|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2020: 79.44
Original Research Article
Volume 5, Issue 12; December: 2021; Page No. 146-151

EVALUATION OF CLINICAL AWARENESS OF DIABETIC MELLITUS AMONG RAKMHSU MEDICAL STUDENTS- A QUESTIONNAIRE SURVEY

Samiha Anjum Hossain [1], Reshme Rafi [1], Batul Abdeali Saherawala [2], B K Manjunatha Goud [3*], Joan Bryant Kumar[4]

[1]Medical graduates, RAKCOMS, RAK Medical and Health Sciences University, Ras Al Khaimah, UAE.
[2]4th year MBBS student, RAKCOMS, RAK Medical and Health Sciences University, Ras Al Khaimah, UAE.
[3]Associate Professor, Department of Biochemistry, RAKCOMS, RAK Medical and Health Sciences University, Ras Al Khaimah, UAE.

[4]Associate Professor, Department of Physiology, RAKCOMS, RAK Medical and Health Sciences University, Ras Al Khaimah, UAE.

Article Info: Received 24 October 2021; Accepted 19 December 2021
DOI: https://doi.org/10.32553/ijmbs.v5i12.2306
Corresponding author: Dr B K Manjunatha Goud
Conflict of interest: No conflict of interest.

Abstract

Introduction: The number of patients with diabetes are increasing in rapid phase and the present medical students will encounter such patients in the future very often. It is essential to understand and update their knowledge through education and awareness programs.

Materials and methods: The cross-sectional questionnaire survey has been conducted in RAK Medical and Health Sciences University (RAKMHSU) with due approval from research ethics committee. After going through various indexed articles related to our topic, a pre designed pre validated questionnaire was prepared. The questionnaire assessed the knowledge about symptoms, investigations, treatment and complications. This was applied after validation to second, third, fourth and fifth year medical students.

Results: The study showed as that majority in both groups 93.5% and 89.2% agreed that they will be involved in taking care of diabetic patients in their future practice. The study also found that 65.2% group A didn't agree that excessive thirst and urination is a indicative of low blood sugar when compared with 31.7% from group B. With regard to symptoms majority in both groups agreed itchy skin is not a symptom of DM. When asked about insulin misuse, only 36.8% and 55.4% students agreed that blood glucose will reduce to below 50mg/dl.

Discussion and conclusion: Our study correlated with various studies which showed that many students had problems in treatment aspects. But we also had positive results which correlated with other study showing they have good knowledge about the symptoms of DM. We also found our students had good knowledge about diabetic ketoacidosis.

In conclusion, there is a need for conducting regular workshops, seminars, conferences in medical colleges to upgrade the knowledge of students and make them competent general physicians.

Key words: Diabetes, Keto acidosis, Education, Knowledge, Risk factors

Introduction

Diabetes mellitus is one of the most challenging health problem encountered in recent century and Type 2 diabetes accounts for 90% of all cases. (1) This always present a challenge for future doctors to treat them with an appropriate knowledge acquisition during their study period. According to the International Diabetes Federation Atlas(IDF), 415 million people have diabetes in the world with more than 35.4 million people in the Middle East and North Africa (MENA) Region; by 2040 this will rise to 72.1 million making the Mena region one of the world's fastest growing regions for diabetes, says IDF. (2)

In 2015 there were over 1 million cases of diabetes in UAE and 19.3 percent of adults aged 20 to 79 in them were diabetic. (3) This was attributed to various factors such as emergence of obesity, unhealthy dietary habits, hypertension, prediabetes and alcohol consumption which have led to increased incidence of diabetes as shown by the study conducted in Canada. (4)

Long standing diabetes leads to multisystem disease and if poorly controlled can cause blindness, renal failure, impotence, increased risk of heart disease, stroke, and poor blood supply to the limbs. (5) These complications are associated with high morbidity and mortality if not treated properly. (6) These complications can be prevented with intervention at the right time and studies have suggested that improved glycemic control and strict metabolic control can delay or prevent the progression of complications associated with diabetes. Various evidence has shown that patients, who

are knowledgeable about DM self-care, have better long term glycemic control. Thus it is important to ensure that patient's knowledge, attitudes and practices are adequate. (7) This is possible as if the treating physician has good knowledge of diabetes and its acquisition starts at the education level. These students will become the fulcrum for providing health care in future times. It is essential that we need to propagate the broadest knowledge of the risk factors, symptoms and complications as well as treatment methods of the disease among medical students. (8, 9, 10)

The students in medical school should update themselves with recent guidelines and increase their ability to use this knowledge in practice to ensure proper care. (11) It has been suggested that appropriate attention should be paid particularly to education in the field of risk factors and symptoms of diabetes mellitus in order to diagnose the disease early enough to prevent or delay its complications. (12, 13)

It is important to know about the awareness level of the disease condition in a population who are directly involved in diagnosis, prevention and treatment, which plays a vital role in future development, early detection and prevention of disease. Based on these facts the study was conducted to outline the knowledge levels in medical students and address the various lacunae if any by educating them.

Materials and Methods:

The cross-sectional questionnaire survey has been conducted in RAK Medical and Health sciences university (RAKMHSU) with due approval from research ethics committee. After going through various indexed articles related to our topic, a pre designed pre validated questionnaire prepared. The validation of questionnaire was done by applying it on a small study group and the results were analyzed using the Cronbach alpha using SPSS software 25. The value between 0.6-0.8 were used for the study and any question below 0.6 were modified to be suitable.

The medical students of 2nd, 3rd, 4th and 5th year were approached and after their consent the study objectives were explained. The questionnaire was distributed and they were asked to fill them in presence of investigators.

The questionnaire had following parts:

1. General questions about diabetes
2. Knowledge about symptoms
3. Knowledge about investigations
4. Knowledge about treatment
5. Knowledge about complications

The filled questionnaire collected at the same time and data entered into excel and later analyzed using SPSS version 25.

Results:

The study involved 42 students from MBBS year 2 (Group A) and 139 students from clinical years (Group B) and their gender distribution has been shown in Table 1.

Table 1: Gender wise data has been shown among the groups

	Male	Female
MBBS year 2	11	35
Clinical years 3,4,5	41	98

The response of study participants for general diabetes mellitus (DM) has been shown in Table 2, which showed that majority in both groups 93.5% and 89.2% agreed that they will be involved in taking care of diabetic patients in future practice. Both groups agreed in higher proportion that genetics is a major cause for DM type 1.

Table 2: Response to general questions in both groups

		Group A		Group B	
		Responses	%	Responses	%
Q1	YES	43	**93.5**	124	**89.2**
	NO	3	**6.5**	15	**10.8**
Q2	Genetic	28	**60.9**	64	**46.0**
	Autoimmune	9	**19.6**	64	**46.0**
	Diet	6	**13.0**	8	**5.8**
	Environmental	3	**6.5**	3	**2.2**
Q4	Red meats	18	**39.1**	52	**37.4**
	Coffee	6	**13.0**	44	**31.7**
	White rice	10	**21.7**	23	**16.5**
	Sugar-sweetened beverages	12	**26.1**	20	**14.4**
Q5	True	39	**84.8**	78	**56.1**
	False	7	**15.2**	61	**43.9**

The study also found that 65.2% group A did not agree that excessive thirst and urination is a indicative of low blood sugar when compared with 31.7% from group B. With regard to symptoms majority in both groups agreed itchy skin is not a symptom of DM as shown in Table 3.

Table 3: Response to symptom questions in both groups

		Group A		Group B	
		Responses	**%**	**Responses**	**%**
Q6	No	30	**65.2**	44	**31.7**
	Yes	16	**34.8**	95	**68.3**
Q7	Diabetes insipidus	25	**54.3**	113	**81.3**
	UTI	7	**15.2**	8	**5.8**
	Hypoglycemia	12	**26.1**	15	**10.8**
	Viral gastroenteritis	2	**4.3**	3	**2.2**
Q8	Heavy thirst	14	**30.4**	75	**54.0**
	Vomiting	2	**4.3**	4	**2.9**
	Diarrhea	1	**2.2**	4	**2.9**
	All the above	29	**63.0**	56	**40.3**
Q9	Thirst	3	**6.5**	4	**2.9**
	Itchy skin	30	**65.2**	99	**71.2**
	Frequent urination	4	**8.7**	4	**2.9**
	Muscle pain	9	**19.6**	32	**23.0**

The response to investigations are shown in Table 4. Which showed that 32.6% and 49.6% agreed that Minnesota multiphasic personality inventory helpful in DM neuropathy. When asked about insulin misuse, only 36.8% and 55.4% students agreed that blood glucose will go below 50mg/dl. Only 23.9% and 64% agreed that glycated hemoglobin is one of investigation used to know the treatment compliance.

Table 4: Response to investigation questions in both groups

		Group A		Group B	
		Responses	**%**	**Responses**	**%**
Q10	Nerve conduction study	8	**17.4**	9	**6.5**
	Foot examination	7	**15.2**	8	**5.8**
	Minnesota multiphasic personality inventory	15	**32.6**	69	**49.6**
	Ultrasound	16	**34.8**	53	**38.1**
Q11	Blood glucose level 200 mg/dl	11	**23.9**	23	**16.5**
	Blood glucose level 50mg/dl	16	**34.8**	77	**55.4**
	Blood glucose level 110 mg/dl	12	**26.1**	15	**10.8**
	Blood glucose 74mg/dl	7	**15.2**	24	**17.3**
Q12	Blood glucose level 80 mg/dl	5	**10.9**	8	**5.8**
	Blood glucose level 90 mg/dl	12	**26.1**	17	**12.2**
	Blood glucose level 70 mg/dl	20	**43.5**	38	**27.3**
	Blood glucose level 55 mg/dl	9	**19.6**	76	**54.7**
Q13	YES	21	**45.7**	28	**20.1**
	NO	25	**54.3**	111	**79.9**
Q14	2-hour postprandial blood glucose	13	**28.3**	17	**12.2**
	Fasting blood glucose	19	**41.3**	26	**18.7**
	Glycosylated hemoglobin	11	**23.9**	89	**64.0**
	Oral glucose tolerance test	3	**6.5**	7	**5.0**
Q15	Metabolic acidosis	27	**58.7**	112	**80.6**
	Metabolic alkalosis	7	**15.2**	10	**7.2**
	Respiratory acidosis	10	**21.7**	12	**8.6**
	Respiratory alkalosis	2	**4.3**	5	**3.6**

In terms of knowledge aspects of treatment as shown in Table 5, the study showed that only 30.4% and 33.8% answered that biguanides acts by reducing the amount of glucose produced by liver and there was a mixed response for treatment using glucagon (Q17), lispro (Q18) and regular insulin (Q19) use in study groups. Only 15.2% and 58.3% agreed that administration

of 50% dextrose should be considered in non-responsive patients due to hypoglycemia. Majority in both groups agreed that every third day insulin injection site should be rotated and 37% of group A said its needed to prevent insulin edema when compared to 54.7% in group B who stated that needed for preventing insulin lipodystrophy. In case of diabetic keto acidosis majority in both groups agreed that most preferred method of treatment will be insulin IV bolus followed by IV infusion**.**

Table 5: Response to treatment questions in both groups

		Group A		Group B	
		Responses	**%**	**Responses**	**%**
Q16	Sulfonylureas	9	**19.6**	40	**28.8**
	Meglitinides	8	**17.4**	12	**8.6**
	Alpha-glucosinidase inhibitor	15	**32.6**	40	**28.8**
	Biguanides	14	**30.4**	47	**33.8**
Q17	TYPE 1	26	**56.5**	92	**66.2**
	TYPE 2	20	**43.5**	47	**33.8**
Q18	TRUE	32	**69.6**	110	**79.1**
	FLASE	14	**30.4**	29	**20.9**
Q19	TRUE	27	**58.7**	58	**41.7**
	FLASE	19	**41.3**	81	**58.3**
Q20	Send blood to the laboratory for analysis	12	**26.1**	22	**15.8**
	Administer the prescribed insulin	13	**28.3**	20	**14.4**
	Administer oxygen per nasal cannula	14	**30.4**	16	**11.5**
	Administer 50% dextrose IV per protocol	7	**15.2**	81	**58.3**
Q21	During the onset: how fast the insulin starts to work	13	**28.3**	31	**22.3**
	During the peak (when the insulin has the strongest effect)	27	**58.7**	91	**65.5**
	During the entire duration: how long the insulin last	6	**13.0**	17	**12.2**
Q22	Third day	14	**30.4**	56	**40.3**
	A Week	15	**32.6**	40	**28.8**
	2-3 weeks	14	**30.4**	31	**22.3**
	3-4 weeks	3	**6.5**	12	**8.6**
Q23	Insulin edema	17	**37.0**	30	**21.6**
	Insulin lipodystrophy	13	**28.3**	76	**54.7**
	Insulin resistance	12	**26.1**	19	**13.7**
	Systemic allergic reactions	4	**8.7**	14	**10.1**
Q24	SC	5	**10.9**	14	**10.1**
	IM	13	**28.3**	21	**15.1**
	IV bolus	9	**19.6**	22	**15.8**
	IV bolus followed by IV infusion	19	**41.3**	82	**59.0**
Q25	10-20%	10	**21.7**	35	**25.2**
	25-40%	14	**30.4**	47	**33.8**
	50-60%	18	**39.1**	44	**31.7**
	85-90%	4	**8.7**	13	**9.4**
Q26	Gives small continuous dose of regular insulin subcutaneously. And the patient can self-administer a bolus prior to meal	17	**37.0**	62	**44.6**
	Is timed to release programmed doses of regular or NPH insulin into the bloodstream at specific intervals	9	**19.6**	35	**25.2**
	Is surgically attached to the pancreas and infuses regular insulin into the pancreas	8	**17.4**	13	**9.4**
	Continuously infuses small amounts of NPH insulin into the bloodstream while regularly monitoring blood glucose levels	12	**26.1**	29	**20.9**

The Table 6 shows the students' knowledge with respect to complications. Majority (63.3%) in group B agreed that diabetic ketoacidosis is a not a complication of Type 2 DM when compared to 47.8% of group A. We also noted that majority 34.8% and 60.4% agreed that hypokalemia is the most common complication of insulin treatment. Both groups agreed that diabetic ketoacidosis and hyperosmolar syndrome are seen with untreated hyperglycemia.

Table 6: Response to complication questions in both groups

		Group A		Group B	
		Responses	**%**	**Responses**	**%**
Q27	YES	24	**52.2**	51	**36.7**
	NO	22	**47.8**	88	**63.3**
Q28	TRUE	30	**65.2**	77	**55.4**
	FLASE	16	**34.8**	62	**44.6**
Q29	Polyuria	8	**17.4**	16	**11.5**
	Hypercalcemia	13	**28.3**	21	**15.1**
	Hypokalemia	16	**34.8**	84	**60.4**
	Cellular dehydration	9	**19.6**	18	**12.9**
Q30	DKA	14	**30.4**	37	**26.6**
	Hyperosmolar syndrome	14	**30.4**	73	**52.5**
	Vitiligo	4	**8.7**	9	**6.5**
	Coma	14	**30.4**	20	**14.4**
Q31	Depression	7	**15.2**	7	**5.0**
	High blood pressure	10	**21.7**	36	**25.9**
	Gum disease	4	**8.7**	7	**5.0**
	All of the above	25	**54.3**	89	**64.0**

Discussion:

This study assessed the knowledge of diabetes specific aspects among medical students of one university. In this study over all knowledge of medical students in both groups were of moderate levels. The study looked into the correct answers for each sections and found existence of a knowledge gap among the participants. This was more so with 2nd year students than clinical years and this indicates that knowledge gaps will be filled up as students move to higher year of education. This provides us hope that by proper training we can make a competent general physician or specialist to take care of diabetic patients in future.

Students in our study were able to diagnose diabetes but they could not indicate appropriate scheme of treatment. Majority of students who took part in our research recognized symptoms of hyperglycemia properly.

In our study we found that students had significant problems with various questions related to treatment aspects, which was also observed in the study done by in America. (14) Our study showed that students had good knowledge about symptoms which is similar to other studies done by Mumtz et al. (15)

A study done by Nawaf H Hamdi Diabetes Mellitus Awareness among Tabuk University students, Saudi Arabia, showed that only 45% of participants identified family history as major risk factor. (16) In our study we have asked about type 1 Diabetes mellitus and many in both groups agreed that genetics was an important etiological factor.

In our study we found that majority had good knowledge about diabetic keto acidosis (DKA) which can be comparable to other studies which showed that the final year students had good knowledge of DKA. (17,18)

Our study did not assess the epidemiology aspects but the diabetic practices among students showed overall poor awareness in treatment aspects. A similar outcome was seen with a study conducted in King Faisal Medical College in Saudi showed that students had poor awareness about epidemiology of diabetes and diabetes practices. (19)

Conclusion:

The increasing number of diabetic patients in the present era is alarming and medical students need to be trained well during their university studies to tackle and provide proper care in the community. Apart from the academic knowledge the students need to attend conferences, webinars, workshops, camps to update their knowledge in their study time.

Limitations:

- The study conducted in one university medical students and results cannot be generalized.
- Response bias.

Source of Funding: Nil

References:

1. Type 2 Diabetes. Diabetes.co.uk. 2019 [cited 5 March 2020]. Available from: https://www.diabetes.co.uk/type2-diabetes.html
2. "United Arab Emirates". International Diabetes Federation. N.p., 2016. Web. 24 Oct. 2016.

3. Walhout, H. Diabetes Rates Are Rising in the Middle East.2016.
4. Thibault V, Bélanger M, LeBlanc E, Babin L, Halpine S, Greene B et al. Factors that could explain the increasing prevalence of type 2 diabetes among adults in a Canadian province: a critical review and analysis. Diabetol Metab Syndr. 2016; 8:71. Accessed from: https://dmsjournal.biomedcentral.com/articles/10.1186/s13098-016-0186-9.
5. Foma M, Saidu Y, Omoleke S, Jafali J. Awareness of diabetes mellitus among diabetic patients in the Gambia: a strong case for health education and promotion BMC Public Health. 2013;13: 1124. Accessed from: http://www.biomedcentral.com/1471-2458/13/1124
6. Karaoui L, Deeb M, Nasser L, Hallit S. Knowledge and practice of patients with diabetes mellitus in Lebanon: a cross-sectional study. BMC Public Health. 2018; 18: 525. doi: 10.1186/s12889-018-5416-7.
7. Tirumala Konduru S, Ranjan A, Muddada S, Shaik S, Vakkapatla L. Assessment of Diabetes Related Knowledge, Attitude and Practice among Diabetics and Non-diabetics using Self Prepared Questionnaire for Awareness of Health Promotion. Indian Journal of Pharmacy Practice. 2017;10(1):32-37. Available from: http://www.ijopp.org/sites/default/files/10.5530ijopp.10.1.8.pdf
8. International Diabetes Federation. IDF Diabetes Atlas Eighth edition 2017. http://fmdiabetes.org/wp-content/uploads/2018/03/ IDF-2017.pdf.
9. Mumtaz S, Ashfaq T, Siddiqui H. Knowledge of medical students regarding diabetes mellitus at Ziauddin University, Karachi. J Pak Med Assoc. 2009; 59: 163–66.
10. Amans RAF, Nazareth F, Arunachalam R et al. Study of awareness about diabetes mellitus among undergraduate medical students. International Journal of Recent Trends in Science and Technology. 2014; 12: 491–93.
11. Araszkiewicz A, Bandurska-Stankiewicz E, Budzyński A, et al. Guidelines on the management of diabetic patients. A position of Diabetes Poland. Clinical Diabetology. 2019; 8(1): 1–95. doi:10.5603/dk.2019.0001
12. Tamunopriye J. The effectiveness of education on awareness and knowledge of childhood diabetes amongst medical students in port harcourt. British Journal of Education Society & Behavioural Science. 2015; 5(4): 410–15. doi: 10.9734/bjesbs/2015/14368.
13. Rubin D, Moshang J, Jabbour S. Diabetes knowledge: are resident physicians and nurses adequately prepared to manage diabetes? Endocr Pract. 2007; 13(1): 17–21. doi: 10.4158/ep.13.1.17.
14. Lansang MC, Harrell H. Knowledge on inpatient diabetes among fourth-year medical students 2005–2006. Diabetes Care. 2007; 30(5): 1088–91. doi: 10.2337/dc06-2174.
15. Mumtaz S, Ashfaq T, Siddiqui H. Knowledge of medical students regarding diabetes mellitus at Ziauddin University, Karachi. J Pak Med Assoc. 2009; 59: 163–66. https://jpma.org.pk/PdfDownload/1645
16. Nawaf H Hamdi, Fawaz K Alanazi, Mohammed A Albalawi, Naif H Hamdi, Raid A Alshehri, Hyder O Mirghani. Diabetes Mellitus Awareness among Tabuk University Students, Saudi Arabia. International Journal of Healthcare Sciences.2016; 4(1):45-46.
17. Nazareth RA, Arunachalam R, Sudeep K. Study of awareness about diabetes mellitus among undergraduate medical students. Int J Rec Tren Scie Technol. 2014;12(3):491-3.
18. Singh H, Thangaraju P, Kumar S, Aravindan U, Balasubramanian H, Selvan T. Awareness of Diabetes and Diabetic Ketoacidosis (DKA) Among Medical Students in a Ter Hospital: An Observational Study. J Clin Diagn Res. 2014;8:4-6.
19. Wadaani FA. The knowledge attitude and practice regarding diabetes and diabetic retinopathy among the final year medical students of King Faisal University Medical College of Al Hasa region of Saudi Arabia: a cross sectional survey. Nig J Cli Practi. 2013;16(2):164-8.