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Knowledge and Practices Regarding Critical Alert Values Among Staff Nurses in Selected Hospitals of Guwahati, Assam: A Descriptive Study

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ABSTRACT

Background of the study: Critical value is defined as a laboratory test result that represents a pathophysiologic state at such variance with normal as to be life-threatening unless something is done promptly and for which some corrective action could be taken. Failure and delayed notification and communication of critical values to the responsible caregiver in timely manner indicates an important patient safety issue. Because of the life-threatening nature of critical laboratory values, it is important for the staff nurses who are involved in 24 hours patient care to have good knowledge and practices regarding critical alert values for better patient outcomes.

Objectives: To assess the knowledge and practices regarding critical alert values among staff nurses, to find the correlation between knowledge and practices and to determine the association between knowledge and practices regarding critical alert values with selected demographic variables.

Methods: A descriptive research design was used to accomplish the objectives. The study was undertaken among 160 nurses working in ICU of selected hospitals of Guwahati, Assam by using convenience sampling technique. Structured knowledge questionnaires and inventory checklist were used to assess the knowledge and practices. The data was collected and analyzed in terms of descriptive and inferential statistics.

Results: The results revealed that majority 84(52.5%) of the participants had adequate knowledge, 53(33.1%) had moderately adequate knowledge and 23(14.4%) had inadequate knowledge regarding critical alert values. The mean score of knowledge and standard deviation was 19.3±6.82. Regarding practice, majority of the participants i.e., 157(98.1%) had adequate practice, 3(1.9%) had moderately adequate practice and none of the participants had inadequate practice regarding critical alert values. The mean score of practice and standard deviation was 10.6±0.7. The study findings showed that there was statistically significant association between the knowledge with age (χ^2 =8.260, p=0.016), educational status (χ^2=7.344, p=0.025) and the total years of experience (χ^2=8.723, p=0.013). There is a moderately positive correlation between knowledge and practices (r=0.163, p-value=0.0387).

Conclusion: The study concluded that majority of the nurses had moderately adequate knowledge and adequate practices regarding critical alert values. Keeping in view the findings, it is recommended that regular training programs on critical alert values, early notification and communication should be done to prevent from complications and to enhance patient safety and outcomes.

Keywords: Critical alert value, notification, communication, immediate response.

INTRODUCTION

The concept of a critical value system was first created and implemented at the Los Angeles County Medical Centre in 1971 under Dr. George Lundberg. This system requires that laboratory personnel identify a critical value and after validation ensure that it is communicated to the clinician so that appropriate action is taken[1]. Various professional bodies have published guidelines and recommendations for the harmonization of critical risk results and their communication[2]. Timely reporting of critical alert values will help in prompt and appropriate action which will result in decrease mortality and morbidity[3].

BACKGROUND OF THE STUDY

The authorized nursing staff are accountable for the communication of critical values to the responsible physician because of their continuous physical proximity to patients[4].Even with the current advancement in technology and automation in laboratory, the labs are not able to communicate all the critical results and the results of urgent sample, to the clinician or care giver due to several errors in the process of notification of results. Many laboratories have used different alerting (visual or audible) and reporting systems such as phone call, online reporting and text message for preventing delays in critical value reporting. Nevertheless, phone call is still the most common method used in clinical laboratories because of its ease of use for asking all recipients to read back the critical values.

Critical value notification to responsible caregiver in a timely manner has potential to improve patient safety which requires cooperative efforts between laboratory personnel and caregivers. It is widely accepted by hospital accreditors that ineffective notification can lead to diagnostic errors that potentially harm patients which are preventable[5].

A retrospective, descriptive study was conducted by Mwogi T et al. (2018) regarding selected critical laboratory tests at a 76 bedded tertiary hospital in Kenya. A three-week period study was conducted and documented if and how critical test results were communicated, the time-frame for communication, and evidence of action taken on the results. In the study, around 5,500 (6.1%) test results were identified as critical and was found that only 71 (21%) of the critical results were documented as having been communicated to the destination departments. Of the communicated results, clinicians were unaware of 21 (29.6%) critical results. The study showed that communication of critical results to inpatient settings was significantly higher than to outpatient settings with communication rates decreasing as the week progressed, during weekends and around holidays[6].

METHODOLOGY

A descriptive design was conducted among the staff nurses in selected hospitals of Guwahati, Assam in the month of July to August 2023. After the ethical clearance, the study was conducted among 160 nurses, selected by using non-probability convenience sampling technique. Data was collected by administering the structured knowledge questionnaire for assessing knowledge and inventory checklist for the practices. After obtaining verbal consent from the ward in-charge, the purpose of the study was explained to the participants prior to data collection and the data was collected after obtaining the verbal and written consent from each sample for their participation in the study. The data was analyzed by using descriptive and inferential statistics.

RESULTS

Section 1: Findings related to demographic variables

The study revealed that of the 160 staff nurses, majority 83(51.88%) were in the age group of 21-25 years, 126 (78.75%) have completed GNM, 108(67.5%) were working in General ICU,78(48.8%) were having <1 year of experience and 116(72.5%) have attended in-service education on critical values.

Table 1: Frequency and percentage distribution of participants according to demographic data. n=160

Demographic variables	Frequency (f)	Percentage (%)
1.Age in years		
21-25 years	**83**	**51.87%**
26-30 years	52	32.5 %
31-35 years	12	7.6%
35 years above	13	8.1%
2. Educational level		
GNM	**126**	**78.75%**
P.B.BSc nursing	14	8.75%
B.Sc Nursing	19	11.88%
M.Sc Nursing	1	0.625%
3.Working area		
General ICU	**108**	**67.5%**
ICCU	16	10%
Semi ICU	16	10%
CTVS ICU	20	12.5%
4.Working experience		
<1 year	**78**	**48.8%**
1-5 years	58	36.1%
5-10 years	11	6.9%
> 10 years	13	8.1%
5. In-service education		
Yes	**116**	**72.5%**
No	44	27.5%

Section 2: Findings related to knowledge

Regarding knowledge, it has been found that majority 84(52.5%) of the participants had adequate knowledge, 53(33.1%) had moderately adequate knowledge and 23(14.4%) had inadequate knowledge regarding critical alert values. The mean score of knowledge and standard deviation was 19.3±6.82.

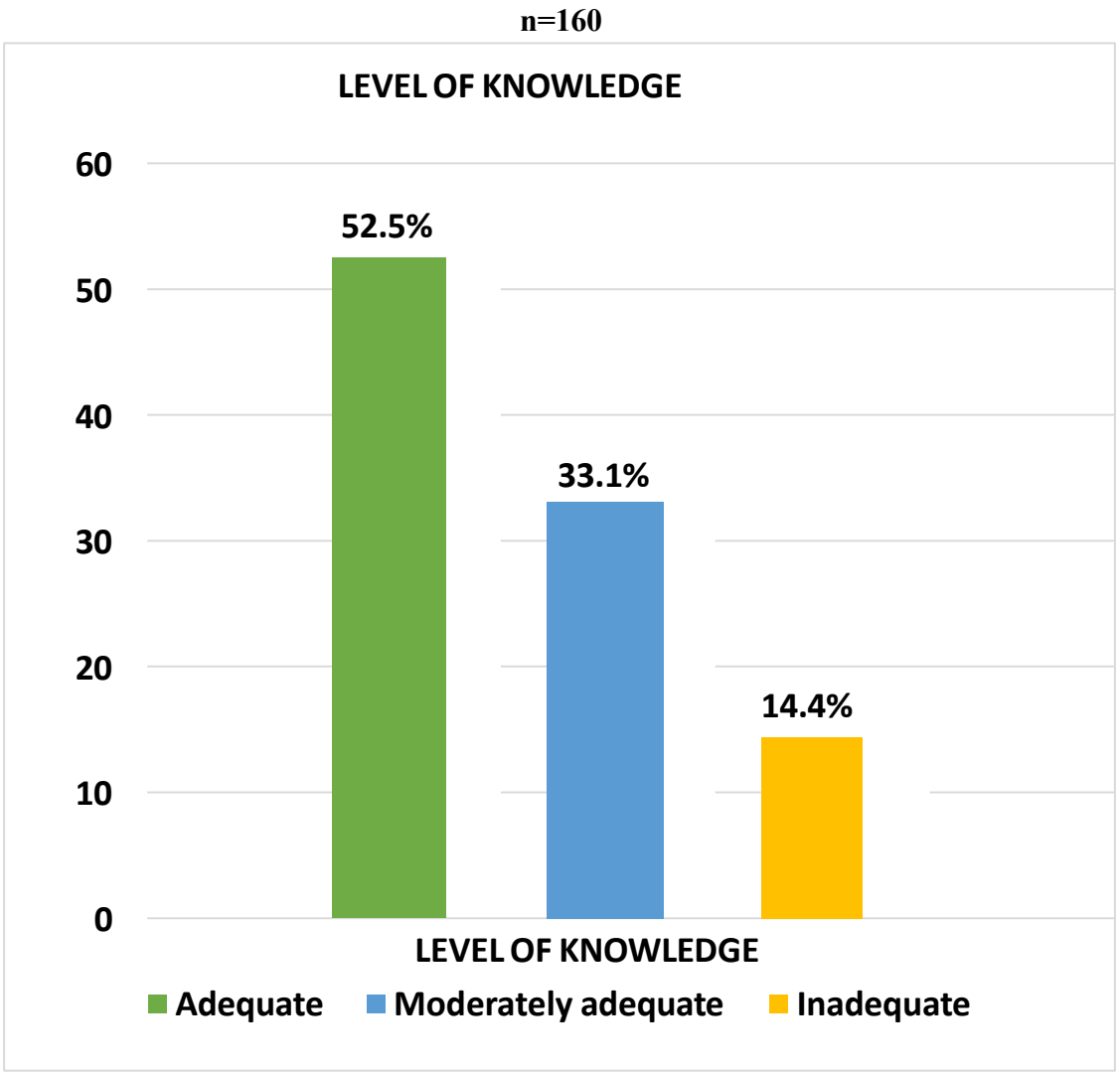

Figure 2: Column diagram showing the percentage distribution of the participants according to their level of knowledge regarding critical alert values.

Section 3: Findings related to Practices

Regarding the practices, the present study shows that majority of the participants i.e., 157(98.1%) had adequate practices, 3(1.9%) had moderately adequate practices and none of the participants had inadequate practices regarding critical alert values. The mean score of practices and standard deviation was 10.6±0.7.

Section 4: Findings related to correlation

In the present study, the calculated correlation coefficient value between knowledge and practices was r=0.163, p-value=0.0387 which showed a moderately positive correlation and found to be significant at $p<0.05$ level of significance. This reflected that as the knowledge regarding critical alert values increases, the practices also increased.

Section 5: Findings related to association

In the present study, the findings showed that there was significant association between the knowledge with age (χ^2 =8.260, p=0.016), educational status (χ^2=7.344, p=0.025) and with the total years of experience (χ^2=8.723, p=0.013) at $p<0.05$ level of significance.

Table 2: Association of knowledge regarding critical alert values with selected demographic variables of the participants.

n=160

Demographic Variables	Adequate		Moderately adequate		Adequate		Df	Cal Value χ^2	Table Value	p-value	Remarks
	F	%	F	%	F	%					
Age in years											
21-25	33	20.61	34	21.2	16	10	2	8.260	5.99	0.016	S
>26 years	51	31.88	18	11.25	8	5					
Educational status											
Graduated	23	14.38	5	3.13	3	1.88	2	7.344	5.99	0.025	S
Non graduated	61	38.13	47	29.38	21	13.13					
Working Area											
General ICU	53	33.13	38	23.75	15	9.38	2	1.609	5.99	0.447	NS
Other ICU	31	19.38	14	8.75	9	5.63					
Working experience											
<1 year	31	19.38	24	15	17	10.63	2	8.723	5.99	0.013	S
> 1 Years	53	33.13	28	17.5	7	4.38					
Protocols and policies											
Yes	63	39.38	34	21.25	15	9.38	2	2.17	5.99	0.338	NS
No	21	13.13	18	12.5	9	5.63					

***p<0.05, NS-Not Significant, df-degree of freedom, Cal value -Calculated value, p value – probability value.**

DISCUSSION

The current study is supported by the study which was conducted by Devanath A et al (2016) with the aim to evaluate the perception and implementation of critical alert protocol amongst laboratory personnel and critical care team in St. John's Medical College at Bengaluru, India. It was found in the study that 100% of the nursing staff had adequate knowledge about the critical alert values and that majority of the critical care nurses i.e., (62.1%) were aware of protocol and documented the critical alert values.

The study findings showed that there was significant association between the knowledge with age (χ^2 =8.260, p=0.016), educational status (χ^2=7.344, p=0.025) and with the total years of experience (χ^2=8.723, p=0.013) at p<0.05 level of significance. The present study is supported by the study conducted by Mudaf BA et al (2022) on assessment of perception of critical value practices among laboratory staff in Kuwait. The study results revealed that gender (p=0.015), age group and working area (p< 0.001) has significant association in the perception of delays in the reporting of critical laboratory values.

Limitations of the study:

- The investigator did not use direct observation to assess the practices
- The study was conducted only in few settings. Hence the findings could not be generalized.

CONCLUSION

Knowledge of nurses regarding critical alert value and timely reporting to physician is crucial for patient safety and treatment outcome. Frequent retraining and monitoring would be needed for continuous implementation of critical values protocol in the health care setting.

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