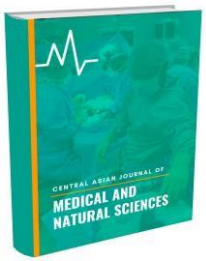

CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
https://cajmns.centralasianstudies.org/index.php/CAJMNS
Volume: 05 Issue: 04 | October 2024 ISSN: 2660-4159

Article

Healthy Lifestyle of Clients with Diabetes Mellitus: Does Self-Care Activities for Diabetes Matter?

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Abstract: A descriptive predictive correlational design was used to guide this study which was conducted in two hospitals and one primary healthcare centers in the XXX City for the period from January 14th 2024 to March 14th 2024. The study included a convenience sample of 378 patients with diabetes. The study instrument includes participants' sociodemographic characteristics. The Measure of Healthy Lifestyle, Diabetes Self-Care Activities (SDSCA), Data were collected through self-report and analyzed using the statistical package for social science, IBM version 27. Self-care glucose testing, foot self-care positively predicted healthy lifestyle for diabetes. This finding implies that the better the self-care related to glucose testing, the healthier the lifestyle the patients with DM enjoy. This finding can explain as clients whose socioeconomic status is somewhat good can have much time for practicing physical activity compared to clients who are of poorer socioeconomic class who spend their time in living earning rather physical activity. Also, clients whose socioeconomic status is somewhat good can have devices for glucose testing compared to clients who are of poorer socioeconomic class.

Keywords: Diabetes Mellitus, Healthy Lifestyle, Self-Care Activities

Citation: Ali, D. A., & Fadhil, S. N. Healthy Lifestyle of Clients with Diabetes Mellitus: Does Self-Care Activities for Diabetes Matter?. Central Asian Journal of Medical and Natural Science 2024, 5(4), 139-149.

Received: 4th Jul 2024
Revised: 11th Jul 2024
Accepted: 18th Jul 2024
Published: 25th Jul 2024

1. Introduction

Diabetes mellitus is a long-term medical condition that poses a public health concern. Diabetes mellites' is the leading cause of death and disability worldwide [1]. Persistent hyperglycemia, a hallmark of diabetes mellitus, has been connected to the emergence of end organ damage, dysfunction, and failure in a number of body organs, including the kidney, heart, nervous system, retina, and blood vessels. Diabetes can cause kidney failure, malfunction, and long-term various tissue damage. Common symptoms of diabetes mellitus (DM) include thirst, urination, blurred vision, and weight loss [2].

Persistent hyperglycemia is linked to macrovascular complications that raise the risk of myocardial infarction and stroke as well as microvascular complications that worsen diabetic nephropathy, retinopathy, and neuropathy. Hyperglycemia can also lead to the potentially fatal diabetic ketoacidosis [3].

The International Diabetes Federation (IDF) estimates that 366 million people worldwide had diabetes mellitus in 2011, and that number is expected to rise to 552 million by

2030 [4]. Around 1.4 million of Iraqis have diabetes. Reported T2DM prevalence in Iraq ranges from 8.5% (IDF—age- adjusted) to 13.9% [5].

The assessment and quality of diabetes care have become more and more prominent topics in the literature relevant to diabetes mellitus. The way that health systems think about and provide care has evolved; the patient is now at the center of the entire care process, and as a result, patient participation and active involvement in delivering care are crucial to the quality of diabetic care [6–8]. Diabetes self-care activities include, in fact, medical nutrition therapy, exercise, foot care, self-monitoring of blood glucose, quitting smoking, using insulin, and using oral antidiabetic medications [9, 10].

A number of research have revealed a clinically significant connection between self-care behaviors and glycemic management, which is important for obtaining diabetes-related positive health outcomes [11, 12]. Self-care behaviors are a collection of actions that people with diabetes or other vulnerable populations take to effectively manage their diabetes on their own [13, 14].

2. Materials and Methods

The study was hospital based cross-sectional study. It was done from January 14th 2024 to March 14th 2024 among patients with diabetes who aged more than twenty years with duration of diabetes for at least one year and were taking allopathic medicine for diabetes were included in the study whereas patients who were not physically fit due to significant medical/surgical conditions, pregnant and lactating women and patients who did not give consent to participate in this study were not considered in the study. It was conducted in Al- Nasiriya City on a sample of 378 patients were selected purposively who are diagnosed with type II DM.

Study Instrument

The questionnaire is one of the means to help collect data that contribute to achieving the results expected by the study, so the researcher designed this questionnaire, which aims to clarify the study objectives and significance by obtaining answers to the study's questions. The study instrument includes sociodemographic variables of age, gender, occupation, education level, monthly income and clinical information which include BMI and duration of having DM.

The Type 2 Diabetes and Health Promotion Scale (T2DHPS)

The T2DHPS (15) measures health promotion-oriented behaviors for type 2 diabetes patients which consists of 28 items that are distributed into Physical Activity (7 items), Risk Reduction (7 items), Stress Management (5 item), Enjoy life (3 item), Health responsibility (3 items), Healthy Diet (3 items). These items are measured on a 5-point Likert scale of 1 for (Never), 2 for (Rarely), 3 for (Sometimes), 4 for (Often), 5 for (Always). The total score ranges between 28-140 with a higher score indicates better health promotion-oriented behaviors. The T2DHPS (Chen et al., 2013) demonstrated very good internal consistency reliability (Cronbach's alpha = 0.85). The concurrent validity of the T2DHPS and six subscales were all negatively associated with fasting blood glucose and glycated hemoglobin [15].

The Summary of Diabetes Self-Care Activities (SDSCA)

The SDSCA is a self-report instrument that measures specific domains of diabetes self-management: diet (general and specific), blood sugar testing, exercise, foot-care, and

cigarette smoking (18). The SDSCA includes 10 items that are distributed into Diet subdomain (4 items), Exercise (2 items), Blood sugar testing (2 items), and Foot care (2 items). These items are measured on an 8-point visual analogue scale (0-7) with higher score indicates greater diabetes self-care activities. The SDSCA displayed average inter-item correlations within scales were high (mean = 0.47), except for specific diet; test-retest correlations were moderate (mean = 0.40). Correlations with other measures of diet and exercise generally supported the validity of the SDSCA subscales (mean = 0.23) [16].

Data Collection

Data were collected for the period from January 14th to March 14th, 2024. Data were collected using a self-reported instrument. The researchers explained to the participants the purpose of the study.

Data Analysis

Data were analyzed using the statistical package for social science (SPSS) for windows, version 27. The descriptive statistical measure of frequency and percent were used to describe participants' sociodemographic characteristics. The arithmetic mean and standard deviation were also used. The stepwise regression was used to identify factors that can predict healthy lifestyle for clients with T2DM.

Ethical Considerations

This study was approved by the ethical committee at the University of XXX, College of Nursing. The researchers assured participants that their participation is voluntary and they can withdraw at any point they wish to, and that all data obtained from the current study will be securely maintained and safeguarded throughout study phases. Informed consent was obtained verbally before participation.

3. Results

The mean age is 53.58 ± 11.54; around quarter age 46-53-years (*n = 95*; 25.1%). More than half are males (*n = 190*; 50.3%) compared to females (*n = 188*; 49.7%). Regarding family's socioeconomic class, most are of lower middle class (*n = 278*; 75.9%), followed by those who are of middle class (*n = 80*; 21.2%), and those who are of upper middle class (*n = 11*; 2.9%). More than a quarter are within normal weight-to-height proportion (*n = 103*; 27.2%), followed by those who have obesity class I (*n = 100*; 26.5%), those who have obesity class II (*n = 64*; 16.9%), and those who are underweight (*n = 12*; 3.2%).

Table 1. Multiple regression model for predicting healthy lifestyle

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	63.154	7.023		8.993	.000
	Age	-.032	.088	-.019	-.365	.715
	Socioeconomic Status	1.020	.249	.208	4.089	.000
	BMI	-.030	.150	-.010	-.201	.841

	Duration	-.103	.159	-.033	-.645	.519
2	(Constant)	11.041	5.206		2.121	.035
	Age	-.028	.045	-.017	-.627	.531
	Socioeconomic Status	.160	.132	.033	1.209	.227
	BMI	.005	.078	.002	.058	.954
	Duration	-.102	.082	-.033	-1.242	.215
	Self-Efficacy for Diet	.545	.074	.242	7.414	.000
	Self-Efficacy for Physical Activity	3.820	.325	.542	11.760	.000
	Self-Efficacy for Glucose Testing	.391	.143	.097	2.734	.007
	Self-Care Physical Activity	-.127	.183	-.031	-.690	.491
	Self-Care Glucose Testing	.518	.150	.104	3.450	.001
	Self-Care Foot Care	.628	.149	.133	4.221	.000
	Goal Achievement and Overcoming Barriers	.172	.088	.074	1.959	.051
	Self-Awareness	.236	.240	.033	.982	.327
	Managing Stress	.683	.300	.075	2.275	.023
	Dissatisfaction Assessment and Readiness to Change	.045	.213	.006	.213	.831

a. Dependent Variable: Healthy Lifestyle

B: Beta, t: T-statistics, Sig: Significance, Std. Error: Standard Error

The multiple regression model reveals that Self-Efficacy for physical activity, family's socioeconomic status, self-care foot care, self-care glucose testing, and Self-Efficacy for glucose testing positively predict healthy lifestyle for diabetes (p-value= .000, .000, .000, .001, .007) respectively.

Table 2. Gender-wise differences in healthy lifestyle factors

Ranks					Mann-Whitney U	Asymp. Sig. (2-tailed)
	Gender	N	Mean Rank	Sum of Ranks		
Physical Activity	Male	190	187.06	35540.50	17395.500	.649
	Female	188	191.97	36090.50		
	Total	378				
Risk Reduction	Male	190	198.43	37702.00	16163.000	.109
	Female	188	180.47	33929.00		
	Total	378				

Stress Management	Male	190	189.32	35970.00	17825.000	.974
	Female	188	189.69	35661.00		
	Total	378				
Enjoying Life	Male	190	197.70	37562.50	16302.500	.137
	Female	188	181.22	34068.50		
	Total	378				
Health Responsibility	Male	190	205.01	38951.50	14913.500	.005
	Female	188	173.83	32679.50		
	Total	378				
Healthy Diet	Male	190	187.80	35681.50	17536.500	.758
	Female	188	191.22	35949.50		
	Total	378				
Healthy Lifestyle	Male	190	192.22	36522.50	17342.500	.626
	Female	188	186.75	35108.50		
	Total	378				

Asymp. Sig. (2-tailed): Asymptomatic Significance (2-tailed), N: Number

The study results reveal that there is a statistically significant difference in health responsibility between sex groups (p-value = .005).

Table 3. Differences in healthy lifestyle factors among socioeconomic class groups

Ranks				Kruskal-Wallis H	df	Asymp. Sig.
	Socioeconomic class	N	Mean Rank			
Physical Activity	Lower Middle	287	185.63	4.226	2	.121
	Middle	80	195.13			
	Upper Middle	11	249.59			
	Total	378				
Risk Reduction	Lower Middle	287	179.70	11.713	2	.003
	Middle	80	214.34			
	Upper Middle	11	264.64			
	Total	378				
Stress Management	Lower Middle	287	182.17	9.409	2	.009
	Middle	80	204.14			
	Upper Middle	11	274.23			
	Total	378				
Enjoying Life	Lower Middle	287	179.80	10.660	2	.005

	Middle	80	215.91			
	Upper Middle	11	250.41			
	Total	378				
Health Responsibility	Lower Middle	287	181.71	7.550	2	.023
	Middle	80	209.06			
	Upper Middle	11	250.50			
	Total	378				
Healthy Diet	Lower Middle	287	180.74	8.503	2	.014
	Middle	80	220.60			
	Upper Middle	11	191.77			
	Total	378				
Healthy Lifestyle	Lower Middle	287	178.72	13.538	2	.001
	Middle	80	217.63			
	Upper Middle	11	266.27			
	Total	378				

Asymp. Sig. (2-tailed): Asymptomatic Significance, df: Degree of freedom, N: Number

The study results exhibit that there are statistically significant differences in risk reduction, stress management, enjoying life, health responsibility, healthy diet, and overall healthy lifestyle among socioeconomic class groups (p-value = .003, .009, .005, .023, .014, .001) respectively.

Table 4. Differences in healthy lifestyle among body mass index groups

Ranks				Kruskal-Wallis H	df	Asymp. Sig.
	BMI Class	N	Mean Rank			
Physical Activity	Underweight	12	188.13	5.102	4	.277
	Within normal	103	177.85			
	Overweight	99	209.08			
	Obesity Class I	100	187.16			
	Obesity Class II	64	181.88			
	Total	378				
Risk Reduction	Underweight	12	105.88	16.094	4	.003
	Within normal	103	182.24			
	Overweight	99	217.39			
	Obesity Class I	100	191.84			
	Obesity Class II	64	170.08			
	Total	378				
Stress Management	Underweight	12	152.00	3.991	4	.407
	Within normal	103	185.37			
	Overweight	99	205.31			
	Obesity Class I	100	187.27			
	Obesity Class II	64	182.20			
	Total	378				

Enjoying Life	Underweight	12	140.96	5.569	4	.234
	Within normal	103	181.73			
	Overweight	99	205.51			
	Obesity Class I	100	192.43			
	Obesity Class II	64	181.77			
	Total	378				
Health Responsibility	Underweight	12	130.92	8.642	4	.071
	Within normal	103	190.96			
	Overweight	99	203.73			
	Obesity Class I	100	196.12			
	Obesity Class II	64	165.79			
	Total	378				
Healthy Diet	Underweight	12	187.58	4.059	4	.398
	Within normal	103	179.01			
	Overweight	99	204.37			
	Obesity Class I	100	194.47			
	Obesity Class II	64	175.96			
	Total	378				
Healthy Lifestyle	Underweight	12	144.58	9.159	4	.057
	Within normal	103	180.19			
	Overweight	99	213.74			
	Obesity Class I	100	191.12			
	Obesity Class II	64	172.87			
	Total	378				

Asymp. Sig. (2-tailed): Asymptomatic Significance, df: Degree of freedom, N: Number

The study results exhibit that there is a statistically significant difference in risk reduction among BMI classes (p-value = .003).

Table 5. Differences in self-care between sex groups

Ranks					Mann-Whitney U	Asymp. Sig. (2-tailed)
	Sex	N	Mean Rank	Sum of Ranks		
Self-Care for diet	Male	190	186.39	35415.00	17270.000	.578
	Female	188	192.64	36216.00		
	Total	378				
Self-Care Physical Activity	Male	190	195.05	37059.50	16805.500	.305
	Female	188	183.89	34571.50		
	Total	378				
Self-Care Glucose Testing	Male	190	191.83	36447.50	17417.500	.675
	Female	188	187.15	35183.50		
	Total	378				
Self-Care Foot Care	Male	190	194.59	36972.00	16893.000	.358
	Female	188	184.36	34659.00		

	Total	378

Asymp. Sig. (2-tailed): Asymptomatic Significance (2-tailed), N: Number

The study results exhibit that there is no statistically significant difference in self-care subdomains between sex groups.

Table 6. Differences in self-care among socioeconomic class groups

Ranks				Kruskal-Wallis H	df	Asymp. Sig.
	Socioeconomic class	N	Mean Rank			
Self-Care for diet	Lower Middle	287	180.73	12.819	2	.002
	Middle	80	226.75			
	Upper Middle	11	147.32			
	Total	378				
Self-Care Physical Activity	Lower Middle	287	180.66	11.881	2	.003
	Middle	80	209.63			
	Upper Middle	11	273.82			
	Total	378				
Self-Care Glucose Testing	Lower Middle	287	184.48	9.101	2	.011
	Middle	80	194.56			
	Upper Middle	11	283.73			
	Total	378				
Self-Care Foot Care	Lower Middle	287	183.63	4.199	2	.123
	Middle	80	204.53			
	Upper Middle	11	233.41			
	Total	378				

Asymp. Sig. (2-tailed): Asymptomatic Significance, df: Degree of freedom, N: Number

The study results exhibit that there are statistically significant differences in self-care for diet, self-care for physical activity, and self-care for glucose testing among socioeconomic class groups (p-value = .002, .003, .011) respectively.

4. Discussion

This descriptive predictive correlational study aimed to (1) identify if participants' age, body mass index, duration of illness, family's socioeconomic status, self-care activities for diabetes, can predict their heathy lifestyle, and (2) investigate the differences in, self-care activities for diabetes between the groups of sex, BMI categories, and socioeconomic class.

The study results display that more than quarter are within normal weight-to-height proportion, followed by those who have obesity class I, those who have obesity class II, and those who are underweight.

The multiple regression model revealed that family's socioeconomic status positively predicted healthy lifestyle for diabetes. This finding implies that the better the family's socioeconomic status, the healthier the lifestyle the patients with DM enjoy. Bullard [17] concluded that there were no significant association between lifestyle factors and socioeconomic deprivation for any of the mental health outcomes.

The multiple regression model revealed that foot self-care positively predicted healthy lifestyle for diabetes. This finding implies that the better the foot self-care, the healthier the lifestyle the patients with DM enjoy. Prevention of diabetic foot and other complications requires changes in lifestyle and adhering to self-care actions which eventually result in glycemic control (Bortoletto et al., 2014). This finding goes in line with that obtained by Iversen et al. [18] who inferred that better foot care is partially associated with better health lifestyle.

The stepwise regression model revealed that self-care glucose testing positively predicted healthy lifestyle for diabetes. This finding implies that the better the self-care related to glucose testing, the healthier the lifestyle the patients with DM enjoy. This finding can be explained as regular glucose testing makes clients believe that they exert a kind of control over their diabetes which in turn contributes to a healthier lifestyle. This finding is inconsistent with that of Middleton et al. [19] who concluded that there is no association between glucose testing and lifestyle.

The study results displayed that there was a statistically significant difference in health responsibility between sex groups. Further Mann-Whitney U demonstrates that male clients enjoy better health responsibility than females. Fenstermaker and West [20] stated that gender confers different norms, prescribed roles and expectations of responsibility upon men and women. This finding is inconsistent with that obtained by Mello et al. [21] who concluded that significantly more responsibility is expected of women.

The study results exhibited that there were statistically significant differences in risk reduction, stress management, enjoying life, health responsibility, and overall healthy lifestyle among socioeconomic class groups. Further Kruskal-Wallis test displays that the values of risk reduction, stress management, enjoying life, health responsibility, and overall healthy lifestyle were greater among clients who are of upper middle socioeconomic class. Socioeconomic status has been a determinant of health through different ways, including health behaviors, physiological mechanisms, environmental conditions, access to health care, and psychosocial factors [22, 23].

This finding can be explained as individuals with better socioeconomic status can have better access to healthcare services, can shop for healthier foods, and can have secure better living arrangements that contribute to risk reduction. This finding is supported by that obtained by McMaughan et al. who concluded that lower SES is associated with reduced access to care [24].

The study results revealed that there was a statistically significant difference in healthy diet among socioeconomic class groups. Further Kruskal-Wallis test demonstrates that the value of healthy diet was greater among clients who are of middle socioeconomic class. This finding is inconsistent with that obtained by Hankonen et al. [25] who concluded that there was no significant difference in the diet determinants among SES.

The study results exhibited that there was a statistically significant difference in risk reduction among BMI classes. Further Kruskal-Wallis test displays that clients who are overweight enjoy healthier lifestyle, followed by those who are within normal weight-to-height proportion.

The study results exhibit that there was a statistically significant difference in self-care for diet among socioeconomic class groups. Further Kruskal-Wallis test exhibits that clients who are of middle socioeconomic class enjoy better self-care in terms of diet.

The study results exhibit that there were statistically significant differences in self-care for physical activity and self-care for glucose testing among socioeconomic class groups. Further Kruskal-Wallis test demonstrates that clients who are of upper middle

class enjoy better self-care for physical activity and self-care for glucose testing. This finding can explained as clients whose socioeconomic status is somewhat good can have much time for practicing physical activity compared to clients who are of poorer socioeconomic class who spend their time in living earning rather physical activity. Also, clients whose socioeconomic status is somewhat good can have devices for glucose testing compared to clients who are of poorer socioeconomic class.

5. Conclusion

This finding can explain as clients whose socioeconomic status is somewhat good can have much time for practicing physical activity compared to clients who are of poorer socioeconomic class who spend their time in living earning rather physical activity. Also, clients whose socioeconomic status is somewhat good can have devices for glucose testing compared to clients who are of poorer socioeconomic class.

6. Conflict of Interest

'The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article'.

7. Implications

The current study involves a number of implications a need to devote special care to clients who are of poor socioeconomic status. Enabling clients to enjoy better foot self-care can contribute to healthier lifestyle. There is a need to devote special care for female clients as they have poorer health responsibility than males.

8. Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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