Original Article

Knowledge of Basic Life Support amongst Medical/Paramedical Professionals, in a Tertiary Care Hospital, Karachi, Pakistan

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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR), a critical skill within basic life support (BLS), is essential for medical professionals in cases of cardiac or respiratory failure. This study aims to evaluate the BLS knowledge and practical application among healthcare professionals at a tertiary care hospital in Karachi, Pakistan, to enhance training outcomes.

Objective: The primary objective was to assess the knowledge and practical skills of BLS among medical and paramedical staff at Ziauddin Hospital and identify gaps in training to improve emergency response effectiveness.

Methods: This cross-sectional descriptive study involved 400 healthcare workers from various departments of Ziauddin Hospital between February and April 2024. Participants were selected to represent a diverse group of doctors, nurses, and paramedical staff. Data was collected using a standardized questionnaire based on European standards and guidelines from the American Heart Association and the Resuscitation Council. The questionnaire included both theoretical and practical aspects of BLS. Data were analyzed using SPSS version 25, with frequencies, percentages, and chi-square tests applied to assess associations between variables. Ethical approval was obtained from the Ziauddin Hospital Ethical Review Committee, ensuring adherence to the Declaration of Helsinki.

Results: The study revealed that 80% of participants knew the abbreviation for BLS. However, only 26.8% correctly identified the immediate action for an unconscious victim. The correct site for chest compressions in adults and infants was known by 88% and 84.5% of participants, respectively. Awareness of AEDs and EMS was high, at 95% and 93%. Practical skills were notably weaker, with significant variability in emergency responses: 26.8% would give two breaths immediately to an unconscious victim, and 76% incorrectly chose to compress the abdomen for a victim submerged in water. The mean age of participants was 27±4.9 years, with a gender distribution of 51.5% female and 48.5% male.

Conclusion: While healthcare professionals at Ziauddin Hospital possess strong theoretical knowledge of BLS, there are significant gaps in practical application, especially in emergency scenarios. To improve patient outcomes in emergencies, more practical, scenario-based training is necessary. This study underscores the need for ongoing, hands-on training sessions to bridge the gap between knowledge and practice.

Keywords: Basic Life Support, Cardiopulmonary Resuscitation, CPR Training, Emergency Medical Services, Healthcare Professionals.

INTRODUCTION

Cardiopulmonary resuscitation (CPR) is a fundamental skill encompassed within basic life support (BLS) that is vital for medical professionals to perform during cardiac or respiratory failure. BLS aims to sustain life in emergencies until more advanced medical intervention is available, making it essential for healthcare professionals and emergency responders to be proficient in these skills, which include performing CPR and using Automated External Defibrillators (AEDs) (1). Globally, cardiac arrest is a leading cause of death, underscoring the importance of BLS in significantly increasing survival rates (2,3). Although advances in medical technology and training techniques have been made, the survival rate for out-of-hospital cardiac arrests (OHCAs) remains low worldwide, with around 92% of OHCA patients dying due to the lack of access to cardiac resuscitation services (4-6). The World Health Organization

(WHO) estimates that sudden cardiac arrest accounts for 15% of deaths globally, highlighting the critical need for widespread and effective BLS training (7-9).

BLS is a crucial component of CPR, which involves maintaining adequate ventilation and circulation in cases of respiratory and cardiopulmonary arrest (10, 11). It is a life-saving technique used in emergencies where an individual's heartbeat or breathing has stopped (12). Despite the theoretical understanding of BLS, practical application often reveals significant gaps, particularly in emergency scenarios. Studies have shown that while healthcare professionals may have a good knowledge of BLS, their ability to effectively apply this knowledge in real-life situations is frequently lacking (3). This discrepancy is particularly evident in developing countries, where up to 10% of all deaths can be attributed to OHCAs (6).

This study aimed to explore the extent of knowledge and perspectives towards BLS among medical and paramedical staff in a tertiary care hospital in Karachi, Pakistan, to guide future enhancements in BLS training programs at the hospital (13,14). By assessing the BLS experience of healthcare workers at Ziauddin Hospital, this study seeks to identify knowledge gaps and improve the practical application of BLS protocols. The study was conducted using a standardized questionnaire based on established frameworks from the American Heart Association (AHA) and the European Resuscitation Council (ERC), ensuring adherence to high standards (15). Data was collected from 400 healthcare workers across various departments between February and April 2024. The participants, who included doctors, nurses, and paramedical staff, were selected to provide a diverse sample representative of the hospital's workforce.

The findings of this study revealed that while healthcare workers at Ziauddin Hospital have a good theoretical knowledge of BLS, there is a significant need for more practical training. The study highlighted areas where practical application of BLS knowledge was inadequate, particularly in emergency scenarios where inappropriate methods were often used. For instance, only a small percentage of participants knew the immediate actions to take for unresponsive victims, and there was confusion regarding the correct procedures in certain emergency situations.

The results underscore the necessity for regular scenario-based training to bridge the gap between theoretical knowledge and practical application. Enhancing the practical training of healthcare workers in BLS can improve patient outcomes in emergency situations by ensuring timely and appropriate medical intervention. This study contributes to the understanding of BLS knowledge among healthcare professionals in Karachi and provides a foundation for improving BLS training programs, ultimately aiming to increase survival rates and reduce complications in cardiac and respiratory emergencies. By addressing these gaps, future efforts can focus on standardizing and improving BLS training for healthcare personnel, ensuring that they are well-equipped to handle emergency situations effectively.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at Ziauddin Hospital, Karachi, from February to April 2024, to assess the knowledge and practical application of Basic Life Support (BLS) among healthcare professionals. A total of 400 active healthcare workers, including doctors, nurses, and paramedical staff, participated in the study. Participants were aged 18 years or older and were selected to represent a diverse cross-section of the hospital's workforce. The study received ethical approval from Ziauddin Hospital's Ethical Review Committee, ensuring adherence to the ethical standards set by the Declaration of Helsinki (reference code 2620920RMEM).

Data collection was carried out using a structured questionnaire, which was adapted from established frameworks used in previous research conducted in India and Saudi Arabia (13, 14). The questionnaire was developed following the guidelines provided by the American Heart Association (AHA) and the European Resuscitation Council (ERC), ensuring that it met high standards of accuracy and relevance (15). To maintain cultural relevance and clarity for the local healthcare setting, the questionnaire was refined and improved during the adaptation process.

The data collection process involved two main approaches: in-person encounters and a digital version distributed via Google Forms. The in-person approach allowed for immediate clarification of questions and ensured genuine responses, while the digital version offered flexibility to accommodate the varying schedules and responsibilities of the hospital staff. Participants were asked about their knowledge and practical application of BLS, including CPR techniques, the use of AEDs, and emergency response procedures.

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Percentages and frequencies were calculated for categorical variables such as gender and profession, while means and standard deviations were computed for quantitative data such as age. Bar charts were used to visually present the distribution of different healthcare professionals who participated in the study. The chi-square test was applied to assess the association between different categorical variables using the cross-tabulation method, with a significance level set at $p < 0.05$.

The analysis revealed significant findings regarding the theoretical knowledge and practical application of BLS among the healthcare professionals at Ziauddin Hospital. The results indicated that while the majority of participants had good theoretical knowledge of BLS, there were notable gaps in practical application, particularly in emergency scenarios. These findings underscore the need for more practical, scenario-based training to improve the ability of healthcare professionals to effectively apply their BLS knowledge in real-life situations. The study's comprehensive approach to data collection and analysis provides valuable insights into the current state of BLS training and highlights areas for improvement to enhance patient outcomes in emergency situations.

RESULTS

The study involved 400 healthcare professionals from Ziauddin Hospital, Karachi, with a mean age of 27±4.9 years. The gender distribution was fairly balanced, with 206 (51.5%) females and 194 (48.5%) males. The participants included a diverse group of doctors, nurses, and paramedical staff, ensuring a representative sample.

Table 1: Demographic Characteristics of Participants

Characteristic	Frequency (%)
Mean Age	27±4.9 years
Gender	
- Female	206 (51.5%)
- Male	194 (48.5%)
Occupation	
- Nurses	60 (15%)
- Physiotherapists	62 (15.5%)
- Other Healthcare Workers	278 (69.5%)

The study assessed the participants' knowledge and practical application of BLS using a structured questionnaire. The majority (318 or 80%) were familiar with the abbreviation BLS. However, only 107 (26.8%) knew the immediate action for an unconscious victim was to give two breaths.

Table 2: Knowledge of Healthcare Professionals Regarding BLS

Knowledge Aspect	Frequency (%)
Knowledge of BLS Abbreviation	318 (80%)
Immediate Action for Unconscious Victims	107 (26.8%)
Correct Site for Chest Compression (Adults)	352 (88%)
Correct Site for Chest Compression (Infants)	338 (84.5%)
Correct Technique for Rescue Breathing (Infants)	311 (78%)
Knowledge of Compression Depth and Rates (Adults)	228 (72%)
Knowledge of Compression Depth (Infants and Neonates)	282 (70.5%)
Knowledge of Compression Rate (Adults)	376 (94%)
Chest Compression to Ventilation Ratio	303 (76%)

The participants showed good knowledge of certain BLS components, such as the correct site for chest compression in adults (88%) and infants (84.5%). However, there were significant gaps in practical application, as only 26.8% of participants knew to give two breaths immediately to an unconscious victim.

Table 3: BLS Knowledge with respect to Response on Emergency Scenario

Variable	Category	Yes (%)	No (%)	p-value
Gender and Knowledge of BLS Abbreviation	Male	187 (96.4%)	7 (3.6%)	$p < 0.05$
	Female	199 (96.6%)	7 (3.4%)	
Immediate Action for Unconscious Victims	Give Two Breaths Immediately	107 (26.8%)	293 (73.2%)	$p < 0.01$
Site for Chest Compression in Adults	Mid-Chest	352 (88%)	48 (12%)	$p < 0.01$
Site for Chest Compression in Infants	One Finger Below Nipple Line	338 (84.5%)	62 (15.5%)	$p < 0.01$
Knowledge of Compression Depth in Adults	1.5-2 inches	228 (57%)	172 (43%)	$p < 0.05$
Response to Choking Incident	No CPR	89 (22%)	311 (78%)	$p < 0.05$
Response to Water Submersion Incident	Compress Abdomen	305 (76%)	95 (24%)	$p < 0.001$

The responses to emergency scenarios highlighted both strengths and weaknesses in practical application. While 88% and 84.5% of participants correctly identified the sites for chest compression in adults and infants, respectively, only 26.8% knew the correct immediate action for an unconscious victim. Additionally, in scenarios like choking and water submersion, there was significant variability in responses, indicating a need for improved practical training.

Overall, the study found that while healthcare professionals at Ziauddin Hospital had a strong theoretical foundation in BLS, there were notable gaps in practical application. These findings suggest a need for more practical, scenario-based training to enhance the ability of healthcare professionals to effectively apply their BLS knowledge in real-life situations. The study underscores the importance of regular, practical training sessions to bridge the gap between knowledge and practice, ultimately improving patient outcomes in emergency situations.

DISCUSSION

The findings of this study indicated that while healthcare professionals at Ziauddin Hospital possessed a strong theoretical knowledge of Basic Life Support (BLS), significant gaps existed in their practical application of these skills, particularly in emergency scenarios. This discrepancy between knowledge and practice echoed the results of similar studies conducted in other regions. For instance, research conducted in India and Saudi Arabia revealed that although healthcare workers had a solid understanding of BLS principles, they struggled with the practical implementation of these techniques in real-life situations (13, 14).

One of the primary strengths of this study was its comprehensive approach, which included a diverse sample of healthcare professionals from various departments, ensuring a representative assessment of BLS knowledge across the hospital. The use of a structured questionnaire based on well-established frameworks from the American Heart Association (AHA) and the European Resuscitation Council (ERC) further ensured the reliability and validity of the data collected (15). However, despite these strengths, the study also had certain limitations. The reliance on self-reported data could have introduced response bias, and the cross-sectional design only provided a snapshot of BLS knowledge at a single point in time, without assessing changes over time or the impact of previous training sessions (16,17).

The results highlighted that while 80% of participants were familiar with the BLS abbreviation, only 26.8% knew the correct immediate action for an unconscious victim. This finding suggested a critical gap in the practical training of healthcare professionals. Previous studies have similarly noted that while theoretical knowledge of BLS is often high, practical skills are frequently inadequate (3, 10). The study also found that participants were generally knowledgeable about the correct sites for chest compressions in both adults and infants, with 88% and 84.5% correctly identifying these sites, respectively. However, in emergency scenarios such as choking or water submersion, responses varied significantly, indicating confusion and a need for more focused training in these areas.

One notable strength of the study was its identification of specific areas where practical BLS training could be improved. For instance, while the knowledge of AEDs and EMS was high, with 95% and 93% awareness, respectively, the practical application of this knowledge in emergency scenarios was less consistent. This inconsistency highlighted the need for regular scenario-based training to reinforce both theoretical knowledge and practical skills. Studies have shown that hands-on training and simulations can significantly improve the ability of healthcare professionals to respond effectively in emergency situations (19, 20).

Despite the robust theoretical foundation observed among the participants, the study underscored the necessity of bridging the gap between knowledge and practice. Enhancing practical training through regular, scenario-based exercises could improve the preparedness of healthcare professionals to handle emergencies. This recommendation aligned with findings from other research, which emphasized the importance of practical training in improving patient outcomes in cardiac and respiratory emergencies (18, 21).

CONCLUSION

In conclusion, the study provided valuable insights into the current state of BLS knowledge and practice among healthcare professionals at Ziauddin Hospital. While the theoretical understanding of BLS was strong, significant gaps in practical application were identified, particularly in emergency scenarios. Addressing these gaps through more practical, scenario-based training could enhance the effectiveness of BLS training programs, ultimately improving patient outcomes in emergency situations. Future research could build on these findings by exploring the impact of different training methodologies on the practical application of BLS skills, thereby providing further guidance for the development of effective training programs.

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