THE EFFECT OF MULTIDISCIPLINARY COLLABORATIVE MODEL ON KNOWLEDGE, SELF-CARE, AND GLYCEMIC CONTROL IN TYPE 2 DIABETES MELLITUS PATIENTS AT ASSUYUTHIYYAH HOSPITAL, PATI

Sony Factarun[1], Ernawati[2], Yunie Armiyati[3]
[1,2,3] Universitas Muhammadiyah Semarang, Indonesia
Email: factarun025@gmail.com, ernawati@unimus.ac.id, yunie@unimus.ac.id

ABSTRACT

The incidence of diabetes mellitus patients is increasing which is followed by many problems that occur, including non-compliance in diabetes mellitus patients characterized by lack of knowledge, self-care and unstable glycemic control, the need for a multidisciplinary collaboration model to improve patient safety and professional satisfaction of caregivers. The purpose of this study was to determine the effect of the multidisciplinary collaborative model on knowledge, self-care and glycemic control of type 2 diabetes patients at Assuyuthiyyah Pati Hospital. Experimental research quantitative approach. Design quasi experiment pretest and post test with control group. The population of patients with type 2 diabetes mellitus in the inpatient room of Assuyuthiyyah Pati Hospital from January to March 2024 according to the inclusion criteria were 106 respondents. Non probability sampling technique, consecutive sampling. Data analysis wilcoxon test and mann whitney test. The results showed that the average knowledge of DM 2 patients in the intervention group before 64.64 and after 76.15, while in the control group before 59.30 and after 66.51, with an average intervention class difference of 11.51, the average self-care before the multidisciplinary collaborative model of 64.42 increased to 77,19 with an average intervention class difference of 10.77, Average DM 2 patients in the glycemic control intervention group before 175.25 and after 118.58 while in the control group before 200.51 and after 162.79, Average glycemic control before the multidisciplinary collaborative model of 175.25 decreased to 118.58 with an average intervention class difference of 56.67.

| KEYWORDS | *Multidisciplinary Collaboration Model, Knowledge, Self-care, Glycemic Control, Type 2 DM.* |

Sony Factarun, Ernawati, Yunie Armiyati

INTRODUCTION

Globally Diabetes Mellitus (DM) is becoming a major chronic health problem of public concern due to its rapid growth and enormous burden. (Oluwaseun Oluwafunmilayo et al., 2020) The number of people with diabetes has continued to increase in recent decades, this is due to several things such as population growth, increasing prevalence of diabetes at various ages, knowledge, low self-care and less strict glycemic control.(Wahyuni et al., 2019) The *Word Health Organization* (WHO) predicts an increase in diabetes mellitus sufferers in Indonesia to increase by 2-3 times by 2024 reaching 738 million. The results of the Basic Health Research (Riskesdas) show that the number of diabetes patients will increase up to 2 times by 2045 reaching 16.6 million.(Indonesian Ministry of Health., 2020) The prevalence of Diabetes Mellitus in Indonesia ranks 6th out of ten countries with the highest number of 10.3 million patients and is estimated to increase to 16.7 million patients by 2045. The highest incidence of DM in Indonesia is DKI Jakarta Province at 3.4%. The prevalence of DM in Central Java province ranks 5th in Indonesia at 2.1% with the highest prevalence in Semarang district (40,483). The prevalence of DM in Pati Regency ranks 3rd in Central Java at 31,276, with the highest prevalence in Juwana sub-district at 2,915 and Trangkil sub-district ranked 3rd in DM cases in Pati at 1,039,(DHO Pati, 2021) with an average of low knowledge in controlling diet, not being halfway in controlling blood sugar levels, lack of self-care such as doing physical exercise, taking drugs not regularly.

The high number of DM cases needs to be followed by proper management to prevent complications and optimize the patient's quality of life. Low self-care in diabetes mellitus patients is often found, namely an unhealthy diet or consuming fast food, minimal physical activity and low motivation to do foot checks or blood sugar. The results of research on DM patients in 2023 in Bogor City showed that low self-care patients, one of which was not compliant in taking medication because there was no motivation in taking medication, forgetfulness and the routine of taking medication was not an activity that would run every day.(Ni et al., 2019) Non-pharmacological approaches involving nurses, nutritionists can provide good patient care in diabetes care by providing prevention such as promoting self-care, dietary compliance, structured education programs with the aim of blood glucose and HbA1c levels within normal limits.(Taïeb et al., 2022) Arfina's research in 2019 with a research sample of 28 people showed the results that patient self-care non-compliance due to lack of dietary restrictions, irregular monitoring of blood sugar levels, long-term management of diabetes mellitus can cause more serious complications.(Arfina, 2019)

Complications in DM patients can be controlled and avoided through knowledge management and self-care of diabetes patients such as dietary management, physical exercise, medication, blood glucose control, DM treatment.

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Knowledge management is important for the care of DM patients because patients' lack of knowledge such as in paying attention to diet, control of blood glucose levels, compliance in taking medication can affect self-efficacy, so that knowledge management in DM self-care cannot run well.(Fitriani & Muflihatin, 2020) A good level of knowledge about health has an influence on DM patients, especially self-care and glycemic control.(Gamia et al., 2023) Research findings in Lebanon state that self-care and controlling glycemic control can prevent complications.

Glycemic control is an important factor in diabetes management with limited quality of life expectations.(Syahrul et al., 2022) Bhandaris' research in 2020 also revealed that patients with type 2 diabetes mellitus did not achieve the recommended glycemic control targets due to a treatment approach that focuses more on individual aspects and tends to see patients separately from their social and psychological context.(Bhandari et al., 2020) Glycemic control serves to assess blood glucose concentrations which are used to assess the benefits of treatment, as guidelines for adjusting diet, exercise and medication to achieve blood glucose levels as normal as possible.(Davies et al., 2022) Care and glycemic control of type 2 diabetes mellitus patients with a collaborative approach can increase knowledge and self-care in controlling blood glucose levels more optimally.(Abdulrhim et al., 2021) A multidisciplinary approach is a glycemic control management strategy in diabetes care,(Taberna et al., 2020) Multidisciplinary approach should be focused on integrated management with multiple treatment goals including glycemic control and lifestyle management.(Oba et al., 2020) The main concept and principle of the multidisciplinary collaboration approach is shared responsibility in decision making, in addition to respecting team members, it must also pay attention to the needs of patients.(Taïeb et al., 2022)

The multidisciplinary collaboration model has been a potential solution for DM patients. Multidisciplinary collaboration model various health professionals (doctors, nurses, dietitians, and pharmacists) work together to provide comprehensive and patient-centered care with multidisciplinary collaboration model can control blood sugar levels.(Tan et al., 2019) The multidisciplinary collaboration model approach especially in monitoring, counseling and treatment optimization has a positive impact on blood glucose levels.(Siaw & Lee, 2019) Research on collaboration model by Nongnut Oba in 2019 in Thailand showed that glycemic control management for DM care involves health professionals (doctors, pharmacists, nutritionists and nurses), each of which has different duties and responsibilities. The doctor is in charge of considering the overall results including the patient's condition, laboratory results, diet, medication records and making the final decision to continue or complete treatment. The pharmacist is in charge of monitoring the patient's medication by checking the patient's remaining medication at each visit by writing a small note proposed to the doctor or nurse aimed at follow-

up education in taking medication. Dietitians are responsible for examining nutrition and providing dietary education to diabetic patients. Nurses have responsibility for case management during treatment.(Oba et al., 2020) This model is suitable for implementation in type A, B, and C hospitals where human resources such as doctors, nurses, pharmacists and nutritionists are available in type D hospitals.

RESEARCH METHOD

Experimental research quantitative approach. Design quasi experiment pretest and post test with control group. The population of patients with type 2 diabetes mellitus in the inpatient room of Assuyuthiyyah Pati Hospital in January - March 2024 according to the inclusion criteria were 106 respondents. Non probability sampling technique, consecutive sampling. Data analysis wilcoxon test and mann whitney test.

RESULT AND DISCUSSION

Multidisciplinary collaborative model on knowledge of type 2 DM patients in intervention and control groups

Table 1. Effect of multidisciplinary collaborative model on the knowledge of patients with type 2 DM in the intervention and control groups at Assuyuthiyyah Hospital Pati

	Intervention Group Mean	Group Mean Control	Std. Deviation Intervention	Std. Deviation control	p-$Value^*$
Knowledge of patients with type 2 diabetes	76,15	66,51	16,624	16,054	0,003

The average knowledge of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 76.15 and the control group was 66.51 with an average difference of -9.64. The results obtained a significance level of 0.003 which means there is a significant difference between the intervention group and the control group.

Multidisciplinary collaborative model on self-care of patients with type 2 diabetes in intervention and control groups

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Table 4.2 Effect of multidisciplinary collaborative model on self-care of patients with type 2 DM in intervention and control groups at Assuyuthiyyah Pati Hospital

	Intervention Group Mean	Group Mean Control	Std. Deviation Intervention	Std. Deviation control	p-Value*
Self-care of patients with type 2 diabetes	77,19	71,17	19,681	20,578	0,051

The average self-care of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 77.19 and the control group was 71.17 with an average difference of -6.02. The results obtained a significance level of 0.051 which means there is a significant difference between the intervention group and the control group.

Multidisciplinary collaborative model on glycemic control of type 2 DM patients in intervention and control groups

Table 4.3 Effect of multidisciplinary collaborative model on glycemic control of type 2 DM patients in intervention and control groups at Assuyuthiyyah Pati Hospital

	Intervention Group Mean	Group Mean Control	Std. Deviation Intervention	Std. Deviation control	p-Value*
Glycemic control of patients with type 2 diabetes	118,58	162,79	33,501	48,875	0,000

The average self-care of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 125.55 and the control group was 145.26 with an average difference of -44.21. The results obtained a significance level of 0.000 which means there is a significant difference between the intervention group and the control group.

The average knowledge of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 76.15 and the control group was 66.15 with an average difference of -9.64. The results obtained a significance level of 0.003 which means there is a significant difference between the intervention group and the control group. The multidisciplinary factor that involves various fields such as doctors, nurses, nutritionists, and pharmacists in providing education and integrated care is the main cause of the difference. The multidisciplinary collaborative model can provide a more holistic approach to managing type 2 DM. Involving various disciplines in care allows patients to get more comprehensive and

specialized information.(Bakhtiar & Duma, 2020) For example, doctors can provide in-depth medical understanding, while nutritionists can provide proper dietary guidance, and nurses can provide daily emotional and practical support. In addition, interprofessional collaboration in this model improves patient adherence to treatment and education. With support from multiple parties, patients tend to feel more supported and encouraged to follow the patient's treatment plan. This can have a positive impact on the patient's understanding and skills in managing the patient's illness.(Meilina & Bernarto, 2021).

The significant difference between the intervention and control groups can also be influenced by the factor of knowledge measurement methods, multidisciplinary interventions provide a more intensive approach in measuring patient knowledge.(Mistiaen et al., 2020)For example, by using a more detailed questionnaire or through a more structured education session. Meanwhile, the significant result at the significance level of 0.004 indicates that the difference between the two groups is not simply the result of chance. Thus, this study provides a strong basis to recommend the use of a multidisciplinary collaborative model in managing patients with type 2 DM, as an effort to improve knowledge and holistic management of the disease.

The average self-care of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 77.19 and the control group was 71.17 with an average difference of -6.02. The results obtained a significance level of 0.051 which means there is a significant difference between the intervention group and the control group. The multidisciplinary collaboration model with various health professions can improve and optimize comprehensive patient self-care in controlling blood sugar levels.(Suryani, 2020) A well-designed multidisciplinary collaboration model can improve patient self-care, and can make one pattern of thinking in solving differences in the experience and approach of multidisciplinary health practitioners in implementing the model can affect the results.(Anderson et al., 2019)

In addition, individual patient characteristics such as education level, underlying health conditions, and motivation to follow treatment can also affect self-care outcomes. Patients with higher educational backgrounds or more stable health conditions have a better ability to perform self-care, regardless of the intervention provided. In addition, environmental factors can also affect patient self-care(Marselia & Karolina, 2019). Family support, accessibility of health facilities, and socioeconomic conditions can play an important role in patients' willingness and ability to perform optimal self-care.(Teras, 2019) Although there was no significant difference in self-care between the two groups in this study, this does not mean that the multidisciplinary collaborative model has no benefits. There may still be positive impacts on other aspects of patient health, such as knowledge

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of the disease, quality of life, or psychological well-being, which were not covered by the parameters measured in this study. (Crepaldi et al., 2024)..

The average self-care of type 2 DM patients in the intervention group who received the multidisciplinary collaborative model was 118.58 and the control group was 162.79 with an average difference of -44.21. The results obtained a significance level of 0.000 which means there is a significant difference between the intervention group and the control group. The multidisciplinary collaborative model seems to have a positive impact in achieving better glycemic control in patients with type 2 diabetes. The involvement of various disciplines, such as doctors, nurses, nutritionists, and pharmacists, in providing care and education is a determining factor in this improvement in glycemic control. The holistic approach adopted by this model allows for comprehensive patient support, from medical monitoring to psychosocial support.(Puspita & Khairunnida, 2022) Factors such as more structured education, intensive medical team support, as well as improved patient understanding of the importance of glycemic control may also play a role in the observed outcomes.(Khan et al., 2020) Patients involved in a multidisciplinary collaborative model are likely to receive more coordinated and comprehensive attention in their disease management, which in turn may increase their motivation and engagement in achieving optimal glycemic control. It is important to note that better glycemic control in the intervention group not only impacts patients' well-being directly, but may also reduce the risk of long-term complications associated with type 2 diabetes. This demonstrates the importance of implementing a multidisciplinary collaborative model in the management of chronic diseases such as diabetes, as part of efforts to improve patients' long-term health outcomes. Nonetheless, it should be kept in mind that every study has certain limitations, and these findings are also influenced by certain factors such as study design, sample population, or intervention characteristics. Therefore, further research is needed to validate these results and further understand the underlying mechanisms, as well as explore potential improvements or modifications to the multidisciplinary collaborative model to improve glycemic control of patients with type 2 diabetes more effectively. Research on reducing blood sugar levels in patients with type 2 diabetes mellitus (DM) with DM foot exercises: A Case Study obtained the results of a decrease in GDS after DM foot exercise therapy. The three study subjects as a whole experienced an average decrease in GDS of 37.6 mg/dl. (Yulianti & Armiyati, 2023).

CONCLUSION

The average knowledge of patients with type 2 DM in the intervention group who received the multidisciplinary collaborative model was 76.15 and the control group was 66.51 with an average difference of -9.64. The average self-care of

patients with type 2 DM in the intervention group who received the multidisciplinary collaborative model was 77.19 and the control group was 71.17 with an average difference of -6.02. The average glycemic control of patients with type 2 DM in the intervention group who received the multidisciplinary collaborative model was 118.58 and the control group was 162.79 with an average difference of -44.21.

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