

# Evaluation of the Effect of Diabetes Knowledge Levels of Nursing Students on Healthy Lifestyle Behaviors

Hemşirelik Öğrencilerinin Diyabet Bilgi Düzeylerinin Sağlıklı Yaşam Biçimi Davranışlarına Etkisinin Değerlendirilmesi



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DOI: 10.17942/sted.1592161

Geliş/Received: 27.11.2024

Kabul/Accepted: 10.07.2025

## Abstract

**Objectives:** This study examines the relationship between nursing students' diabetes knowledge levels and their healthy lifestyle behaviors.

**Methods:** The research sample consisted of 299 students studying at the Faculty of Nursing of two foundation universities in Istanbul. Data was collected using the Participant Information Form, the Adult Diabetes Knowledge Test, and the Healthy Lifestyle Behaviors Scale-II. Descriptive statistics and Pearson correlation analysis were employed to analyze the data.

**Results:** The mean age of the participants was  $21.6 \pm 1.6$  years, and 81.6% were women. The total score average of the Healthy Lifestyle Behavior Scale-II is  $130.73 \pm 20.23$ . Among the subscales, the highest mean score was found in spiritual development ( $25.45 \pm 4.38$ ), and the lowest score was in physical activity ( $18.25 \pm 3.93$ ). Although a weak positive correlation was observed between diabetes knowledge and healthy lifestyle behaviors, this relationship was not statistically significant ( $r=0.085$ ,  $p=0.145$ ).

**Conclusions:** Although the correlation did not reach statistical significance, the results highlight the potential influence of diabetes education on lifestyle choices. The study fills a gap in the literature among nursing students. It highlights the need to integrate preventive health education into the nursing curriculum due to the increasing prevalence of diabetes.

**Keywords:** diabetes mellitus; healthy lifestyle; knowledge; nursing students; nursing education; preventive health

## Özet

**Amaç:** Bu çalışmanın amacı hemşirelik öğrencilerinin diyabet bilgi düzeyleri ile sağlıklı yaşam biçimi davranışları arasındaki ilişkiyi incelemektir.

**Yöntem:** Araştırmanın örneklemini İstanbul'daki iki vakıf üniversitesinin Hemşirelik Fakültesi'nde öğrenim gören 299 öğrenci oluşturdu. Veriler Katılımcı Bilgi Formu, Yetişkin Diyabet Bilgi Testi ve Sağlıklı Yaşam Biçimi Davranışları Ölçeği-II kullanılarak toplandı. Verilerin analizinde tanımlayıcı istatistiksel yöntemler ve Pearson korelasyon analizi uygulandı.

**Bulgular:** Katılımcıların yaş ortalaması  $21,6 \pm 1,6$  yıl olup, %81,6'sı kadındır. Sağlıklı Yaşam Biçimi Davranışları Ölçeği-II toplam puan ortalaması  $130,73 \pm 20,23$ 'tür. Ölçeğin alt ölçekleri arasında en yüksek puan ortalaması manevi gelişimde ( $25,45 \pm 4,38$ ), en düşük puan ise fiziksel aktivitede ( $18,25 \pm 3,93$ ) bulunmuştur. Diyabet bilgisi ile sağlıklı yaşam tarzı davranışları arasında zayıf pozitif bir korelasyon gözlenmiştir, bu ilişki istatistiksel olarak anlamlı değildir ( $r=0,085$ ,  $p=0,145$ ).

**Sonuç:** Korelasyon istatistiksel olarak anlamlı olmasa da sonuçlar diyabet eğitiminin yaşam tarzı seçimleri üzerindeki potansiyel etkisini vurgulamaktadır. Çalışma, hemşirelik öğrencilerinde literatürdeki bir boşluğu doldurmaktadır ve diyabetin giderek yaygınlaşması nedeniyle hemşirelik müfredatına koruyucu sağlık eğitiminin entegre edilmesinin gerekliliğini vurgulamaktadır.

**Anahtar Sözcükler:** diabetes mellitus; sağlıklı yaşam tarzı; bilgi; hemşirelik öğrencileri; hemşirelik eğitimi; koruyucu sağlık

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## Introduction

Diabetes Mellitus (DM) is a chronic disease characterized by elevated blood glucose levels due to defects in insulin secretion or utilization. DM is classified into four categories: type 1, type 2, gestational diabetes, and other specific types. Among these, type 2 DM, which has a long prediabetes phase, accounts for 90% of all diabetes cases (1). Studies show that the rate of increase in diabetes prevalence in Turkey is three times the global average and four times the European average. According to the 2017 Turkey Nutrition and Health Survey conducted by the Ministry of Health, the prevalence of diabetes among individuals aged 19 and over in Turkey is 13.5%. The same study found the prevalence of obesity among individuals aged 15 and over to be 31.5% and the prevalence of physical inactivity to be 42.4%. The TURDEP 1 and TURDEP 2 studies indicate that the ten-year (2000-2010) diabetes growth rate is approximately 97%. It is currently estimated that 9.5 million individuals with diabetes are receiving treatment in Turkey, and this number is increasing each year (2).

As a chronic disease, DM remains a significant concern both in Turkey and globally. If left untreated, it can negatively impact individuals' quality of life due to acute and chronic complications (3,4). While medical treatment is commonly used to manage diabetes, medical nutrition therapy and exercise are also critical factors in preventing diabetes and delaying the development of complications (5,6). Healthy lifestyle behaviors, which play a crucial role in preventing diabetes, are defined as controlling behaviors that negatively impact health and selecting daily activities that are appropriate for an individual's health status (6). Numerous sources emphasize the influence of healthy lifestyle behaviors and environmental factors on developing type 2 diabetes (1,7,8,9). Given the mortality and morbidity associated with diabetes, as well as its increasing prevalence, addressing this issue is essential. In Turkey, diabetes awareness at the societal level is very low. In two studies, the Consensus Research Group found that diabetes awareness in the population was 35% and 37%. The lowest awareness rate was found among individuals aged 30 years. This low level of awareness

hinders the development of diabetes prevention and consciousness in society (2).

In this context, healthcare professionals who play a key role in solving health problems are expected to have high levels of knowledge and awareness about diabetes.

This study aims to:

- 1) Assess the diabetes knowledge levels of undergraduate nursing students,
- 2) Measure the healthy lifestyle behaviors of undergraduate nursing students,
- 3) Investigate the impact of diabetes knowledge levels on healthy lifestyle behaviors.

The research hypothesis posits that "Increased diabetes knowledge levels among nursing students will enhance their healthy lifestyle behaviors."

## Methods

### Design

This study used an exploratory approach that combines cross-sectional and correlational designs to gain an in-depth understanding of the current situation and relationships between variables. The STROBE guidelines (10) conducted the research, which is widely accepted for reporting epidemiological observational studies. This methodological approach is suitable for broadening the scope of the study and enhancing the understanding of the relationships between variables.

### Setting and participants

The research was conducted at two private universities on the European side of Istanbul, Turkey's largest metropolis. Data collection occurred during the academic year from February to June 2024. During this period, interviews were conducted with the students, and the objectives and significance of the study were explained. Before data collection, informed consent was obtained from the students using verbal and written forms through the Informed Voluntary Consent Form. A total of 422 nursing students who were in their second year or higher were enrolled at the two universities. The researchers reached 330 nursing students and distributed the data collection instruments. Valid data were obtained from 299 students. Participation rate of approximately 70%. Thirteen forms were

excluded from the analysis due to multiple response options, and the observer-researcher discarded eight forms because they were completed in a shorter time than expected. Ten students were not included in the study due to their participation in the pilot test. Surveys were distributed on paper before the start of classes. The questionnaires included no details that could reveal the identity of the students.

The study population included all nursing students, with the exception of those in their first year, who were enrolled at two private universities at the time of the study. Focusing on specific universities provides insight into the student profile, educational approach, and other critical factors within the nursing programs at these institutions. These two universities are similar in terms of nursing education. As the students were enrolled in diabetes-related courses during the fall semester at both universities, data collection was conducted in the subsequent spring semester. The study participants were selected from a group of students who were actively continuing their education at the same university during the 2023-2024 academic year and voluntarily committed to participating in the research.

#### **Inclusion criteria for the study:**

Being enrolled at the specified university,  
Being a second-year or higher nursing student,  
Actively continuing education,  
Willingness to participate in the study.

#### **Exclusion criteria for the study:**

Students enrolled in different departments,  
Students who were registered but not actively continuing their education,  
Students who filled out multiple forms,  
Students who wished to withdraw from the study.

#### **Variables**

The nursing programs at private universities consist of eight semesters at the undergraduate level. To apply what they have learned in the university, students must work in clinical settings for seven semesters throughout their education. In this study, the dependent variable was determined as the healthy lifestyle behaviors of nursing students, while the independent variables were the students'

diabetes knowledge levels. The research refrained from intervening to alter the effect of these variables on the dependent variable. Secondary variables include socio-demographic factors such as gender and age, as well as individual contextual variables like smoking, alcohol use, and the presence of chronic diseases.

#### **Data collection**

The research collected data using the Participant Information Form developed by the researchers and the Diabetes Knowledge Scale for Adults. Participants responded to the Diabetes Knowledge Scale for Adults with "Yes," "No," or "Don't Know." The Healthy Lifestyle Behaviors Scale-II was designed in a four-point Likert format, where participants were instructed to carefully evaluate each statement and choose from responses ranging from "Never (1)," "Sometimes (2)," "Often (3)," to "Regularly (4)."

#### **Bias**

Data were collected at the beginning of the fall semester to mitigate selection bias. Completion of the survey forms took approximately 15-20 minutes. Post-data collection, the observer-researcher conducted a thorough review of the responses, excluding any surveys completed in less than five minutes, to ensure the validity and reliability of the data.

#### **Participant Information Form**

The Participant Information Form, developed by the researchers in line with the literature, includes five questions regarding the socio-demographic characteristics and healthy lifestyle behaviors of nursing faculty students (age, gender, smoking, alcohol use, presence of chronic diseases) (11,12).

#### **Diabetes Knowledge Scale for Adults (DKSA)**

Yavuz and Erol developed the Diabetes Knowledge Scale for Adults (DKSA) in 2022 (13). This scale consists of 28 items and is divided into five sub-dimensions: general knowledge about diabetes, symptoms of diabetes, blood glucose measurement and values, diabetes risk factors, and diabetes complications. Responses to the scale are recorded as "Yes," "Don't Know," and "No." Correct answers are awarded 1 point, while

incorrect and “Don’t Know” responses receive 0 points. Incorrect answers are reverse-scored. Higher scores indicate a greater level of knowledge about diabetes.

**Healthy Lifestyle Behaviors Scale II (HLBS-II)**

The Healthy Lifestyle Behaviors Scale II (HLBS-II) was developed by Walker et al. in 1996 to measure health-promoting behaviors associated with a healthy lifestyle. The scale consists of 52 items and is divided into six sub-dimensions: Physical activity, interpersonal relations, spiritual growth, nutrition, health responsibility, and stress management. The scale is structured as a four-point Likert scale, with all items phrased positively. The total score reflects the overall level of healthy lifestyle behaviors. The minimum possible score on the scale is 52, while the maximum is 208. The Turkish validity and reliability of the scale were established by Bahar et al. in 2008. In this study, the Cronbach’s Alpha value for the total scale was found to be 0.94, with sub-dimension Cronbach’s Alpha values ranging from 0.79 to 0.87 (7).

**Data analysis**

Data were analyzed using the SPSS 25.0 (Statistical Program for Social Sciences) software package. Descriptive characteristics of the participating students were determined through frequency and percentage analyses, while mean and standard deviation statistics were used for scale evaluation. Data were presented as mean ± standard deviation for parametric tests, while for non-parametric tests, the median (minimum-maximum) was reported. Categorical data were expressed as frequency (n) and percentage (%). Differences in scale levels based on the students’ descriptive characteristics were analyzed using the independent samples t-test. Pearson correlation and linear regression analyses were applied to explore the relationships between dimensions affecting the students’ scale levels. In interpreting the correlation coefficients (r), values between 0.00-0.25 were considered very weak, 0.26-0.49 weak, 0.50-0.69 moderate, 0.70-0.89 strong, and 0.90-1.00 very strong. Cronbach’s Alpha and Kuder-Richardson-20 (KR-20) were applied for reliability analysis. The total Cronbach’s Alpha value for the Healthy

Lifestyle Behaviors Scale-II was calculated as 0.805, and the KR-20 value for the Diabetes Knowledge Scale for Adults was 0.94. A p-value of less than 0.05 was considered statistically significant.

**Ethical issues**

This study was approved by the Istanbul Beykent University Social Sciences Ethics Committee (Approval no. 2023/129792). Participants gave informed consent and could terminate their participation at any time.

**Results**

**Demographics**

The mean age of the participants (n=299) was 21.6±1.6 years, and 81.6% (n=244) of them were female, while 18.4% (n=55) were male. Among the students, 21.4% reported smoking, and 16.4% reported alcohol consumption. Additionally, 93.3% of the nursing students reported no chronic illnesses (Table 1)

Table 1. Distribution of students according to descriptive characteristics		
Features	x ± SD*	Minimum-Maximum Value
Age	21.6±1.6	19-31
	n	%
Gender		
Female	244	81.6
Male	55	18.4
Smoking		
Yes	64	21.4
No	235	78.6
Alcohol use		
Yes	49	16.4
No	250	83.6
Chronic disease status		
Yes	20	6.7
No	279	93.3
*x: mean (average) SD: Standard Deviation		



<b>Table 2. Diabetes Knowledge Scale for Adults (DKSA) score averages</b>		
	<b>x ± SD*</b>	<b>Minimum-Maximum Value</b>
Scale total	23.31±3.71	6-28
General information	4.96±1.02	1-6
Blood glucose measurement	4.02±1.05	0-5
Diabetes risk factors	3.00±1.00	0-4
Symptoms of diabetes	6.88±1.56	0-8
Complications of diabetes	4.46±0.97	0-5
*x: mean (average) SD: Standard Deviation		

<b>Table 3. Healthy Lifestyle Behaviors Scale-II (HLBS-II) score averages</b>		
	<b>x ± SD*</b>	<b>Minimum-Maximum Value</b>
Scale total	130.73±20.23	77-208
Spiritual growth	25.45±4.38	11-46
Health responsibility	21.84±4.19	9-36
Physical activity	18.25±3.93	8-32
Nutrition	20.99±4.06	11-36
Interpersonal relationships	24.96±3.96	16-36
Stress management	19.25±3.71	10-32
*x: mean (average) SD: Standard Deviation		

### DKSA and HLBS-II score averages

The mean total score for the Diabetes Knowledge Scale for Adults (DKSA) was 23.31±3.71, with scores ranging from 6 to 28 (Table 2). Female students had significantly higher diabetes knowledge scores than male students (p=0.002). Similarly, in the diabetes symptoms sub-dimension, female students scored significantly higher (p=0.005).

The mean score for the Healthy Lifestyle Behaviors Scale-II (HLBS-II) was 130.73±20.23. Among the sub-dimensions, the highest mean score was observed in spiritual growth (25.45±4.38), while the lowest was in physical activity (18.25±3.93) (Table 3). When examining the HLBS-II sub-dimensions, it was found that female students had higher mean scores in interpersonal relations than male students (p=0.005). Although female students scored significantly higher than male students on the DKSA and certain sub-dimensions of the HLBS-II, the group sizes were not statistically balanced.

### Relationships between DKSA and HLBS-II levels

A weak positive correlation was observed between the total scores of the DKSA and the HLBS-II (r=0.085, p=0.145), although this was not statistically significant. Additionally, weak positive but non-significant correlations were found between the DKSA and the sub-dimensions of spiritual growth (r=0.035, p=0.550), health responsibility (r=0.093, p=0.145), physical activity (r=0.045, p=0.432), and stress management (r=0.083, p=0.154). A weak negative correlation was also observed between the general knowledge sub-dimension of the DKSA and the HLBS-II (r=-0.095, p=0.102); however, this result was also not statistically significant. However, a weak but statistically significant positive correlation was found between the students' diabetes knowledge levels and the interpersonal relationships subscale of the healthy lifestyle behaviors scale (r=0.138; p=0.017) (Table 4).

**Table 4.** Correlation analysis between DKSA and HLSB II scores

	DKSA Sum		DKSA General information		DKSA Blood glucose measurement		DKSA Risk factors		DKSA Symptoms		DKSA Complications		HLSBII Sum	
	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p
DKSA Sum	1	-	.499**	<.001*	.632**	<.001*	.569**	<.001*	.802**	<.001*	.704**	<.001*	.085	.145
DKSA General information	.499*	<.001*	1	-	.170**	.003	.907	.095	.181**	.002	.229**	<.001*	-.095	.102
DKSA Blood glucose measurement	.632**	<.001*	.170**	.003	1	-	.203**	<.001*	.393**	<.001*	.299	<.001*	.142*	.014
DKSA Risk factors	.569**	<.001*	.097	.095	.203**	<.001*	1	-	.318**	<.001*	.302**	<.001*	.011	.856
DKSA Symptoms	.802**	<.001*	.181**	.002	.393**	<.001*	.318**	<.001*	1	-	.497**	<.001*	.100	.085
DKSA Complications	.704**	<.001*	.229**	<.001*	.299**	<.001*	.302**	<.001*	.497**	<.001*	1	-	.101	.081
HLSBII Sum	.085	.145	-.095	.102	.142*	.014	.011	.856	.100	.085	.101	.081	1	-
HLSBII Spiritual growth	.035	.550	-.031	.597	.055	.347	-.024	.678	.055	.348	.044	.445	.799**	<.001
HLSBII Health responsibility	.093	.109	-.098	0.092	.170**	.003	-.032	.580	.131*	.023	.099	.086	.863**	<.001
HLSBII Physical activity	.046	.432	-.131*	.024	.103	.075	.060	.303	.020	.728	.113	.052	.796**	<.001
HLSBII Nutrition	.033	.570	-.161**	.005	.111	.055	.035	.542	.062	.286	.047	.421	.852**	<.001
HLSBII Interpersonal relationships	.138*	.017	-.010	.865	.142*	.014	.018	.760	.132	.022	.154**	.008	.829**	<.001
HLSBII Stress management	.083	.154	-.045	.439	.137*	.018	.001	.984	.102	.079	.052	.372	.869**	<.001

\*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

	HLSBII Spiritual growth		HLSBII Health responsibility		HLSBII Physical activity		HLSBII Nutrition		HLSBII Interpersonal relationships		HLSBII Stress management	
	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p	r <sup>a</sup>	p
DKSA Sum	.035	.550	.093	.109	.046	.432	.033	.570	.138*	.017	.083	.154
DKSA General information	-.031	.597	-.098	.092	-.131	.024	-.161**	.005	-.010	.865	-.045	.439
DKSA Blood glucose measurement	.055	.347	.170**	.003	.103	.075	.111	.055	.142*	.014	.137*	.018
DKSA Risk factors	-.024	.678	-.032	.580	.060	.303	.035	.542	.018	.760	.001	.984
DKSA Symptoms	.055	.348	.131*	.023	.020	.728	.062	.286	.132*	.022	.102	.079
DKSA Complications	.044	.445	.099	.086	.113	.052	.047	.421	.154**	.008	.052	.372
HLSBII Sum	.799**	<.001	.863**	<.001	.796**	<.001	.852**	<.001	.829**	<.001	.869**	<.001
HLSBII Spiritual growth	1	-	.563**	<.001	.472**	<.001	.592**	<.001	.715**	<.001	.625**	<.001
HLSBII Health responsibility	.563**	<.001	1	-	.660**	<.001	.686**	<.001	.687**	<.001	.727**	<.001
HLSBII Physical activity	.472**	<.001	.660**	<.001	1	-	.710**	<.001	.521**	<.001	.639**	<.001
HLSBII Nutrition	.592**	<.001	.686**	<.001	.710	<.001	1	-	.562**	<.001	.724**	<.001
HLSBII Interpersonal relationships	.715**	<.001	.687**	<.001	.521**	<.001	.562**	<.001	1	-	.660**	<.001
HLSBII Stress management	.625**	<.001	.727**	<.001	.639**	<.001	.724**	<.001	.660**	<.001	1	-

\*\* Correlation is significant at the 0.01 level (2-tailed). \*Correlation is significant at the 0.05 level (2-tailed).

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## Discussion

This study aimed to determine the impact of nursing students' diabetes knowledge levels on their healthy lifestyle behaviors. The participants' average age was  $21.6 \pm 1.6$  years, consistent with the literature (11,14-17). This consistency is likely due to the studies conducted with similar age groups and young populations. Most participants were female (81.6%), which aligns with previous research (12,15,18,19). This gender distribution may be related to the nature of the nursing field. Additionally, the low prevalence of smoking (21.4%) and alcohol consumption (16.4%) among the students, consistent with findings in other studies (19-21), may be attributed to the fact that these students are studying in a nursing program.

It is essential for nursing students, who are future healthcare professionals, to possess complete and adequate knowledge of diabetes in clinical practice to provide quality and effective nursing care to their patients. Furthermore, maintaining healthy lifestyle behaviors and setting an example for the community is equally essential (11,22). In this study, the mean diabetes knowledge score among nursing students was relatively high ( $23.31 \pm 3.71$ ) (Table 3). Similarly, Anastasiou et al. (2019) (14) reported that nursing students had sufficient knowledge regarding diabetes and its risk factors. Ramjan et al. (2017) (16) also found high levels of diabetes knowledge among nursing students in Japan and Australia. These findings are consistent with the results of our study. However, other studies by Alsolais et al. (2022), Sari et al. (2022), and Tawalbeh & Gharaibeh (2014) identified insufficient diabetes knowledge among nursing students. The differences in study outcomes may be attributed to variations in the educational system (11,17,23).

In our study, female students scored higher on the subscales of diabetes symptoms and general diabetes knowledge in the DKSA. This finding is consistent with the studies of Alsolais et al. (2022) and Yıldırım Togluk & Kavurmacı (2021), where female students also achieved higher scores. The higher mean scores among female students in our study and the literature

may be due to the larger proportion of female participants than male students. Thus, our study aligns with the literature (11,22).

The mean total score for the HLBS-II in our study was  $130.73 \pm 20.23$ . Considering the scale's possible range of 52 to 208, this score suggests moderate healthy lifestyle behaviors. Similar results were observed in studies by Aksoy & Uçar (2014) [24], Bakouei et al. (2018), Alzahrani et al. (2019) [26], Bülbül et al. (2020), and Özkan et al. (2022), which align with our findings (12,19,24,25,26).

Among the subscales of the HLBS-II, students scored the highest in spiritual growth and the lowest in physical activity. This outcome is consistent with the studies by Bülbül et al. (2020) and Özkan et al. (2022) (12,19). Similar subscale scores were also found in the studies of Alzahrani et al. (2019) and Bakouei et al. (2018) (25,26). These consistent findings suggest that young individuals may prioritize spiritual growth but allocate less time to physical activities due to factors such as the increasing use of technology and the intensity of academic work. Ideally, students in health-related fields should be expected to dedicate more time to physical activity due to the content of their courses. However, this study and others suggest that university students lead a sedentary lifestyle and have not fully developed healthy behaviors such as regular physical activity.

Numerous studies have reported gender as a factor influencing healthy lifestyle behaviors (27,28). Research has shown that women have better health responsibility, interpersonal relations, and nutritional habits than men (25,26). In our study, female students also demonstrated better interpersonal relations. However, it should be noted that the gender distribution in the sample was unbalanced; therefore, the results of gender-based comparisons may be due to unequal group sizes.

Our study observed a weak positive correlation between students' diabetes knowledge and healthy lifestyle behaviors; however, this relationship was not statistically significant. Nevertheless, a relationship between higher diabetes knowledge and healthy lifestyle behaviors was expected. Due to the limited



number of similar studies focusing specifically on nursing students, it isn't easy to directly compare our findings with existing research. However, existing literature clearly shows that individuals with lower scores in healthy lifestyle behaviors have a higher risk of developing diabetes (12,19,20). In this context, our findings align with the general trend in the literature and may provide a preliminary basis for future research.

The study showed a relationship between students' diabetes knowledge levels and interpersonal relationships subscales of the healthy lifestyle behaviors scale. A study by Özkan et al. (2022) also found that improved interpersonal relationships among students were associated with a reduced risk of type 2 diabetes (19). This suggests that peer education may be an effective strategy for diabetes prevention.

### Limitations

The primary limitation of this study stems from its cross-sectional design. The sample consisted only of nursing students from Istanbul, a city characterized by high social and economic development levels. To enhance the generalizability of the findings and gain a more comprehensive understanding of diabetes knowledge levels, it is recommended that future studies include students from rural areas. Adopting a cohort study design could be a potential strategy to address the limitations inherent in cross-sectional studies. A cohort study involves the longitudinal tracking and analysis of a defined group of individuals over a specific period. This method facilitates the observation of longitudinal trends, allows for a more in-depth exploration of relationships between variables, and enhances the validity of outcome interpretations.

### Conclusions

This study demonstrates the relationship between diabetes knowledge levels and healthy lifestyle behaviors. The findings indicate that nursing students generally have good diabetes knowledge. Considering the rapid increase in diabetes incidence and the impact of diabetes knowledge on healthy lifestyle behaviors among young individuals, it can be predicted that diabetes will continue to pose a significant challenge in the future. The lack of specific research focusing on nursing students highlights

the need to fill this gap by raising awareness of the increasing number of diabetes cases. This approach is crucial to promote educational curricula and health policy development actively. Increasing nursing students' knowledge about diabetes and integrating healthy lifestyle behaviors into their lives will play an effective role in preventing diabetes.

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### References

1. American Diabetes Association. Prevention or delay of type 2 diabetes: Standards of medical care in diabetes-2020. *Diabetes Care*.2020;43(1);32-6. <https://doi.org/10.2337/dc20-S003>
2. Turkish Diabetes Foundation. National diabetes strategy 10<sup>th</sup> year final report. 2023. Retrieved from [https://www.turkdiab.org/admin/PICS/webfiles/TDV\\_UDS\\_2023\\_112454.pdf](https://www.turkdiab.org/admin/PICS/webfiles/TDV_UDS_2023_112454.pdf)
3. Gezer C, Ulusan D. Is there a relationship between disease knowledge level, healthy lifestyle, and quality of life in individuals with type 2 diabetes? *Turkish Journal of Hygiene and Experimental Biology*. 2020;77(2):155-66. <https://doi.org/10.5505/TurkHijyen.2019.65037>
4. Kueh YC, Morris T, Ismail AAS. The effect of diabetes knowledge and attitudes on self-management and quality of life among people with type 2 diabetes. *Psychology, Health & Medicine*. 2017;22(2):138-44. <https://doi.org/10.1080/13548506.2016.1147055>
5. International Diabetes Federation. *IDF Diabetes Atlas (10<sup>th</sup> ed.)*. International Diabetes Federation;2021. <https://diabetesatlas.org>
6. Sevgi Doğan ES, Şahin CK, Akan DD, Pakyüz SÇ, Işık KI, Mıngır K. Determination of diabetes risk among nursing students. *İzmir Democracy University Health Sciences Journal*. 2022;5(2):607-19. <https://doi.org/10.52538/iduhes.1005968>
7. Bahar Z, Beşer A, Gördes N, Ersin F, Kissal A. Validity and reliability study of the Healthy Lifestyle Behaviors Scale II. *C.U. Journal of School of Nursing*. 2008;12(1):1-13.

8. Erdoğan G, Coşansu G. Diabetes risk awareness: A metropolitan example. *Journal of Continuing Medical Education*. 2021;30(5):307-16. <https://doi.org/10.17942/sted.876596>
9. Spruijt-Metz D, O'Reilly GA, Cook L, Page KA, Quinn C. Behavioral contributions to the pathogenesis of type 2 diabetes. *Current Diabetes Reports*. 2014;14:1-10. <https://doi.org/10.1007/s11892-014-0524-2>
10. Von Elm E, Altman DG, Egger Ö, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for reporting observational studies. *BMJ* 2007 Oct 20;335(7624):806-8. doi: 10.1136/bmj.39335.541782.
11. Alsolais AM, Bajet JB, Alquwez N, Alotaibi KA, Almansour AM, Alshammari F, Cruz JP, Alotaibi JS. Predictors of self-assessed and actual knowledge about diabetes among nursing students in Saudi Arabia. *Journal of Personalized Medicine*. 2023;13(1):57. <https://doi.org/10.3390/jpm13010057>
12. Bülbül E, Çelik S, Alçiçek H, Dindar A, Furtana M, Günal M, Karga SN, Öztunç B, Yılmaz A. Determination of diabetes risk and healthy lifestyle behaviors among nursing students. *Turkish Journal of Diabetes and Obesity*. 2020;4(3):2308. doi: 10.25048/tudod.780220.
13. Yavuz K, Erol S. Developing a diabetes knowledge scale for adults and its psychometric properties. *Clinical and Experimental Health Sciences*. 2022;12(3):711-8. <https://doi.org/10.33808/clinexphealthsci.1052243>
14. Anastasiou V, Tsaloglidou A, Minasidou E, Kafkia T, Koukourikos L, Dimitriadou A. Investigation of the knowledge of nursing students and nursing assistants' students on diabetes mellitus II and its prevention. *International Journal of Caring Sciences*. 2019;12(3):1837-49.
15. Khamaiseh AM, Alshloul MN. Diabetes knowledge among health sciences students in Saudi Arabia and Jordan. *Journal of the University of Jordan*. 2019;58(1):37-48.
16. Ramjan LM, Watabe H, Salamonson Y. Diabetes knowledge and perceptions among nursing students, and curriculum differences in Japan and Australia: A cross-sectional study. *Nurse Education Today*. 2017;53:7-12. <https://doi.org/10.1016/j.nedt.2017.03.005>
17. Tawalbeh L, Gharaibeh B. Diabetes knowledge among university nursing students in the North of Jordan. *Pakistan Journal of Nutrition*. 2014;13(12):728-34. <https://doi.org/10.3923/pjn.2014.728.734>
18. Kes D, Can Cicek S. Mindful eating, obesity, and risk of type 2 diabetes in university students: A cross-sectional study. *Nursing Forum*. 2021;56(3):483-89. <https://doi.org/10.1111/nuf.1257>
19. Özkan İ, Taylan S, Çiçek S. Evaluation of type 2 diabetes risk perceptions, healthy lifestyle behaviors, and type 2 diabetes risk levels of nursing and child development students. *İzmir Democracy University Health Sciences Journal*. 2022;5(2):495-510. <https://doi.org/10.52538/iduhs.1005967>
20. Doğan B, Yörük N, Öner C, et al. 2017. Evaluation of diabetes risk and eating habits of university students and personnel. *Turkish Journal of Family Practice*. 2017;21(2):50-5. <https://doi.org/10.15511/tahd.17.00250>
21. Yılmaz MÇ. Hemşirelik öğrencilerinin sağlık algıları ile fiziksel aktivite düzeyleri. *Journal of Human Rhythm*. 2019;5(4):323-38.
22. Yıldırım Togluk Ş, Kavurmacı M. Determination of nursing students' knowledge levels regarding diabetes and insulin administration. *Samsun Journal of Health Sciences*. 2021;6(1):94-102. <https://doi.org/10.47115/jsbs.858468>
23. Sari Y, Upoyo AS, Sumeru A, et al. 2022. Nursing students' knowledge and attitude toward diabetic ulcer care and their contributing factors in Indonesia. *International Journal of Nursing Sciences*. 2022;9:496-503. <https://doi.org/10.1016/j.ijnss.2022.09.013>
24. Aksoy T, Uçar H. Healthy lifestyle behaviors of nursing students. *Journal of Hacettepe University Faculty of Nursing*. 2014;1(2):53-67.
25. Bakouei F, Jalil Seyedi-Andi S, Bakhtiari A, et al. Health promotion behaviors and its predictors among college students in Iran. *International Quarterly of Community Health Education*. 2018;38(4):251-8. <https://doi.org/10.1177/0272684X18804599>
26. Alzahrani SH, Malik AA, Bashawri J, et al. Health-promoting lifestyle profile and associated factors among medical

- students in a Saudi university. SAGE Open Medicine. 2019;7:1-7. <https://doi.org/10.1177/2050312118825701>
27. Shaheen AM, Nassar OS, Amre HM, et al. Factors affecting health-promoting behaviors of university students in Jordan. Health. 2015;7(1):1-8. <https://doi.org/10.4236/health.2015.71001>
28. Cho YH, Ra JS, Park JY, et al. Factors influencing health-promoting behaviors in college students in Korea. Indian Journal of Science and Technology. 2016;9(43):1-9. <https://doi.org/10.17485/ijst/2016/v9i43/104958>