

## HEALTH PROMOTION MODEL: PEER HEALTH EDUCATION TOWARD DECREASING RISK OF DIABETES MELLITUS TYPE II

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### ABSTRACT

**Objective:** The increased number of Diabetes Mellitus (DM) disease over years, we suggest the effort to make primary prevention in community groups. Peer Health Education (PHE) can be used as a method for promoting health in these community groups. Through PHE, it is expected that community groups that have the risk of DM disease can improve knowledge about healthy lifestyle behavior and conduct behavior change to achieve optimal health degree and avoid DM disease. The objectives of the research are to analyze knowledge of cadre before and after education, to analyze knowledge of housewife before and after education, and to analyze the risk of DM before and after education using PHE.

**Methods:** The research design used quasy experiments, the number of research subjects is 119 people. Data was analyzed using the Wilcoxon test.

**Results:** The result of research showed that there was a difference of knowledge of cadre before and after education, there was a difference of knowledge of housewife before and after education, and there was a decrease of DM risk factor before and after education using PHE model.

**Conclusion:** Health promotion model is effective in reducing the risk factor of DM type II through food management and exercise to decrease body mass index and abdominal circumference. Suggestions for health agencies always provide efforts and training to generate cadre motivation and encourage cadres to always be positive toward the risk of health problems in the main community against the prevention of non-communicable diseases (DM).

**Keywords:** Health promotion model, Peer health education, Diabetes mellitus.

### INTRODUCTION

Diabetes mellitus (DM) is one dangerous disease that is often referred to as the silent killer other than heart disease; DM is one of the major health problems. DM is characterized by chronic hyperglycemia and impaired metabolism of carbohydrates, fats, and proteins [1]. Long-term complications include cardiovascular disease, chronic renal failure, retinal damage that can lead to blindness, as well as nerve damage that can lead to impotence and gangrene with the risk of amputation. Global study shows that the number of DM sufferers in 2013 has increased from 382 million to 592 million by 2035 [2]. DM has been the cause of 4.6 million deaths. The World Health Organization (WHO) reminded that the prevalence of diabetics in Indonesia potentially experienced a drastic increase from 8.4 million people in 2000 to 21.3 million patients in 2030 later [3].

The DM is currently the sixth leading cause of death in all age groups in Indonesia. This is caused by unhealthy living behavior that continues to grow in society. National Basic Health Research showed that the prevalence of diabetes in urban areas reached 5.7% [4]. In 2013, the proportion of Indonesian aged  $\geq 15$  years with DM is 6.9%. Recently, many studies reveal that the DM patients is not only depend by age, but also caused by their life style. Prevalence of DM based on a doctor's diagnosis and symptoms increased with age. Total DM patients aged between 40 and 59 years but from age  $\geq 65$  years tend to decrease [5]. DM can be prevented, delayed by arrival, or eliminated by controlling risk factors. There are several causes of DM, namely growing age, over 40 years many vital organs weakened, and the body began to experience sensitivity to insulin [6,7]. Women who have experienced menopause have a tendency to be less sensitive to the hormone insulin [8] so that DM prevalence in women tends to be higher than in men. Family history of DM disease, hereditary, or genetic factors have a contribution that cannot be underestimated for someone affected by diabetes. Cigarette/tobacco widely known to give negative effect on health, including the

risk of a person susceptible to DM disease [9]. Therefore, understanding of DM risk factors is very important to know, understand, and can be controlled by the program holders, educators, educators and health cadres in the surrounding community. DM control is prioritized on early prevention through prevention efforts of DM risk factors and promotion and prevention efforts by non-neglecting curative and rehabilitative efforts. In accordance with the implementation of research and development of health support, we suggest PHE as the strategic development of health through the promotion of health and community empowerment. This strategy can be used as an effort to help the provision of health information for a person of community groups. PHE can be done through various educational models through the way of sharing the information to prevent the DM risk factors.

One of the early prevention efforts is using health model education, as the new way to deliver the knowledge of the DM risk using peer health education (PHE) strategy. PHE is one strategy that can be used to provide health education to people with certain characteristics. This activity is carried out by a person with the same characteristics as a community group and is considered to have the ability to influence the group so that efforts to improve knowledge and skills and behavior change are easier to produce. From some research results, PHE is able to effectively use to improve knowledge, skills, and ability to change one's health behavior [10]. PHE can be used as a method for promoting health in these community groups. It is expected that community groups that have the risk of DM disease can improve knowledge about healthy lifestyle behavior to prevent DM itself.

### METHODS

#### Experimental design

This study uses an experimental quasy design, with one group pre-test-post-test design approach to compare groups before and after health promotion (PHE). In this research is carried out several stages

of activities: (1) education on cadres by health personnel educator, (2) cadres is sharing the knowledge to the housewives and (3) housewife has to educate her family and maybe other people who has closest related prevention DM. After this activities done, then we identified the risk of DM disease in risk group before and after being educated. The research was carried out in Kalipare Village, Kalipare Subdistrict, Malang, Indonesia. The study was conducted from June to November 2017. The research subjects were taken from several groups of people divided into three groups: Cadres, housewives, and respondents who have the risk of DM type II disease, starting from age 40 and follow group associations in the study area. Samples will be taken by purposive sampling technique, amounting to 119 people, and divided into 30 cadres, 37 housewives, and 52 people who are at risk of DM.

The independent variable in this research is the health promotion model: PHE. PHE is the provision of health education on the modification of healthy lifestyles to community groups that have the risk of DM disease using audiovisual media, modules, and booklets. This health promotion will be conducted by PHEs who are representatives of community groups appointed by researchers with certain criteria. The educator criterion is someone who is believed and considered by a community group at risk of having the ability to influence community groups in their community. The dependent variable in this research is the risk of DM disease. The risk of DM disease is the emergence of factors that can increase the likelihood of DM disease which is marked by the results of DM risk assessment of DM disease parameter of this variable measurement based on Finnish association of diabetes.

The questionnaire, which has been used, contains 15 closed questions about the modification of respondents' lifestyle including diet, physical activity (exercise), stress management, and smoking habit. Observation done through physical examination using a tensiometer to measure blood pressure. We examined the glucose-test, and microtia to calculate body mass index (BMI). We also use sheet score of DM risks checklist to assess the risk of DM disease using score. The analysis was conducted to analyze the data of PHE's influence on the decrease in risk of DM disease in the community at risk. The data analyzed using paired t-test analysis.

## RESULTS AND DISCUSSION

### Increasing the knowledge of cadres

The test results using Wilcoxon test showed a significance value of 0.000 which is smaller than alpha 0.05 ( $p < 0.05$ ), so it can be concluded that there is a significant difference between Kalipare cadre knowledge between pre-test and post-test. The average pretest value ( $34.54 \pm 3.28$ ) is known to be lower than the average post-test value itself ( $52.88 \pm 7.44$ ). From the results of the analysis of knowledge, cadres can be concluded that there is an increase in knowledge before and after the education about DM and how to prevent; it will certainly support the role of cadres. According to Kumar *et al.* [11], the role of cadres, in general, is to carry out health service activities and makes it successful with the community and planning village-level health service activities. With the existence of health cadres, health services that have been done by health workers alone can be assisted by the community. Thus society is not only an object of development but also a development partner itself. Furthermore, with the presence of cadres, the messages delivered can be received. It was explained that the formation of cadres is a manifestation of development in the field of health.

### Increasing the knowledge of the housewives

Significance value gained from the test showed the value of 0.00 smaller than alpha 0.05 ( $p < 0.05$ ), so it can be concluded that there is a significant difference between the categories of answers of housewives in Kalipare Village between pre-test and post-test. The average value of pre-test ( $41.89 \pm 5.21$ ) is lower than the average post-test score ( $89.37 \pm 7.88$ ). From the analysis of knowledge of cadres, it can be concluded that there is an increase of knowledge before and after education about DM and its prevention. Housewives are an important target in DM prevention education. A mother not only acts as a parent or housewife

who takes care of home problems, but also can be the cadres to deliver the information. There are many other roles that a mother has to run, one of which is in keeping the health of each family member. Mothers' role in maintaining family health cannot be underestimated. Mother is a mover in a family and must be sensitive to everything that happened in her family.

### Identify risk factors before and after education about DM and prevention

The risk of DM between the respondents in this research is known from three categories as shown in Fig. 1:

Based on the test, the results showed a significance value of 0.00 smaller than alpha 0.05 ( $p < 0.05$ ,  $H_0$  is rejected), so it can be concluded that there is a significant difference between total risk score between pre-test and post-test. The difference is due to the average total risk score pre-test ( $16.71 \pm 2.34$ ) higher than the average total risk score post-test ( $14.67 \pm 3.55$ ). Based on the results of data analysis of the calculation of the score to determine the risk of DM after the education, there is a decrease in risk, based on diabetes risk assessment of the Finnish Diabetes Association of existing risk factors (age and family history) and there can be changed through the reduction of risk factors such as BMI, abdominal circumference, exercise, and consumption of vegetables and fruits, from the results of the this research, we found that the risk of DM is decline through the increase of vegetables and fruit consumption, also the exercise in order to reduce the obesity. This will certainly contribute to the decrease in BMI and stomach circumference.

On this research, we found that PHE can increase the knowledge of the people about the risk of DM. This can be seen by the decrease in the number of respondent who does not even know the risk of DM, to become aware and acknowledge about their own risk of the lifestyle due the risk of DM. One of that is the factors related to a person experiencing DM. When people reached over 40 years, many of the vital organs have weaken and the body begins to experience insensitivity to insulin. Older women (over 40 years old) and if they experienced menopause, they also have a tendency to be less sensitive to the insulin hormone. In 2013, the proportion of Indonesians aged  $\geq 15$  years with DM is 6.9%. Patients affected not only old age, but many are still aged of productive. DM prevalence based on doctor's diagnosis and symptoms increases with age but from age 65 years tends to decrease. Most DM patients aged 40–59 years. The age group that suffered the most DM was 45–52. Increased diabetes risk of diabetes with age, especially at age more than 40 years, is due at that age began to increase glucose intolerance. The existence of the aging process causes a decrease in the ability of pancreatic  $\beta$ -cells in producing insulin [12]. In addition to older individuals, there is a decrease in mitochondrial activity. This is associated with increased muscle fat levels and triggering insulin resistance [13].

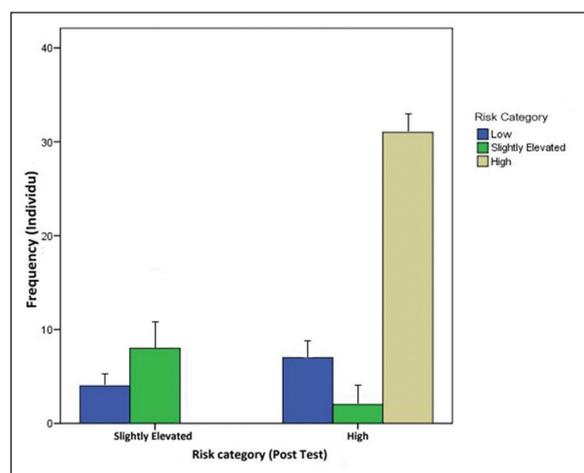


Fig. 1: The risk of diabetes mellitus category of the respondent

Prevention efforts can be made through health promotion efforts. This way can be done by the cadres that have been selected and educated to promote their knowledge about the DM risk to the others. Health promotion is connected with the provision of information content to the public with respect to health issues. On the prevention of DM, the actions that can be done are (1) early diagnosis and prompt of treatment. Early diagnosis and prompt treatments are performed in relation to early detection efforts of individuals who later experience DM in the future so that early prevention efforts can be done to prevent the growing risk of developing the disease. Efforts related to early diagnosis in DM are to conduct a screening of DM in the community and conduct a survey of family food consumption patterns at the community level.

The prevention stages in DM include primary and secondary prevention. Primary prevention is an effort aimed at people who belong to high-risk groups, namely those who have not suffered but have the potential to suffer from DM. Counseling is a very important role in primary prevention efforts. The wider community through non-governmental organizations and other social institutions should be included. Similarly, the government through all the relevant ranks such as the Ministry of Health and the Ministry of Education should incorporate DM primary prevention efforts in health education and education programs. From preschool days, it should have been implanted about the importance of regular physical activity, healthy patterns and types of food, keeping the body from being overweight, and the risk of smoking for health. Secondary prevention is an effort to prevent the occurrence of complications in patients who have suffered DM. Secondary prevention is performed by providing adequate treatment in early stage detected on DM patient. This purposed to prevent the organs complications since the beginning of DM stage disease. Here, the PHE can be the decision-making and problem-solving activity. PHE also acts as an active collaboration with the health education team, and self-care behaviors projects to increase the community's health status [14].

Type II diabetes usually occurs when lifestyle and behavioral patterns are not well established [15,16]. The successful management of self-sufficient diabetes requires the active participation of patients, families, and communities. The health team should assist patients in the direction of behavior change. To achieve successful behavior change, comprehensive education, skills development, and motivation are required. The education includes the understanding of DM disease, the meaning and the need for DM control and monitoring, the DM complication, pharmacological and non-pharmacological interventions, hypoglycemia, special problems encountered, foot care in diabetes, and how to develop support systems and teaching skills.

Peer education is a popular concept that refers to various approaches such as communication channels, methodology, philosophy, and strategy. This method is popularly used to fulfill the necessary knowledge and skills. PHE was also known as the way of sharing informed decisions about health-related issues [17]. The term "peer education" refers to an understanding of something that stands equal to another, something belonging to the same or with simple words as peer education. Groups are intended to be categorized by age, economic status, or maybe their marital status. Peer education usually involves the use of specific group members to produce change among other members of the same group. Peer education is often used to change the level of behavior in individuals by modifying one's knowledge, attitudes, beliefs, or behaviors. Peer education, however, can also affect changes at the group or community level by modifying norms and stimulating collective action that leads to changes in existing programs and policies in society. Learning model applied in peer education is communication, information, and education. Regular assesment needs to be evaluated to achieve or may maintain the health status and awareness to their risk leads to be DM patient [18].

## CONCLUSION

The model of health promotion through PHE is done through stages involving all stakeholders and done gradually through community participation that adapts to local culture. The education process to the cadres and housewives after the PHE is know to be effective against the risk of DM. Peer education is important means of disseminating information about DM, risk prevention, and possible complications that arise. Peer education can overcome some difficulties and also can transfer knowledge and communication done more freely and openly in the peer group.

## CONFLICTS OF INTEREST

The author declares that there is no conflict interest on publishing this article.

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