

The Effect of Sociodemographic Characteristics on The Lifestyle Among Type 2 Diabetic Patients in Mosul City

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KEYWORDS ABSTRACT

Diabetic mellitus, lifestyle

Introduction: Diabetes Mellitus is a condition that causes persistently increased blood glucose levels in the body. It is the second leading cause of years spent disabled globally and is a major cause of death with high mortality rates. Objective: To identify the effect of sociodemographic characteristics on the lifestyle among type 2 diabetes mellitus in Mosul City. Methods and materials: A non-experimental cross-sectional study design was implemented on a total of 400 Type II Diabetic Patients who make periodic visits to Al-Wafaa Specialized Centre for Diabetes and Endocrinology by A non-probability sample. A developed interviewing questionnaire was used to collect information related to sociodemographic, and lifestyle was assessed by using HPLP-II, from October 15th, 2023, to June 1st, 2024. The collected data were compiled and analysed using percentages, mean, standard deviation, minimum, maximum, Spearman's Correlation and Chi Square using SPSS version 26. P values of 0.05 were used as a cut-off point for the significance of the statistical test. Results: Majority of participants were female, reside in urban areas, married, unable to read and write, unemployed and never smoked (52.3%, 78.7%, 79.0%, 29.7%, 57.4%, and 44.2%) respectively. In addition to that, there was a significant correlation between the sociodemographic characteristics and lifestyle among the participants. The patients scored highest in the interpersonal relations and scored lowest in the physical activity factors. Finally, most of the patients practiced health-promoting lifestyle pattern moderately (63.5%). Conclusions: The study showed that, there is a significant correlation between lifestyle and sociodemographic characteristics of the study participants.

1. Introduction

Diabetes Mellitus is a condition that causes persistently increased blood glucose levels in the body. It is the second leading cause of years spent disabled globally and is a major cause of death with high mortality rates (Alzyoud et al., 2024). Type 2 diabetes, referred to as non-insulin-dependent or adult-onset diabetes, results from the body's ineffective use of insulin, resulting in problems including obesity and a sedentary lifestyle (Syaripudin et al.). Based on the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019, diabetes was the 8th most prevalent contributor to morbidity and mortality globally, impacting approximately 460 million individuals of all ages and nationalities. According to the International Diabetes Federation (IDF), the number of people worldwide with diabetes in 2021 was estimated to be 537 million. Translating into healthcare costs of US\$966 billion, with projections of reaching more than \$1054 billion by 2045. This represents a significant burden for healthcare systems (Ong et al., 2023). The ageing population, urbanization, population expansion, and rising rates of obesity and physical inactivity are all contributing factors to the rising number of diabetics. The World Health Organization (WHO) predicts the worldwide incidence of diabetes across all age categories will be 4.4% in 2030, up from 2.8% in 2000 (ALSailawi et al., 2019).

Numerous Low-Risk Lifestyle Behaviours (LRLBs), including everyday routine practices, have been linked to a decreased risk of diabetes development. Achieving and maintaining a healthy weight, adhering to a nutritious diet, getting regular exercise, giving up smoking, and consuming moderate amounts of alcohol are a few of them. A family history of type 2 diabetes, a past of reduced tolerance for or impaired fasting glucose, high blood pressure, being obese, and the risk of heart disease are additional factors that greatly contribute to the development of diabetes mellitus (Khan et al., 2023; Sabirovna & Shekhrozovna, 2023). Personal habits, including alcohol use, smoking status, food preferences, and physical activity levels, may influence the prognosis and complication rates of type 2 diabetes. Contextual assessment is necessary for lifestyle behaviours since they are deeply entrenched in people's lives and greatly influence them. Enhanced comprehension of the distribution of diverse

lifestyle behaviours and the variables linked to them should facilitate the effective targeting of lifestyle treatments towards critical areas of need (Carter et al., 2023).

Individuals who have diabetes are all impacted by the condition, irrespective of their age, race, or socioeconomic status. Nevertheless, it disproportionately affects countries with low and middle incomes due to limited access to assets, medical services, and education, intensifying its devastating impact. As a result, diabetes worsens differences in medical services among various regions and individuals, perpetuating health inequalities (Sugandh et al., 2023). Therefore, this study aimed to identify the effect of socio-demographic characteristics on lifestyle among type 2 diabetic patients in Mosul City.

2. Methods and materials

Ethical considerations

Before initiating this thesis project, a proposal was submitted through the Scientific and Ethical Council for Graduate Studies at Nursing College, University of Mosul. The official permission of the Nineveh Health Directorate's Ethical Research Council was obtained for the study to be started. To ensure confidentiality, numerical codes were used in the interview questionnaires. Finally, Type II Diabetic Patients who agreed to participate in the research were informed, and their written consent was obtained.

Study design

To achieve the study's objectives, a non-experimental cross-sectional study design was implemented at the Al-Wafaa Specialized Centre for Diabetes and Endocrinology. The study lasted from October 15th, 2023, to June 1st, 2024.

Study sample

A total of 400 from type II diabetic patients who make periodic visits to the Al-Wafaa Specialized Centre for Diabetes and Endocrinology included in the study by A non-probability sample.

Data collection & Tools

Data was collected by the interview method from the November 12th 2023 to March 5th 2024, and to collect samples for the study, a questionnaire was prepared for this purpose. Which composed of:

Part one

The researcher gathered sociodemographic data from respondents, encompassing their age, sex, place of residency, marital status, level of education, work, and monthly income.

Part Two: Habits and medical profile:

Smoking

Alcohol

Body Mass Index.

Part three:

Health-Promoting Lifestyle Profile-II (HPLP-II) is an English assessment created by Walker and Hill-Polerecky in 1996 to evaluate adult involvement in promoting a healthy lifestyle. The lifestyle encompasses six elements that influence wellness. The HPLP-II scale consists of six subscales: Health Responsibility (HR), Physical Activity (PA), Nutrition (N), Spiritual Growth (SG), Interpersonal Relations (IR), and Stress Management (SM). Every component contains nine items, except physical activity and stress management, which have eight items each. Individuals evaluated each behaviour using a four-point response method, where 1 indicated "never," 2 indicated "sometimes," 3 indicated

"often," and 4 indicated "routinely". The questionnaire involves 52 items about lifestyles associated with Type 2 Diabetes Mellitus (T2DM) (Davis & De Guzman, 2022).

- Health Responsibility
- Physical Activity
- Nutrition
- Spiritual Growth
- Interpersonal Relations
- Stress Management

The HPLP II's total score is determined by calculating the average grade of all 52 components included in the HPLP. The range of this score is from 52 to 208. The HPLP II grade is split into four categories, as indicated in the table below (Ayse Sahin RN, 2021).

Table (3-1): Categories of HPLP II

Scores	Categories of lifestyle
52-90	Poor
91-129	Moderate
130-168	Good
169-208	Excellent

Validity

The tool used in the study was validated to provide confidence in the results by a group of (10) experts who were chosen from various fields to look at the content's validity for clarity, relevance, and applicability.

Reliability

To determine the reliability of parameter measurement in type II diabetic patients and to measure the error in the measurement technique, each instrument used in the current study was assessed by statistical analysis. Correlation coefficients were computed to measure the reliability of the study tools, as shown in the table below, and Cronbach's alpha for (HPLP II) was (0.84). This means that the tools are stable and reliable.

Statistical analysis

The collected data were compiled and analysed using percentages, mean, standard deviation, minimum, maximum, Spearman's Correlation and Chi Square using SPSS version 26. P values of 0.05 were used as a cut-off point for the significance of the statistical test.

3. Results and Discussion

Table (1): Descriptive statistics of sociodemographic characteristics of the study group variables.

Variables		F	%
Sex	Male	191	47.7
	Female	209	52.3
Total		400	100.0
Residence	Urban	315	78.7

	Rural	85	21.3
Total		400	100.0
Marital status	Single	5	1.3
	Married	316	79.0
	Widowed	74	18.4
	Divorced	5	1.3
Total		400	100.0
Educational level	Unable to read and write	119	29.7
	Read and write	56	14.0
	Primary school	93	23.3
	Secondary school	68	17.0
	High school	20	5.0
	University education	44	11.0
Total		400	100.0
Occupation	Employee	103	25.8
	Unemployed	230	57.4
	Retired	67	16.8
Total		400	100.0
Family's income	<250.000 IQD	74	18.4
	250.000-499.000 IQD	125	31.3
	500.000-1.000.000 IQD	145	36.3
	>1.000.000 IQD	56	14.0
Total		400	100.0
Smoking	No	177	44.2
	Current	76	19.0
	X-smoking	59	14.8
	Passive smoking	88	22.0
Total		400	100.0
Alcohol	Yes	7	1.8
	No	393	98.2
Total		400	100.0

Table (2): Mean scores of Health Promotion Lifestyle Profile II.

HPLP and sub-scores	Mean± Std. Deviation	Min-Max Scores
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Health Responsibility	19.80±4.15	11.00-35.00
Physical activity	10.85±3.70	8.00-30.00
Nutrition	25.00±3.40	15.00-34.00
Spiritual Growth	23.45±5.60	9.00-36.00
Interpersonal Relations	25.10±4.40	13.00-36.00
Stress Management	19.20±4.90	8.00-32.00
HPLP Total Score	123.40±18.35	72-191

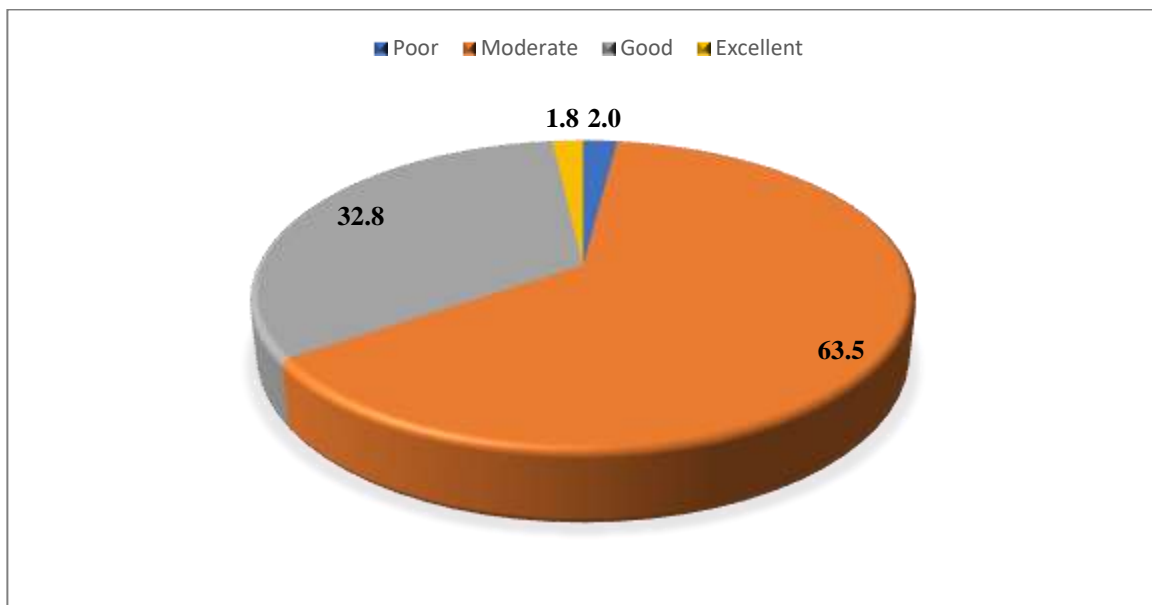


Figure (1): Categories of lifestyle.

Table (3): The Relationship Between the Sociodemographic Characteristics of the Study Samples and Their Lifestyle.

Variables		Categories of lifestyle.				
		Poor	Moderate	Good	Excellent	Total
Sex	Male	3	100	83	5	191
	Female	5	154	48	2	209
Total		8	254	131	7	400
		$\chi^2= 21.851$ Sig= 0.000**				
Residence	Urban	6	204	100	5	315
	Rural	2	50	31	2	85
Total		8	254	131	7	400
		$\chi^2= 1.119$ Sig= 0.772				
Marital status	Single	0	4	1	0	5
	Married	3	190	117	6	316
	Widowed	3	57	13	1	74

	<i>Divorced</i>	2	3	0	0	5
<i>Total</i>		8	254	131	7	400
		$\chi^2= 51.568$ Sig= 0.000**				
<i>Education level</i>	<i>Unable to read and write</i>	6	95	18	0	119
	<i>Read and write</i>	1	40	15	0	56
	<i>Primary school</i>	1	55	36	1	93
	<i>Secondary school</i>	0	38	27	3	68
	<i>High school</i>	0	11	7	2	20
	<i>University education</i>	0	15	28	1	44
<i>Total</i>		8	254	131	7	400
		$\chi^2= 61.890$ Sig= 0.000**				
<i>Occupation</i>	<i>Employee</i>	1	50	46	6	103
	<i>Unemployed</i>	7	170	52	1	230
	<i>Retired</i>	0	34	33	0	67
<i>Total</i>		8	254	131	7	400
		$\chi^2= 42.887$ Sig= 0.000**				
<i>Family income</i>	<i><250.000</i>	6	54	14	0	74
	<i>250.000-499.000</i>	1	79	43	2	125
	<i>500.000-1.000.000</i>	1	93	49	2	145
	<i>>1.000.000</i>	0	28	25	3	56
<i>Total</i>		8	254	131	7	400
		$\chi^2= 32.215$ Sig= 0.000**				
<i>Smoking</i>	<i>No</i>	4	123	47	3	177
	<i>Current</i>	1	44	29	2	76
	<i>X-smoking</i>	0	35	23	1	59
	<i>Passive smoking</i>	3	52	32	1	88
<i>Total</i>		8	254	131	7	400
		$\chi^2= 8.435$ Sig= 0.491				

Discussion of sociodemographic characteristics of the study participants.

In the present study, **Table 1** showed that among the 400 participants, male and female were (47.7% and 52.3%), respectively. A similar study to this has been carried out by (Ravindrarajah et al., 2023), which agreed with our finding and reported that (48.3%) were male and (51.7%) were female. Additionally, the majority of participants were married (79.0%) and had income between 250.000 and 499.000 IQD (36.3%). A previous study by (Mohamed et al., 2021) confirmed this study's findings and reported that (85.1%) were married and (33.3%) had an income of less than 5000 QR (Qatari Riyal). Furthermore, most participants lived in urban areas, were illiterate, and were unemployed (78.7%, 29.7%, and 57.4%), respectively. A study by (Megahed et al., 2021) confirmed this study's findings and reported that 68.5% came from urban areas, 42.4% were illiterate, and 63.0% were unemployed. Moreover, only (19.0%) of participants currently smoke and (1.8%) consume alcohol. A study carried out by (Maimaituexun et al., 2023) agreed with this study's finding, as fewer participants were current smokers (16.73%) and current alcohol drinkers (11.29%).

Discussion of Health Promotion Lifestyle Profile- II in Diabetic Patients

Table (2) revealed that participants had practised their health-promoting lifestyle domains differently, from the lowest one to the highest one by mean and standard deviation (physical activity 10.85 ± 3.70 , stress management 19.20 ± 4.90 , health responsibility 19.80 ± 4.15 , spiritual growth 23.45 ± 5.60 , nutrition 25.00 ± 3.40 , and interpersonal relationships 25.10 ± 4.40) respectively. A total HPLP-II score was (123.40 ± 18.35), indicating that the study individuals practised their health-promoting lifestyle attitudes moderately. A previous study carried out by (Pourjam et al., 2019) harmonized our findings and reported that study participants scored physical activity as the lowest domain and interpersonal relationships as the highest domain (14.77 ± 3.90 , 27.07 ± 4.74) respectively, with a total HPLP-II score (130.58 ± 17.38). According to the researcher, people's ability to practice exercises and activities starts to be limited as they get old, and some disorders, such as diabetes, can prevent them from maintaining communication and relationships with other people, even those from different social and ethnic backgrounds.

Similarly, in our study, **figure (1)** showed that study participants practice their lifestyle moderately (63.5%). A similar study conducted by (Tezcan & KARABACAK, 2022) agreed with our results and reported that individuals who participated in the study practiced health-promoting lifestyle attitudes moderately at (122.83 ± 24.15).

The Correlation Between Sociodemographic Characteristics and Lifestyle of the Study Participants

Table (3) demonstrated a significant difference in lifestyle between males and females ($\chi^2 = 21.851$, $p = 0.000$), indicating sex plays a role in lifestyle variations. A previous study by (Li et al., 2018) approved this finding and reported a difference in lifestyle based on sex ($p = 0.004$). In the researcher's opinion, men spend a larger portion of the day engaging in recreational activities than women, such as practising hobbies, communicating with family and friends, exercising, attending cultural events, ... etc. Men have more time and opportunities to engage in various sporting activities than women, in addition to a healthier eating pattern among men. Additionally, the present study revealed differences in lifestyle based on occupation and marital status ($\chi^2 = 42.887$, $p = 0.000$), ($\chi^2 = 51.568$, $p = 0.000$) respectively. Previous research (Tezcan & KARABACAK, 2022) agreed with our findings and reported a strong relationship between lifestyle and occupation ($p = 0.043$). Still, the same study disagrees with our marital status findings ($p = 0.084$). The researcher suggests that working people can structure their food and social activities around their work schedule, and this constant routine benefits their well-being and mind-set. Furthermore, employed persons prioritize positive health behaviours and engage in higher physical activity levels. Regarding marital status, the researcher suggests that the difference belongs to the culture and community as married patients, particularly females, spend much time on household tasks and do not perform regular physical activities and social interactions.

Furthermore, our study demonstrated that educational level significantly correlates with lifestyle ($\chi^2 = 61.890$, $p = 0.000$), suggesting higher education levels may relate to better lifestyles. Our finding has

been confirmed by a previous study done by (Tol et al., 2014), which reported Participants having a higher degree of education exhibited a greater overall rating in health-promoting behavioural habits ($p = <0,001$). The outcomes indicate a significant correlation between higher educational attainment and adopting healthy living behaviours. Hence, the researcher proposes that education enhances knowledge of healthy habits and promotes the adoption of health-promoting behaviours. Moreover, a significant difference in lifestyle was also based on the family income (economic status) ($\chi^2 = 32.215$, $p = 0.000$). A similar study was conducted by (Softa et al., 2016), which agreed with this study's findings and reported that economic status significantly impacts the lifestyle ($p=0,008$). People who have a favourable financial standing can easily afford their healthcare bills. The findings indicate that an enhancement in individuals' financial condition will favour how they feel about maintaining good health.

References

- [1] ALSailawi, H., Mudhafar, M., Majhool, A. A., & Asaad, A. (2019). Study of Cystatin C as early biomarker of nephropathy in patients with type 2 DM and risk stratification in Tarnaka Hospital of Hyderabad City in India. *Journal of US-China Medical Science*, 16, 232-241.
- [2] Alzyoud, M., Alazaidah, R., Aljaidi, M., Samara, G., Qasem, M., Khalid, M., & Al-Shanableh, N. (2024). Diagnosing diabetes mellitus using machine learning techniques. *International Journal of Data and Network Science*, 8(1), 179-188.
- [3] Ayse Sahin RN, B. (2021). Healthy Lifestyle Behaviors of the Patients with Diabetes. *International Journal of Caring Sciences*, 14(3), 1740-1748.
- [4] Carter, N., Li, J., Xu, M., Li, L., Xu, S., Fan, X., Zhu, S., Chahal, P., & Chattopadhyay, K. (2023). Lifestyle behaviours and associated factors among people with type 2 diabetes attending a diabetes clinic in Ningbo, China: A cross-sectional study. *Plos one*, 18(11), e0294245.
- [5] Davis, B., & De Guzman, S. (2022). Validity and reliability evidence of health-promoting lifestyle profile (HPLP)-II among nursing students: A confirmatory factor analysis. *Teaching and Learning in Nursing*, 17(4), 364-370.
- [6] Khan, T. A., Field, D., Chen, V., Ahmad, S., Mejia, S. B., Kahleová, H., Rahelić, D., Salas-Salvadó, J., Leiter, L. A., & Uusitupa, M. (2023). Combination of multiple low-risk lifestyle behaviors and incident type 2 diabetes: a systematic review and dose-response meta-analysis of prospective cohort studies. *Diabetes care*, 46(3), 643-656.
- [7] Li, J., Yu, J., Chen, X., Quan, X., & Zhou, L. (2018). Correlations between health-promoting lifestyle and health-related quality of life among elderly people with hypertension in Hengyang, Hunan, China. *Medicine*, 97(25), e10937.
- [8] Maimaitituexun, R., Chen, W., Xiang, J., Kaminga, A. C., Wu, X. Y., Chen, L., Yang, J., Liu, A., & Dai, W. (2023). Prevalence of comorbid depression and associated factors among hospitalized patients with type 2 diabetes mellitus in Hunan, China. *BMC psychiatry*, 23(1), 158.
- [9] Megahed, F. I. A.-L., Hassan, S. A. A., Abdelwahid, H. A., & Farg, H. K. (2021). Effect of lifestyle modification on glycemic control of type 2 diabetic patients at suez canal university hospitals. *Psychology and Pathophysiological Outcomes of Eating*, 185.
- [10] Mohamed, H., Makhlof, M., Zainel, A., Osman, S., & Selim, N. (2021). Association of sociodemographic characteristics and lifestyle with type 2 diabetes mellitus and glycemic control: A cross-sectional study. *J Community Med Public Health*, 2, 2-10.
- [11] Ong, K. L., Stafford, L. K., McLaughlin, S. A., Boyko, E. J., Vollset, S. E., Smith, A. E., Dalton, B. E., Duprey, J., Cruz, J. A., & Hagins, H. (2023). Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*, 402(10397), 203-234.
- [12] Pourjam, R., Estebarsari, F., Kandi, Z. R. K., Estebarsari, K., & Mostafaei, D. (2019). An analytical study of the factors affecting the health promoting lifestyle; comparison of type II diabetic patients with healthy people. *Journal of Renal Injury Prevention*, 8(3), 247-252.
- [13] Ravindrarajah, R., Sutton, M., Reeves, D., Cotterill, S., Mcmanus, E., Meacock, R., Whittaker, W., Soiland-Reyes, C., Heller, S., & Bower, P. (2023). Referral to the NHS Diabetes Prevention Programme and conversion from nondiabetic hyperglycaemia to type 2 diabetes mellitus in England: A matched cohort analysis. *PLoS Medicine*, 20(2), e1004177.
- [14] Sabirovna, I. N., & Shekhrozovna, B. F. (2023). DIAGNOSTIC CRITERIA AND TREATMENT OF TYPE 2

DIABETES MELLITUS. Galaxy International Interdisciplinary Research Journal, 11(10), 237-240.

- [15] Softa, H., Bayraktar, T., & Uğuz, C. (2016). Yaşlı bireylerin algılanan sosyal destek sistemleri, sağlıklı yaşam biçimi davranışları ve etkileyen faktörler. Yaşlı Sorunları Araştırma Dergisi, 9(1), 1-12.
- [16] Sugandh, F., Chandio, M., Raveena, F., Kumar, L., Karishma, F., Khuwaja, S., Memon, U. A., Bai, K., Kashif, M., & Varrassi, G. (2023). Advances in the management of diabetes mellitus: a focus on personalized medicine. Cureus, 15(8).
- [17] Syaripudin, A., Karningsih, A. S., Dahbul, N. A., & Rolly, H. Diabetes Melitus and Lifestyle Patterns in Society: A Comprehensive Literature Review.
- [18] Tezcan, B., & KARABACAK, B. G. (2022). The Relationship Between Health-Promoting Behaviors and Socio-demographic and Clinical Characteristics of Patients with Diabetes. Clinical and Experimental Health Sciences, 12(2), 360-367.
- [19] Tol, A., Mohebbi, B., Sadeghi, R., Maheri, A. B., & Eshraghian, M. R. (2014). Determinants of health-promoting behaviors among type 2 diabetic patients: voice of Iran. Open Journal of Endocrine and Metabolic Diseases, 4(09), 219.