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Diabetes awareness: Significant knowledge gap among medical and nursing students in Delhi

Running Title: Diabetes knowledge in medical and nursing students

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The authors of this manuscript are willing to share the data supporting the results of this manuscript upon request.

Ethical aspects:
The study was approved by the Institutional Ethics Committee-Human Research, University College of Medical Sciences, Delhi vide letter no. IECHR-2023-61-8-R1 dated 31/10/2023. Written informed consent was obtained for participation in the study and use of the data for research and educational purposes. The procedures in the study followed the principles of the Helsinki Declaration of 1975, as revised in 2000.

KEYWORDS	ABSTRACT
complication, diagnosis, prevention, questionnaire, risk factor, validation	**Background:** Diabetes is a public health problem in India. Assessing and supplementing the knowledge and awareness about diabetes, its risk factors and its basic management is crucial in primary, secondary and tertiary prevention of diabetes.
	Objective: To assess the knowledge of diabetes in medical and nursing students through a questionnaire based survey in a tertiary teaching hospital in Delhi.
	Methodology: A validated diabetes awareness and knowledge (DAK) questionnaire was administered to medical and nursing students in their early years of training. Basic demographic information was noted.
	Results: Filled questionnaires of total 314 students of medical (31.4% females) and nursing (100% females) training at entry [M0 (98) and N0 (62) respectively] and after 1 year of training [M1 (109) and N1 (45) respectively] was analyzed. Median (IQR) age was 20 (2) years. Median score of medical students was higher than nursing students (30.3/50 vs 28/50; p=0.003). Medical and nursing students had comparable DAK scores at their entry and significantly higher scores after 1 year of training [M0 26.0 vs M1 35.0 and N0 24.7 vs N1 31.0; p<0.001 for both]; more in medical students than nursing students (M1 35.0 vs N1 31.0; p<0.001). All students had low scores in questions on basics of diabetes; lower in nursing students than the medical students; lower in entry years than after 1 year of training.
	Conclusion: Medical and nursing students had 'low' level of diabetes knowledge at entry and 'moderate' level after 1 year of training while remaining short of what is desirable.

Introduction

India has the second highest prevalence of diabetes in the world, accounting for 1 in 7 of all adults living with diabetes worldwide.[1] As type 2 diabetes can largely be prevented by lifestyle modifications, it's important to have widespread awareness about its risk factors and prevention. It's also important to have early diagnosis and proper treatment of diabetes to prevent complications and thus associated morbidity and mortality. Thus assessing the level of knowledge and then supplementing it appropriately is crucial in primary, secondary and tertiary prevention of diabetes.

With the rising prevalence of obesity and unhealthy lifestyle, it's prudent to target our youth as they are the ones who are at risk as well as they are the primary caregivers for the affected members of their family or community, thus making a difference. Countries having high age adjusted prevalence of diabetes in adults like Saudi Arabia, Pakistan, Sri Lanka, China have assessed the awareness and knowledge of diabetes in not only their general and diabetic population, but also in school going students, non-health related professional college students as well as medical students and healthcare providers.[2-10] There is scarcity of such studies in young population of India.[11-14] Also as no similar study has been done in the Indian medical and nursing students in their early years of training in the past, this study was planned.

Materials and Methods

After Institutional Ethics Committee approval (IECHR-2023-61-8-R1) dated 31/10/2023, total 342 consenting students from first and third semesters of MBBS and Nursing from University College of Medical Sciences and Florence Nightingale College of Nursing, Delhi respectively filled a prevalidated diabetes awareness and knowledge (DAK) questionnaire between November 2023 and March 2024 along with few basic information like age, gender and parental history of diabetes. [15] The knowledge in individual domains and in total was labeled as very low, low, moderate and high if the students scored <40%, ≥40% to <60%, ≥60% to <80% and ≥80% marks respectively in total and in individual domains. Anthropometric measurements were taken in the lecture hall with individuals wearing light clothing and no shoes. Weight was measured to the nearest 0.1 kg on digital weighing machine. Height was measured to the nearest 0.1 cm using a portable Seca stadiometer. Body mass index (BMI) was calculated by weight (in kilogram) divided by square of height (in m^2). Waist circumference (WC) was measured at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest as recommended by WHO.[16]

A prevalidated diabetes knowledge and awareness (DAK) questionnaire consisting of 47 questions and 50 marks covering different aspects of diabetes domain-wise, with good validity (scale content validity index score and content validity ratio of 0.98 and 0.82 respectively) and reliability (Cronbach's coefficient alpha of 0.76) was used. Domain I consisted of 'Basics of diabetes: types, symptoms, pathophysiology and diagnosis of diabetes'. Domain II to IV consisted of 'risk factors', 'treatment including lifestyle modifications' and 'complications and prevention' respectively.[15]

Sample Size: Taking the formula: Sample size= $(1.96)^2$ x p (1-p)/ (Relative Marginal Error)^2 for finite population of 500 and relative marginal error of 10%, when average score for the questionnaire was taken as 37%, sample size comes out to be 285.[17] When average correct response rate 52.5% is taken, sample size comes out to be 206.[11,18] Considering nonresponse from 20% students, sample size comes out between 356 and 258. Thus we planned to take more than 300 students.

Statistical analysis: Statistical analysis was performed using the Statistical Program for Social Sciences version 23 (IBM Corp. New York, USA). Numerical data was mentioned as median (interquartile range). DAK questionnaire scores were denoted in marks as well as percentages. To compare medians between different student groups, Kruskal Wallis test was done. A two sided p value of <0.05 was taken to be statistically significant.

Results

Though 342 students have given the consent for participating in the study, 17 students didn't fill the questionnaire and 11 filled it with all 'don't know' option, thus those forms were rejected and analysis was done on 314 forms.

Out of 314 students, 98, 109, 62 and 45 were from Medical first (M0) and third (M1) semester and Nursing first (N0) and third (N1) semester respectively. Median age (IQR) of the whole group and M0, M1, N0 and N1 were 20 (2) years, 19 (2) years, 20 (2) years, 20 (2) years, and 21 (1) years, respectively. In M0 and M1, 31 (31.6%) and 34 (31.2%) were females. In N0 and N1, all students were females. History of diabetes was present in both parents in 8 (2.5 %) students and one parent in 65 (20.7 %) students. There is history of regular exercise only in 99 (31.5%) students. Median BMI of the group is 22.5 (5.4) kg/m^2 with boys having median BMI of

23.4 (5.8) kg/m^2 and girls of 22.3 (5.1) kg/m^2; 88 (28%) students had obesity (BMI $\geq$25 kg/m^2) while 54 (17.2%) students were overweight (BMI between 23.0 to 24.9 kg/m^2). Median WC of boys and girls were 80 (14.3) cm and 72.5 (12) cm.

The details about questions pertaining to 'basics of diabetes: types, symptoms, pathophysiology and diagnosis' (domain 1) and 'risk factors' (domain 2) are given in table 1 and 2 respectively. As shown in table 1, the knowledge about types of diabetes, diagnosis of diabetes and childhood diabetes was very poor in the students especially in nursing students. Only 9.3-22.4 percent nursing students knew the right plasma glucose and HbA1$_c$ cutoffs for diagnosis of diabetes as compared to 47.3-62.3% medical students. As shown in table 2, most of the nursing (above 69%) and medical students (above 84%) had the understanding of predominant risk factors for diabetes like overweight/obesity, no exercise and family history of diabetes. But very few of them responded correctly about risk factors like history of COVID infection, polycystic ovaries or history of having delivered a large size baby (12.6% to 29% and 3.7% to 13.1% respectively).

The details about questions pertaining to 'basic knowledge about treatment of diabetes including lifestyle modification' (domain 3) and 'complications and prevention of diabetes' (domain 4) are given in table 3 and table 4 respectively. As shown in table 3, most of the medical and nursing students (73.4% to 82.1% and 68.2% to 89.7% respectively) were aware of the dietary management of diabetes. But majority of them (~ 80% each) marked that people with diabetes can feel whether their blood sugar levels are high or normal which is actually not true. As shown in Table 4, not many medical and nursing students were aware of the common late complications of diabetes where only 45.4% medical students and 30.8% nursing students rightly mentioned at least 3 late complications while 22.2% medical and 51.4% nursing students knew 1-2 complications. Apart from diabetic nephropathy, neuropathy and retinopathy, foot ulcers, gangrene, chronic kidney disease, heart attack, paralysis, eye damage, blindness and cataract, many students also mentioned osmotic symptoms, poor immunity, poor wound healing and acute complications like diabetic ketoacidosis (DKA), hypoglycemia and hyperglycemia in the late complications of diabetes.

As shown in table 5, higher number of the medical and nursing students had 'moderate' level of diabetes knowledge after 1 year of training; even 17.4% medical students attained 'high' level of diabetes knowledge. The median total DAK score of students was 29.5(10)/50 with scores found significantly higher in medical students as compared to nursing students (30.3/50 vs 28/50; p=0.003); the difference mainly driven by the differences in domain I (9.5 vs 7; p<0.001) and that too in questions relating to diagnosis of diabetes. There was no difference in the median DAK scores and domain-wise knowledge scores between M0 and N0 except for domain I (8 vs 6; p=0.001). There were significant differences in the median scores of DAK and domain I knowledge scores between M1 and N1 (p<0.001 in both); the scores in other domains being not significantly different.

The students of M1 and N1 performed better than M0 and N0 respectively in every domain except for the risk factor domain between N1 and N0 where the difference in scores was not statistically significant and both the groups had 'low' level ($\leq$50% score) of knowledge.

Males performed better than females in domain I and thus in total percentage [9.5(3.5) vs 8(3.5); p <0.001 and 61(22) vs 57(20.5); p<0.028]. There was no correlation of history of diabetes in parents and the knowledge scores obtained in total or in individual domains. There was no difference in scores between students who exercised daily and who didn't.

Discussion:

Assessment of DAK in medical and nursing students from their early years of training, revealed 'moderate' and 'low' level of diabetes knowledge and awareness overall respectively despite comparable DAK scores at entry and significant increase in scores in both the groups after 1 year of training; medical students recorded higher scores than nursing students at the end of 1 year. The level of knowledge in medical students in 'basics of diabetes' domain was higher than nursing students at entry as well as after 1 year of training while it was comparable in other domains of diabetes. Both the group of students recorded higher scores in different domains after 1 year of training except nursing students in 'risk factors' domain, where the scores were not significantly different from entry level.

Our study comprehensively assessed the DAK in early years of medical and nursing training by using predefined domains which dealt with different aspects of diabetes knowledge. Although several studies have evaluated basic knowledge of diabetes in resident doctors or duty nurses along with specific knowledge about complications like DKA, diabetic retinopathy, hypoglycemia etc. in final year medical students, very few studies with comprehensive assessment of DAK could be found in literature in early medical and nursing students.[13,14, 17-22] Even in these studies, the questionnaires used are heterogeneous, students enrolled are from different grades and there is a lot of ambiguity about the domains being tested and assessed.

Total DAK scores:

In our study, early year medical and nursing students had 30.3/50 (60.6%) and 28.0/50 (56%) median DAK scores respectively. Extensive search of literature did not reveal any Indian study which has evaluated comprehensive diabetes knowledge in early year medical students although diabetes knowledge about complications had been evaluated in final year students. In a study from Chicago, first and second year medical students had preclinical and clinical knowledge scores of 1.23/3 (41%) and 0.99 (33%) respectively.[17] However, they used a 6 item questionnaire to assess the knowledge of prediabetes and diabetes prevention only. In a study from China, the medical students scored mean 14.4 score out of 22 (65.45%).[8] Scores higher than our study can be explained by the fact that they used mean scores where some extreme high values in scores can shift the mean to higher side while our study expressed these as median scores. Secondly, higher scores can also be explained by the fact that half of these students were from later years (grade 3 and 4) of medical college having better theoretical and clinical exposure to diabetes. In two studies done on nursing students in Saudi Arabia, the mean total actual diabetes knowledge scores were 22.5/49 (49.5%) and 14.1/49 (28.7%) respectively, which were both lower than in our study.[2,3] Nursing students were recruited predominantly from senior classes in both the studies and 87% provided direct care to the patients and 40% have attended courses, workshops, or conferences on diabetes and diabetes care in the former study. Despite these differences, our nursing students had better scores which may reflect better diabetes awareness in general in our country and a greater emphasis on diabetes education early in the training of nurses.

Diabetes Knowledge in different aspects of diabetes:
a) Basic knowledge about diabetes:

In our study, in the domain which dealt with the basics of diabetes: types, symptoms, pathophysiology and diagnosis, the medical students and nursing students had 'moderate' and 'low' level of knowledge respectively. Over 2/3rd of medical students and over half of nursing

students responded correctly overall, the numbers being significantly lower for 'diagnosis' of diabetes compared to 'symptoms'.

In an Indian study on final year medical students, the percent correct responders for questions pertaining to 'basics of diabetes' were similar (51.2% to 97.6%) to that in our study.[13] In a study on nursing students from Karnataka, correct responses were reported in a higher percentage of students for diagnosis and monitoring (13.4% to 65%) as all grades of nursing students were included.[14] In this study, correct responses were lower for symptoms (28.3% to 30%) which may point to better awareness of diabetes in metropolitan cities of India.

In other studies, Chinese medical students had similar scores (~70%) while Saudi Arabian nursing students reported 'low' level of knowledge for diabetes pathology, symptoms and management.[2,8] The reason for these results is same as to that discussed with the total scores. The percentages of Syrian medical students from preclinical years giving correct responses were 52.7% to 67.6% in general knowledge about diabetes overall and 55.3% to 94.9% for symptoms and 24.3% to 40.5% for diagnosis, which was lower than in our study.[18] Our medical students had higher correct responders in all aspects of this domain in spite of the fact that diagnosis of diabetes is taught mainly in third and fourth years of medical training.

b) Risk factors of Diabetes:

Knowledge of risk factors was 'low' among both medical and nursing students with about half of them giving correct responses. As with overall knowledge of diabetes, Chinese medical students (mean score of 64%) had higher scores while this domain was not evaluated in Saudi Arabian nursing students.[2,8] Similar to our study, 36.5% to 83.8% of Syrian medical students responded correctly, although they assessed only 7 risk factors compared to 14 in our study.[18]

c) Basic knowledge about treatment of diabetes:

In our study, in the domain which dealt with the basic knowledge about treatment of diabetes including lifestyle modification, the medical and nursing students had 'moderate' level of knowledge with scores above 60%. The correct responders especially for lifestyle modification ranged from 65% to over 80% with medical students faring marginally better. The Karnataka nursing students study reported lower percentage of correct responses in treatment domain, just as for the basics of diabetes domain.[14] Syrian medical students responded correctly 23.0% - 51.4% of the time which indicated poor knowledge but may also be because they included only 2 questions compared to a more comprehensive assessment (13 questions) in our study.[18] Chinese medical students performed similar to our study while Saudi Arabian nursing students did not fare well.[2,8] However knowledge assessed in both these studies was not restricted to 'treatment' alone and included questions on diagnosis and symptoms.

d) Complications and prevention of diabetes:

The level of knowledge about complications and prevention of diabetes was 'moderate' among our medical students but was 'low' among nursing students, with the percentage of correct responders following a similar trend. Correct responses were higher for diabetes prevention in both the groups. Similar to our study, 40% to 50% nursing students from Karnataka responded correctly for complications even though they included students from later years also.[14] Chinese medical students and Saudi Arabian nursing students had 'low' level of knowledge.[2,8] None of these studies reported on knowledge regarding diabetes prevention. Medical students from Syria reported higher percentage of correct responses for complications but similar numbers overall for diabetes prevention.[18] However, while our study assessed the

complications by open ended questions, the Syrian study used leading questions thus eliciting a higher percent of correct responses.

In our study, very few students had high level of diabetes knowledge (≥80%). This is not optimal in a country like India where diabetes is a major health problem, and it is expected that medical and nursing students should have a knowledge score of at least 80% so that they can play a major role in raising public awareness about diabetes. Some changes in curriculum or a provision of mandatory online courses utilizing the government teaching portals like 'swayam' should be thought of. Mass awareness programme similar to that done in Saudi Arabian University students could be done in our medical and nursing students soon after admission in a college in a phased manner targeting nursing students first. [23]

Our study has the limitation of being a small single center cross-sectional study that assessed DAK in two different sets of students i.e. at entry level and in those who have completed 1 year of training. A longitudinal study will give better idea about improvement of DAK in our medical and nursing students with each year of training. Involving multiple centers will give a better perspective about the differences in DAK in different regions.

Conclusion:

Medical and nursing students soon after entering their respective training displayed low but similar levels of knowledge about diabetes. Knowledge levels were better in students who completed 1 year training while remaining well short of what is desirable. Thus there is an urgent need to empower our medical and nursing students from early years of training to suitably prepare them as health professionals who can help raise the level of diabetes awareness among the public and contain the rising burden of diabetes in our country.

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Table 1: Percent correct response to questions pertaining to Domain I-Basics of diabetes: types, symptoms, pathophysiology and diagnosis of diabetes

Questions with Answer/Percent of correct responses	Medical (n=207)	Nursing (n=107)
1. How is diabetes diagnosed? **By plasma glucose test**	115(55.6%)	25 (23.4%)
2. Prevalence of diabetes in India **Very common**	199 (96.1%)	104 (97.2%)
3. How many types of diabetes are there? **>4**	21 (10.1%)	03 (2.8%)

4. Symptoms of diabetes
  • **frequent urination**
  • **excessive thirst**
  • **weight loss despite normal appetite**
  • **lack of energy**
  Average no. of correct responders
	201 (97.1%)
	195 (94.2%)
	130 (62.8%)
	178 (86%)
	85%
		101 (94.4%)
		102 (95.3%)
		66 (61.7%)
		82 (76.6%)
		82%

Have you heard of oral glucose tolerance test (OGTT)?Yes	142 (68.6%)	52 (48.6%)
5. The fasting plasma glucose level cutoff for diagnosis of diabetes is **126 mg/dl.**	103 (49.8%)	14(13.1%)
6. The 2 hour post OGTT plasma glucose level cutoff for diagnosis of diabetes is **200 mg/dl.**	98 (47.3%)	10 (9.3%)
7. The diagnostic cutoff of HbA1c for diabetes is **6.5 %.**	129 (62.3%)	24 (22.4%)
8. The primary problem in type 1 diabetes is deficiency of insulin.-**True**	144 (69.6%)	64 (59.8%)
9. Insulin is secreted by the adrenal glands.- **False**	172 (83.1%)	90 (84.1%)
10. Women can get diabetes during pregnancy.-**True**	161 (77.8%)	66 (61.7%)
11. All children ultimately grow out of their diabetes.- **False**	134 (64.7%)	57 (53.3%)
12. Diabetes is contagious.-**False**	169 (81.6%)	94 (87.9%)
13. Type 2 diabetes cannot happen to a child.-**False**	109 (52.7%)	44 (41.1%)
Average percent correct responders	69.6%	52.8%

Table 2: Percent correct response to questions pertaining to Domain II- risk factors of diabetes:

No.	Risk factors//Percent of correct responses	Correct response	Medical (n=207)	Nursing (n=107)
1.	Has seizure disorder	No	57 (27.5%)	63 (58.9%)
2.	Has history of COVID infection	Yes	26 (12.6%)	04 (3.7%)
3.	Is overweight or obese	Yes	180 (86.9%)	83 (77.6%)
4.	Has a family history of Diabetes	Yes	175 (84.5%)	83 (77.6%)
5.	Has a smoker in the family	No	67 (32.4%)	38 (35.5%)
6.	Has history of polio vaccination	No	95 (45.9%)	49 (45.8%)
7.	Has history of polycystic ovaries	Yes	45 (21.7%)	14 (13.1%)
8.	Doesn't exercise	Yes	176 (85%)	74 (69.2%)
9.	Has high salt intake	No	53 (25.6%)	39 (36.4%)
10.	Is over the age of 35 years	Yes	148 (71.5%)	62 (57.9%)
11.	Has vitamin B deficiency	No	54 (26.1%)	17 (15.9%)
12.	Has history of large sized baby (>4 kg)	Yes	60 (29%)	09 (8.4%)

13.	Patient with high blood pressure, heart attack or paralysis should be regularly checked for diabetes.	True	179 (86.5%)	89 (83.2%)
14.	**If no one in your family has diabetes, there are no chances that you will get the disease.**	False	169 (81.6%)	95 (88.8%)
	Average percent correct responders		51.2%	51.3%

Table 3: Percent correct response to questions pertaining to Domain III- basic knowledge about treatment of diabetes

No.	Statements/Percent of correct responses	Correct response	Medical (n=207)	Nursing (n=107)
1.	The only medicine available for Type 2 diabetes is insulin.	False	122 (58.9%)	37 (34.6%)
2.	Treatment of diabetes in children is similar to diabetes in adults.	False	125 (60.4%)	66 (61.7%)
3.	Individuals with diabetes should have regular medical check-ups.	True	189 (91.3%)	97 (90.7%)
4.	People with diabetes on medicines should not skip their meals.	True	170 (82.1%)	94 (87.9%)
5.	People with diabetes can feel whether their blood sugar levels are high or normal.	False	49 (23.7%)	22 (20.6%)
6.	People with diabetes don't have to take their insulin or pills when they're sick.	False	145 (70%)	67 (62.6%)
7.	Too much of insulin causes an insulin addiction.	False	80 (38.6%)	25 (23.4%)
8.	All drugs used to treat type 2 diabetes can cause low blood sugar levels.	False	48 (23.2%)	24 (22.4%)
9.	It is not safe to exercise with diabetes.	False	172 (83.1%)	88 (82.2%)
10.	People in early stage of type 2 diabetes can reverse it with weight reduction and lifestyle modification.	True	150 (72.5%)	70 (65.4%)
11.	The best diet for people with diabetes is balanced healthy diet.	True	152 (73.4%)	96 (89.7%)
12.	People with diabetes should not eat fruits as they are sweet.	False	153 (73.9%)	73 (68.2%)
13.	Portion control of food is the key to dietary management in diabetes.	True	161 (77.8%)	90 (84.1)
	Average percent correct responders		63.8%	61.0%

Table 4: Percent correct response to questions pertaining to Domain IV- prevention of diabetes and its complications

No.	Statements/Percent of correct responses	Correct response	Medical (n=207)	Nursing (n=107)
1.	Complications of diabetes in their early stages can be reversed with good glucose control.	True	167 (80.7%)	81 (75.7%)
2.	Shaking and sweating are signs of high blood sugar levels.	False	35 (16.9%)	14 (13.1%)
3.	Diabetes ketoacidosis can develop in type I diabetes only.	False	93 (44.9%)	21 (19.6%)
4.	People with borderline blood glucose levels can normalize it with weight reduction and lifestyle modification.	True	181 (87.4%)	84 (78.5%)
5.	People with diabetes should wear covered and comfortable footwear.	True	105 (50.7%)	63 (58.9%)
6.	**If you have borderline diabetes, there is no need to worry.**	False	165 (79.7%)	70 (65.4%)
7.	**Three late complications of diabetes†** 3 correct responses 2 correct responses 1 correct response		67.6% 94(45.4%) 28(13.5%) 18(8.7%)	82.2% 33(30.8%) 32(29.9%) 23(21.5%)
	Average percent correct responders		61.1%	56.2%

†Atleast 1 correct response was taken as positive response.

Table 5: Diabetes awareness and knowledge (DAK) questionnaire scores in different domains and levels in different groups

Domains/ Streams	Total M (n= 207)	M0 (n=98)	M1 (n=109)	Total N (n= 107)	N0 (n=62)	N1 (n=45)	Total (n= 314)	P value
1. Basics of Diabetes (Total marks 14)	9.5 (3.5)	8.0 (3.5)	10.5 (3.0)	7.0 (2.5)	6.0 (2.5)	8.0 (3.5)	8.7 (4.0)	**p<0.001ᵃ,ᵇ,ᵉ p<0.013ᶜ p=0.001ᵈ**
2. Risk factors (Total marks 14)	7.0 (3.0)	6.0 (3.0)	8.0 (2.5)	7.0 (3.0)	6.0 (3.0)	7.0 (3.0)	7.0 (3.0)	**p<0.001ᵇ Rest NS**
3. Basic treatment related knowledge (Total marks 13)	9.0 (3.0)	8.0 (3.0)	9.0 (3.0)	8.0 (3.0)	7.0 (3.0)	9.0 (2.5)	8.5 (3.0)	**p<0.001ᵇ,ᶜ Rest NS**
4. Complications and prevention (Total marks 9)	6.0 (3.0)	4.0 (3.0)	7.0 (3.0)	5.0 (2.0)	4.0 (2.0)	6.0 (2.0)	5.0 (3.0)	**p<0.001ᵇ,ᶜ Rest NS**
Total marks (50)	30.3 (11.0)	26.0 (8.9)	35.0 (8.5)	28.0 (8.5)	24.7 (8.5)	31.0 (4.7)	29.5 (10.0)	**p<0.001ᵇ,ᶜ,ᵉ p=0.003ᵃ Rest NS**
Level of DAK								
≥80%- High level of DAK	19 (9.2)	00	19(17.4)	00	00	00	19 (6.0)	
≥60-<80%- Moderate level of	93 (44.9)	27 (27.5)	66(60.5)	38 (35.5)	07 (11.3)	31 (68.9)	131 (41.7)	

DAK								
≥40-<60%- Low level of DAK	76 (36.7)	53 (54.1)	23(21. 1)	50 (46.7)	38 (61.3)	12 (26.7)	126 (40.1)	
<40%- Very low level of DAK	19 (9.2)	18 (18.4)	01(0.01)	19 (17.7)	17 (27.4)	02 (0.04)	38 (12.1)	

Values are in Median (IQR) for scores and n(%) for level of Diabetes awareness and knowledge

Students of M0: Medical first semester, M1: Medical third semester, N0: Nursing first semester, N1: Nursing third semester

[a] Kruskal Wallis test between Medical and Nursing students; [b] Kruskal Wallis test between M0 and M1;

[c] Kruskal Wallis test between N0 and N1; [d] Kruskal Wallis test between M0 and N0;

[e] Kruskal Wallis test between M1 and N1