Factors Associated with Self-Management Behaviour among Type 2 Diabetes Mellitus Patients

Factores asociados con el comportamiento de autogestión entre pacientes con diabetes mellitus tipo 2

Fadli[1,a,c*], Nursalam [2b], Nilawati Uly[3c], Ratnasari Iskandar[4c], Haeril Amir[5d], Andi Sastria Ahmad[6e]

SUMMARY

Objective: *This study aims to analyse the associated factors with self-management behaviour in type 2 diabetes mellitus (T2DM) patients. **Method**: The study used a cross-sectional approach with a total sample of 115 T2DM patients in Sidrap Regency, South Sulawesi, selected through multistage random sampling. Data were analysed with Chi-Square test and logistic regression. **Results**: Respondents with good self-management knowledge were 94 times more likely to manage the disease (Ex(b) = 94.26), and those with good self-efficacy were 54 times more likely to practice good self-management behaviour. **Conclusion**: Factors greatly affecting self-management are knowledge, self-efficacy, and family support. Self-management can also prevent complications.*

Keywords: *Type 2 diabetes mellitus, family support, self-efficacy, motivation, knowledge, self-management behaviour*

RESUMEN

Objetivo: *Este estudio tiene como objetivo analizar los factores asociados con el comportamiento de autocuidado en pacientes con diabetes mellitus tipo 2 (DM2). **Método:** El estudio utilizó un enfoque transversal con una muestra total de 115 pacientes con DM2 en Sidrap Regency, South Sulawesi, seleccionados a través de un muestreo aleatorio de etapas múltiples. Los datos fueron analizados mediante la prueba de Chi-Cuadrado y regresión logística. **Resultados:** Los encuestados con buen conocimiento de automanejo tenían 94 veces más probabilidades de manejar la enfermedad (Ex(b) = 94,26), y aquellos con buena autoeficacia tenían 54 veces más probabilidades de practicar un buen comportamiento de automanejo.*

ORCID: 0000-0001-9951-2679[1]
ORCID: 0000-0002-9052-6983[2]
ORCID:0000-0002-1937-2889[3]
ORCID:0000-0002-7682-3500[4]
ORCID:0000-0002-2350-0150[5]
ORCID: 0000-0001-6722-2626[6]

[a]Doctoral Student of Nursing, Faculty of Nursing, Universitas Airlangga, Jalan Dr. Ir. H. Soekarno, Mulyorejo, Kec. Mulyorejo, Surabaya, East Java 60115
[b]Nursing Department, Faculty of Nursing, Universitas Airlangga,

Jalan Dr. Ir. H. Soekarno, Mulyorejo, Kec. Mulyorejo, Surabaya, East Java 60115
[c]Faculty of Health, Mega Buana University, Jalan Andi Ahmad, Palopo, South Sulawesi 91913
[d]Faculty of Public Health, Universitas Muslim Indonesia, Makassar
[e]Faculty of Health, Mega Buana University, Jalan Andi Ahmad, Palopo, South Sulawesi 91913

*Corresponding author: Fadli
E-mail: fadli-2021@fkp-unair.ac.id
Adress: Jalan Dr. Ir. H. Soekarno, Mulyorejo, Kec. Mulyorejo, Surabaya, East Java 60115; Jalan Andi Ahmad, Palopo, South Sulawesi 91913

Conclusión: *Los factores que afectan en gran medida el automanejo son el conocimiento, la autoeficacia y el apoyo familiar. El autocontrol también puede prevenir complicaciones.*

Palabras clave: *Diabetes mellitus tipo 2, apoyo familiar, autoeficacia, motivación, conocimiento, comportamiento de automanejo.*

INTRODUCTION

Diabetes mellitus (DM) is a chronic progressive metabolic disorder involving elevated blood glucose levels due dysregulation of insulin hormone (1). DM has several categories, including type 1, type 2, maturity-onset diabetes of the young (MODY), gestational diabetes, neonatal diabetes, and secondary causes due to endocrinopathies, steroid use, etc. The main subtypes of DM are Type 1 diabetes mellitus (TDM1) and Type 2 diabetes mellitus (T2DM), which classically result from defective insulin secretion (T1DM1) and/or action (T2DM2) (2). T2DM affects approximately 422 million people worldwide (3). Based on the data from the International Diabetes Federation (IDF), in 2021, 537 million people had diabetes worldwide, i.e., approximately one in ten people. That number is estimated to be 643 million in 2030. Indonesia is the fifth-highest country with 19.5 million people with diabetes, and by 2045 is expected to increase by 28.6 million (4).

In addition to the increasing number of cases, DM also causes acute complications, such as diabetic ketoacidosis, nonketotic hyperosmolar, hypoglycaemia, and chronic complications, such as macroangiopathy, microangiopathy, and neuropathy (5). Complications increase the cost of survival and affect the quality of life. A study in Palestine showed that almost 34 % of people with diabetes had a poor quality of life (6). In this case, self-management is important in treating diabetes mellitus.

Self-management for type 2 diabetes treatment includes dietary regulation, physical activity/exercise, blood glucose monitoring, medication adherence, and self/foot care (7). Adherence will improve management's achievement, while poor blood sugar regulation can lead to poor glucose control (8). In other words, compliance can prevent complications (9).

A past study involving 123 respondents shows that 62.6 % scored low on blood sugar monitoring indicators (10). A study in China shows that 50.4 % of diabetes patients' self-management was moderate and 33.6 % low (11). These studies indicate that many patients may not understand self-management thoroughly. The success of self-management can be influenced by several factors such as age, sex, education level, duration of suffering, knowledge, self-efficacy, burden of diabetes, family support (12,13).

Previous research has also shown that self-care and self-management educational interventions can improve patients' self-management (14). However, results have not been optimum, and many people are still unable to manage their disease independently. A self-management model based on self-regulation is needed to control emotions and self-concept. Families' knowledge and skills also need to be increased in helping patients overcome their problems. Therefore, this study aims to analyse the factors associated with self-management behaviour in T2DM patients.

METHOD

The design of this study was a cross-sectional, with data collected from Empagae Health Centre in Sidrap Regency. The dependent variable used in this study was self-management behaviour, and the independent variables were knowledge, motivation, emotional state, family support, and self-efficacy. The sample size was 115 T2DM patients recruited using the technique of multistage random sampling. The criteria were patients with T2DM, undergoing outpatient treatment in community health centers, able to communicate well, aged 35-60, having blood glucose levels between 71-380 mg/dL, and willing to participate. All participants were provided written consent and agreed to follow the study protocol approved by the Health Research Ethics Committee of the Faculty of Health, Mega Buana University, Palopo, Indonesia.

This study reveals the correlation between self-care behaviour and knowledge, motivation,

emotional aspects, family support, and self-efficacy of T2DM patients. The research questionnaire was divided into four parts: 1) demographic data, 2) T2DM self-management data using the diabetes self-management questionnaire (DSMQ) (15), 3) family support data using the health social support questionnaire, 4) knowledge about diabetes, emotional aspect assessed using problem areas in diabetic scale (PAIDS), motivation levels measured using the treatment self-regulation questionnaire (TSRQ), and self-efficacy tested using the diabetes self-efficacy scale (DMSES). The factors associated with self-management behaviour were evaluated by using logistic regression analysis.

RESULTS

Table 1 shows that most women with T2DM did not have complications such as hypertension and stroke. The average age was pre-elderly, with an average length of T2DM suffering of 4.5 years. The average blood sugar value in the abnormal category was 253.8 mg/dL.

Table 1. Characteristics of Respondents (n=115)

Characteristics	Mean ±SD	n (%)
Gender, n (%)		
Male	-	43 (37.4)
Female	-	72 (62.6)
Disease complications, n (%)		
No complications	-	63 (54.8)
There are complications	-	52 (45.2)
Age, years (±Up to)	50.5±8.39	-
Length of suffering from DM, years (±up to)	4.6±3.40	-
Blood sugar value, mg/dL (±up to)	253.8±43.86	-

Table 2 shows that 61 respondents' knowledge about self-management was good, and 25 were low. The p-value from the Chi-Square test was 0.0001, which implies a relationship between knowledge and self-management. Meanwhile, 54 respondents' self-efficacy was good, and 32 were low. The Chi-Square shows a p-value of 0.0001, implying a relationship between self-efficacy and self-management. Regarding family support, 45 participants' self-management was good. Meanwhile, 33 respondents with lacked family support showed less optimal self-management. The Chi-Square test results show a p-value of 0.0001, suggesting a relationship between family support and self-management.

Thirty respondents with high motivation showed good self-management, and 33 with low motivation showed poor self-management. The Chi-Square test showed a p-value of 0.024, suggesting a link between motivation and self-management. Likewise, 29 people with good emotional regulation showed good self-management, and 37 others with poor emotional regulation showed poor self-management. The Chi-Square test shows a p-value of 0.001, suggesting a relationship between emotional aspects and self-management.

Table 3 indicates that motivation and emotional aspects were not included in multivariate modelling (p-value > 0.25). Meanwhile, knowledge, self-efficacy, and family support factors were included. The findings show that the link between knowledge and T2DM self-management was the most significant (p=0.0001). Exp (B) value was 94.26, meaning someone with good knowledge has 94.3 times the opportunity to conduct T2DM self-management well.

Table 2. Factors Associated with Self-Management Behaviour in T2DM Patients (n=115)

| Variable | Self-Management Behaviour | | | | Total | | p |
| | Good | | Poor | | | | |
	n= 74	%	n=41	%	n=115	%	
Diabetes knowledge							
Have better knowledge	61	53.0	16	13.9	77	67.0	<0.001
Have less knowledge	13	11.3	25	21.7	38	33.0	
Self-efficacy							
Have better self-efficacy	54	47.0	9	7.8	63	54.8	<0.001
Have less self-efficacy	20	17.4	32	27.8	52	45.2	
Family support							
Good	45	39.1	8	7.0	53	46.1	<0.001
Have less	29	25.2	33	28.7	62	53.9	
Motivation							
Good	30	26.1	8	7.0	38	33.0	0.024
Low	44	38.3	33	28.7	77	67.0	
Emotional aspects							
Good	29	25.2	4	3.5	33	28.7	0.001
Low	45	39.1	37	32.2	82	71.3	

Table 3. Analysis Factors Associated with Self-Management Behaviour among Type 2 Diabetes Mellitus Patients

| Variable | P | OR (Exp B) | 95% CI | |
			Min	Max
Diabetes knowledge	<0.001	94.26	8.94	752.19
Self-efficacy	<0.001	42.57	3.58	247.25
Family support	0.023	0.153	0.02	0.84

DISCUSSION

Self-management for type 2 diabetes treatment includes dietary regulation, physical activity/exercise, blood glucose monitoring, medication adherence, and self/foot care (7). Patients need to be self-disciplined to carry out this to improve management outcomes. Non-adherence may increase blood sugar levels, which means poor glucose control (8). Compliance is crucial to improving quality of life and preventing complications (9).

Quality of self-management is influenced by factors such as age, gender, level of education, duration of type 2 diabetes, knowledge, self-efficacy, stress, and family support (13).

This study shows that self-efficacy is integral (p-value of 0.0001). For example, self-efficacy or the ability to organize and perform specific tasks to obtain expected results (10), can alter a person's way of thinking, feeling, and acting (16). According to the Health Belief Model (HBM), supposing a person has certain knowledge, attitudes, and skills to do something, without high self-efficacy, they may not act on it (17). A study in Thailand reported a relationship between self-efficacy and self-care, with a p-value for diabetes knowledge of 0.001(18).

High self-efficacy also promotes adherence to recommended treatment regimens for chronic diseases to care for oneself. Self-efficacy can also mean high confidence or trust. Someone with high confidence tends to perform DM self-management. diabetes self-management education intervention has been shown to be effective in dealing with type 2 diabetes mellitus. Furthermore, DSME has a positive effect on lifestyle changes and the self-care of T2DM patients (19).

The bivariate analysis also shows a significant relationship between knowledge and self-management with p=0.0001 (10). Good self-management depends on willingness, high motivation, and sufficient DM knowledge. For example, dietary knowledge is important for T2DM patients to avoid complications. Pedagogic interventions can be optimised to increase patients' knowledge about the disease, management, treatment, interactions, diets, physical activities, and optimisation of existing health facilities. However, patients are often aware of the dietary recommendations but do not follow them because the foods are not tasty. They eat what they want once no serious symptoms are noticed. In this case, knowledge and awareness are not enough and should be followed by changing behaviour to improve survival and life quality (20). Therefore, social support from family is needed.

Previous studies also show that patients did not have sufficient knowledge about self-management. Education on self-care and self-management has not been optimal, and many people cannot manage their disease (14). This study has shown that the factors affecting self-management are knowledge, self-efficacy, and family support. Therefore, educational interventions can focus on these aspects. Family members need to be educated as well to support patients in managing their disease. Additionally, a spiritual approach is needed to help patients improve their emotional regulations and self-concepts.

Lastly, the limitation of this research is that it does not address the spiritual approach. Future research can develop self-management behaviour interventions that integrate spiritual aspects through different theoretical approaches. Future research can also focus on families' knowledge and skills in helping patients overcome their disease problems and improve life quality.

CONCLUSION

This study showed that the factors influencing self-management were knowledge, self-efficacy, and family support. Educational interventions can therefore focus on these aspects. Family members also need to be trained to help patients manage their illness. Additionally, a spiritual approach is necessary to help patients improve their emotional adjustment and self-concept.

Authors' Contributions

All contributors contributed significantly to this study, and all authors agree with the manuscript's content.

Conflict of Interest

The author(s) declared no potential conflicts of interest concerning this article's research authorship and/or publication.

Availability of Data and Materials

All data generated or analyzed during this study are included in this published article.

Ethical Approval

This article received ethical permission from Faculty of Health, Mega Buana University, Palopo, Indonesia.

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