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ASSESSMENT OF NURSES' KNOWLEDGE REGARDING HYPOGLYCEMIA RECOGNITION AND MANAGEMENT IN TERTIARY CARE HOSPITALS OF KPK

Muhammad Aliyan, Muhammad Kashan

Medical Students, Rehman Medical College, Peshawar, Pakistan

ABSTRACT

Background: Hypoglycemia, especially in hospitalized patients, is a potentially fatal condition. Preventing complications requires prompt recognition and management and nurses play a pivotal role in ensuring patient safety. The objective of this study was to assess the knowledge of nurses regarding the recognition and management of hypoglycemia in tertiary care hospitals of KPK.

Materials & Methods: From March to April 2025, five tertiary care hospitals in KPK were included in a descriptive cross-sectional study. Nurses with more than a year of experience were given a pre-validated questionnaire on recognizing and managing hypoglycemia. SPSS v22 was used to analyze data from 481 completed responses, with a significance level of $p < 0.05$.

Results: Among participants, 67% demonstrated good knowledge, 24% average, and 11% poor. Most participants correctly identified the definition (66.5%), symptoms (64.2%), and first-line treatment for conscious patients (70.6%). However, fewer correctly answered advanced questions regarding treatment for unconscious patients (54.4%) and medication adjustment in recurrent hypoglycemia (46.5%). A significant association was found between clinical experience and knowledge level ($p <0.05$), but not with educational qualification ($p >0.05$).

Conclusion: In spite of satisfactory level of knowledge, there are still significant gaps in the treatment of complex hypoglycemia cases. To improve clinical preparedness it is encouraged to implement regular hands-on training, simulation-based learning, and enhanced curriculum that emphasize endocrine emergencies.

KEY WORDS: Emergency Treatment; Hypoglycemia; Knowledge; Nursing Care; Tertiary Care Centers.

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INTRODUCTION

Hypoglycemia means blood sugar (glucose) below 4mmol/L. It needs to be treated quickly to stop it getting worse and avoid any complications. Symptoms of hypoglycemia include, feeling hungry/dizzy/anxious/irritable. Also, there may be sweating, shaking, tingling lips, heart palpitations, feeling tired or weak, blurred vision or feeling confused. In severe hypoglycemia the patient may get seizure or fit or become unconscious.[1] Emergency treatment of hypoglycemia is to eat or drink something that will raise the blood sugar quickly, such as a small glass of fruit juice or sugary fizzy drink, 5 glucose or dextrose tablets, 4 large jelly babies, or 2 tubes of glucose gel. Awareness about hypoglycemia recognition and management among patients, attendants, and general public and health care providers is necessary to handle the situation promptly.[2] Hypoglycemia awareness among nurses is crucial for patient safety, yet studies indicate that nurses may have varying levels of knowledge regarding its recognition and management. While many nurses understand the basic definition and potential consequences of hypoglycemia, some studies show that knowledge gaps exist, particularly in identifying specific symptoms and implementing timely and evidence-based treatment.[3]

Prevalence of hypoglycemia in hospitalized patients ranges from 3.5% to 10.5% and most of these patients have diabetes and take insulin as a treatment. In 20-22.6% patients with diabetes may suffer hypoglycemia

Corresponding Author:

Muhammad Kashan
Medical student
Rehman Medical College
Peshawar, Pakistan
E-mail: kashankhanmarwat0301@gmail.com

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during their hospital stay. Mortally is about 6.5% among inpatients with hypoglycemia as compared to 3.8% in those who do not experience hypoglycemia. It is therefore, important that nurses should have adequate information regarding recognition and management of hypoglycemia.[4] A study's conducted by Das et al; highlighted the fact that most diabetic patients had a fair knowledge of hypoglycemia sign and symptoms. The health care providers should educate patients about the sign of hypoglycemia. So that hypoglycemic incidence and morbidity could be prevented and treated at early level. Some good institute trains their staff in this respect.[5,6] In one study it was noticed that, illiteracy, older age of the patients and a low socioeconomic status were all associated with inadequate knowledge regarding hypoglycemia.[7] In another study, the American Association of Clinical Endocrinology observed that majority of the patients were unfamiliar of the triggers or causes of hypoglycemic episodes, despite the fact more than half of the study participants had previously experienced episodes.[8]

The American Diabetes Association describes hypoglycemia as "any abnormally low plasma glucose concentration that exposes the subject to potential harm".[9] Mostly the aggressive treatment usually increases hypoglycemic episodes, hypoglycemia is a common side effect linked to insulin use. Therefore, it is presumed to be a major hurdle to proper glycemic control.[10] There is a lack of available literature regarding the knowledge among nurses about hypoglycemic symptoms and management in our country. Therefore, it is necessary to know about this issue and make guidelines accordingly in this respect. Awareness programs like seminars and workshops can be organized to make awareness among healthcare providers. The aim of this study was to determine the nurses' knowledge of hypoglycemia sign & symptoms and management protocols.

MATERIAL AND METHODS

This cross-sectional study was conducted in Rehman Medical college Peshawer from March 1 to April 30, 2025, after Institutional Review Board (IRB) approval. Participants have been selected via convenience sampling from five teaching hospitals in KPK, that is MMTH DIKhan, RMI Peshawer, HMC Peshawer, ATH Abbottabad and STH Swat. All of the nurses who served in the gynecology, Orthopaedic, surgical, and medical wards were included. Nursing students and those with less than a year of experience were excluded from this study. After obtaining informed consent, participants were given a pre-design questionnaire. A total of thirty participants participated in a pilot study to evaluate the questionnaire's reliability. Ten experts from the departments of medicine and endocrinology assessed its content validity. Questionnaire were composed of three sections, in section I four questions on the participants' demographics were included. Six questions in Section II tested participants' recognition of hypoglycemia. Four questions in Section III assessed their knowledge of managing hypoglycemia. Two points were given for each right response. The following categories were used to group knowledge scores, Good: score more than 8, Average: 6-8 Poor: less than 6. After editing and coding, the data was imported into SPSS version 22. Frequencies and percentages were used to summarize categorical data. A p-value of less than 0.5 was set significant.

RESULTS

Total 500 questionnaires were distributed, 100 in each selected hospital, 481 were completed and included in the final analysis remaining 19 questionnaires were excluded due to incomplete responses, giving a response rate of 96.2%. The mean age of the participants was 36.25 ±4.8 years. As seen in **Figure 1**, majority of participants worked in medical (30%), orthopaedic (23%), surgical (26%), and gynecology (21%) wards at the chosen institutions. The largest age group was between the ages of 31 and 40 (40.8), majority of participants (53.2%) had a diploma in nursing, followed by a bachelor's degree in nursing (33.1%). In terms of clinical experience, 27.5% had more than six years of experience, whereas 40.7% had four to six years as shown in **Table 1**.

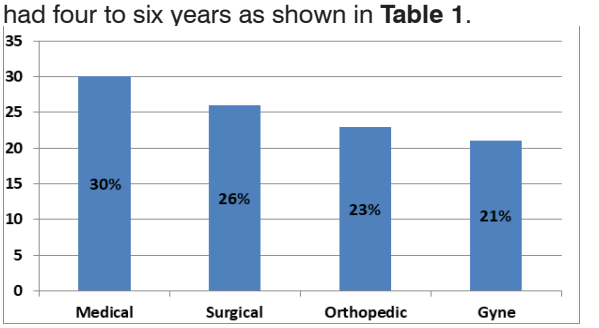

Figure 1. Ward-wise distribution of participants (n = 481)

Table 1: Demographic Characteristics of Participants (n = 481)

Variables	Frequency (n)	%age
Age Group (years)		
20-30	148	30.8%
31-40	196	40.8%
41-50	102	21.2%
>50	35	7.2%
Qualification		
Diploma in Nursing	256	53.2%
BSc Nursing	159	33.1%
Post RN	66	13.7%
Experience (years)		
1-3	153	31.8%
4-6	196	40.7%
>6	132	27.5%

Participants' hypoglycemia recognition and man-

Table 2. Assessment of Hypoglycemia Recognition and Management

Statements	N	%
1. What is the standard definition of hypoglycemia?	320	66.5
2. Which of the following is a typical symptom of hypoglycemia?	309	64.2
3. Which of the following is the best differential diagnosis for hypoglycemia in an unconscious patient?	290	60.2
4. Which investigation is most commonly used to confirm hypoglycemia at bedside?	355	73.8
5. What is the major complication of hypoglycemia?	250	51.9
6. What is the cause of hypoglycemia?	229	47.6
7. What is the first-line treatment for a conscious patient with mild hypoglycemia?	340	70.6
8. What should be administered to an unconscious hypoglycemic patient?	252	54.4
9. Which of the following is the best intervention in a diabetic patient with recurrent hypoglycemia?	224	46.5
10. How can hypoglycemia be managed in a fully awake patient at home?	312	64.8

agement was asses using ten structured questions. Statements 1-6 assessed their ability to recognize hypoglycemia, while Statements 7-10 assessed their understanding of how to treat it. The number and percentage of participants who answered each question correctly are shown in **Table 2**. Regarding hypoglycemia management 70% chose oral glucose as first-line treatment for conscious patients; only 54% correctly answered about 50% IV dextrose to unconscious patient. Only 46% responded correctly regarding adjustment of hypoglycemic medications in recurrent hypoglycemia in diabetic patient. Participants' overall knowledge regarding hypoglycemia recognition was categorized based on the number of correct responses to the first six statements. As shown in **Table 3**, 67% of participants had good knowledge (5-6 correct answers), 24% had average knowledge (3-4 correct answers), and 11% had poor knowledge (less than 3 correct answers).

Table 3. Classification of hypoglycemia overall knowledge level

Knowledge Level	Percentage (%)
Good	65
Average	24
Poor	11

There was a statistically significant association between years of clinical experience and hypoglycemia recognition and management ($p < 0.05$). However, no significant association was found between educational qualification and recognition score ($p > 0.05$).

DISSCUSSION

The knowledge of nurses in tertiary care hospitals of KPK, regarding the recognition and treatment of hypoglycemia was evaluated in this cross-sectional study. Overall awareness was encouraging, with 65% of the 481 respondents exhibiting good knowledge, 24% moderate, and 11% poor. This suggests relatively strong foundational knowledge when compared to comparable studies conducted in low and middle-income settings.[11] The inclusion of five teaching hospitals and the high response rate of 96.2% were significant strengths that improved generalizability. Indicating sufficient frontline preparedness the majority of nurses correctly defined hypoglycemia (66.5%), its symptoms (64.2%), and the first course of treatment for conscious patients (70.6%).

However, there are gaps in critical care reasoning as less than half correctly addressed advanced aspects like managing unconscious patients (54.4%) and adjusting medication (46.5%). Previous studies have shown that while surface-level knowledge may be sufficient, deeper clinical insight into endocrine emergencies is often lacking.[12,13] The importance of hands-on education is supported by a significant correlation ($p<0.05$) between clinical experience and knowledge. However, there was no correlation with educational background ($p>0.05$), suggesting that the curriculum may be deficient. Notably, only 73.8% recognized blood glucose testing as the key diagnostic step, underscoring the need for reinforcement of essential clinical practices, especially in emergency settings.[14,15] External validity is strengthened by the large sample size and multi-center design. Methodological rigor is ensured by using a questionnaire that has already been tested. Convenience sampling, possible recall and social desirability bias, and an emphasis on knowledge rather than real clinical performance are some of the limitations. Future studies should use observational or simulation-based methods to examine how knowledge is applied in practice and evaluate the long-term effects of focused training interventions.

It is essential that nursing education and extending professional development include hypoglycemia-specific training. Refresher sessions and simulation-based learning may help in concluding the knowledge-practice gap.[14-17] To minimize preventable complications, especially in patients with diabetes, hospital administrators should make sure evidence-based procedures are available and followed, and legislators should incorporate

hypoglycemia management into national nursing competency standards.

CONCLUSION

In spite of satisfactory level of knowledge, there are still significant gaps in the treatment of complex hypoglycemia cases. To improve clinical preparedness it is encouraged to implement regular hands-on training, simulation-based learning, and enhanced curriculum that emphasize endocrine emergencies.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	MA, MK
Acquisition, Analysis or Interpretation of Data:	MA, MK
Manuscript Writing & Approval:	MA, MK

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.