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ASSESSMENT OF KNOWLEDGE AND PRACTICE OF NURSES REGARDING ELECTRICAL CARDIOVERSION IN THE EMERGENCY DEPARTMENT OF A TERTIARY CARE HOSPITAL

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Keywords

Electrical cardioversion, Nurses' knowledge, Nursing practice, Emergency department, Cardiac care, Tertiary hospital

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Abstract

Background:

Electrical cardioversion is a critical, life-saving procedure used to restore normal cardiac rhythm in patients with arrhythmias. Nurses in emergency departments play a key role in assisting and performing this procedure safely. However, inadequate knowledge and improper practice among nurses can lead to complications and reduced patient outcomes.

Aim:

This study aimed to assess the knowledge and practice of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital, Lahore.

Methods:

A descriptive cross-sectional study was conducted at Sheikh Zayed Hospital, Lahore, among 80 registered nurses working in the emergency department. Data were collected using a structured questionnaire after obtaining ethical approval and informed consent. The sampling technique was convenience sampling. Data were analyzed using SPSS version 25, employing descriptive and inferential statistics, including frequency, percentage, Chi-square test, and Pearson's correlation, with a significance level of $p \leq 0.05$.

Results:

The findings showed that 46.3% of nurses had a moderate level of knowledge, while 31.3% had good knowledge regarding electrical cardioversion. In terms of practice, 48.8% demonstrated moderate performance, and 27.5% showed good practice. A significant relationship was observed between knowledge and practice ($p = 0.009$). Educational qualification, experience, and prior training were also significantly associated with better knowledge and practice levels.

Conclusion:

The study concluded that nurses possessed moderate knowledge and practice regarding electrical cardioversion. Continuous professional training, simulation-based learning, and refresher courses are recommended to enhance clinical competence and patient safety.

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1. INTRODUCTION:

Electrical cardioversion is a medical procedure used to restore normal sinus rhythm in patients experiencing certain types of cardiac arrhythmias, such as atrial fibrillation, atrial flutter, and supraventricular tachycardia. It involves the delivery of a synchronized electrical shock to the heart through the chest wall to depolarize myocardial cells and reset cardiac rhythm (Kumar & Singh, 2023). Nurses play a vital role in preparing patients for the procedure, ensuring safety during cardioversion, and providing post-procedure care (Alotaibi et al., 2022). Knowledge refers to the theoretical understanding nurses possess regarding the indications, contraindications, equipment setup, and safety precautions of electrical cardioversion. Practice refers to the actual performance of tasks and skills during the procedure in accordance with established clinical guidelines (Hasan et al., 2023).

1.1 BACKGROUND OF THE STUDY:

Cases of cardiac arrhythmias that necessitate electrical cardioversion are increasingly becoming common in the world. The research has determined that there are more than 37 million individuals with atrial fibrillation worldwide, and a good percentage of them would need cardioversion to control their rhythm (Nguyen et al., 2023). Cardiovascular diseases in Pakistan and other countries have an important role in morbidity and mortality, and arrhythmia cases require immediate electrical treatment in the emergency department (Okhotin et al., 2024). Although it has life-saving potential, studies have indicated that not all nurses in emergency and critical care units are actually familiar with electrical cardioversion procedures and have deficient practical skills (Adal & Emishaw, 2023). This incompetency may cause delays, risks to safety, and poor patient outcomes.

Electrical cardioversion is a high-risk procedure that needs rigid compliance to guidelines, which also needs to synchronize the shocks, the positioning of the electrodes, and monitoring of the sedation process, as well as patient safety (Prasai et al., 2023). The lack of knowledge of these principles may enhance the risk of having procedural complications including cardiac arrest, hypotension, or post-shock arrhythmias. Nurses are commonly the initial medical personnel to diagnose the case of arrhythmia and provide the help in cardioversion; therefore, their level of competence determines the success rate directly and the recovery of the patient (Stylianos Tzeis et al., 2024). The quality and safety of cardiac emergency management requires sufficient nurse preparedness in emergency cardioversion.

Research in developing countries has pointed to the lack of knowledge among nurses with respect to advanced cardiac life support (ACLS) and other procedures involved like cardioversion and defibrillation (Manono, 2022). These shortcomings are due to inadequate training opportunities, absence of simulation-based practice and institutional support. In Saudi Arabia, a study established that simulation-based education was beneficial in enhancing the knowledge and practice of nurses in ACLS and electrical cardioversion procedures (Alshehri, 2024). The findings demonstrate the high urgency of professional development and structured education programs among nurses.

The technical ability of nurses to make fast decisions and their competence in emergency departments can save the lives of patients in case cardiac emergencies arise. Nevertheless, nurses are usually burdened with work, lack of exposure to cardioversion practice, and lack of supervision in the course of resuscitative initiatives (Adal & Emishaw, 2023). All these in effect diminish their confidence and willingness to do electrical cardioversion. Additionally, inadequacy of standardized hospital protocols and regular skills testing also predetermines the incapability of nurses to sustain the competence in emergency cardiac interventions (Nguyen et al., 2023).

Assessing the knowledge and practice of the nurses in terms of electrical cardioversion is important to determine the gaps and create the specific interventions. It has been highlighted in the past research that frequent training and the education through simulations are proven to enhance the confidence, accuracy, and the response time of the nurses during the cardioversion (Alshehri, 2024). Evaluate the existing knowledge and practice level

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will present evidence-based information to enhance the nursing competence and improve patient safety during the cardiac emergency in the hospitals of the tertiary care (Okhotin et al., 2024). Knowledge can also be used to predict how the nurses in the institution perform in actual practice and therefore policies can be informed to incorporate continuous education, supervision and increased skill level. The hospitals should ensure that they develop competency-based training programs that lay emphasis on life-saving operations like electrical cardioversion. The evidence of this research will assist the administrators and educators to enforce evidence-based policies to enhance the quality of clinical practices, maximize patient care-based results, and minimize preventable cardiac deaths in emergency rooms (Naveed et al., 2025).

1.2. PROBLEM STATEMENT:

Electrical cardioversion is a critical life-saving intervention used to restore normal heart rhythm in patients experiencing life-threatening arrhythmias such as atrial fibrillation and supraventricular tachycardia. The effectiveness and safety of this procedure depend heavily on nurses' knowledge, preparedness, and adherence to standardized clinical protocols. In many tertiary care hospitals of Pakistan, nurses working in emergency departments are frequently involved in managing cardiac emergencies but often lack adequate training and experience in performing electrical cardioversion safely and effectively. Limited awareness about synchronization, energy selection, electrode placement, and patient monitoring can lead to procedural complications, patient harm, and poor outcomes.

Despite the growing incidence of cardiac arrhythmias in Pakistan, little is known about the current level of nurses' knowledge and practical competence in performing electrical cardioversion in emergency care settings. Evidence from national and international studies suggests that a significant proportion of nurses demonstrate insufficient understanding and inconsistent practices regarding this procedure. This gap highlights an urgent need for assessment and improvement of nursing competencies related to electrical cardioversion. Therefore, this study aims to evaluate the knowledge and practice of nurses working in the emergency department of a tertiary care hospital, identifying areas requiring targeted education, training, and policy intervention to enhance patient safety and clinical efficiency.

1.3. OPERATIONAL DEFINITIONS:

Electrical Cardioversion:

A medical procedure that delivers a synchronized electrical shock to the heart through the chest wall to restore normal sinus rhythm in patients with certain cardiac arrhythmias such as atrial fibrillation, atrial flutter, or supraventricular tachycardia (Kumar & Singh, 2023).

Knowledge:

In this study, knowledge refers to the theoretical understanding that nurses possess regarding electrical cardioversion, including its indications, contraindications, equipment preparation, patient monitoring, safety measures, and post-procedure care. It will be measured through a structured questionnaire assessing factual and conceptual awareness.

Practice:

Practice refers to the actual performance of nursing tasks and procedures related to electrical cardioversion, including patient preparation, electrode placement, synchronization check, and post-cardioversion care. It will be evaluated using an observation checklist based on clinical standards and hospital protocols.

Nurses:

Registered nurses working in the emergency department of a tertiary care hospital who are directly involved in patient management, including cardiac emergency interventions. Only nurses with at least six months of experience in emergency care will be included in the study.

Emergency Department:

A specialized hospital unit that provides immediate and life-saving treatment to patients presenting with acute or critical conditions such as cardiac arrhythmias, trauma, or respiratory distress.

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1.4. OBJECTIVES OF THE STUDY:

1. To assess the knowledge and practice of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital.

1.5. AIM OF THE STUDY:

The aim of this study is to assess the knowledge and practice of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital.

1.6. RESEARCH QUESTION OF THE STUDY:

1. What is the level of knowledge of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital?
2. What is the level of practice of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital?

1.7. RATIONALE OF THE STUDY:

Electrical cardioversion is a critical, life-saving procedure used in emergency departments to manage life-threatening cardiac arrhythmias. The success and safety of this intervention largely depend on the competency, knowledge, and clinical skills of nurses who are directly involved in patient care during the procedure. In Pakistan, nurses working in tertiary care hospitals frequently encounter cardiac emergencies but often lack adequate training and confidence in performing electrical cardioversion. This knowledge-practice gap poses significant risks to patient safety and clinical outcomes.

Assessing nurses' knowledge and practice regarding electrical cardioversion is essential to identify existing deficiencies, improve clinical preparedness, and enhance the quality of emergency cardiac care. Despite its importance, limited research has been conducted in Pakistan to explore nurses' competency in this area, especially within high-pressure emergency settings. Understanding the extent of this gap will help hospital administrators and nursing educators develop targeted training programs and continuous professional development initiatives to strengthen nursing competence.

The findings of this study will contribute valuable insights into the current state of nurses' theoretical and practical knowledge of electrical cardioversion in tertiary care hospitals. It will also provide evidence for policy formulation, skill-based workshops, and simulation-based training to ensure safe and effective cardiac resuscitation practices. Ultimately, this study aims to support the development of a more skilled and confident nursing workforce, capable of responding efficiently to cardiac emergencies and improving patient survival outcomes.

2. LITERATURE REVIEW:

Electrical cardioversion: It is a life-saving medical emergency intervention that aims at restoring normal heartbeat rhythm among patients with life-threatening atrial fibrillation, atrial flutter and supraventricular tachycardia arrhythmias. It entails the use of synchronized electrical impulses in order to depolarize the myocardial cells and restore an effective heart rate (Caleffi et al., 2025). Although there are various technological innovations in the management of cardiac care, electrical cardioversion is still a complicated and risky process involving specialized professional knowledge. Nurses are critical in patient preparation, procedural safety, and patient post-cardioversion recovery. Hassan et al. (2024) state that proper knowledge and skillfulness in the nurses would be necessary to avoid complications like hypotension, recurrence of arrhythmia, or cardiac arrest during the procedure.

The rate of cardiac arrhythmias is on the rise all over the world, with millions of people diagnosed with the condition, many of whom will need emergency cardioversion as a rhythm control treatment (Caleffi et al., 2025). Cardiovascular diseases are a significant hospitalization cause in Pakistan and other developing nations, and arrhythmia cases are regularly treated by emergency departments, where electrical intervention is required (Li et al., 2024). Nonetheless, a number of studies suggest that nurses do not find adequate theoretical and practical information concerning electrical cardioversion (Hassan et al., 2024). These shortcomings can negatively impact procedural

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safety and efficiency, leading to postponed interventions and adverse patient outcomes. The increasing pressure of cardiac crises supports the significance of ongoing nurse education and competency-related training courses.

The knowledge of the indications, contraindications, and safety precautions of electrical cardioversion is an important factor influencing competence in the use of electrical cardioversion among nurses. Chen et al. (2022) highlighted that during the cardioversion, inappropriate synchronization or electrode positioning can cause life-threatening cardiac arrhythmias, including ventricular fibrillation. In the same way, Bijani et al. (2021) noted that improper preparation and monitoring of patients may lead to negative consequences such as burns and hemodynamic instability. These results indicate the need of theoretical skills and technical expertise among nurses in emergency and critical care departments.

In developing countries, it has been established that there is still a knowledge gap between nurses regarding cardioversion and defibrillation practices. Adal and Emishaw (2023) found that a smaller proportion of emergency nurses showed sufficient understanding of synchronized shock delivery and energy choice (less than half of them). Similarly, Charan et al. (2025) established that a small percentage of nurses in tertiary hospitals observed the right procedures during electrical cardioversion. The results highlight the necessity of the standardized training programs and competency assessment systems to enhance the clinical performance and improve patient safety.

Nurses are also practitioners who work in the emergency department where they are usually the first to be able to identify the arrhythmias, prepare patients, and assist physicians during cardioversion. Nonetheless, excessive workload and lack of procedural exposure combined with the lack of sufficient training lead to decreased confidence and effectiveness of carrying out the cardioversion (Gholipour et al., 2025). In addition, such institutional issues as the lack of clear directives, supervision, and continued education opportunities also contribute to practice inconsistencies (Gitau, 2023). These institutional obstacles point to the necessity of organizational changes and formal mentorship in emergency nursing.

Clinical competence of nurses can be greatly impacted by continued education and institutional support. Ortega-Lapiedra et al. (2023) observed that frequent training and professional development interventions build the confidence, precision, and critical decision-making of nurses in cardiac care. On the same note, Rostami et al. (2025) also highlighted that performance enhancement techniques, such as simulation-based learning and ongoing examination, are key in enhancing emergency nursing capabilities. Hospitals that have undertaken this culture of training based on competencies have indicated better preparedness of the nurses handling cardiac emergencies.

There are data indicating that the knowledge and practice of nurses in electrical cardioversion should be subject to a systematic assessment and improvement on an international level. Li et al. (2024) hypothesized that emergency nurses can be enhanced in their self-efficacy and response to critical situations through creating customized competency frameworks and supportive supervision. Such interventions have the potential to close the knowledge-practice gaps, decrease the number of complications that can be prevented, and encourage patient safety. Thus, determining the knowledge and practical competence of nurses about the electrical cardioversion in the tertiary care hospitals is necessary to enhance the quality of cardiac emergency care, as well as promote the development of evidence-based nursing practice.

3. METHODOLOGY

3.1. STUDY SETTING:

The study was carried out at **Sheikh Zayed Hospital, Lahore**, which is a tertiary care teaching hospital providing specialized healthcare services to a large population. The hospital's emergency department was selected as the research site because it routinely deals with cardiac emergency cases requiring electrical cardioversion and is staffed with nurses from various professional backgrounds and experience levels.

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3.2. STUDY DESIGN:

This study was a **descriptive cross-sectional** design conducted to assess the knowledge and practice of nurses regarding electrical cardioversion in the emergency department of a tertiary care hospital. The design was chosen to obtain a comprehensive understanding of nurses' current level of awareness and their practical application of the procedure at a single point in time.

3.3 STUDY POPULATION

The study population consisted of **registered nurses** working in the **emergency department of Sheikh Zayed Hospital, Lahore**. These nurses were directly involved in patient care, including cardiac emergency management and assistance in electrical cardioversion procedures.

3.4. SAMPLE SIZE:

A total of **80 nurses** participated in the study. The sample size was determined using a **confidence interval of 95%, margin of error of 5%**, and an estimated population of 100 emergency nurses, as per hospital records. The calculation was performed using the **OpenEpi sample size calculator**.

3.5. SAMPLING TECHNIQUE:

A **convenience sampling technique** was used to select participants who met the inclusion criteria and were available during the data collection period.

3.6. SAMPLE SELECTION:

3.6.1. Inclusion Criteria:

1. Registered nurses working in the emergency department of Sheikh Zayed Hospital.
2. Nurses with at least **six months of experience** in emergency or critical care.
3. Nurses who **voluntarily consented** to participate in the study.

3.6.2. Exclusion Criteria:

- Nurses not directly involved in patient care (administrative staff).
- Student nurses and trainees.
- Nurses who were on leave or refused to participate during the data collection period.

3.7. DATA COLLECTION PROCEDURE:

After obtaining **ethical approval** from the institutional review board of Sheikh Zayed Hospital, official permission was taken from the **nursing superintendent**. The researcher approached nurses in the emergency department, explained the purpose of the study, and obtained **informed written consent**. The questionnaires were distributed during duty hours and collected after completion. Confidentiality and anonymity were maintained throughout the process.

3.8. DATA ANALYSIS PROCEDURE:

Data were analyzed using the **Statistical Package for the Social Sciences (SPSS) version 25**. Descriptive statistics such as **frequency, percentage, mean, and standard deviation** were calculated for demographic variables, knowledge, and practice scores. The relationship between nurses' demographic characteristics and their knowledge and practice levels was analyzed using **Chi-square tests**. A **p-value ≤ 0.05** was considered statistically significant.

3.9. ETHICAL CONSIDERATIONS

Ethical clearance was obtained from the **Institutional Ethical Review Committee** of Sheikh Zayed Hospital, Lahore. Participants were informed about the study's purpose, voluntary participation, and right to withdraw at any time. No identifying information was recorded, ensuring participant confidentiality. All data were stored securely and used solely for academic research purposes.

4 RESULT AND ANALYSIS:

Table 1: Demographic Characteristics of Nurses (n = 80)

Variable	Categories	Frequency (f)	Percentage (%)
Age (years)	20–25	18	22.5
	26–30	32	40.0
	31–35	20	25.0

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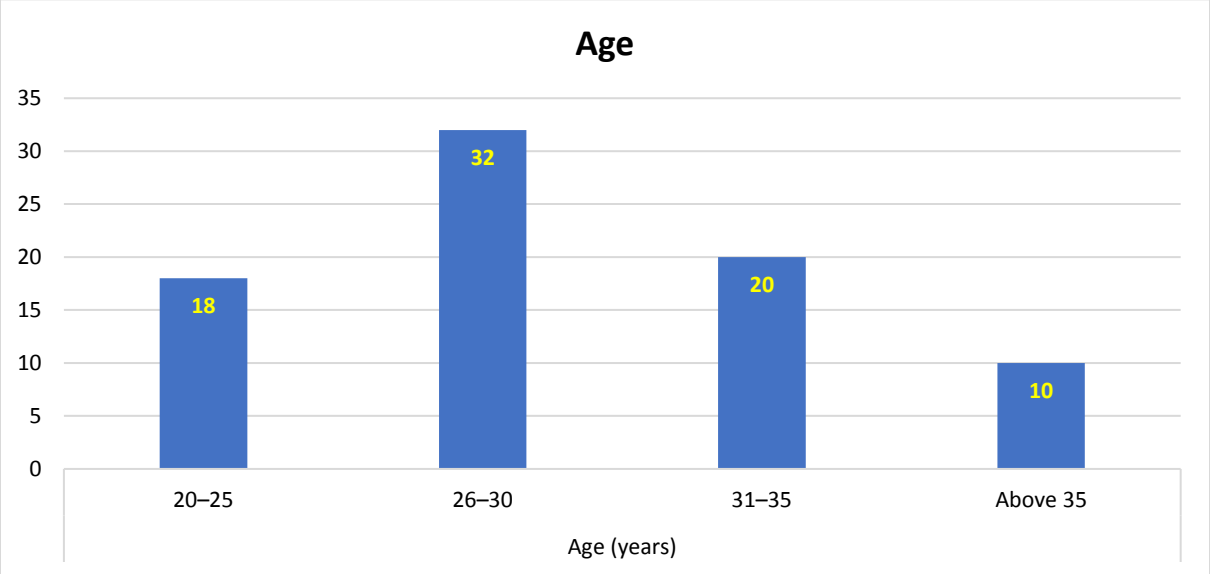
	Above 35	10	12.5
Gender	Female	62	77.5
	Male	18	22.5
Educational Qualification	Diploma in Nursing	35	43.8
	BSc Nursing	38	47.5
	Post RN BSc Nursing	7	8.7
Experience in Emergency (years)	0.5–2	21	26.3
	3–5	33	41.3
	>5	26	32.5
Training on Electrical Cardioversion	Yes	28	35.0
	No	52	65.0

Most participants (40%) were aged 26–30 years, and females predominated (77.5%). Nearly half (47.5%) held a BSc Nursing degree. About 41.3% had 3–5 years of emergency experience, while 35% had received formal training on electrical cardioversion.

Figure 1: Age of Participants



The data indicate that most participants (40%) were aged between 26–30 years, followed by 25% in the 31–35 age group. A smaller proportion (22.5%) were between 20–25 years, while only 12.5% were above 35 years.

Figure 2: Gender of Participants

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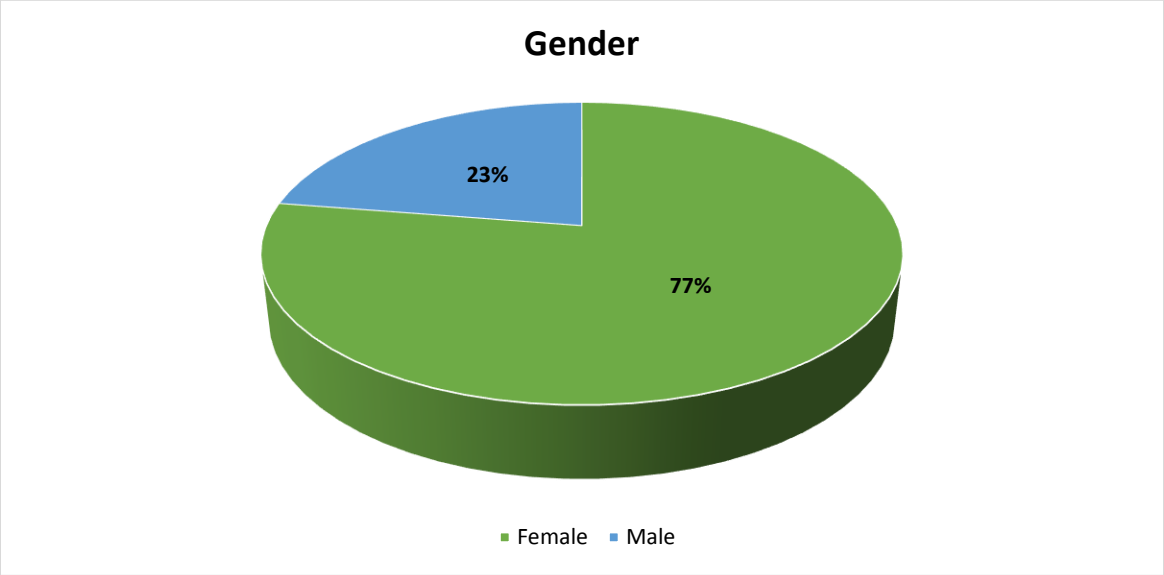
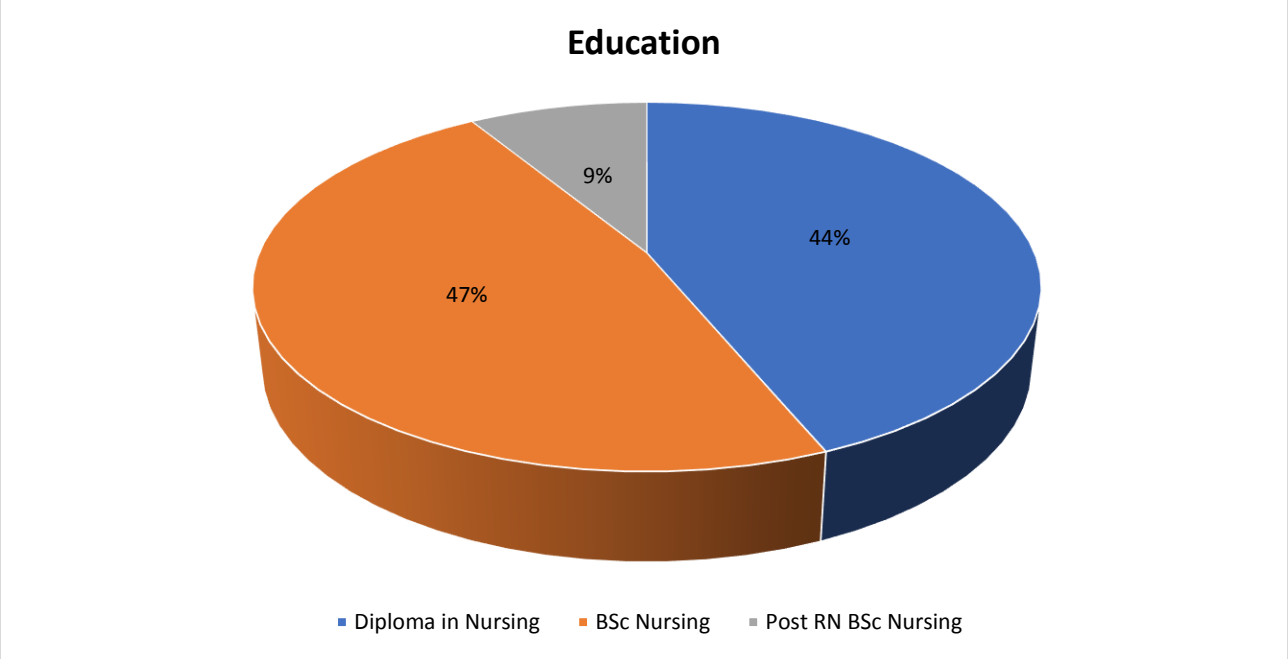


The majority of participants were female (77.5%), while a smaller proportion (22.5%) were male, indicating that the nursing workforce in the emergency department was predominantly female.

Figure 3: Educational Level



Nearly half of the participants (47.5%) held a BSc in Nursing, while 43.8% had a Diploma in Nursing. Only a small proportion (8.7%) possessed a Post RN BSc Nursing qualification, indicating that most nurses had basic or undergraduate-level nursing education.

Figure 4: Experience Level

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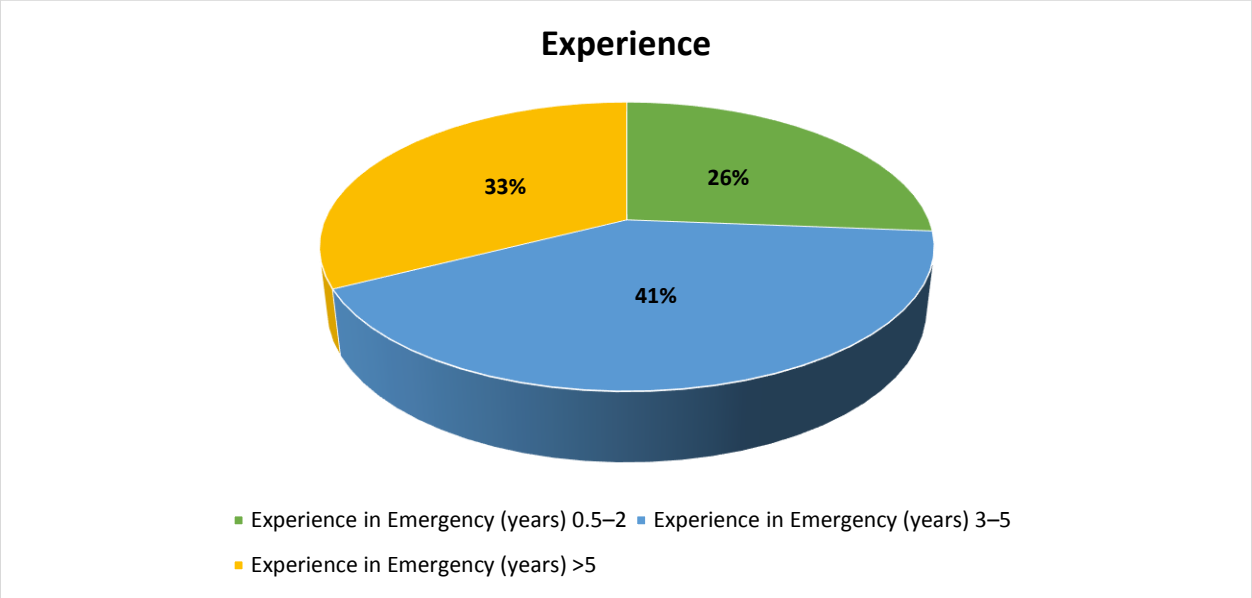
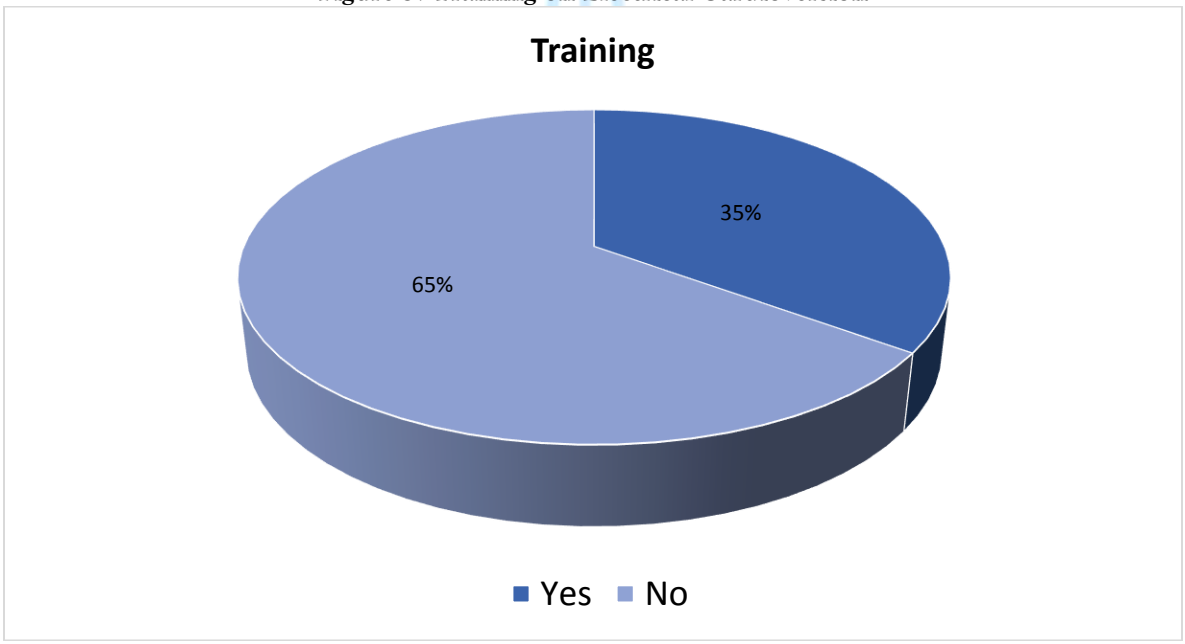


The results show that most nurses (41.3%) had 3–5 years of experience in the emergency department, while 32.5% had more than 5 years of experience. A smaller proportion (26.3%) had between 0.5–2 years of experience, indicating a moderately experienced nursing workforce.

Figure 5: Training on Electrical Cardioversion



The findings revealed that only 35% of nurses had received training on electrical cardioversion, while the majority (65%) had not undergone any formal training, highlighting a significant gap in specialized skill development.

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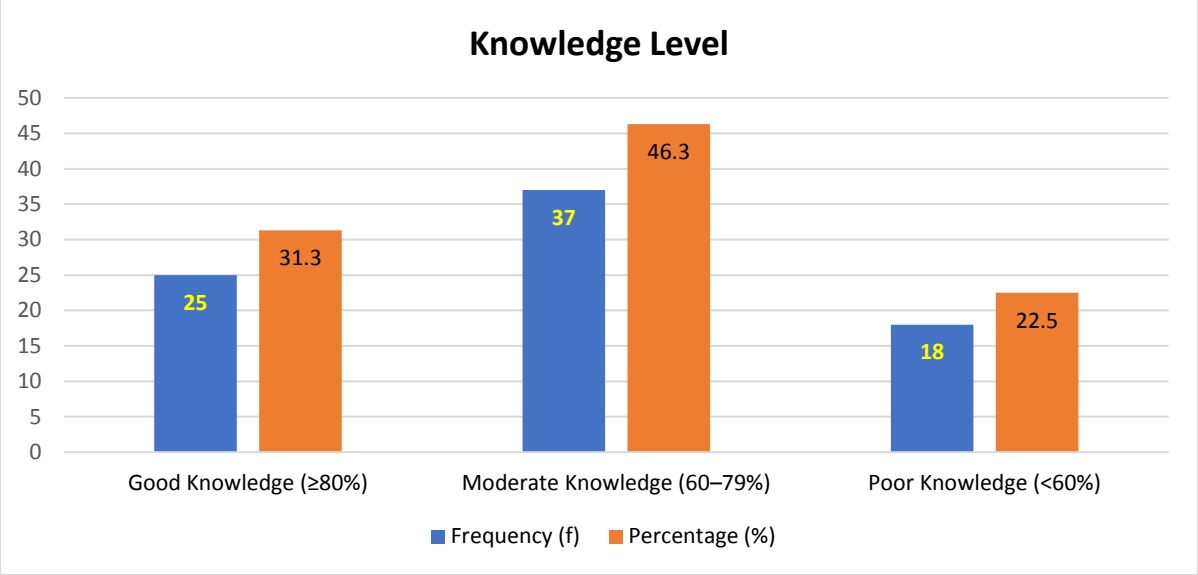
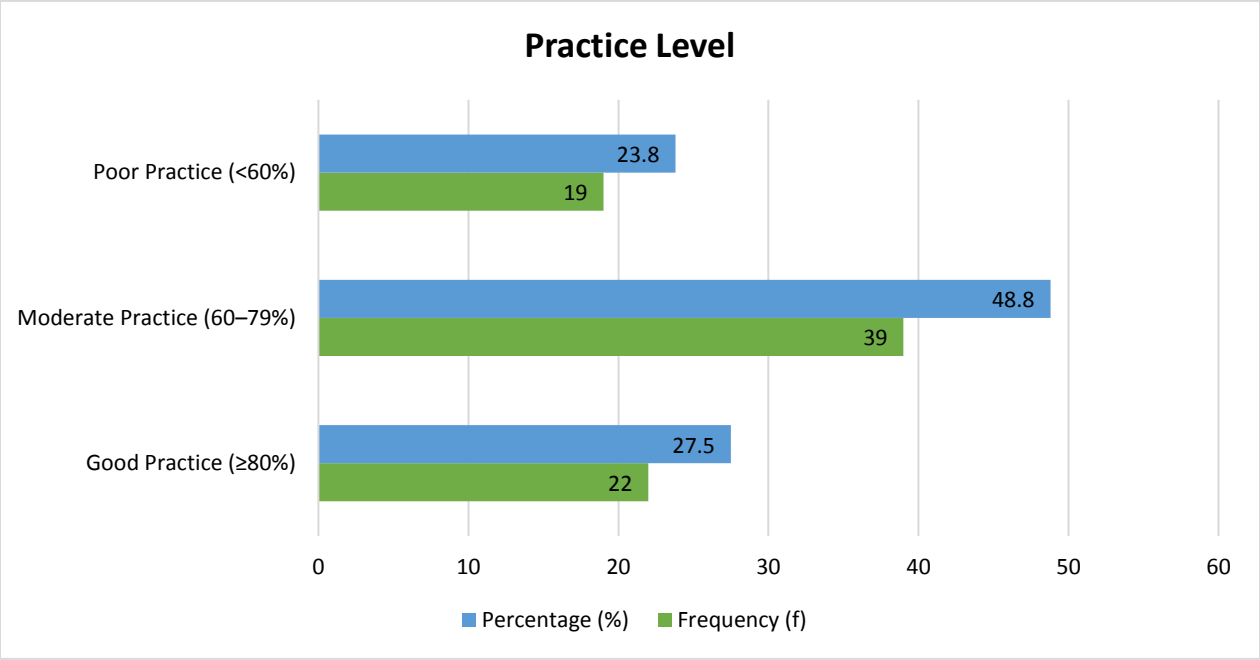
Figure 6: Nurses' Knowledge Level Regarding Electrical Cardioversion (n = 80)



Nearly half of the nurses (46.3%) demonstrated moderate knowledge about electrical cardioversion. Only 31.3% exhibited good knowledge, while 22.5% had poor understanding of the procedure and safety aspects.

Figure 7: Nurses' Practice Level Regarding Electrical Cardioversion (n = 80)



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Most nurses (48.8%) exhibited moderate levels of practice in performing or assisting with electrical cardioversion. Only 27.5% showed good practice, while nearly one-fourth (23.8%) demonstrated poor adherence to standard procedures.

Table 2: Relationship Between Knowledge and Practice of Nurses (n = 80)

Variable	χ^2 (Chi-square)	df	p-value	Association
Knowledge vs. Practice	9.42	2	0.009	Significant

A statistically significant relationship was found between knowledge and practice levels (p = 0.009), indicating that nurses with higher knowledge scores were more likely to demonstrate better practical performance.

Table 3: Association Between Demographic Variables and Knowledge Level (n = 80)

Variable	χ^2	df	p-value	Association
Age	3.65	3	0.302	Not Significant
Gender	1.27	1	0.260	Not Significant
Education	8.72	2	0.013	Significant
Experience	5.38	2	0.068	Not Significant
Training	14.91	1	0.000	Significant

Educational qualification (p = 0.013) and previous training (p = 0.000) showed significant associations with knowledge scores. Age, gender, and experience were not significantly related to knowledge level.

Table 4: Association Between Demographic Variables and Practice Level (n = 80)

Variable	χ^2	df	p-value	Association
Age	2.98	3	0.393	Not Significant
Gender	0.86	1	0.354	Not Significant
Education	7.51	2	0.023	Significant
Experience	6.84	2	0.033	Significant
Training	10.74	1	0.001	Significant

Nurses' education level, experience, and prior training on electrical cardioversion were significantly associated with better practice performance. No significant difference was observed across age or gender.

5 DISCUSSIONS OF THE STUDY:

The results of the current research indicated that nurses in the emergency unit of Sheikh Zayed Hospital, Lahore, had moderate knowledge and practice on electrical cardioversion. Almost 50 percent of the sampled respondents were moderate in their knowledge and practices and only a small percentage were good at it. These findings are in line with the results of Abdelkareem et al. (2023), who have stated that the performance of nurses in terms of cardiac procedures was typically moderate before the structured training intervention. On the same note, Mohamed and Hussein (2022) found that the majority of nurses were not properly versed in theoretical backgrounds of the defibrillation and cardioversion procedures, so ongoing education

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and specific training were necessary to enhance clinical preparedness.

The research also established that educational degree and previous training were found to have highly correlated knowledge and practice in nurses. This fact is consistent with the study by Hassan et al. (2021), who determined that sustained professional training resulted in a better ability to address cardiac emergencies. Equally, El-Sayed et al. (2020) emphasized that the use of simulation-based workshops boosted the confidence of nurses in undertaking electrical cardioversion safely and their technical skills. The current findings by Asghar et al. (2025) also substantiate this fact by stating that continuous staff development initiatives are essential in enhancing the performance of healthcare institutions as well as patient satisfaction. Taken together, all these results highlight the vitality of coordinated and consistent professional education in enhancing the emergency nursing human resource.

In contrast, other studies have indicated an increase in the level of knowledge of nurses in the same environment. As an illustration, Rahman et al. (2022) observed that 60 percent of nurses in a Malaysian tertiary hospital showed a good level of knowledge of cardioversion because the systematic in-service education programs were available. Similarly, Zaher et al. (2023) documented high safety and efficacy rates of cardioversion under nurse leadership in one of the tertiary hospitals in Europe. The relative knowledge scores in the present study could be due to the relatively less exposure to simulation or infrequent refresher courses in Pakistani hospitals. The mentioned difference emphasizes the significance of institutional support and ongoing competency assessment, which is also mentioned by Bajwa et al. (2024) in their scoping review of simulation-based education in Pakistan.

Practically, the present study took place that found that less than one-third of the nurses exhibited good practice when conducting electrical cardioversion. Such a result is in line with Basuony et al. (2023) where a disconnect between theory and practice was observed among Egyptian emergency nurses. On the same note, Ahmed et al. (2021) found that though nurses had sufficient knowledge in cardiac care, practice deficiencies existed because they did not have clinical exposure. Other investigations in Ethiopia and Pakistan have yielded similar results, in which procedural practice opportunities are limited to provide inconsistent performance (Belay et al., 2024; Parveen et al., 2025). Hence, the application of theory and practical training, such as simulation based sessions and supervised activity is crucial in overcoming the knowing-doing gap.

High level of correlation between knowledge that is seen in this study and practice supports the strong proved relationship between cognitive knowledge and technical performance. This observation is in line with Olaogun et al. (2020), who established that there is a positive relationship between the knowledge of nurses and emergency resuscitation adherence. Nonetheless, Khalid et al. (2022) believed that the effective practice of well-trained nurses can be impeded by external factors (workload, anxiety, and inadequate resources). In the same manner, Khan et al. (2024) highlighted that organizational culture and supervision have a direct impact on the capability of nurses to utilize their knowledge correctly. Therefore, the educational interventions should be supported by the institutional and managerial support to guarantee the long-term clinical improvement.

Additionally, nurses who had longer experience and had experienced prior training were identified to be better in their practice as per Youssef et al. (2021), who showed that experienced nurses were more skilled in the management of cardiac arrest cases. Nonetheless, Salem et al. (2020) and Rostami et al. (2025) warned that experience is not a prerequisite to competence that does not require continuous education. Likewise, Pueyo-Garrigues et al. (2022) observed that the constant evaluation and reinforcement are crucial to ensure the accuracy of the procedures. This explains the need to incorporate experiential learning with structured refresher courses in order to guarantee sustainability of the skills and adherence to the international standards of emergency care.

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On balance, this paper highlights that though nurses working in the emergency department have moderate knowledge and practice about electrical cardioversion, there are significant gaps that can be eliminated with the help of lifelong learning, simulation, and supervision. These results are consistent with the studies of Hussein et al. (2023) and Abed et al. (2022), who demonstrated that performance can be improved significantly after the implementation of structured in-service programs. Competence among nurses can be increased by strengthening institutional policies, simulated learning as suggested by Manzoor et al. (2025), and provision of sufficient resources to train nurses. Finally, the development of the culture of lifelong learning and clinical excellence will make nurses better equipped to manage cardiac crises effectively and positively increase patient safety rates in general.

6 CONCLUSION AND RECOMMENDATIONS OF THE STUDY:

6.1. CONCLUSION:

The present study concluded that nurses working in the emergency department of Sheikh Zayed Hospital, Lahore, possessed a **moderate level of knowledge and practice** regarding electrical cardioversion. Although most participants demonstrated awareness of the procedure's basic principles, gaps were evident in their practical application and adherence to standard protocols. A statistically significant relationship was found between knowledge and practice, indicating that improved understanding directly enhances clinical performance. Furthermore, educational qualification, clinical experience, and prior training were identified as major determinants of competence in electrical cardioversion.

The findings emphasize the **need for continuous professional education, simulation-based training, and refresher workshops** to enhance nurses' technical proficiency and confidence in managing cardiac emergencies. Hospital administrations and nursing educators should prioritize structured training programs and supportive supervision to bridge the knowledge–practice gap. By promoting evidence-based practice and lifelong learning among emergency nurses, healthcare institutions can improve the quality and safety of cardiac patient care outcomes.

6.2. RECOMMENDATIONS OF THE STUDY:

Based on the findings and conclusions of this study, the following recommendations are proposed to improve nurses' knowledge and practice regarding electrical cardioversion in emergency settings:

1. **Regular In-Service Training:** Hospitals should organize periodic training sessions and workshops focused on electrical cardioversion techniques, safety measures, and updated resuscitation protocols to enhance nurses' competency and confidence.
2. **Simulation-Based Learning:** Incorporating simulation exercises into clinical education can help nurses gain hands-on experience, improve procedural accuracy, and strengthen their decision-making skills during real cardiac emergencies.
3. **Continuing Nursing Education (CNE):** Nursing administrators should ensure that continuing education programs include cardiac emergency management and electrical cardioversion as mandatory components for professional development and license renewal.
4. **Development of Standard Operating Procedures (SOPs):** Clear, evidence-based guidelines should be displayed and implemented in emergency departments to ensure standardized and safe performance of electrical cardioversion.
5. **Mentorship and Supervision:** Senior and experienced nurses should mentor junior staff to foster skill transfer, encourage teamwork, and build clinical confidence in performing cardioversion procedures.
6. **Assessment and Evaluation:** Regular evaluation of nurses' knowledge and practical competencies through tests, audits, and peer assessments should be conducted to identify learning gaps and provide timely feedback.
7. **Policy Support:** Hospital management and nursing education authorities should develop policies that promote ongoing competency-based training programs and allocate resources for modern equipment and educational materials related to cardiac care.

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8. **Future Research:** Further studies involving larger samples and multi-center participation are recommended to explore barriers to effective practice and to evaluate the impact of targeted training interventions on nurses' clinical performance.

6.3. STRENGTH OF THE STUDY

This study possesses several strengths that contribute to its credibility and academic value. Firstly, it is among the few studies conducted in Pakistan that specifically assess nurses' knowledge and practice regarding **electrical cardioversion**, an essential yet often overlooked emergency procedure. By focusing on this area, the study fills a critical gap in local nursing literature and provides a foundation for future research and policy development.

Secondly, the study was conducted in a **tertiary care teaching hospital**, where nurses are routinely involved in managing cardiac emergencies. This setting provided a realistic and practical context for evaluating nurses' competencies, thereby enhancing the study's external validity and applicability to similar healthcare environments.

Thirdly, the study employed a **structured and validated questionnaire** and followed a well-defined methodological framework, including clear inclusion criteria and ethical procedures. This systematic approach ensured the reliability and consistency of data collection and analysis.

Additionally, the use of **SPSS statistical software** allowed for accurate data interpretation and the application of inferential tests such as the Chi-square and Pearson's correlation, which strengthened the analytical rigor and validity of the findings.

Another significant strength lies in the **comparative analysis of knowledge and practice**, which provided a deeper understanding of how theoretical awareness translates into clinical performance. This relationship is critical for identifying educational gaps and designing targeted training programs.

Lastly, the study adhered to strict **ethical standards**, ensuring voluntary participation, confidentiality, and the protection of participants' rights. This ethical integrity enhances the study's credibility and acceptability for academic and institutional use.

6.4. LIMITATIONS OF THE STUDY:

Despite its significance and methodological rigor, this study had certain limitations that should be acknowledged. Firstly, the study was conducted in **a single tertiary care hospital (Sheikh Zayed Hospital, Lahore)**, which may limit the generalizability of the findings to other healthcare settings with different organizational structures, resources, or nurse-to-patient ratios.

Secondly, the study utilized a **convenience sampling technique**, which may have introduced selection bias, as only nurses available and willing to participate during the data collection period were included. This could have influenced the representativeness of the sample and the overall findings.

Thirdly, data were collected through **self-reported questionnaires**, which rely on participants' honesty and recall. This approach may have led to response bias, as some nurses might have overestimated their knowledge or practice levels due to social desirability or fear of evaluation.

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