. Empowerment Process

Tampubolon (2001), community empowerment has the following process:

a. Getting to know the local community
b. Gathering knowledge about the local community
c. Identifying the local leaders
d. Stimulating the community to realize that it has problems

2.3. Health cadres

According to the Ministry of Health of the Republic of Indonesia (1993), cadres are members of the community chosen to deal with health problems, both individuals and communities, and to work in a very close relationship with the place of primary health care. Cadre knowledge and skills need to be fostered continuously by technical officers from various cross sectors in accordance with their fields, this can improve services (Mantra, 1983). Training has a positive impact on both individuals and organizations. Smith (1997) states that individual capability profiles are related to skills acquired from training. According to Mantra (1983) the development of knowledge is very necessary, through training that is tailored to the needs and problems faced by the community.

3. RESEARCH METHODS

3.1. Research design

The type of this research used is the constructive and quality methods, using quasi-experimental design (quasi experiment), with the design of The Separate Sempt Pretest-posttest Control Group Design, which was carried out in two groups, namely the intervention group and the control group. This design aims to find a causal relationship with research involvement in manipulating independent variables (Polit and Hungler, 1999). The second stage of the research was a quasi-experimental study with a pre and post test control group design.

3.2. Research Location And Time

3.2.1. Research sites

The location of this research will be conducted in the Work Area of the Mulio Rejo Health Center, Sunggal District, Deli Serdang Regency.

4. POPULATION AND SAMPLE

4.1. Population

The population in this study were all diabete mellitus sufferers in the Mulio Rejo Community Health Center, Sunggal District, Deli Serdang Regency, totaling 200 people.

4.2. Sample

For the purposes of quantitative analysis, the sample size in this study was calculated using the formula of Slovin as follows:

$$n = \frac{N}{(1 + N.d^2)}$$

Information :
n = number of samples
N = total population
d = degree of desired determination (equal to 0.1)

Where :

$$n = \frac{N}{(1 + N.d^2)}$$

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Based on table 8 the results of statistical calculations on the variable behavior of controlling blood sugar levels in the intervention group obtained tcount = 6.824 (tcount> t table) then Ho is rejected and Ha is accepted. With a value (pvalue = 0,000 (p value ≤ 0.05), it shows that the Behavior Control of Blood Sugar Levels in the intervention group is different Behavior controlling blood sugar levels of respondents before and after the development of community empowerment intervention models through cadres.

The results of statistical calculations in the control group obtained tcount = 6.143 (tcount> t table) then Ho is rejected and Ha is accepted. With a p-value = 0.002 (p value ≤ 0.05), it shows that the control behavior of Blood Sugar Levels in the control group there are differences in the respondent's behavior before and after the development of a community empowerment intervention model through cadres.

In the variable Blood Sugar Level in the intervention group obtained tcount = 7.597 (tcount> ttable) then Ho is rejected and Ha is accepted. With a p-value = 0,000 (p value ≤ 0.05), it shows that in the Blood Sugar Level in the intervention group there are differences in the respondents' blood sugar levels before and after the development of a community empowerment intervention model through cadres.

The results of statistical calculations in the control group obtained tcount = 6.274 (tcount> t table) then Ho is rejected and Ha is accepted. With a p-value = 0,000 (p value ≤ 0.05), it shows that in the Blood Sugar Level in the control group there are differences in the respondents' blood sugar levels before and after the development of a community empowerment intervention model through cadres.

a. Discussion

1. Differences in Behavioral Control of Blood Glucose Levels before and after the development of a community empowerment intervention model through cadres in the work area of the Mulirejo Health Center, Sunggal District, Deli Serdang Regency in the intervention group.

Based on the results of research that has been done, controlling behavior of respondents in the intervention group prior to community empowerment shows an average of 2.15. While the average control behavior after empowerment through community empowerment through cadres is 1.2. The average blood sugar level prior to empowerment through cadres is 220.8 mg / dl. While the average blood sugar level after empowerment through cadres is 181.69 mg / dl.

This shows that the actions taken in the intervention group have an impact on changes in blood sugar control behavior in the form of an increase in the average score of controlling behavior in blood sugar levels, then also proved using a paired t-test, showing a pvalue = 0,000 (p < 0.005).

According to the researchers' assumptions, the average value of the intervention group in controlling the behavior of blood sugar levels prior to empowerment has increased after community empowerment through cadres, as well as blood sugar levels that have a response and have decreased after community empowerment through cadres. Community level based interventions through community empowerment are things that increase individual potential and power.

Providing health education and counseling is essentially an activity to convey messages to the community, groups, or individuals in the hope that the group will get knowledge about better health. This is in line with the opinion of Notoadmodjo (2005) which states that information will affect one's knowledge.

The results of the study are in line with Nursiswati's research (2014), that the impact of the health and community empowerment empowerment program in DM self care management is an increase in the ability of DM sufferers in self care management of their illnesses. There also appears to be an increase in the knowledge of cadres and family heads in the management of DM which is further expected to be able to improve the quality of life of DM sufferers.

2. Differences in Behavioral Control of Blood Glucose Levels in the work area of the Mulirejo Health Center, Sunggal District, Deli Serdang Regency in the Control group.

Based on the results of research that has been done controlling behavior on group respondents on the first day showed an average of 2. While the average control of prilakupada on the 5th day was

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The results of the study are in line with Nursiswati's research (2014), that the impact of the health and community empowerment empowerment program in DM self care management is an increase in the ability of DM sufferers in self care management of their illnesses. There also appears to be an increase in the knowledge of cadres and family heads in the management of DM which is further expected to be able to improve the quality of life of DM sufferers.

5. Differences in Behavioral Control of Blood Glucose Levels in the work area of the Mulirejo Health Center, Sunggal District, Deli Serdang Regency in the Control group.

Based on the results of research that has been done controlling behavior on group respondents on the first day showed an average of 2. While the average control of prilakupada on the 5th day was 1.2. The average blood sugar level on the first day is 220.8 mg / dl. While the average blood sugar level on the 5th day is 181.69 mg / dl.

The paired t-test results showed that there were differences in the control behavior of the KGD control on the first day to the fifth day with a p-value = 0.048 ($p < 0.005$)

Research conducted by Lafatata hun 2013 also mentioned that controlling blood sugar levels regularly had a significant relationship with blood glucose levels in DM patients. The more routine the patient controls fasting blood sugar levels and on schedule, the better his blood sugar levels will be.

6. Differences in Behavioral Control of Blood Glucose Levels before and after the development of a community empowerment intervention model through cadres in the work area of the Mulirejo Health Center, Sunggal District, Deli Serdang Regency in the Intervention Group and the Control group

Based on the results of research that has been done, the behavior of controlling blood sugar levels in the intervention group and the control group after community empowerment through cadres shows the average is not much different, the average KGD control behavior after modern dressing wound care in the intervention group is 1, 2 with an average KGD = 181.69 mg / dl. While the average KGD control behavior after community empowerment through cadres in the control group is 1.2 with an average KGD = 178.69 mg/dl.

This shows that the development of a community empowerment intervention model through cadres of diabetes mellitus can improve control behavior in the intervention group with greater points (0.95) compared to the control group (0.8), with a p value = 0.045

According to the researchers' assumptions controlling KGD for people with diabetes mellitus is very important because it can help determine the appropriate medical treatment so as to reduce the risk of severe complications and adjust/control, physical activity, and the need for insulin levels to improve daily KGD. According to Askandar (2007) effective management of diabetes mellitus requires changes in the lifestyle of patients with diabetes mellitus, including self-monitoring of blood sugar levels consuming drugs, controlling sugar content and nutrients in food, regular exercise, and foot and skin care.

Success in increasing blood sugar control in society requires many people who must participate. One who needs to participate is the Diabetes Militus cadre, where the Diabetes Militus cadre is a person who often socializes with all residents in the village. With the formation of cadres it will be easy to monitor the implementation of the program for controlling blood sugar levels for people suffering from diabetes mellitus. It is expected that cadres can transmit the knowledge possessed to the surrounding community.

5. CONCLUSIN & SUGGESTION

5.1. CONCLUSION

Based on the results of research conducted by researchers on respondents in the Work Area of Mulirejo Health Center, Sunggal District, Deli Serdang Regency in January 2020 regarding the development of a community empowerment intervention model through diabetes cadres, it can be concluded as follows:

1. From the results of the research that has been done, there are differences in the behavior of respondents KGD control in the intervention group before and after community empowerment in

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the Work Area of the Mulirejo Community Health Center, Sunggal District Deli Deli Serdang Januari 2020.

2. From the results of research conducted, there is no KGD control behavior of respondents in the control group before and after the treatment of modern dressing wounds in the Work Area of Mulirejo Health Center, Sunggal District, Deli Serdang Regency, January 2020.
3. From the results of the research that has been done, there are differences in the behavior of the respondents KGD control in the intervention group and the control group after modern dressing wound care is done in the Mulirejo Health Center Work Area, Sunggal District, Deli Serdang Regency, January 2020.

5.2. SUGGESTIONS

Provide scientific information and theoretical basis related to the development of community empowerment through health cadres interventions for controlled glucose in diabetes mellitus patients. As a basis for forming and activating health cadres in the management of glucose control in patients with diabetes mellitus.

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