MEDISAINS
Jurnal Ilmiah Ilmu - Ilmu Kesehatan

Original Article

# Factors influence self-care behavior and diabetic management in patients with diabetes mellitus

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## ARTICLE INFORMATION

Received: July 11, 2023
Revised: August 25, 2023
Accepted: August 30, 2023

## KEYWORDS

Self-Care; Motivation; Family Support; Diabetic Management

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## A B S T R A C T

**Background:** Self-care behavior and diabetic management in patients with diabetes mellitus (DM) tends to be low, especially during the COVID-19 pandemic. Various studies have found the influence of knowledge with self-care behavior diabetic management, as well as attitudes, motivation, family support and self-efficacy, but research analyzing the most dominant factors that play a role in influencing diabetic patients in self-care behavior and diabetic management is still limited.

**Purposes:** Analyzing the factors that influence self-care behavior and diabetic management in diabetic patients. This study also analyzes the factor that play the most dominant role to influence self-care behavior and diabetic management in diabetic patients.

**Methods:** This type of research is observational analytic with cross-sectional design. Patients of type 2 diabetes were the population in this study, with a sample size of 312 selected by convenience sampling. Factors of knowledge, attitude, motivation, family support and self-efficacy were observed in the study which were thought to be factors affecting self-care behavior diabetic management. The data were analyzed by chi square test and logistic regression.

**Results:** The factors of knowledge, family support, and motivation significantly influence self-care behavior and diabetic management ($p<0.05$). The motivation factor is the most dominant factor affecting it (AOR 2.760; $p<0.001$).

**Conclusion:** Good knowledge about diabetes management plus optimal family support and high motivation will improve self-care behavior and diabetic management in diabetic patients.

## INTRODUCTION

The International Diabetes Federation (IDF) estimates the number of people with diabetes mellitus (DM) to be around 463 million or 9.3% of the total world population in 2019. This number is predicted to increase to 578 million in 2030 and 700 million in 2045. Indonesia is ranked sixth in the world with the highest mortality rate due to DM.[1]

Uncontrolled diabetes will lead to chronic complications of diabetes namely nephropathy, neuropathy, retinopathy, coronary artery disease and peripheral artery disease.[2–5] The complications can be minimized through good self-care by controlling glucose levels, foot care, good diet and appropriate use of pharmacological drugs.[6–8]

A preliminary study found that self-care behavior and diabetic management in DM patients tends to be low, especially during the last COVID-19 pandemic.[9,10] This bad situation is thought to be triggered by economic, mental and emotional factors, low knowledge of good diabetes management, lack of activity during the pandemic, lack of support from family, and low self-efficacy.[11–13]

Various studies have found the influence of knowledge on self-care behavior and diabetic management,[14] as well as attitudes,[15] motivation[16], family support[17] and self-efficacy.[18] However, research analyzing the most dominant factors that play a role in influencing diabetic patients in self-care behavior and diabetic management is still limited. In order to fill the gap, it is crucial to know the dominant

https://doi.org/10.30595/medisains.v21i2.18663

factors that influence self-care behavior in diabetic management. This study aims to analyze the effect of knowledge, attitude, motivation, family support, and self-efficacy on self-care behavior in diabetic management and analyze the most dominant factor affecting the behavior among diabetic patients.

## METHOD

### *Study Design*

This is an analytic observational study with a cross-sectional design.[19]

### *Settings and Respondents*

The study was conducted at Petang Public Health Center, Badung, Bali, Indonesia from August to October 2022. The population were all patients with type 2 diabetes. The sample in this study was 312 respondents with the inclusion criteria being patients medically diagnosed with type 2 DM, male or female, undergoing outpatient care, and willing to become respondents.[20] Diabetes patients having physical, cognitive and mental limitations are exclusion criteria in this study. The sampling technique in the study was carried out by convenience sampling.[21]

### *The Variable, Instrument, and Measurement*

There are two types of variables in this study, namely the independent variables of knowledge, attitude, motivation, family support and self-efficacy and the dependent variable, namely self-care behavior and diabetic management. The knowledge variable was measured using the Spoken Knowledge in Low Literacy in Diabetes Scale (SKILLD) instrument,[22] the attitude variable was measured by Diabetes Attitude Scale (DAS),[23] the motivation variable was measured by Motivational Cognitions in Diabetes Self-Care (MCDS),[24] the family support was measured Diabetes Social Support Questionnaire-Family Version (DSSQ-Family),[25] the variable of self-efficacy or Confidence in Diabetes Self-Care (CIDS)[26] and the self-care behavior variable diabetic management were measured by the Self-Care Inventory-revised (SCI-R).[27] The measurement of each variable was done by direct interview to the respondents.

### *Data Analysis*

The data analysis in this study was tested with chi-square statistical analysis and multiple logistic regression.[28,29]

### *Ethical Consideration*

This study has received a research ethics permit from the Research Ethics Committee of the Institute of Technology and Health (ITEKES) Bali with a registration number of 04.0009/KEPITEKES-BALI/I/2023.

## RESULTS

Table 1 shows that most of the respondents are female, with the majority age <60, the majority has a high school education, and most of them do not work, their monthly incomes are primarily below the average minimum wage, and most of the respondents have DM ≤5 years. Table 2 shows the influence of knowledge, motivation, family support, and self-efficacy on self-care behavior management in DM patients ($p<0.05$). It also proves that there is no effect of attitude factor to it ($p>0.05$).

Table 3 shows that motivation is the most dominant variable affecting self-care behavior and diabetic management in DM patients because it has the highest AOR value among other variables (OAR: 2.760; 95% CI: 1.575-4.838; $p <0.001$). The AOR value in Table 3 means that good knowledge of diabetes management with high motivation in controlling diabetes and good family support will further increase (2x) self-care diabetic behavior in DM patients

**Table 1.** Characteristics of the Respondents (n=312)

| Characteristics | Result |
|---|---|
| **Gender** | |
| Male | 81 (26%) |
| Female | 231 (74%) |
| **Age, years** | |
| <60 | 181 (58%) |
| ≥60 | 131 (42%) |
| **Education** | |
| Uneducated | 43 (13.8%) |
| Elementary | 54 (17.3%) |
| Junior high school | 49 (15.7%) |
| Senior high school | 143 (45.8%) |
| College | 23 (7.4%) |
| **Employment** | |
| Unemployment | 150 (48.1%) |
| Farmer | 55 (17.6%) |
| Self-employed | 98 (31.4%) |
| Civil servant | 9 (2.9%) |
| **Income, Average Minimum Wage** | |
| ≤ Rp 2.7 million | 251 (80.4%) |
| > Rp 2.7 million | 61 (19.6%) |
| **Duration of DM. years** | |
| ≤5 | 287 (92%) |
| >5 | 25 (8%) |

## DISCUSSION

This study found that self-care behavior and diabetic management in diabetes patients is significantly influenced by knowledge, motivation and family support, where the motivation variable is the one with the strongest influence among others. Motivation is closely related to compliance, for example motivation to recover from a disease. Someone with a high motivation to recover from a disease will be more likely to comply with the treatment he is taking and vice versa.[30–32]

**Table 2.** The Influence of Knowledge, Attitude, Motivation, Family Support, Self-Efficacy to Self-Care Behaviour and Diabetic Management (n=312)

| Variables | Self-Care Behaviour and Diabetic Management | | $X^2$ | p-value |
|---|---|---|---|---|
| | Good | Not good | | |
| **Knowledge** | | | | |
| High | 28 (80.0%) | 7 (20.0%) | 5.858 | 0.016 |
| Low | 163 (58.8%) | 114 (41.2%) | | |
| **Attitude** | | | | |
| Positive | 154 (59.9%) | 103 (40.1%) | 1.031 | 0.310 |
| Negative | 37 (67.3%) | 18 (32.7%) | | |
| **Motivation** | | | | |
| High | 161 (66.5%) | 81 (33.5%) | 12.815 | <0.001 |
| Low | 30 (42.9%) | 40 (57.1%) | | |
| **Family Support** | | | | |
| Supportive | 147 (66.5%) | 74 (33.5%) | 8.958 | 0.003 |
| Less supportive | 44 (48.4%) | 47 (51.6%) | | |
| **Self Efficacy** | | | | |
| Good | 117 (66.1%) | 60 (33.9%) | 4.110 | 0.043 |
| Not good | 74 (54.8%) | 61 (45.2%) | | |

**Table 3.** Multivariate Analysis of Factors Affecting Self-Care Behaviour and Diabetic Management (n=312)

| Variabel | β | SE | Wald | p-value | AOR | 95% CI |
|---|---|---|---|---|---|---|
| | | | | | | Lower-Upper |
| Motivation | 1.015 | 0.286 | 12.579 | <0.001 | 2.760 | 1.575-4.838 |
| Family support | 0.787 | 0.263 | 8.956 | 0.003 | 2.197 | 1.312-3.678 |
| Knowledge | 1.014 | 0.448 | 5.125 | 0.024 | 2.757 | 1.146-6.636 |
| Constanta | -3.781 | 0.865 | 19.097 | <0.001 | 0.023 | |

The motivation and compliance of respondents in undergoing self-care behavior and diabetic management in the study was shown by routinely checking blood sugar levels, maintaining diet, foot care, good physical activity and using diabetes drugs correctly. The results of this study support the results of previous studies which found a significant relationship between motivation and compliance with maintaining blood sugar levels,[33] diet,[34] foot care,[35] medication, and physical activity in diabetic patients.[36] Diabetics who are not compliant with blood sugar control, diet, foot care, medication and physical activity are due to low motivation.

In this study, motivation is an important factor for diabetics, because the motivation will provide a strong impetus to carry out self-care behavior and diabetic management. Seeing its importance to the implementation of self-care behavior and diabetic management, it is important for nurses to determine interventions to increase motivation by providing knowledge through health education and counseling, providing support, direction to patients and families to maintain self-management activities in daily life so that blood sugar stability can be maintained.[37]

The knowledge factor about diabetes control is the second factor that affects self-care behavior and diabetic management in diabetic patients. Knowledge about diabetes control is very important for diabetic patients to keep their blood glucose levels under control. With good knowledge about diabetes, a diabetic patient will be able to understand what to do and not to do to maintain the stability of their blood sugar levels. In a previous study, it was found that patients who had good knowledge about diabetes had lower blood glucose levels than those with less knowledge.[38]

It was also revealed that family support also influences self-care behavior and diabetic management in diabetic patients. Family support is very important to motivate patients to carry out treatment.[39] Lack of family support can have an impact on stress levels which in turn will discourage them from carrying out treatment or self-care.[40] Family support can also help patients to accept their sick condition. Besides, it can predict a person to adhere to a lifestyle, especially regarding his/her diets.[41] The results of previous research even proved that respondents receiving a good family support had a 10 times chance of carrying out good diabetes self-care management compared to those who did not (OR=10,30).[42]

## CONCLUSIONS AND RECOMMENDATION

Good knowledge about diabetes management, accompanied by high motivation to manage the disease and good support from the family, will improve self-care behavior and diabetic management, positively impacting the life quality among DM patients. Increasing knowledge and motivation through health counseling is vital to improving their self-care behavior and diabetic management. It is essential to increase family support; solid social support will be more motivated by better self-care behavior and diabetic management.

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