Original Article

doi:10.31674/mjn.2024.v16i01.012

MJN

Knowledge about Type 1 Diabetes in Children among Nursing Students of the University of Mosul, Iraq

Rian Mahmood Ibrahim, Nada Hani Idrees, Nasir Muwfaq Younis*

University of Mosul, Mosul, 41002 Nineveh Governorate, Iraq

**Corresponding Author's Email: nasir.mufaq@uomosul.edu.iq*

ABSTRACT

Background: A metabolic condition known as diabetes mellitus (DM) is defined by a shortfall in insulin secretion or activity, which leads to hyperglycemia. Type I, type II, and gestational diabetes are the three main subtypes of diabetes mellitus. **Objective:** To determine the knowledge of nurses' students about type 1 diabetes in children. **Methods**: A descriptive study was conducted to evaluate the nursing students at the University of Mosul's understanding of diabetes type 1 in children. The student's information was gathered between January 2, 2023, and January 15, 2023. A total of 152 samples were collected during the research. Data was collected using a questionnaire constructed based on previous studies and related to the literature, which consisted of 22 questions. Data were entered and analyzed using the statistics program. **Results:** The knowledge of the students at the College of Nursing was relatively good, but not at a high level; the educational level of 152 students was "79.6%" acceptable, "18.4%" good, and "1.9%" poor. In the present study, the males and females were approximately equal. **Conclusion:** The students' knowledge of the signs and symptoms was good, indicating that they are well-informed about diabetes and motivated to explore ways to reduce the disease as well as treatment.

Keywords: Children; Diabetes Mellitus; Student Knowledge

INTRODUCTION

A metabolic condition known as diabetes mellitus (DM) is defined by a shortfall in insulin secretion or activity, which leads to hyperglycemia. Type I, type II, and gestational diabetes are the three main subtypes of diabetes mellitus. The immune system destroys the islets of Langerhans' beta cells, thereby reducing the amount of insulin secreted. Type I diabetes is the result (Alanazi *et al* ., 2022).

One of the most prevalent disorders that medical practitioners encounter is diabetes mellitus (Type 1 and Type 2). Adult prevalence rates were projected to be 4% globally in 1995, and by 2025, they are predicted to rise to 5.4%. Aside from considerable mortality, diabetes-related morbidities such as diabetic retinopathy, neuropathy, and cardiovascular disease are among the problems. The considerable morbidity and mortality rates brought on by these problems have put a significant financial strain on society. The effects of diabetes on public health are widely known to both healthcare professionals and public policymakers (Mohanty *et al*., 2022).

Diabetes mellitus (DM) management is complicated and necessitates expertise from both patients and healthcare professionals. The incidence and prevalence of diabetes mellitus (DM), a common chronic ailment that currently affects 8.3% (371 million) of the worldwide population, is sharply increasing around the world. This metabolic disease is characterized by hyperglycemia brought on by deficits in insulin secretion, insulin action, or both (ADA, 2010). It is separated into three groups: Type I diabetes mellitus, an autoimmune disease, is specifically defined as cell death leading to an absolute lack of insulin (Alanazi *et al*., 2022). T1D is a chronic autoimmune disease with an insulin deficit. The pancreas secretes the hormone insulin, which controls how fats are stored and how carbs are metabolized. As a result, it is necessary for cells to utilize carbohydrates as fuel. Diabetes can develop when insulin synthesis is hampered or when the body does not appropriately respond to the insulin produced (Chhibber *et al*., 2022; Banerjee *et al*., 2022). Type I diabetes mellitus is the most common

Received: January 29, 2024 Received in revised form: June 20, 2024 Accepted: June 26, 2024

autoimmune endocrine disorder in kids and teenagers (T1DM), which has a growing incidence globally and varies by race, nation, and area. Several studies in the previous two decades revealed a marked rise in T1DM incidence in kids up to age 14 (Sparapani *et al.*, 2017).

This study investigates the use of the health promotion word "self-care" in the context of patient education programs for young people with type 1 diabetes (Ahmad *et al*., 2022). Diabetes mellitus, commonly known as type 1 diabetes, is one of the most common metabolic diseases in children around the world. Type I diabetes (T1D) is becoming more common. T1D is tough to manage, and teens with diabetes face additional challenges because of their age. This article's goal is to explain how schools may foster a supportive environment and enhance the experiences and results of teenagers with T1D (Chu *et al*., 2023).

Diabetes mellitus (type 1 diabetes), one of the most common metabolic disorders in children worldwide, is becoming more common. There are more than 1.1 million children and teenagers worldwide who have type 1 diabetes. The possibility of hypoglycemia is a concern for 56% of diabetics. More than 60% of diabetic patients' families are concerned about their loved ones' hypoglycemia. More than 34 million patients worldwide are using the products for diabetes care. This article's goal is to explain how schools may foster a supportive environment and enhance the experiences and results of teenagers with T1D (Oraibi *et al*., 2022). Both patients and medical staff, especially nurses, need to have a firm understanding of DM and its management in order to provide the best diabetes care. To achieve high levels of diabetes care and self-management, nurses must have a solid understanding of all aspects of DM care and treatment in order to direct their practice and help patients successfully manage their disease. Nurses' level of understanding about diabetes can influence their attitudes towards treating this condition (Allawi & Ahmed, 2023; Bag, 2020). The study aims to identify the knowledge of third- and fourth-stage students about type 1 diabetes in children, and to determine the differences in knowledge between these two groups.

METHODOLOGY

Study Design

An evaluation of the nursing students at the University of Mosul's understanding of type 1 diabetes in children was done using a descriptive study method.

Setting

The study participants were informed of the importance of the study and the confidentiality of the information, and their voluntary oral consent was obtained to participate in the study. The study's setting included the fact that the College of Nursing is in northern Iraq, in the Nineveh Governorate, on the left side of the city of Mosul. It is located behind the College of Pharmacy.

Study Tools

The purposeful non-probability method was selected from the third and fourth classes in the college of nursing. Data was collected using a questionnaire constructed based on previous studies and related to the literature. The questionnaire consisted of two different groups of questions. The study tool was divided into two parts: The first part included variables on the most effective treatment for type 1 diabetes, which determined the study's stage. Part two included 10 questions on understanding the signs and symptoms of diabetes mellitus (DM1), and 12 questions on understanding the complications associated with the disease. A total of 22 questions were closed-ended, requiring answers such as (Yes) and (No). Each correct answer received one point, while each incorrect answer received a zero score, the researchers developed tools of the study according to (Yasir & Aziz, 2022). Who used the tools of this study on the same samples of our study, and after reviewing the enlightenment of the questionnaire of previous researchers, modifications were made to it in a manner consistent with the current study.

Data Collection

Took place between January 2, 2023, and January 15, 2023. A total of 152 samples were collected during the research.

Validity and Reliability

Eight experts, who were health educators and faculty members of the university, established the validity of the content. There were two experts in child and adolescent health, two experts in statistics, language, and grammar, and two experts in community medicine. Lastly, we included two specialists in mental health nursing. The Pearson correlation coefficient was calculated for the questionnaire to determine the internal reliability ($r = 0.80$).

Statistical Analysis

Using the same statistical style in the analysis of the findings of the study, statistical descriptive and inferential statistics were used for the analysis, which was done using SPSS version 26. The significance threshold was established at $p = 0.05$.

Ethical Consideration

The ethical agreement for this study was obtained from the Ethical Committee of Medical Colleges at the University of Mosul, Iraq with approval no. 342861 on 2nd February 2023.

RESULTS

Table 1: Demographic Characteristics of the Student Third and Fourth Stage (n =152)

Demographic Characteristics	3rd Class		4th Class	
	No	%	No	%
Stages	72	47.7	80	52.3
Female	41	56.9	35	43.8
Male	31	43.1	45	56.3

Table 1 shows the demographic characteristics of the students in the third and fourth stages. The highest percentage was 56.4% for the fourth stage, while it was 47.7% for the third stage. The number of females was higher than that of males (n =152).

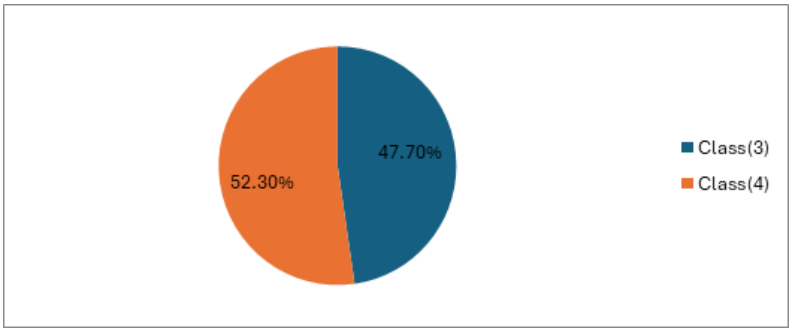

Figure 1: Shows the Classes of the Studied Variable.

Table 2: The Relationship between the Knowledge of the Third and Fourth Stage Students about Type 1 Diabetes

Total Score	Chi-Square				
	3rd Class No %		4th Class No %		*P*-value
Poor	8	5.2	13	8.6	0.000
Accepted	70	46.3	50	33.1	
Good	7	4.6	3	2	

Table 2 shows that highly significant (p-value=0.000) difference in the knowledge of the third and fourth stage students about type 1 diabetes.

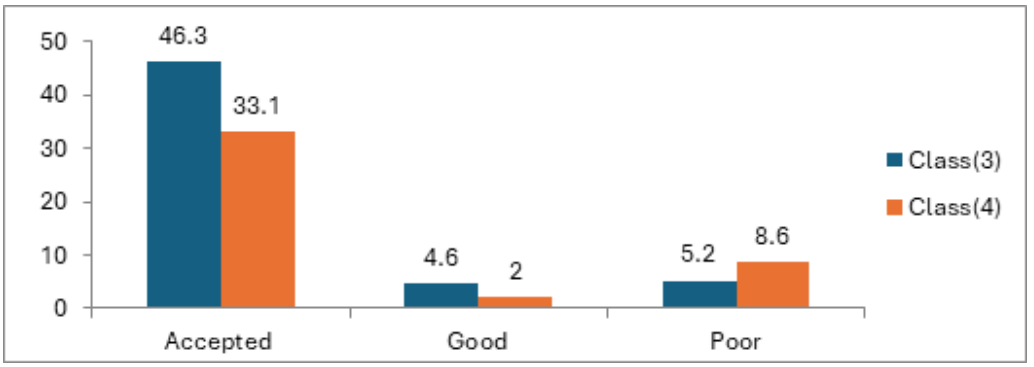

Figure 2: Shows the Difference between the Knowledge (total score) between Third and Fourth Stage Students

Table 3: Students' Knowledge about the Best Treatment for Type 1 Diabetes in Children

Education Level		F	%
3rd Class	Diabetes Pills	47	65.3
	Insulin Injection	25	34.7
	Total	72	100%
4th Class	Diabetes Pills	42	52.5
	Insulin Injection	38	47.5
	Total	80	100%

In Table 3 the number of students in the third and fourth stages who chose the best treatment for diabetes mellitus type 1 in children is: 58.5% of the students in both stages chose diabetes pills as the best treatment, 65.3% of the third stage and 52.5% of the fourth stage, while 47.5% of the fourth stage students believed insulin injection was the best treatment compared to 34.7% of the third stage students.

Table 4: Test-Retest for the Study Tools

Test-Retest Reliability	Item	Pearson Correlation Coefficient
Knowledge About Type 1 Diabetes	22	0.80

This table shows the performance test of the measurement using the Pearson correlation coefficient to determine internal reliability.

DISCUSSION

Type 1 diabetes mellitus, type 2 diabetes mellitus (which accounts for 90% of cases), and gestational diabetes mellitus (DM) are the three main subtypes of the metabolic condition diabetes mellitus (DM), which is characterized by persistent hyperglycemia. The 21st century's fastest-growing worldwide health emergency is diabetes mellitus (DM). Adults with diabetes are expected to have a prevalence of 463 (9.3%) million cases in 2019 and 578 (10.2%) million cases by 2030. In low- and middle-income nations, 84.3% of undiagnosed cases were discovered, and 50.1% of the 463 million people with diabetes are unaware of their chronic symptoms. The Middle East and North Africa (MENA) region has the highest prevalence of diabetes, with 12.2% of the population currently expected to have the disease and a projected 13.3% increase by 2030 (Gazzaz, 2020; Ayed *et al.*, 2023).

The student in the third and fourth stages exhibits the following demographic characteristics:

Table 1 shows that there were no statistical differences between the genders of the third and fourth stages, and the stages were, respectively, number and percentage (72, 47.7, 80, and 52.3). In Saudi Arabia, another study (Oraibi *et al.*, 2022) also found no statistical differences between the third and fourth stages, with 173 (62.9%) and 102 (37.1%) students, respectively. The number of students in each stage was nearly equal, and the same was true

for their genders because the sample type was voluntary.

The relationship between the knowledge of the third and fourth-stage students about type 1 diabetes is significant

Table 2 revealed that there were highly significant differences (p-value = 0.000) between third and fourth graders regarding their knowledge. Other research has reached the same conclusion (p-value = 0.001) (Sparapani *et al* ., 2017). In the study, the third-stage students had a higher level of knowledge than the fourth, primarily due to their exposure to e-learning during the Corona pandemic last year. This e-learning influenced their level of knowledge because type 1 diabetes in children is a specialty in child and adolescent health nursing (Ali, 2023).

Students' knowledge about the best treatment for type 1 diabetes in children

The study showed the students' knowledge about the best treatment for type I diabetes in children was about the use of diabetes-reducing pills and insulin injections between the third and fourth stages, number, percentage (%), respectively, 47, 65.3, 25, 34.7, and 42, 52.5, 38, and 47.5. Note that the only treatment that a child uses to treat type 1 diabetes is insulin injections. Wu *et al*. (2022) found the same results in their studies.

Limitations

While the study faced challenges due to the non-cooperation of some students in the third and fourth stages, resulting in partial success, it provided valuable insights. The study, although limited to a single institution, lays a strong foundation for future research. Expanding this research to include multiple institutions across different regions will offer a more comprehensive understanding of nursing students' knowledge about type 1 diabetes in children. These findings can guide further studies and contribute significantly to improving nursing education and care practices.

CONCLUSION

The study found that there was a roughly equal involvement among men and women. The knowledge of students at the College of Nursing was relatively good, but not at a high level, as indicated by the educational level of one hundred fifty-two students. Of these, one hundred and twenty-one students, or seventy-nine and a half percent, were considered acceptable, twenty-eighteen and a half percent were considered good, and three students, or one and nine tenths, were considered poor. The students' knowledge of the signs and symptoms was good, indicating that they are well-informed about diabetes and are motivated to explore ways to reduce the disease and treatment.

The findings suggest that while nursing students have a relatively good understanding of type 1 diabetes, there is room for improvement in their education to ensure higher levels of knowledge and better preparedness in managing the condition. Future research could expand the sample size and include multiple institutions to gain a broader understanding, and longitudinal studies could be conducted to assess the impact of enhanced educational interventions on students' knowledge and clinical practice.

Conflict of Interest

The authors declare that they have no competing interest.

ACKNOWLEDGEMENT

The authors would like to sincerely thank all the students and universities that helped with this study. The nursing students who voluntarily took part in this study are appreciated by the authors. Their enthusiastic participation was essential in producing insightful findings about the University of Mosul's nursing students' understanding of type 1 diabetes in children. Their co-operation was essential towards the success of this study.

REFERENCES

Ahmad, J., Rizvi, N., Ahmad, F., & Siddiqi, S. S. (2022). Teneligliptin versus vildagliptin in Indian patients with type 2 diabetes inadequately controlled with metformin. *Journal of Medical Pharmaceutical and Allied Sciences, 11*(1), 4100-4. https://doi.org/10.55522/jmpas.V11I1.1478

Alanazi, M. A., Alqhtani, N. D. M., Otayf, B. Y., Almalki, M. A. S., Alessa, N. A., Al Sharyah, S. M. B. N., ... & Almukhayzim, R. F. (2022). Prevalence and risk factors of diabetes mellitus type-2 patients in Saudi Arabia: community-based study. *International Journal of Medicine in Developing Countries, 6*(4), 637-637. https://doi.org/10.24911/IJMDC.51-1642193458

Ali, H. M. A. (2023). Evaluation of awareness and attitude of paediatric nursing students, nurses, and adolescents regarding type one diabetes advanced devices and virtual nursing. *KONTAKT-Journal of Nursing & Social Sciences related to Health & Illness, 25*(2). http://doi.org/10.32725/kont.2023.013

Allawi, R. H., & Ahmed, M. M. (2023). Assessment of Nurse's Knowledge Towards Diabetic Ketoacidosis among children in Mosul City/Iraq. *Rawal Medical Journal, 48*(2). https://www.rmj.org.pk/fulltext/27-1677229881.pdf

American Diabetes Association (2009). Diagnosis and classification of diabetes mellitus. *Diabetes Care, 32*(Suppl 1), S62–S67. https://doi.org/10.2337/dc09-S062

Ayed, A. Y., Younis, N. M., & Ahmed, M. M. (2023). Comparison of infection severity of vaccinated and unvaccinated health workers with Corona Virus: A cohort study. *Journal of Education and Health Promotion,* (1), 336. https://doi.org/10.4103/jehp.jehp_440_23

Bag, R. (2020). A study to identify the perceived stress among first year basic b sc. Nursing students in a selected college of nursing in Kolkata (West Bengal), India. *Malaysian Journal of Medical Research (MJMR), 4*(4), 19-22. https://doi.org/10.31674/MJMR.2020.V04I04.004

Banerjee, S., Goswami, K., Bandyopadhyay, A., & Maity, C. (2022). Oxidative Status and Insulin Resistance in Diabetic Retinopathy: Effect of Natural Antioxidants. *International Journal of Advancement in Life Sciences Research, 5*(1), 5-11. https://doi.org/10.31632/ijalsr.2022.v05i01.002

Chhibber, B., Sethi, J., Chhabra, H. S., & Jain, A. Effect of habitual lumbar curvature on electromyographic activity of trunk muscle and intravaginal pressure during still standing and dynamic task among non-osteoporotic post-menopausal women. *Age (Years), 51*(3.27881), 0-37125. https://doi.org/10.55522/jmpas.V11I6.4673

Chu, P., Patel, A., Helgeson, V., Goldschmidt, A. B., Ray, M. K., & Vajravelu, M. E. (2023). Perception and Awareness of Diabetes Risk and Reported Risk-Reducing Behaviors in Adolescents. *JAMA Network Open, 6*(5), e2311466-e2311466. https://doi.org/10.1001/jamanetworkopen.202311466

Gazzaz, Z. J. (2020). Knowledge, Attitudes, and Practices Regarding Diabetes Mellitus Among University Students in Jeddah, Saudi Arabia. *Diabetes, Metabolic Syndrome and Obesity, 13*, 5071–5078. https://doi.org/10.2147/DMSO.S287459

Mohanty, S., Sahoo, S., Patra, S., & Sahoo, B. M. (2022). Self-micro emulsifying drug delivery systems: State-of-art a technology to enhance the solubility of poorly water-soluble drug. *Journal of Medical Pharmaceutical and Allied Sciences, 11*(6), 5368–74. https://doi.org/10.55522/jmpas.V11I6.4162

Oraibi, O., Sanguf, M., Gadi, W., Almatrafi, R., Muafa, M., Hakami, F., ... & Alhazmi, A. (2022). Awareness of diabetes mellitus and its risk factors among the Saudi non-diabetic population in Jazan Region, Saudi Arabia. *International Journal of Medicine in Developing Countries, 6*(11), 1369-1369. https://doi.org/10.24911/IJMDC.51-1663660426

Sparapani, V. D. C., Liberatore Jr, R. D., Damião, E. B., de Oliveira Dantas, I. R., de Camargo, R. A., & Nascimento, L. C. (2017). Children with type 1 diabetes mellitus: self-management experiences in school. *Journal of School Health, 87*(8), 623-629. https://doi.org/10.1111/josh.12529

Wu, H., Patterson, C. C., Zhang, X., Ghani, R. B. A., Magliano, D. J., Boyko, E. J., ... & Luk, A. O. (2022). Worldwide estimates of incidence of type 2 diabetes in children and adolescents in 2021. *Diabetes Research and Clinical Practice, 185*, 109785. https://doi.org/10.1016/j.diabres.2022.109785

Younis, N. M. (2023). Evaluation the health lifestyle of kindergarten students at Mosul city/Iraq. *International Journal of Medical Toxicology & Legal Medicine, 26*(1and2), 148-152. https://doi.org/10.5958/0974-4614.2023.00023.2

Yasir, R. A., & Aziz, A. R. (2022). Diabetic Specific Routines Assessment for Adolescent with Diabetes Mellitus Type 1 from Parent Perspective. *Mosul Journal of Nursing, 10*(3), 26-38. https://doi.org/10.33899/mjn.2022.175358