Assessment of the knowledge and Practice of Blood Sugar Measurement Technique among Staff Nurses of a Selected Hospital, Kolkata, West Bengal

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Abstract

The investigators conducted an explorative survey to assess the knowledge and practice of blood sugar measurement technique among staff nurses of Intensive Therapy Units (ITUs) of Rabindranath Tagore International Institute of Cardiac Sciences in Kolkata. 80 staff nurses were selected by convenient sampling technique from six ITUs. A structured knowledge questionnaire and observation checklist were used to collect data. Study findings showed that 45% participants had satisfactory knowledge and 97.5% participants had satisfactory practice level. There was significant relationship between knowledge and practice on blood sugar measurement technique among staff nurses (p=< 0.001). There was no significant association found between knowledge and selected variables such as age and professional qualification (p=>0.05) except period of working experience(p=<0.01). There

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was also no significant association found between practice and selected variables such as age, professional qualification and working experience (p=>0.05).

Keywords : Knowledge, Practice, Blood Sugar Measurement Technique

Introduction

Diabetes Mellitus is a group of metabolic diseases characterized by high blood glucose level caused by disturbances in carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, or action or both.[1]

Hyperglycemia or high blood glucose level occurs when there is no sufficient insulin to achieve normoglycemia. Either the body has stopped making insulin (Type-I diabetes) or there is insulin but the amount of insulin is less than what is required or it is working inefficiently (Type-II diabetes). Exposure to hyperglycemia overtime may damage tissues in organs throughout the body.[2]

The prevalence of Type-II diabetes mellitus in India show an upward trend. The International Diabetes Federation (IDF) estimates worldwide 194 million people with diabetes in 2003 and this will increase to 334 million by the year 2025. The IDF also reports that in 2007 there were 46.5 million people in India with diabetes and that this number is expected to go to 80.3 million by 2025.[3]

Before the discovery of insulin in 1921, the patient with diabetes had very little hope; now the disease can be controlled so successfully that a diabetic who is willing to follow the necessary selfcare regimen can expect to enjoy a fully productive life. Diabetes care is usually monitored by laboratory examinations, urine testing and monitoring of blood glucose which interpret the results and guide how to manage the condition by the health care personnel. Monitoring of blood glucose is a cornerstone of diabetes management and done by use of glucometer reliably if it is used correctly. They are small, portable and easy to handle. The results are available in just a few seconds. There are many types of glucometer available in the market and each machine has its own specific technique to use it. Thus following the manufacturer's instructions is very important to get the correct result. Blood glucose level of the patient will help to determine appropriate intervention, which if correctly

taken, will help to correct hypo or hyperglycemia and prevent brain damage and death. Therefore a thorough knowledge of various equipments and devices is essential for all health care personnel specially the nurses to check and record blood glucose level of their clients as a bedside procedure.[3]

Crosser A. and McDowell J.R. (1982), Florida, conducted a study on 76 nurses to evaluate the nurses performance and interpretation of urine testing and capillary nlood glucose monitoring measures which showed that the registered nurses did not perform those tests accurately according to standards.[4]

Scheiderich S.D. et.al. (1983) conducted a study on 137 volunteer registered nurses to evaluate the knowledge level about diabetes mellitus which showed that surgical unit nurses scored lower than the medical unit nurses and significant differences were found among scores between hospitals, therefore a curriculum for regular in-service education was recommended for the development of nurses to assure a high level of knowledge.[5]

The investigators from their clinical experience also had been realized that the nurses need to be evaluated periodically to determine their level of knowledge and practice regarding blood sugar measurement technique so that continuing in-service education program may emphasize regarding the same.

It had been also found form the review of literature that there were very few research studies conducted on the same problem thus the researchers were interested to conduct the study.

Objectives of the study are -

- to assess the knowledge of blood sugar measurement technique among staff nurses
- to assess the practice of blood sugar measurement technique among staff nurses
- to find out relationship between knowledge and practice of blood sugar measurement technique among staff nurses
- to find out association between knowledge of blood sugar measurement technique and selected variables
- to find out association between practice of blood sugar measurement technique and selected

variables

Methodology :

Research approach – Non-Experimental Survey approach

Research design – Descriptive Explorative Survey design

Variables -

- Knowledge and practice of staff nurses

- Selected variables : age, professional qualification, period of working experience

Setting – Six ITUs of Rabindranath Tagore International Institute of Cardiac Sciences (RTIICS), Kolkata, West Bengal.

Population - Registered staff nurses

Sample and sample size - 80 staff nurses of selected hospital

Sampling technique – Convenient sampling technique

Sampling criteria – staff nurses who are present at the time of data collection and willing to participate in the study.

Data collection tools and technique –

Tools	Variables	Technique
1. Structured Knowledge Questionnaire	Knowledge	Paper pen test
2. Observation Checklist	Practice	Observation

Definition of terms

Knowledge – it refers to the written response of the staff nurses to the items regarding blood sugar measurement technique as assessed by structured knowledge questionnaire.

Practice – it refers to the steps followed by the staff nurses during blood sugar measurement as assessed by observational checklist.

Staff nurses – registered staff nurses who are working in intensive therapeutic unit (ITUs) of the selected hospital.

Blood sugar measurement technique – it refers to the method of assessment of blood sugar level by the help of glucometer Accucheck only.

Selected variables – in this study this refers to the staff nurses age, professional qualification and

period of working experience.

Data collection procedure

- Formal permission was taken from the General Manager (Nursing) of RTIICS and principal, College of Nursing, Asia Heart Foundation.

- Sister In-charges of the ITUs were informed about the purpose of the study and requested to help in arranging the duties of the staff nurses.

- Purpose of the study was explained to the samples and their informed written consent was taken.

- The samples were coded in number so that anonymity could be maintained.

- Data collected for final study was from 6th June to 12th June, 2011

- At first structured knowledge questionnaire was administered to them

- They were given approximately 15 minutes to respond to the questionnaire

- Then the investigators observed the practice of the subjects on blood sugar measurement technique by the help of observational checklist. The time taken to observe the procedure was approximately 10 minutes for each participants.

Results and Discussion

Out of 80 participants, the majority (50%) were belongs to the age group of 23-24 years, 56.25% were graduate and 42.5% of participants had <1 year of working experience.

Table 1 : Mean, Median and SD of knowledge on blood sugar measurement technique among staff nurses.   N=80

	Mean	Median	SD
Knowledge	16.91	17	2.98

Date presented in table 1 show that the mean knowledge of the participants is 16.91 with median 17 and standard deviation 2.98.

Table 2 : Frequency and percentage distribution of knowledge score on blood sugar measurement technique among staff nurses   N=80

Sl. No.	Knowledge level (score range)	Frequency	Percentage
1.	Satisfactory (≥70%)	36	45
2.	Unsatisfactory (<70%)	44	55

The data presented in table 2 show that out of 80 participants, 44 (55%) staff nurses had unsatisfactory knowledge level.

Table 3: Mean, Median and SD of practice on blood sugar measurement technique among staff nurses.   N=80

Area	Mean	Median	SD
Practice	26.71	27	1.34

Data presented in table 3 show the mean score of practice on blood sugar measurement technique among staff nurses 26.71 with median 27 and standard deviation 1.34.

Table 4: Frequency and percentage distribution of practice on blood sugar measurement technique among staff nurses.   N=80

Sl. No.	Practice level (score range)	Frequency	Percentage
1.	Satisfactory ($\geq$80%)	78	97.5
2.	Unsatisfactory (<80%)	02	02.5

Data presented in table 4 show that most of the participants (97.5%) had satisfactory practice level on blood sugar measurement technique.

Table 5: Mean, median, SD, 'r' and 't' value of knowledge and practice on blood sugar measurement technique among staff nurses   N=80

Criteria	Mean	Median	SD	'r' value	't' value
Knowledge	16.91	17	2.98		
				.44	6.16
Practice	26.71	27	1.34		

't'(78) = 3.4, p=< 0.001

Data presented in table 5 show the correlation coefficient between knowledge and practice

of staff nurses which is significant at 0.001 level of significance with 't' value 6.16 for df

78. Hence it can be interpreted that there is significant positive relationship between

knowledge and practice of staff nurses on blood sugar measurement technique; that means

the nurses who had good knowledge also had good practice on blood sugar measurement

technique and vice versa.

Table 6: Association between knowledge of staff nurses on blood sugar measurement
technique and selected variables.   N=80

Variable	Knowledge		Chi-square value	df	Remarks
	< median	≥ median			
Age (in years)					
≤ 22	12	10			
23-24	16	24	1.4	2	not significant
≥25	07	11			
Professional qualification					
GNM	17	18	1.02	1	not significant
B.Sc (Basic)	27	18			
Period of working experience					
< 1 year	17	17			
1-2 years	09	07	13.58	3	significant**
2-<3 years	15	05			
≥3 years	05	05			

x^2 (1)= 3.84, (2) = 5.991, (3) 7.815 p=>0.05, <0.01**

Data presented in table 6 show that there is no significant association between knowledge
of staff nurses on blood sugar measurement technique with the age and professional
qualification which is evident from the obtained chi-square value at df 2 and 1 respectively
at 0.05 level of significance. Thus it can be inferred that above mentioned variables are not
influencing the knowledge of staff nurses. The data also depicted that the obtained chi-
square value between knowledge and period of working experience is 13.58 at df 3 is more
than the table value at 0.01 level of significance. So, there is significant association
between the knowledge and working experience of the participants, thus it can be inferred
that the knowledge is influenced by the nurses' period of working experience.

Table 7: Association between practice of staff nurses on blood sugar measurement technique and selected variables.   N=80

Variable	Practice		Chi-square value	df	Remarks
	< median	≥ median			
Age (in years)					
≤ 22	16	06			
23-24	20	20	3.47	2	not significant
≥25	12	06			
Professional qualification					
GNM	25	10	3.37	1	not significant
B.Sc (Basic)	23	22			
Period of working experience					
< 1 year	18	16			
1-2 years	10	06	0.64	3	not significant
2-<3 years	12	08			
≥3 years	05	05			

x^2 (1)= 3.84, (2) = 5.991, (3) 7.815 p=>0.05

Data presented in table 7 show that there is no significant association between practice of staff nurses on blood sugar measurement technique with the selected variables like age, professional qualification and period of working experience which is evident from the obtained chi-square value at df 1,2 and 3 respectively at 0.05 level of significance. Thus it can be inferred that above mentioned variables are not influencing the practice of staff nurses.

The study findings are limited to a small sample of ITU nurses of a selected hospital only and adopting Convenient sampling technique. Thus the generalization of the study findings would not be possible. On the basis of the study findings the following recommendations can be offered for future research –

-   similar study can be done for a large sample of staff nurses in various unit of same hospital

-   random sampling technique can be adopted

-   a comparative study can be conducted between male and female nurse

-   a comparative study can be conducted between staff nurses of government and private

- hospitals

- an experimental study can be carried out using teaching strategies like planned teaching program, information booklet, pamphlet, video based CD etc.

Conclusion

It has been observed that though only 45% nurses had satisfactory knowledge level but their practice level of blood sugar measurement by use of glucometer was highly satisfactory (97.5%). This may be because of their continuous use of the glucometer machine in the care setting everyday for their diabetic clients as well as routine on-admission and pre-surgery blood glucose test by that machine only according to institutional policy. This finding implies the need of imparting continuous education to the staff nurses regarding blood sugar measurement technique to improve their knowledge too, which will make them as strong as practically and theoretically.

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