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Original Research

The Relationship Between Lifestyle and Glycated Haemoglobin Hba1c and Body Mass Index BMI among Type 2 Diabetic Patients

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Abstract:

Introduction: Diabetes Mellitus is a long-term disorder with elevated sugar levels and decreased tolerance to glucose. It results from inadequate pancreatic insulin production, inefficient body insulin use, or both.

Objective: To identify the relationship between lifestyle and glycated haemoglobin and Body Mass Index among type 2 diabetic patients

Methods: A non-experimental cross-sectional study design has been carried out. A total of 400 type 2 diabetes patients were selected according to the inclusion and exclusion criteria by non-probability sampling who make periodic visits to the Al-Wafaa Specialized Centre for Diabetes and Endocrinology at Mosul city in Northern of Iraq.

Results: The study revealed that there is a strong negative correlation between lifestyle and each of Glycated Haemoglobin HbA1c and Body Mass Index BMI at (r = -0.890, p = 0.000 and r =r-0.611, p = 0.000), respectively.

Conclusions: The study showed that, there is a significant correlation between lifestyle and each of Glycated Haemoglobin HbA1c and Body mass index BMI.

Keywords: Diabetic mellitus, lifestyle

Introduction:

Diabetes Mellitus is a long-term disorder with elevated sugar levels and decreased tolerance to glucose. It results from inadequate pancreatic insulin production, inefficient body insulin use, or both. Two types of diabetes are there. Type 1 Diabetes, known as insulin-dependent or childhood-onset diabetes, is defined by insufficient production of insulin. 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 [(1)].

Because many type II DM patients have no symptoms, the illness is often misdiagnosed for years, leaving them untreated throughout the disease's occult phase. Polyuria, polydipsia, polyphagia, and weight loss are typical signs of diabetes mellitus in diagnosed individuals. Additional signs and symptoms could include

paraesthesia in the lower limbs, a yeast infection, and clouded eyesight (balanitis in men) [2].

Type 2 diabetes often has no obvious symptoms. A heightened sensation of thirst might be the patient's first symptom. A person who has a dry mouth consumes three to five litres of water a day. Urges to empty the bladder rise in frequency and volume as a consequence. Itching, redness, and irritation of the groin area's skin occur. Itching spreads gradually to the knees, elbows, armpits, and stomach. Diabetes patients have a greater appetite and are hungry one to two hours after the last meal. Weight stays the same or drops in spite of the higher calorie content of meals because glucose is excreted in the urine rather than absorbed. Patients often report tired, dry skin that breaks out easily and fungal infections. While cuts and abrasions heal slowly, bruises are readily visible on the body; there is an increase in blood pressure, and headaches and light-headedness are prevalent [3].

Diabetic retinopathy, neuropathy, diabetic cataracts, nephropathy, and diabetic ketoacidosis are results of long-term exposure to elevated blood glucose levels caused by diabetes mellitus. Free radical damage—which can result in hypertension, atherosclerosis, and cardiovascular disease—is more likely to affect people with diabetes mellitus. Diabetic individuals are more likely to have heart disease, coronary artery disease (CAD), and sudden cardiac death. Multiple studies have shown that cognitive impairment in type 2 diabetes affects perception, learning, memory, IQ, and attention [4].

A Glycated Haemoglobin (HbA1c) level of < 7.0% is the overall target for diabetes care in diabetic individuals. Reductions in HbA1c and the risk of chronic complications and death are linked to improved long-term diabetes management. The increased risk of hypoglycaemia is also caused by inadequate control over blood sugar. Fear of hypoglycaemia causes blood glucose levels to remain elevated, which is a major contributing factor to the disease's inadequate metabolic management and lowers the likelihood of treatment improvement. At the moment, hypoglycaemia is thought to be the biggest barrier to achieving diabetic metabolic control [5].

A person's regular way of living, or lifestyle, encompasses the behaviours and mindsets that impact their health, positively or negatively. A poor lifestyle may lead to sickness and morbidity, while a good lifestyle may improve overall wellness and happiness. Stress management, responsibility for health, relationships, spiritual growth, nutrition, and physical activity combine to form a health-promoting lifestyle. The death rate and the number of healthy activities individuals adopt are related because adopting healthy habits lowers the mortality rate by 66% [6].

Studies had indicated that good lifestyle behaviours improve chronic illness health. Health-promoting behaviours and quality of life in DM patients are influenced by cultural and medical variables such as age, gender, education level, marital status, and duration of DM. Additionally, 'Type 2 DM prevention programs' effectively fostered good living habits [7].

Method and material:

A non-experimental cross-sectional study design has been carried out. A non-probability sample was purposively selected from type II diabetic patients who make periodic visits to the Al-Wafaa Specialized Centre for Diabetes and Endocrinology, a total of 400 type 2 diabetes patients were selected according to the inclusion and exclusion criteria by non-probability sampling at Mosul city in Northern of Iraq. Inclusion criteria; Type II diabetes individuals, both sexes and age more than 18 years old. Exclusion criteria; Type 2 Diabetic individuals below the age of 18 and Type 2 diabetes individuals declined to be involved in the research.

Study Tools:

Data was collected through constructed interviewing questionnaire, and it is composed of (2) steps and included the following:

Step one:

An interview was conducted to fill out the questionnaire with the type II diabetic patients in the Al-Wafaa Specialized Centre for Diabetes and Endocrinology after obtaining informed consent.

The researcher introduced and asked questions related to:

Part one:

Sociodemographic data, encompassing their age, sex, residence, marital status, level of education, occupation, and monthly income.

Part Two: Habits and medical profile:

Smoking

Alcohol

Body Mass Index (BMI).

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 [11].

Step two:

Blood sampling:

A blood sample from each participant in the study was drawn from the antecubital vein after sterilization by venepuncture using a 5ml disposable syringe, the blood was placed in a standard laboratory tube to estimate the serum level of HbA1c). The analysis method was done using CL900i and BS230Mindray.

Statistical Analysis:

The collected data were compiled and analysed using percentages and frequencies to determine the sociodemographic characteristics of the participants, and the Spearman's correlation analysis to determine the relationship between continuous variables. using version 26 of the Statistical Package for Social Sciences (SPSS) software. P values of 0.05 were used as a cut-off point for the significance of the statistical test.

Results:

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

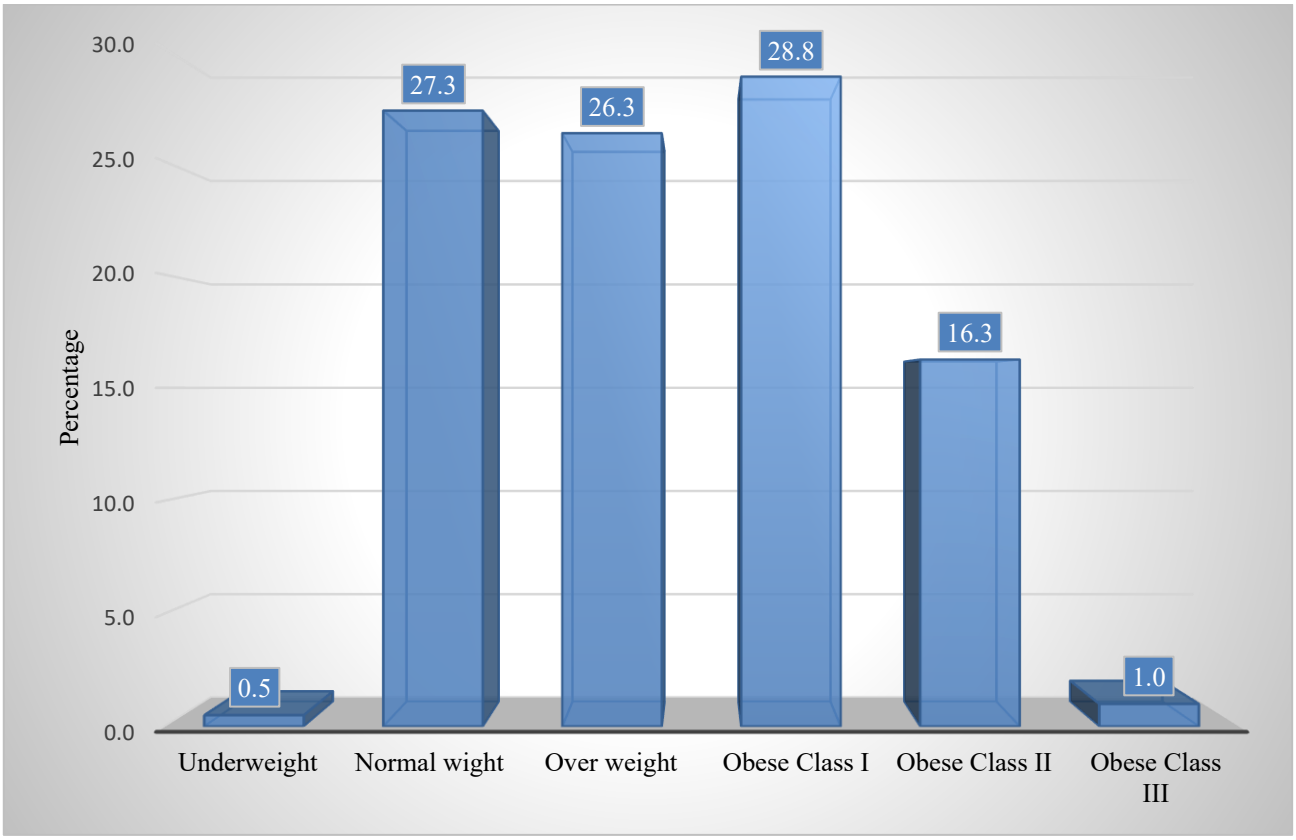

Figure (1): Body mass index (BMI) classification among the study participants.

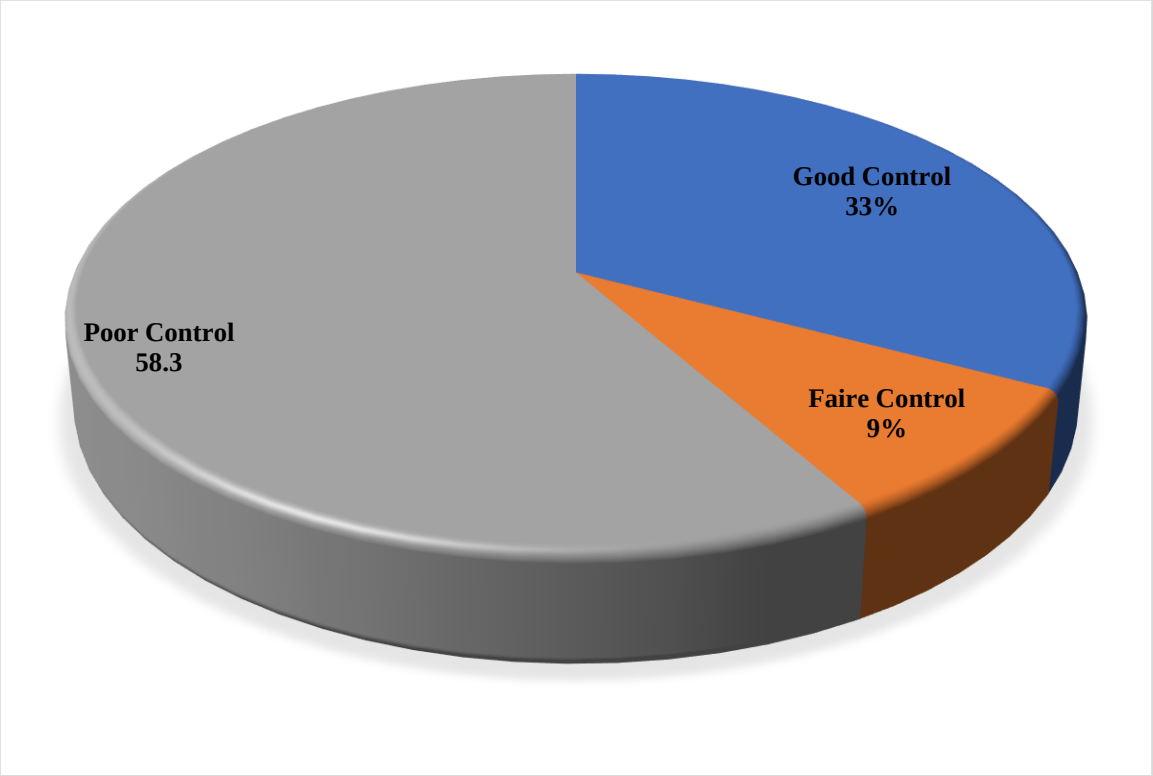

Figure (2): Classification of HbA1c

Table (2): Correlation between Lifestyle and Selected Variables

Variables	*Lifestyle*	
	Pearson correlation (r)	*P-value*
HbA1c	*-0.890*	*0.000***
BMI	*-0.611*	*0.000***

BMI = Body Mass Index; HbA1c = glycated hemoglobin.

Discussion:

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 [8], 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 [9] 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 [10]. 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 [11], agreed with this study's finding, as fewer participants were current smokers (16.73%) and current alcohol drinkers (11.29%).

Table (2); demonstrated a negative relationship between lifestyle and HbA1c levels (r = -0.890, p = 0.000), indicating that as lifestyle improves, HbA1c levels tend to decrease. These findings were similar to the results of the study conducted by [12], which reported that the level of HbA1c was inversely correlated with health-promoting lifestyles (r = -0.230, P.= 0.002). So, based on these results, lifestyle modification for patients with type II diabetes is significantly associated with the

improvement of glucose control. HbA1c can be controlled and managed by increasing patient health knowledge and encouraging self-management and healthy lifestyles. Health awareness is important for diabetic patients' self-management since strong self-management leads to disease control and a delay in chronic consequences. Problem-solving, active planning, and goal setting are all part of good self-management, as is the development of personal problem-solving abilities and effective treatment of chronic disease symptoms. So, good habits in everyday life are a big part of how well HbA1c is controlled in people with type II diabetes.

Additionally, a significant negative correlation exists between lifestyle and BMI ($r = -0.611$, $p = 0.000$), suggesting that as lifestyle improves, BMI tends to decrease as well. Similarly, a study conducted in Taiwan by [13], reported that BMI negatively correlates with lifestyle ($r = -0.363$, $P.= 0.002$). Healthy lifestyles are the most important factor in preventing and managing obesity. Poor habits and unhealthy eating habits sometimes cause it. Therefore, it is necessary to focus on modifying a healthy lifestyle, including physical activity of any kind, as well as on healthy eating patterns accompanied by sports. The results will be better.

Conclusions:

A strong negative correlation existed between lifestyle and each of Body Mass Index (BMI) and Glycated Haemoglobin (HbA1c).

References:

1. Syaripudin, A., Karningsih, A. S., Dahbul, N. A., & Rolly, H. Diabetes Melitus and Lifestyle Patterns in Society: A Comprehensive Literature Review.
2. Ali, H., Hamayun, S., Ullah, M., Abbas, M., Rehman, M., Waleed, A., & Shaukat, A. (2023). A Systematic Review: Clinical Manifestations of Diabetes Mellitus and The Role of Pharmacists in Management of Type II Diabetes. *Journal of Women Medical and Dental College*, *2*.
3. 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.
4. Alam, S., Hasan, M. K., Neaz, S., Hussain, N., Hossain, M. F., & Rahman, T. (2021). Diabetes Mellitus: insights from epidemiology, biochemistry, risk factors, diagnosis, complications and comprehensive management. Diabetology, 2(2), 36-50.
5. Szadkowska, A., Zozulińska-Ziółkiewicz, D., Walczak, M., Cyganek, K., Wolnik, B., Gawrecki, A., & Myśliwiec, M. (2019). Experts opinion: implantable continuous glucose monitoring system—innovation in the management of diabetes. *Clinical Diabetology*, *8*(6), 318-328.
6. Gheibizadeh, M., Bazpour, M., Malehi, A. S., & Keikhaei, B. (2017). Health-Promoting Lifestyle of Adolescents with β-Thalassemia Based on Precede Model in Ahvaz, Iran, 2016. *Jundishapur Journal of Chronic Disease Care*, *6*.
7. GÜLSEVEN KARABACAK, B. (2022). The relationship between health-promoting behaviors and socio-demographic and clinical characteristics of patients with diabetes mellitus.
8. 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.
9. Mohamed, H., Makhlouf, 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.

10. 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.
11. Maimaitituerxun, 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.
12. Ha, M., Chen, J., Zhang, X., Yang, H., & Liu, C. (2020). Relationships of social support, health-promoting lifestyles, glycemic control, and bone turnover among adults with type 2 diabetes. *Japan Journal of Nursing Science*, *17*(1), e12280.
13. Lee, C.-T., Lin, C.-Y., Strong, C., Lin, Y.-F., Chou, Y.-Y., & Tsai, M.-C. (2018). Metabolic correlates of health-related quality of life among overweight and obese adolescents. *BMC pediatrics*, *18*, 1-8.