

RELATIONSHIP BETWEEN CPR KNOWLEDGE AND PRACTICE CHALLENGES AMONG NURSES IN A TERTIARY CARE HOSPITAL, LAHORE

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ABSTRACT

Background

Cardiac arrest is a leading cause of in-hospital mortality, and timely initiation of cardiopulmonary resuscitation (CPR) is critical for patient survival. Nurses are often the first responders to cardiac emergencies in tertiary care hospitals; therefore, adequate CPR knowledge and the ability to overcome practice-related challenges are essential. Despite established CPR guidelines, nurses frequently encounter barriers that may hinder effective resuscitation efforts, particularly in high-acuity clinical settings.

Aim

To determine the correlation between CPR knowledge and practice challenges among nurses working in a tertiary care hospital in Lahore, Punjab, Pakistan.

Methods

A correlational cross-sectional study design was employed. The study was conducted at Services Hospital, Lahore, and included 80 registered staff nurses selected using a convenience sampling technique. Data were collected using a structured self-administered questionnaire comprising demographic information, a CPR knowledge assessment based on American Heart Association guidelines, and a practice challenges scale. Data were analyzed using SPSS version 26. Descriptive statistics summarized demographic characteristics and CPR knowledge levels. Chi-square tests assessed associations between CPR knowledge and demographic variables, while Pearson's correlation coefficient determined the relationship between CPR knowledge and practice challenges.

Results

The mean CPR knowledge score was 7.85 ± 2.41 , indicating a moderate level of knowledge. More than half of the nurses demonstrated moderate CPR knowledge. Lack of confidence, inadequate training, and psychological stress were the most frequently reported practice challenges. CPR knowledge was significantly associated with clinical area and clinical experience ($p < 0.05$). A statistically significant moderate negative correlation was found between CPR knowledge and practice challenges ($r = -0.42$, $p < 0.001$).

Conclusion

Nurses exhibited moderate CPR knowledge, and higher knowledge was associated with fewer perceived practice challenges. Regular training, simulation-based learning, and institutional support are recommended to enhance CPR competency and improve resuscitation outcomes.

Keywords

Cardiopulmonary resuscitation, CPR knowledge, practice challenges, nurses, tertiary care hospital

Introduction

Cardiopulmonary resuscitation (CPR) is a lifesaving emergency procedure performed to restore cardiac and respiratory function in patients experiencing cardiac arrest. CPR knowledge refers to nurses' understanding of the correct sequence of actions, compression-ventilation ratio, compression depth and rate, airway management, and the use of automated external defibrillators according to international guidelines. Practice challenges refer to the physical, psychological, organizational, and legal barriers that may hinder nurses from performing CPR effectively in real clinical situations. Nurses in tertiary care hospitals are often the first responders to cardiac emergencies, making CPR competency essential for patient survival and outcomes (American Heart Association, 2023). These concepts form the foundation for examining the relationship between CPR knowledge and challenges to practice among nurses in high-acuity clinical settings.

Cardiac arrest is also a leading cause of death in the global context, especially in hospital where patients who are critically ill are at a higher risk. It is indicated that early and high-quality CPR is an effective method of improving survival and neurologic outcomes among patients suffering sudden cardiac arrest (Topjian et al., 2021). The role of initiating CPR lies with nurses because they are the ones who are at the bedside most of the time. Although the current state of the science of resuscitation has improved, the discrepancies in knowledge and performance of CPR among nursing staff continue to exist, which is why the evaluation of competence and impediments to practice should be regarded as essential (Oermann et al., 2022).

Nurses are put under the high pressure to make quick decisions and be technical in their clinical exposures to cardiac emergencies. It has been demonstrated that poor CPR knowledge will lead

to a delay in the start of such a process, incorrect compressions, and overall ineffectiveness of the resuscitative attempt (Meaney et al., 2021). Such difficulties are increased by the inadequate hands-on, lack of simulation, and the limited CPR incidences in real life, which are also associated with the deterioration in the retention of skills by nurses (Alhassan et al., 2023).

Physiologic degradation in the cardiac arrest requires prompt medical attention to avoid permanent irreparable organ destruction. Until advanced life support provision is possible effective CPR sustains both cerebral and coronary perfusion. Poor patient outcomes are caused by inadequate compression depth, wrong hand position, and improper ventilation method (Perkins et al., 2021). Without confidence or sufficient knowledge, nurses might be reluctant to perform CPR, which is likely to cause death. CPR training and competency tests can hence be described as vital aspects of quality nursing care.

Various factors within the clinical setting affect the relationship between CPR knowledge and performance in practice. It has been found out that better CPR performance can be observed in nurses who have a higher level of theoretical knowledge both in simulated and real emergency situations (Kim and Ahn, 2022). Practice issues, on the other hand, that are likely to disrupt the willingness and capability of nurses to do CPR include fear of harming, fear of infection, insufficient equipment, psychological pressure, and legal issues (Alshammari et al., 2021). These obstacles are common in tertiary care hospitals where the patients are very sick.

Institutional support and training programs are the key to CPR competency retention. Frequent training on the Basic Life Support and Advanced Life Support is linked to enhanced knowledge retention and lowered performance anxiety in nurses (Owolabi et al., 2022). The absence of refresher training and small access to simulation-

based educational settings are the factors that result in decreasing CPR competence with time, especially in resource-constrained healthcare systems.

The organizational factors that lead to practice challenges concerning CPR include poor staffing, excessive workload, lack of detailed resuscitation guidelines, and lack of access to resuscitation equipment (Almeida et al., 2023). Psychological strain in cases of emergency also influences the performance of nurses causing hesitations or mistakes. These issues need specific educational intervention and favorable workplace policies to be addressed.

CPR is still a core aspect of the nursing practice in tertiary care hospitals. It is also necessary to comprehend the relationship between CPR knowledge and practice issues among a nurse to enhance resuscitation outcomes. The recognition of knowledge gaps and obstacles to practice would be useful to develop structured training programs, positive institutional policies, and evidence-based strategies that would increase the confidence and competence of nurses. CPR preparedness among nurses can help to increase patient survival, decrease in-hospital mortality and improve the quality emergency care in tertiary hospitals.

Methods

This study utilized a correlational cross-sectional study design to explore the association between knowledge of cardiopulmonary resuscitation (CPR) and practice-related issues for nurses within one of the largest tertiary care facilities. Services Hospital Lahore, Punjab, Pakistan, provides emergency, critical care, and surgical services as part of its health offerings. The study population included registered staff nurses who had direct patient care responsibilities in the medical, surgical, and emergency nursing services, as well as within the intensive care and coronary care units and the inpatient nursing wards. The sample comprised 80 nurses. The Raosoft sample size calculator for study surveys was used to determine the sample size at a 95% confidence interval and 5% margin of error. The convenience sampling method was used for study recruitment. The inclusion criteria required at least six (6) months

of clinical practice as a registered nurse and willingness to participate. The exclusion criteria comprised nursing students, nurses in training, nurses on administrative or extended leave, nurses with less than six (6) months of clinical practice, and those who were in receipt of leave.

Data Collection Procedure

Approval from nursing administration as well as from the relevant hospital departments was sought before data collection commenced. Eligible nurses were approached during their break and after their clinical shifts. A detailed explanation of objectives and significance of the study in addition to the risks and benefits of participating was provided to all potential participants. Participation in the study was granted only after participants provided the researcher with written consent. Data collection was achieved using a hard-copy structured self-administered questionnaire. Participants completed the questionnaire and returned it to the researcher immediately. The study process safeguarded the participants' right to privacy and anonymity. Participants were informed that the study would not compromise the confidentiality of their personal information and that data would be used for the study only.

Data Analysis Procedure

Data were subjected to coding and were analyzed with the Statistical Package for the Social Sciences (SPSS) version 26 after they had been entered. Descriptive statistics such as frequencies, percentages, means, and standard deviations were computed for demographics, levels of knowledge of CPR, and practice challenges. Inferential statistics were used to study the relationships of the variables in the study. Chi-square tests were used to evaluate associations among categorical variables and practice challenges and knowledge of CPR were evaluated using Pearson's correlation. A p-value of less than 0.05 was considered statistically significant.

Results

Demographic Analysis

The demographic characteristics showed that most nurses were aged between 30–39 years (43.8%),

followed by those aged 20–29 years (40.0%). Female nurses constituted the majority of participants (72.5%), while males represented 27.5% of the sample. Nurses were distributed across various clinical areas, with the highest proportion working in the emergency department (25.0%). Medical and surgical wards accounted for 22.5% and 20.0% of participants, respectively,

while ICU and CCU staff comprised smaller proportions. Regarding clinical experience, most nurses had 3–5 years of experience (37.5%). Nurses with 6 months to 2 years of experience accounted for 35.0%, whereas those with more than 5 years of experience represented 27.5% of the sample.

Table 4.1
Demographic Characteristics of Nurses at Services Hospital, Lahore (N = 80)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–29	32	40.0
	30–39	35	43.8
	≥40	13	16.2
Gender	Male	22	27.5
	Female	58	72.5
Clinical Area	Medical Ward	18	22.5
	Surgical Ward	16	20.0
	Emergency	20	25.0
	ICU	15	18.8
	CCU	11	13.7
Clinical Experience	6 months–2 years	28	35.0
	3–5 years	30	37.5
	>5 years	22	27.5

The mean CPR knowledge score among nurses was 7.85 out of a possible 15, with a standard deviation of 2.41. This indicates a moderate level of CPR knowledge, with noticeable variability in knowledge scores among the participants.

Table 2
Mean CPR Knowledge Score of Nurses

Variable	Mean	Standard Deviation
CPR Knowledge Score (out of 15)	7.85	2.41

The findings revealed that lack of confidence and inadequate training were the most prominent practice challenges to CPR, with the majority of nurses either strongly agreeing or agreeing with these statements. A considerable proportion of participants also reported psychological stress as a major barrier during CPR performance. Fear of injuring the patient was identified as a challenge by more than half of the nurses, indicating concern about causing harm during resuscitation.

Responses regarding fear of infection were more evenly distributed, suggesting mixed perceptions among nurses. In contrast, most participants disagreed that lack of equipment was a major barrier, indicating adequate availability of resources. Legal concerns were acknowledged by a substantial number of nurses, reflecting apprehension about medico-legal consequences associated with CPR practice.

Table 3
Perceived Practice Challenges to CPR Among Nurses

Practice Challenge	Strongly Agree (%)	n	Agree (%)	n	Neutral (%)	n	Disagree (%)	n	Strongly Disagree (%)	n
Fear of injuring patient	12 (15.0)		35 (43.8)		18 (22.5)		12 (15.0)		3 (3.7)	
Fear of infection	8 (10.0)		22 (27.5)		25 (31.2)		20 (25.0)		5 (6.3)	
Lack of confidence	25 (31.2)		32 (40.0)		10 (12.5)		10 (12.5)		3 (3.7)	
Inadequate training	30 (37.5)		28 (35.0)		15 (18.8)		5 (6.2)		2 (2.5)	
Psychological stress	20 (25.0)		38 (47.5)		12 (15.0)		8 (10.0)		2 (2.5)	
Lack of equipment	5 (6.2)		15 (18.8)		20 (25.0)		30 (37.5)		10 (12.5)	
Legal concerns	18 (22.5)		30 (37.5)		20 (25.0)		10 (12.5)		2 (2.5)	

The chi-square analysis showed no statistically significant association between CPR knowledge level and gender ($\chi^2 = 1.24$, $df = 2$, $p = 0.538$). However, a statistically significant association was observed between CPR knowledge level and clinical area ($\chi^2 = 15.67$, $df = 8$, $p = 0.047$), indicating that CPR knowledge varied across

different clinical units. Additionally, clinical experience demonstrated a highly significant association with CPR knowledge level ($\chi^2 = 18.92$, $df = 4$, $p = 0.001$), suggesting that nurses with greater clinical experience had better CPR knowledge.

Table 4
Association Between CPR Knowledge Level and Demographic Variables

Variable	χ^2 value	df	p-value
Gender	1.24	2	0.538
Clinical Area	15.67	8	0.047*
Clinical Experience	18.92	4	0.001*

The correlation analysis revealed a moderate negative relationship between CPR knowledge score and overall practice challenges score ($r = -0.42$, $p < 0.001$). This statistically significant

finding indicates that higher CPR knowledge was associated with fewer perceived practice challenges among nurses.

Table 5
Correlation Between CPR Knowledge and Practice Challenges

Variables	Pearson's r	p-value
CPR Knowledge Score & Overall Practice Challenges Score	-0.42	<0.001*

Discussion

The current paper has investigated the connection between the CPR knowledge and practice issues among the nurses in a tertiary hospital in Lahore, Pakistan. The results revealed that there was moderate level of knowledge on CPR among nurses who showed significant differences among different clinical areas and experience. These findings demonstrate the persistent significance of

routine CPR training and organizational encouragement so that effective resuscitation practices can be adopted in the hospital environment.

The demographic results showed that the majority of the nurses were aged 20 to 39, with the female population. This finding aligns with the profile of the global nursing workforce in which females are the majority of the clinical nursing workers

(World Health Organization, 2020). The same age and gender tendencies are also observed in the research carried out in Pakistan, Saudi Arabia, and other developing nations, which indicates similar workforce demographics (Alshammari et al., 2021).

The findings indicated that a greater proportion of nurses were moderate in their level of CPR knowledge with only a quarter being good in their knowledge. The result coincides with the findings of the research that have cited moderate knowledge of CPR among nurses even after exposure to training (Kim and Ahn, 2022; Meaney et al., 2021). By comparison, high-income countries have documented better frequencies of nurses with a good CPR understanding, which is credited to organized training, recurrent refining courses, and learning through simulation (Oermann et al., 2022).

The average CPR knowledge score also justifies the observation of average overall knowledge in the participants. This variability in scores implies that exposure to training, usage of the skills, and the retention levels vary. The same differences have been documented in research works in tertiary hospitals in Africa and Asia, where unequal training opportunities are among the factors that result in uneven CPR competence among nurses (Owolabi et al., 2022).

Problem identification Practice issues Analysis of practice barriers revealed that lack of confidence and insufficient training were most frequently reported as barriers to CPR performance. The results are comparable to the previous studies that concluded that the lack of confidence and training is among the key impediments to successful resuscitation (Alshammari et al., 2021; Alhassan et al., 2023). Conversely, other research carried out in healthcare systems that are well-resourced has recorded reduced perceived barriers related to training, probably as a result of periodic competency evaluations and obligatory certification courses.

Another serious hindrance to CPR practice identified in the current study was the psychological stress. This result confirms previous studies indicating that emergency conditions cause great anxiety and stress in nurses, and this factor

may adversely influence the decision-making and performance of nurses (Meaney et al., 2021). As found in high-acuity settings like emergency departments and ICUs, stress-related obstacles are more apparent (Stetler et al., 2020).

A significant number of nurses also reported fear of harming the patient and legal issues. Such issues have been extensively reported in the global literature, especially in the contexts in which the legal guarantees and institutional regulations on resuscitation are incomprehensible (Alhassan et al., 2023). Conversely, nurses, in those countries that have clear legal frameworks and resuscitation policies, report that they experience lower levels of fear associated with legal implications (Perkins et al., 2021).

Interestingly, most of the participants did not see the absence of equipment as a significant obstacle. This result is in contrast to the research done in under-resourced hospitals, where the lack of equipment poses a significant barrier to the practice of CPR (Owolabi et al., 2022). This difference may be attributed to the fact that the Services Hospital has resuscitation equipment, which illustrates how the institutional resources help to make emergency care accessible.

The chi-square test showed that CPR knowledge and gender did not have significant relations, which is also supported by several studies that show that CPR competency does not depend on gender (Kim and Ahn, 2022). Nevertheless, CPR knowledge had significant links with clinical area and clinical experience and this implies that CPR knowledge is better with exposure in the workplace and with professional maturity.

Nurses with higher clinical experience and those who work in high-acuity units had a higher level of CPR knowledge. The problem has also been observed in a critical care environment, where repeated exposure to cardiac emergencies improves knowledge retention and confidence (Oermann et al., 2022). On the other hand, other studies have focused on the importance of the recent training as opposed to experience and this means that experience alone might not yield the needed job without continuous learning.

The correlation analysis showed that there was a statistically significant moderate negative

correlation between CPR knowledge and practice challenges. This implies that the better the CPR knowledge of nurses, the less the perceived barriers to performing CPR. The given evidence aligns with the previous studies that have shown that increased knowledge leads to decreased anxiety, greater confidence, and readiness to commence resuscitation (Kim and Ahn, 2022; Alshammari et al., 2021).

By and large the study findings indicate that although nurses have a basic knowledge base on CPR, implementation issues especially training, confidence, and psychological stress, are still a matter of concern. Regular refresher training, education by simulation, supportive leadership, and clear institutional policies might help to resolve such problems and enhance CPR performance. The combination of improving the knowledge of nurses on CPR and at the same time lowering barriers to practice can help improve resuscitation and survival rates of patients in tertiary care hospitals in Pakistan.

Conclusion

The study concluded that nurses working in a tertiary care hospital in Lahore demonstrated a moderate level of cardiopulmonary resuscitation (CPR) knowledge, with significant variability across clinical areas and levels of experience. Practice challenges such as lack of confidence, inadequate training, psychological stress, and legal concerns were commonly reported and negatively influenced CPR performance. A statistically significant negative correlation was identified between CPR knowledge and practice challenges, indicating that higher knowledge was associated with fewer perceived barriers. These findings highlight the importance of strengthening CPR education and addressing practice-related challenges to improve resuscitation outcomes and enhance the quality of emergency nursing care.

Recommendations

Regular and mandatory CPR refresher training programs should be implemented for nurses to improve knowledge retention and skill competency. Simulation-based training and mock resuscitation drills should be conducted

periodically to enhance confidence and reduce psychological stress during real-life emergencies. Hospital management should ensure the availability of adequate resuscitation equipment and establish clear CPR protocols to support nurses during cardiac arrest situations. Policies addressing medico-legal concerns should be communicated clearly to reduce fear and hesitation among nurses. Further multicenter studies with larger sample sizes are recommended to generalize findings across different healthcare settings.

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