Journal of Medical and Health Studies
ISSN: 2710-1452
DOI: 10.32996/jmhs
Journal Homepage: www.al-kindipublisher.com/index.php/jmhs

JMHS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Factors Associated with Self-Care Management Practices among Patients with Diabetes Mellitus Type II in Saudi Arabia

Budour Alotaibi[1] ✉ and Dalyal Alosaimi[2]
[1]Prince Sultan Military Medical City, Saudi Arabia
[2]King Saud University, Saudi Arabia
Corresponding Author: Budour Alotaibi, **E-mail**: Bodbodalmuqati@gmail.com

| ABSTRACT
Diabetic patients' self-care management practices help to keep diabetes under control, which includes performing activities such as eating a healthy diet, physical activity in regular patterns, conducting foot care, adhering to medication, and self-monitoring of blood glucose. The aim of the current study is to identify the factors which are associated with self-care management practices among patients with diabetes mellitus Type II in Saudi Arabia. A cross-sectional design was applied in this study among patients with type II DM in the Prince Sultan Military Medical City in Riyadh, in which a convenience sampling technique was applied to recruit the patients, and the total number of samples collected was 377. The summary of Diabetes Self-care Activities (SDSCA) instrument, which was adopted from AlJohani et al. (2016), was used in the current study to collect data. The mean percentage of patients' self-care management practices among type II diabetic patients is 51.29%. A significant association was revealed between self-care management practices and patients' factors such as gender, age, educational level, and income in some domains. There is a need to educate low educated diabetic patients on self-care management and those who have low income. The dissemination of leaflets that give information to patients and can be shared and read with their families needs to be widely circulated. Health education information that is delivered through TV channels and social media is also required.

| KEYWORDS

Self-Care Management; Patients; Diabetes; Saudi Arabia

| ARTICLE INFORMATION

ACCEPTED: 15 February 2023 **PUBLISHED:** 09 March 2023 **DOI:** 10.32996/jmhs.2023.4.2.5

1. Introduction

Diabetes is one of the most common chronic diseases and has reached pandemic proportions worldwide. Diabetes is a lifelong disorder with no cure, and the lack of patient participation in the process of treatment is one of the reasons for the lack of success and attaining the desired results in the care of diabetics. Inadequate self-care in diabetics is a major problem that health care providers encounter (Solhi et al., 2017). This issue not only has an impact on mortality rates but also increases treatment costs (Ishak et al., 2017).

According to a report by the Saudi Arabian Ministry of Health, approximately 0.9 million people were diagnosed with diabetes in 1992, but this figure rose to 2.5 million people in 2010, representing a 2.7 times increase in the incidence rates in less than two decades. In 2015, 4660 patients with diabetes attended family and medical clinics across Saudi Arabia (MOH, 2015).

As the prevalence of diabetes rises, it is more important to focus on maintaining target blood glucose levels and the prevention of complications among diabetic patients, in which the patient plays an important role in diabetes management; hence, the patient has to follow self-care practices to achieve target blood glucose levels and prevent poor health outcomes (Anitha Rani & Shriraam, 2019). The World Health Organization (WHO) estimates that the mortality rate associated with DM will double by 2030 (Chaudhury

et al., 2017). The associated complications include stroke, myocardial infarction, kidney damage, early death, and eye damage (WHO, 2017). Alterations in lifestyle, including a healthy diet, daily exercise, and monitoring of blood-glucose levels, may delay the progression of T2DM (Eva et al., 2018).

American Association of Diabetes Educators suggests that a person's healthy lifestyle, diet, monitoring and maintenance of glucose level, and medication adherence should be strictly followed by diabetes patients (Miller et al., 2015). American Diabetes Association advocates weight loss, monitoring the intake of carbohydrates and fiber, and restriction of cholesterol, saturated fat, trans fat, and sodium as an integral part of DM treatment (Grey, 2015). In addition, it is suggested that patients require additional approaches to address individual, family, and social practices to improve self-management (Powers et al., 2016).

Diabetic patients' self-care management practices are self-care activities to keep diabetes under control, which include performing activities such as eating a healthy diet, physical activity in a regular pattern, conducting foot care, adherence to medication, and self-monitoring of blood glucose (American Diabetes Association Standards of medical care in diabetes, 2016). The aim of the current study is to identify the factors which are associated with self-care management practices among patients with diabetes mellitus Type II in Saudi Arabia.

2. Materials and Methods

2.1 Design and Sampling Process

The study adopted a quantitative cross-sectional design. The target population of this study consisted of patients who have diabetes mellitus type II who are attending a diabetic treatment center and family and community medicine department in the Prince Sultan Military Medical City in Riyadh, where a convenience sampling technique was applied to recruit the patients. The study sample was calculated by the Stephen Thompson formula; it was 381 patients after calculation, and 377 out of 381 (98.9%) responded to the study questionnaire.

2.2 Study Instrument

The summary of Diabetes Self-care Activities (SDSCA) instrument, which was adopted from Toobert et al. (2000), was used in the present study to collect data. This instrument was translated into the Arabic language by AlJohani et al. (2016), and it is valid for use among the Saudi population. The study questionnaire consists of 4 parts: diet (2 items), exercise (2 items), blood glucose testing (2 items), and foot care (2 items), and 2 questions each about medications and smoking. The questionnaire also has an extension, and the items included in the extension to the SDSCA aim to identify the amount of self-management diabetes education the participants have received. The extension consists of 4 sections: diet (8 items), exercise (6 items), blood glucose testing (5 items), and medications (5 items). This part has some questions related to the advice given by healthcare providers regarding self-care practices.

Factors that have been used in the current study to show the association with self-care management practices include patients' gender, age, income, marital status, and educational level. Also, other factors have been used, such as the duration of the disease and other comorbidities.

2.3 Ethical Considerations

The researcher was committed to all ethical considerations required to conduct this study; ethical approval was obtained from Institutional Review Board (IRB) and from Prince Sultan Military Medical City to get approval to collect the data. More importantly, informed consent was obtained from all respondents to fill up the questionnaire. There have been no risks or harm due to participation in this study

2.4 Statistical analysis

Statistical methods that have been used include descriptive statistics, such as mean, standard deviation, and mean percentages. Also, several statistical tests have been used, such as independent sample *t*-test, One-way ANOVA, and person correlation test.

3. Results

The study showed the men and mean percentage for each item in self-care management practices among diabetic patients with type II; the study results showed that the mean of days in which the patient follows a healthful diet is 3.53 out of 7 days, with a mean percentage of 50.42%. The mean of days in which the patient followed exercise is 3.15 out of 7 days, with a mean percentage of 45.0%, the mean of days related to conducting foot care is 2.87 out of 7 days (41.0%), and it was 5.54 days out of 7 for medication practices, while it was 2.87 days out of 7 for testing blood glucose (Table 1).

Table 1: Self-Care Management Practices among Diabetic Patients

Self-Care Management Practices	Maximum mean score (%)	Minimum	Mean	SD	Mean %
Diet	7 (100.0)	0 (0.0)	3.53	2.31	50.42
Exercise	7 (100.0)	0 (0.0)	3.15	2.30	45.0
Foot care	7 (100.0)	0 (0.0)	2.87	1.21	41.0
Medication practices	7 (100.0)	0 (0.0)	5.54	1.37	79.14
Testing blood glucose	7 (100.0)	0 (0.0)	2.87	2.66	41.0
Total	7 (100.0)	0 (0.0)	3.59	1.71	51.28

The results also showed that there is a significant difference in the level of patients' following recommended medication practices between males and females ($p<0.05$); female patients have a significantly higher mean level of following medication practices than males. On the other hand, there is no significant difference in the mean level of patients' following self-care management practices related to diet, exercise, testing blood glucose, and foot care with regard to their gender (table 2).

Table 2: Differences in the Level of Self-Care Management Practices with regard to Patients' Gender

Nurses'-related barriers	N	Mean	SD	t statistics	p value[1]
Diet					
Male	153	3.3366	2.28677	-1.374 (375)	0.432
Female	224	3.6696	2.32767		
Exercise					
Male	153	3.4085	2.42753	1.740 (375)	0.891
Female	224	2.9888	2.20855		
Testing Blood Sugar					
Male	153	2.9641	2.62960	0.542 (375)	0.588
Female	224	2.8125	2.69248		
Foot care					
Male	153	2.8487	1.27679	-0.394 (375)	0.694
Female	224	2.8989	1.16933		
Medications					
Male	151	5.3267	1.48148	-2.586 (373)	0.010
Female	224	5.6972	1.27319		

[1]Independent sample *t* test

Moreover, there is a significant positive correlation between patients' following recommended diet and testing blood sugar and their ages ($p<0.05$); with an increase in the patient's age, self-care management practices regarding diet and testing blood sugar increase. The table also shows that there is a significant inverse correlation between patients' following recommended exercise and their ages ($p<0.05$); with an increase in the patient's age, self-care management practices regarding exercise decrease. On the other hand, there is no significant correlation between patients' self-care management practices regarding foot care and medication and their ages.

Table 2: Correlation between Patients' Age and their Self-Care Management

Self-care Management Domain	Patient's Age	
	R	**p value**[1]
Diet	0.171	0.001
Exercise	-0.203	0.000
Testing BG	0.147	0.004
Foot care	0.000	0.399
Medications	.0040	0.444

[1] Pearson Correlation

Regarding the ages of patients, there is a significant positive correlation between patients' self-care management practices regarding diet, testing blood sugar, foot care, and medications, and their ages ($p<0.05$), with an increase in the duration of disease among patients; self-care management practices regarding diet, testing blood sugar, foot care, and medications. Also, there is a significant inverse correlation between patients' self-care management practices regarding recommended exercise and their duration of disease ($p<0.05$); with an increase in the patients' duration of disease, self-care management practices regarding exercise decrease (Table 3).

Table 3: Correlation between Duration of Disease and the Patients' Self-Care Management

Self-care Management Domain	Duration of Disease	
	r	**p value**[1]
Diet	0.126	0.015
Exercise	-0.119	0.020
Testing blood sugar	0.159	0.000
Foot care	0.147	0.000
Medications	0.130	0.012

[1] Pearson Correlation

The results also revealed that there is a significant difference in the level of patients' self-care management practices regarding exercise with regard to their educational levels in favor of those who have below secondary school. Also, there is a significant difference in the level of patients' self-care management practices regarding foot care with regard to their educational levels in favor of those who have university degrees and higher. On the other hand, there is no significant difference in the level of patients' self-care management practices regarding testing blood glucose and medications with regard to their educational levels (Table 4).

Table 4: Differences in the Level of Patients' Self-Care Practices with regard to their Educational Levels

Variable	**N**	**Mean**	**SD**	**F (df)**	***P* value**[1]
Diet					
Illiterate	159	3.64	2.33	2.190 (3, 373)	0.089
Below secondary	118	3.67	2.26		
Secondary	48	2.73	2.26		
University and higher	52	3.62	2.33		

Testing Blood Glucose					
Illiterate	159	2.90	2.63	1.093 (3, 373)	0.352
Below secondary	118	2.61	2.65		
Secondary	48	2.80	2.78		
University and higher	52	3.41	2.66		
Exercise				6.189 (3, 373)	0.000
Illiterate	159	2.58	2.22		
Below secondary	118	3.69	2.28		
Secondary	48	3.45	2.16		
University and higher	52	3.44	2.37		
Medications					
Illiterate	159	5.78	1.20	2.190 (3, 373)	0.509
Below secondary	118	5.40	1.42		
Secondary	47	5.33	1.76		
University and higher	51	5.33	1.24		
Foot Care					
Illiterate	159	2.69	1.11	2.848 (3, 296)	0.037
Below secondary	118	2.99	1.27		
Secondary	48	2.84	1.10		
University and higher	52	3.20	1.37		

[1]One way ANOVA

Regarding patients' income, there is a significant difference in the level of patients' self-care management practices regarding diet with regard to their income in favor of those who have an income of more than 10,000 SAR. Also, there is a significant difference in the level of patients' self-care management practices regarding testing blood sugar with regard to their income in favor of those who have an income of more than 10,000 SAR.

Moreover, there is a significant difference in the level of patients' self-care management practices regarding exercise with regard to their income in favor of those who have an income of more than 10,000 SAR. On the other hand, there is no significant difference in the level of patients' self-care management practices regarding foot and medications with regard to their income (Table 5).

Table 5: Differences in the Level of Patients' Self-Care Practices with regard to their Income

Variable	N	Mean	SD	F (df)	*P* value[1]
Diet					
<5,000 SAR	102	3.04	2.23	4.288 (2, 371)	0.014
5,000 – 10,000	193	3.57	2.34		
>10,000	79	4.04	2.24		
Testing Blood Glucose					
<5,000 SAR	102	2.95	2.62	1.357 (2, 371)	0.012
5,000 – 10,000	193	2.53	2.60		
>10,000	79	3.58	2.78		
Exercise				4.490 (2, 371)	0.013

<5,000 SAR	6	3.16	2.85		
5,000 – 10,000	247	3.09	2.61		
>10,000	7	3.85	3.13		
Medications					
<5,000 SAR	102	5.69	1.29	0.894 (2, 371)	0.410
5,000 – 10,000	193	5.50	1.45		
>10,000	77	5.43	1.26		
Foot care					
<5,000 SAR	102	2.77	1.13	2.219 (2, 371)	0.110
5,000 – 10,000	193	2.84	1.22		
>10,000	79	3.13	1.25		

[1]One way ANOVA

4. Discussion

The study results revealed the association between different factors and self-care management practices among type II DM. The study results revealed that there was a significant difference in the level of patients' following recommended medication practices between males and females, in which female patients had a significantly higher mean level of following medication practices than males. On the other hand, there is no significant difference in the mean level of patients' following self-care management practices related to diet, exercise, testing blood glucose, and foot care with regard to their gender.

These results are similar to what has been revealed by the study Alsomali (2018), which found that there were significant differences between males and females in terms of taking medication, in which more female patients reported taking their medication than males. This could be explained by the fact that males being out of the home more frequently, forget to take their medications more often, while the majority of females are housewives, which makes it easier for them to take their medications throughout the day. A similar study carried out in Saudi Arabia (Albargawiab et al., 2016) also found that female patients demonstrated higher adherence to medication than males, and a study in Nigeria similarly found that females had higher adherence to treatment protocols (Uchenna et al., 2010).

Regarding gender and diet, the current study results are not consistent with the results of Alsomali (2018), which found there were significant differences in diet adherence, exercise regimes, and testing blood sugar levels between males and females.

Regarding self-care practices and patients' age, the study results are not consistent with the results of Alsomali (2018), which found that age was not significantly related to any diabetes self-care activities. Also, findings from Kurnia et al. (2017) also found no significant differences between age groups with respect to all dimensions of self-care management practices.

Moreover, the results of the current study are not similar to the results revealed by Al Johani et al. (2015), which revealed that age was not associated with overall self-care management practices. Current study results could be attributed to the fact that the factor of age plays an important role in stimulating the patient to be more adherent to the self-care regimen, as old-age patients are afraid of death if they do not adhere to the recommended regimens.

Regarding self-care practices and patients' education, the current study results are similar to what has been revealed by Alsomali (2018), which revealed that exercise had been associated with the educational level of patients, while it was not similar in other variables, especially diet, and testing of blood glucose. Also, the current study results are not consistent with the results of Dedefo et al. (2019), which revealed that the educational level of patients did not have an effect on the self-care practices of diabetic patients. Moreover, this is similar to a study conducted in the Brazilian context, which found that the level of education impacted adherence to self-care activities (Cortez et al., 2017).

The results of the current study could be attributed to the fact that with an increase in the educational level, the patients become more oriented toward disease and its complication; thus, with an increase in educational level, the foot care of patients increased. Moreover, patients who are below secondary school are the most ones who practice exercise; this could be attributed to their free time, which may have free time for practicing exercise, in comparison to educating patients; they are more busy.

Regarding self-care practices and patients' income, the current study results are not similar to what has been revealed by Al Johani et al. (2015), which revealed that income did not have a significant effect on the self-care management practices of patients. On the other hand, similar results were revealed by Alsomali (2018). The results of the current study could be attributed to the fact that an increase in the person's income; might lead the person to think about more than one choice; thus, he/she becomes more interested in preventive measures, and he/she becomes more interested in commitment for the medication and treatment plans.

5. Conclusion

The study revealed that there are some factors that have a significant effect on self-care management practices among patients with type 2 DM, like gender, age, and income in some domains. To prevent morbidity and mortality associated with diabetes, patients' dedicated self-care activities are of crucial importance. There is a need to educate low-educated diabetic patients on self-care management and those who have low income. The dissemination of leaflets that give information to patients and can be shared and read with their families needs to be widely circulated. Health education information that is delivered through TV channels and social media is also required.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

[1] AlJohani, KA., Kendall, GE., Snider, PD. (2016). Psychometric Evaluation of the Summary of Diabetes Self-Care Activities-Arabic (SDSCA-Arabic): Translation and Analysis Process. *J Transcult Nurs, 27*(1), 65-72.

[2] Anitha Rani, M., & Shriraam, V. (2019). Are Patients With Type 2 Diabetes Not Aware, or Are They Unable to Practice Self-Care? A Qualitative Study in Rural South India. *Journal of primary care & community health*, *10*, 2150132719865820.

[3] Chaudhury A, Duvoor C, Reddy Dendi VS, Kraleti S, Chada A, Ravilla R, (2017). Clinical review of antidiabetic drugs: implications for type 2 diabetes mellitus management. Front Endocrinol 8:6.

[4] Eva, J. J., Kassab, Y. W., Neoh, C. F., Ming, L. C., Wong, Y. Y., Abdul Hameed, M., Hong, Y. H., & Sarker, M. (2018). Self-Care and Self-Management Among Adolescent T2DM Patients: A Review. *Frontiers in endocrinology*, *9*, 489.

[5] Grey A. (2015). Nutritional recommendations for individuals with diabetes. In: De Groot LJ, Chrousos G, Dungan K, Feingold KR, Grossman A, Hershman JM, Koch C, Korbonits M, McLachlan R, New M, Purnell J, Rebar R, Singer F, Vinik A. editors. Endotext[Internet]. South Dartmouth, MA: MDTesxt.com, Inc.

[6] Ishak, N., MohdYusoff, S., Rahman, R &Kadir, A. (2017). Diabetes self-care and its associated factors among elderly diabetes in primary care. *Journal of Taibah University Medical Sciences, 12*(6) 504-511

[7] Miller DK, Austin MM, Colberg SR, Constance A, Dixon DL, MacLeod J. (2015). Diabetes Education Curriculum: A Guide to Successful Self-Management. 2nd ed. Chicago, IL: American Association of Diabetes Educators.

[8] Ministry of Health. Statistics report 2015 [cited 2015 5th Nov]. Available from: http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx.

[9] Powers MA, Bardsley J, Cypress M, Duker P, Funnell MM, Fischl AH (2016). Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. ClinDiabetes (2016) 34:70–80. 10.2337/diaclin.34.2.70 [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[10] Solhi, M., Nejaddadgar, N., Jegarghosheh, S., Abolfathi, M.&Ashtarian, H. (2017). Self-Care and Related Factors in Patients with Type 2 Diabetes.*Asian Journal of Biomedical and Pharmaceutical Sciences*,7(61)6-10

[11] Toobert, D., Hampson, S., Glasgow, R. (2000). The Summary of Diabetes Self-Care Activities Measure. *Diabetes Care, 23*(7), 943 – 950.

[12] WHO (2017). Global Report on Diabetes: Diabetes Programme. Geneva: World Health Organization.