

# The Effect of Health Belief Model on Prevention Chronic Disease DM in Elderly at Bangun Rejo Village Tanjung Morawa District in 2022

Rosmega Pakpahan<sup>1</sup>, Zulkarnain Batubara<sup>2</sup>, Petra Dian Sari<sup>3</sup>, Siti Nurfadhilah<sup>4</sup>

<sup>1,2,3,4</sup>STIKes Mitra Husada Medan

## ARTICLE INFO

### Article history:

Received Sep 17, 2022

Revised Sep 24, 2022

Accepted Okt 15, 2022

### Keywords:

The Health Belief Model  
Prevention Of Chronic Disease  
DM  
The Elderly

## ABSTRACT

This study aims to determine the effect of The Health Belief Model in the prevention of chronic disease Diabetes Mellitus in the elderly . This research was conducted in Bangun Rejo Village, Tanjung Morawa sub-district, Deli Serdang Regency. This study used a quasi-experimental design with a non-equivalent control group research design. The number of samples in this study were 34 people who were taken using a purposive sampling technique by taking into account the inclusion criteria. The sample was divided into 17 people as the experimental group and 17 people as the control group. The measuring instruments used in this study were questionnaires that had been tested for validity and reliability, blood glucose measuring devices, and observation sheets. The experimental group was given an intervention. Effect of The Health Belief Model on the prevention of chronic disease and in the elderly. The analysis used was univariate analysis and bivariate analysis with dependent and independent t tests. The results showed that before being given health education, the influence of The Health Belief Model was that the majority of respondents had sufficient knowledge as many as 9 people (38.2%) and after being given health education based on The Health Belief Model had good chronic disease prevention as many as 17 people (50, 0%). Statistical results obtained p value  $(0.000) < (0.05)$ , so that the results obtained that there is an effect of The Health Belief Model in the prevention of chronic diseases in the elderly. The results of this study are expected to be one of the nursing interventions in increasing the prevention of chronic diseases in the elderly.

This is an open access article under the [CC BY-NC](https://creativecommons.org/licenses/by-nc/4.0/) license.



### Corresponding Author:

Rosmega,  
STIKes Mitra Husada Medan,  
Jl. Puntu air 4 Pasar 8 Kecamatan Medan Johor, Sumatera Utara, Indonesia  
Email: [rosmega1062@gmail.com](mailto:rosmega1062@gmail.com)

## INTRODUCTION

Chronic disease according to the World Health Organization (WHO) is a disease of long duration which generally develops slowly and is the result of genetic, physiological, environmental and behavioral factors. Globally, regionally and nationally in 2030 it is projected that there will be an epidemiological transition from infectious diseases to non-communicable diseases (World Health Organization, 2018)

The Government of Health has issued a health program that can help serve people who have various chronic diseases with Prolanis. PROLANIS (Chronic Disease Management Program) is a health care system and a proactive approach that is carried out in an integrated manner involving participants, health facilities and BPJS Health (BPJS Kesehatan, 2014).

The IDF explained that 415 million adults suffer from DM and it is estimated that by 2040 people with DM will increase to 642 million people. This disease can attack all levels of age and socioeconomic, from various epidemiological studies in Indonesia, the prevalence of DM is 1.5%-2.3% in the population aged more than 15 years, even in an epidemiological study in Manado, the prevalence of DM 6 was found, 1%, research conducted in Jakarta, Surabaya, Makassar, and other cities in Indonesia proves an increase in prevalence from year to year, based on population growth patterns, it is estimated that in 2020 there will be as many as 178 million people aged over 20 years and assuming a DM prevalence of 4%, 7 million DM patients will be obtained, a very large number that can be handled by specialists / subspecialists / endocrinologists. One of the main goals of treatment, because DM is a chronic disease that cannot be cured, but if the level of blood sugar can be controlled properly, then physical complaints due to acute or chronic complications can be minimized or prevented, in addition, low quality of life and psychological problems can exacerbate metabolic disorders, either directly through hormonal stress reactions, or indirectly.

Qualitative research conducted by Insiyah (2019) "Level of knowledge and adherence to diabetes mellitus diet in patients with diabetes mellitus at the Simalingkar B Health Center Medan Johor" through interviews, it was found that all respondents did not know the number of calories that must be met in a day and 70% of respondents did not set a schedule. diet. So the researchers suggest the need for counseling in the form of health education regarding good and appropriate diet management so that people with diabetes are able to control glucose and fat levels and prevent the development of complications.

One of the efforts made in improving the education of DM sufferers is health education using The Health Belief Model theory. The Health Belief Model was first proposed by Resenstock 1966, then refined by Becker, et al 1970 and 1980, this theory was first used in patients with tuberculosis (TB) who had failed screening programs (Burke, 2013).

The Health Belief Model is used to explain and predict preventive health behavior, as well as the role of illness and disease behavior. This model consists of four main constructs that influence health behavior, namely perceived susceptibility, which is a person's subjective perception of the risk of contracting a disease or disease, perceived severity, which is a person's opinion about the seriousness of the disease condition and its consequences, and perceived benefits. benefits) is the patient's belief in the effect of the recommended action to reduce the risk or seriousness of the impact, perceived barriers are a person's feelings about the obstacles experienced during the health action that has been suggested (Bayat et al., 2013).

According to Hasneli (2009) in his research "The effect of health belief model on dietary behavior to prevent complications of DM type 2" was obtained after attending an education program based on The Health Belief Model, the experimental group's dietary behavior score was higher ( $p < .001$ ) than before getting an education program based on The Health Belief Model, as well as a higher dietary behavior score than the control group who only received health education from the Deli Serdang Hospital health team ( $p < .001$ ).

Based on interviews conducted with 10 DM patients in Bangun Rejo Village, Tanjung Morawa District on 15 and 16 May 2022, it was found that 8 respondents experienced complications such as retinopathy, neuropathy, stroke, and heart vascular disease. Seven out of ten respondents said that they never received counseling about health prevention from the puskesmas directly and only got knowledge about DM prevention through television media.

Based on these data, the researchers are interested in researching "The Effect of The Health Belief Model in the prevention of chronic diseases" because DM patients need health education to improve disease prevention.

## RESEARCH METHOD

This research was conducted in Bangun Rejo Village, Tanjung Morawa District, Deli Serdang Regency, North Sumatra Province, starting from May to June 2022. This study used a quasi-experimental design with a non-equivalent control group research design.

The population in this study were all DM patients who resided in Bangun Rejo Village, Tanjung Morawa District, Deli Serdang Regency, North Sumatra Province 2022. Sampling used purposive sampling technique. The sample amounted to 34 patients.

The data collection tool used is a questionnaire that refers to a conceptual framework to measure the level of prevention of chronic DM disease with an observation sheet and to observe the achievement of the success of health education that has been given, the researchers first conducted a questionnaire test on 20 respondents in Bangun Rejo Village, District Tanjung Morawa, Deli Serdang Regency, North Sumatra

Data analysis used univariate analysis and bivariate analysis. Univariate analysis was used to describe the characteristics of respondents, namely age, gender, last education, respondent's occupation, duration of suffering from DM, observation data, namely glucose levels. Bivariate analysis used Dependent Simple t Test and Independent Simple t Test because the data distribution was normal with p-value 0.0.

## RESULT AND DISCUSSION

### Comparison of knowledge on prevention of chronic DM in the experimental and control groups after being given health education

**Table 1.** Comparison of Knowledge about Prevention of Diabetes Mellitus in Experimental and Control Groups After Health Education is Given

Knowledge of DM prevention after being given health education	Mean	SD	Min	Max	p value
experiment	16,00	1,118	14	17	0,000
Kontrol	10,47	1,586	8	13	

The results of statistical analysis using the t-Independent test obtained p value  $0.000 < (0.05)$ , it can be concluded that there is a significant difference in knowledge about prevention of chronic DM after being given health education based on The Health Belief Model in the experimental group and the control group without given health education.

### Comparison of Knowledge on Prevention of Chronic Disease DM Experimental Group Before and After Health Education was given

**Table 2.** Comparison of knowledge about prevention of chronic disease in the experimental group before and after health education

Knowledge of DM-Disc Management before and after being given health education	Mean	SD	Min	Max	p value
Pretest	11,29	1,116	9	14	0,000
Posttes	16,00	1,118	14	17	

The results of statistical analysis using the t-Dependent test obtained p value  $0.000 < (0.05)$ , it can be concluded that there is an increase in knowledge about DM prevention before and after being given health education based on The Health Belief Model in the experimental group.

### Comparison of Knowledge on prevention of chronic disease DM Control Group Before and After Without Health Education

**Table 3.** Comparison of Knowledge about prevention of chronic disease DM Control Group Before and After Without Health Education

knowledge about prevention of DM before and after without being given health education	Mean	SD	Min	Max	p value
Pretest	11,29	1,116	9	14	0,000
Posttes	16,00	1,118	14	17	

The results of statistical analysis using the test t-Dependent obtained p value  $0.020 < (0.05)$ , it can be concluded that there is a decrease in knowledge about the prevention of DM in the control group before and after without health education.

## Discussion

### Characteristics of Respondent

#### a. Gender

Based on research that has been conducted on 34 respondents, it was found that the majority of the respondents' gender were women, amounting to 27 people (79.4%). According to the RI Ministry of Health's Riskesdas (2018), the highest proportion of people with DM in Indonesia are women.

The results of this study are supported by Jelantik's research (2019), that women are 3-7 times more at risk of developing DM than men because women have higher LDL or bad cholesterol glyceride levels than men. Gender is also related to the different life roles, activities and behaviors between men and women.

Physically, women have the opportunity to experience a higher Body Mass Index (BMI) due to the monthly cycle syndrome (premenstrual syndrome) experienced by postmenopausal women, resulting in the distribution of fat in the body being easily accumulated, thus causing women to be at risk of developing DM (Andraini, 2017).

#### b. Ages

The results obtained by distribution of respondents based on the age category of the majority are early elderly (46-55 years) as many as 20 people (58.8%). Age over 45 years is one of the risks of DM, and the risk of suffering from glucose intolerance will increase with age (PERKENI, 2015). With increasing age, the body's physiological functions decrease due to a decrease in insulin secretion or resistance so that the ability of the body's functions to control high blood glucose is less than optimal.

In addition, the elderly are susceptible to stress. The causal factors include a decrease in physiological conditions, lack of family attention to the elderly, and changes in the surrounding environment due to social situations that will increase anxiety and fear. Anxiety will trigger the hormone epinephrine to come out in excess to break down glycogen in the body into glucose so that elderly people who experience anxiety increase blood glucose levels (Hidayah, 2013).

#### c. Last education

Based on the research that has been done, it was found that the majority of the latest education levels were high school, namely 11 people (32.4%). The higher the education, the easier it is for them to be able to receive information so that the more knowledge they have, and vice versa (Mubarak et al., 2007).

According to Prabowo and Hastuti (2015) education is able to influence the dietary management behavior of DM patients, as well as factors associated with personality such as motivation and intentions from within, the return of DM patients to their initial diet because they feel their body condition is good so that their self-control is reduced, and have not been able to apply the proportion of nutrients consumed in accordance with the recommendations.

#### d. Occupation

The results showed that most of the respondents were unemployed and the majority were housewives (IRT), namely 21 people (61.8%). Grant's research (2009) found that those who do not work will be at risk of developing DM because they tend to do less physical activity so that the metabolic process or burning calories does not go well.

Martalena (2020) which states that most of the respondents are housewives and entrepreneurs make their eating schedule inconsistent every day. Work activities are carried out without certain limitations and based on the ability of each subject, so that the meal schedule varies from one subject to another. It is different if the subject obtained works in an office or has work activities that are limited by time, so that adherence to the eating schedule can be described. In addition, according to Mubarak et al. (2007) work environment can make a person gain experience and knowledge either directly or indirectly.

#### **e. Long Suffering DM**

Based on the results of the study, it was found that most of the duration of suffering from DM in the two groups of 5-10 years were 18 people (52.9%). The length of time suffering from DM is associated with a decrease in pancreatic beta cell function, causing complications that generally occur in patients with a long illness after 5-10 years (Smeltzer & Bare, 2011).

The results of this study are in line with Firdaus (2016)'s research which says that complications in type 2 diabetes that are long-term do not occur in the first 5 to 10 years. The duration of DM is related to the risk of DM complications, one of which is microvascular complications of diabetic neuropathy (PERKENI, 2015).

The results showed that the majority of respondents in the experimental group had sufficient knowledge before being given the intervention (38.2%) and after being given the intervention they were well informed (50.0%) and the majority of respondents in the pretest control group had sufficient knowledge (35.3%). and the posttest obtained the majority of sufficient knowledge (32.4%).

It can be concluded that there was an increase in knowledge in the experimental group before and after the provision of health education based on the Health Belief DM-Disc diet management model, while in the pretest and posttest control groups there was no significant increase without intervention.

The results of this study are in accordance with the research of Riauwi, Hasneli and Lestari (2014) on "Effectiveness of health education with the application of The Health Belief Model on family knowledge about diarrhea" with the p value of knowledge before and after the intervention is  $0.000 < (0.05)$  where there is a significant difference in knowledge after being given the intervention. The mean value after the intervention was given to the experimental group was 21.00 while in the control group the mean value was 25.20.

#### **Effectivity *The Health Belief Model on Knowledge of prevention chronic disease in Elderly***

This study was grouped by researchers into 2 groups, namely the experimental group and the control group. The experimental group was given an intervention in the form of health education based on The Health Belief Model while the control group was not given an intervention in the form of health education based on The Health Belief Model.

The results of statistical tests showed that there was an increase in management knowledge about the DM-Disc diet which was significant for DM patients in the experimental group, with p value  $0.000 < (0.05)$ . Meanwhile, in the control group, there was an increase in knowledge about the prevention of chronic diabetes mellitus in the elderly with a statistical mean of DM patients with p value  $0.020 < (0.05)$ .

Statistical results showed that there was a significant difference between management knowledge about DM-Disc diet after (posttest) given health education based on The Health Belief Model in the experimental group and the control group with p value  $0.000 < (0.05)$ .

This is supported by Vahidi's (2015) research on "The Effect of an Educational Program Based on the Health Belief Model on Self-Efficacy among Patients with Type 2 Diabetes Referred to the Iranian Diabetes Association in 2014". 2 increased after being given health education based on

The Health Belief Model with  $p < 0.001$ .

Another study conducted by Firdaus (2017) on "The effectiveness of health education based on the Health Belief Model on the patient's knowledge and self-awareness about diabetic foot care" which showed that after participating in a health education program based on the Health Belief Model there was a significant increase in knowledge and self-awareness. with p value (0.000 & 0.000)  $< (0.05)$ .

The Health Belief Model is derived from psychological and behavioral theory on the basis that two behavioral components are related to: alth is the desire to avoid disease or otherwise be cured if it is sick and the belief that certain health measures will prevent, or cure disease (LaMorte, 2016). The Health Belief Model emphasizes the role of perceived susceptibility, perceived severity, perceived benefits and perceived barriers to a disease that can threaten their health.

Before the intervention was given, in the construction of perceived susceptibility, respondents were not aware of the risk of DM by not regulating their diet, smoking, and not knowing the concept of DM, then in the construction of perceived severity, respondents already knew some complications, but did not aware of and can make DM develop into complications that can lead to death.

Furthermore, on the construction of perceived benefits, respondents are not aware of the benefits of preventing chronic DM disease and only rely on the use of drugs, and on the construction of perceived barriers, respondents have not been able to overcome the obstacles of non-compliance in carrying out dietary management.

After being given health education based on The Health Belief Model on the construction of perceived susceptibility, respondents realized that the behavior they had been carrying out so far could be a risk for developing DM complications and respondents expressed a desire to change their lifestyle and started trying to regulate their diet using prevention. on the construction of the severity (perceived severity) the respondent is more severe with DM complications.

Then in the construction of benefits (perceived benefits) respondents know the benefits and importance of preventing chronic diabetes mellitus in the elderly, one of which can regulate glucose levels, blood pressure and fat levels, and respondents know that drugs are only used if glucose levels are not controlled, and after doing prevention for 3 days in a row respondents are more aware of the benefits of regulating diet, one of which is a decrease in blood glucose levels. Furthermore, in the construction of perceived barriers, respondents can identify obstacles that might occur if they know how to overcome these obstacles.

Based on the description above, it can be concluded that health education based on The Health Belief Model has an effect on increasing the prevention of chronic DM disease. This is probably caused by the education of DM sufferers are elderly so that patients do not work, namely housewives so that DM sufferers have free time to increase their knowledge and insight, especially in the health sector.

Health education based on The Health Belief Model also plays an important role in increasing respondents' knowledge because this method uses an approach that opens minds or makes respondents aware of DM disease and its prevention. This is what makes respondents become serious about listening to health education provided by researchers.

## CONCLUSION

The knowledge value of the experimental group using the Dependent t test obtained p value 0.000  $< (0.05)$ , it can be concluded that there is an increase in knowledge about the prevention of chronic DM disease before and after being given health education based on The Health Belief Model in the experimental group.

## References

ADA. (2015). *Diabetes care: Standards of medical care in diabetes*. Diperoleh tanggal 6 Desember 2016 dari

- www.diabetes.teithe.gr/UsersFiles/entypa/STANDARDS%20OF%20MEDICA20CARE%20IN%20DIABETES%20 2015.pdf 20
- Andraini, D. (2017). *Pengaruh program diet dm- disc terhadap indeks massa tubuh (IMT) pasien diabetes mellitus tipe 2*. Skripsi (tidak dipublikasikan). Pekanbaru: Universitas Riau.
- Bayat, F., dkk. (2013). *The effects of education based on extended health belief model in type 2 diabetic patients: A randomized controlled trial*. Diakses tanggal 14 Desember 2016 dari [www.ncbi.nlm.nih.gov/pmc/articles/PMC3879225/pdf/2251-6581-12-45.pdf](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3879225/pdf/2251-6581-12-45.pdf)
- Burke, E. (2013). *The health belief model*. Diperoleh tanggal 7 Maret 2017 dari [https://www.iccwa.org.au/useruploads/files/soyf/2013\\_resources\\_videos/the\\_health\\_belief\\_model.pdf](https://www.iccwa.org.au/useruploads/files/soyf/2013_resources_videos/the_health_belief_model.pdf)
- Farrell, M., & Dempsey, J. (2011). *Smeltzer and Bare's textbook of medical-surgical nursing*. Philadelphia: Lippincott.
- Firdaus, I. D. (2016). *Efektifitas pendidikan kesehatan berdasarkan Health Belief Model terhadap pengetahuan dan kesadaran diri pasien tentang perawatan kaki diabetes*. Skripsi (tidak dipublikasikan). Pekanbaru: Universitas Riau.
- Grant. (2009). *Gender spesific epidemiology of diabetes a representative cross sectional study, international journal for equity in health*. Diperoleh tanggal 12 April 2017 dari <http://www.equityhealthj.com/content//1/6>
- Hasneli, Y. N (2009). *The effect of a health belief model based educational program to prevent diabetes complication on dietary behavior of Indonesian adults with type 2 diabetes mellitus*. Jurnal Keperawatan Provesional Indonesia. Vol. 1. Pekanbaru: ISSN.
- Hasneli, Y. N. (2016). *Penerapan model DM-Disc terhadap kepatuhan diet pasien diabetes*. Pekanbaru.
- Hidaayah, N. (2013). *Stress pada lansia menjadi faktor penyebab dan akibat terjadinya penyakit*. Diperoleh tanggal 7 juli 2017 dari [journal.unusa.ac.id/index.php/jhs/article/view/21](http://journal.unusa.ac.id/index.php/jhs/article/view/21)
- Insiyah & Hastuti, R.T. (2016). *Tingkat pengetahuan dan kepatuhan tentang diet diabetes mellitus pada pasien di Puskesmas Sibela Kota Surakarta*. Diperoleh tanggal 30 Mei 2017 dari [jurnal. poltekkes-solo.ac.id/index.php/Int/article/viewFile/165/147](http://jurnal.poltekkes-solo.ac.id/index.php/Int/article/viewFile/165/147)
- Jelantik. (2019). *Hubungan faktor risiko umur, jenis kelamin, kegemukan dan hipertensi dengan kejadian diabetes mellitus tipe II di wilayah kerja Puskesmas Mataram*. Diperoleh tanggal 9 Juni 2017 dari [www.lpsmataram.com](http://www.lpsmataram.com)>Februari-2014
- Kemenkes RI. (2013). *Diabetes melitus penyebab kematian nomor 6 di dunia: Kemenkes tawarkan solusi CERDIK melalui posbindu*. Diperoleh tanggal 28 November 2016 dari [www.depkes.go.id/article/view/2383/diabetes-melitus-penyebab-kematian-nomor-6-di-dunia-kemenkes-tawarkan-solusi-cerdik-melalui-posbindu.html#sthash.UEM8cBjb.dpuf](http://www.depkes.go.id/article/view/2383/diabetes-melitus-penyebab-kematian-nomor-6-di-dunia-kemenkes-tawarkan-solusi-cerdik-melalui-posbindu.html#sthash.UEM8cBjb.dpuf)
- Kemenkes RI. (2014). *Pusat data dan informasi kementerian kesehatan RI: Situasi dan analisis diabetes*. Diperoleh tanggal 28 November 2016 dari [www.depkes.go.id/resources/download/pusdatin/infodatin/infodatin-diabetes.pdf](http://www.depkes.go.id/resources/download/pusdatin/infodatin/infodatin-diabetes.pdf)
- LaMorte, W. W. (2016). *The health belief model*. Boston University School of Public Health. Diperoleh tanggal 1 Maret 2017 dari <http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html>