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Assessing the Level of Knowledge Regarding Basic Life Support in Undergraduate Nursing Students at Private Colleges of Nursing at Peshawar, Pakistan

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Abstract

This study looks at the level of knowledge about Basic Life Support (BLS) among undergraduate nursing students at private colleges in Peshawar, Pakistan. BLS is a crucial skill for healthcare workers, especially in emergency situations where quick action can make a life-or-death difference. The goal of this research is to assess how prepared nursing students are to perform BLS and to pinpoint areas where their training could be improved. To gather data, we used a descriptive cross-sectional survey design with 218 fourth- year nursing students who were selected through convenience sampling. The study was conducted in private nursing colleges in Peshawar. The duration of the study was from August to December. Undergraduate nursing students were included in the study. A structured questionnaire was used to collect information, which included questions about participants‟ demographics, general knowledge of BLS, and more specific details about emergency medical procedures. The study also followed ethical guidelines, ensuring confidentiality and informed consent from all participants. The results showed a wide range of knowledge among students regarding BLS. While many students had a good grasp of basic concepts like the importance of early defibrillation and rescue breathing techniques, there were notable gaps in their understanding of critical areas, such as the correct compression-to-ventilation ratio for adults and recognizing the signs of cardiac arrest. Statistical analysis showed that prior training and clinical experience had a positive impact on their BLS competency. However, the overall results were concerning, with none of the students reaching an "excellent" level, and only a few falling into the "good" category.

Conclusion

The findings of this study point to an urgent need for more effective BLS training within nursing programs. By focusing on the gaps in students' knowledge and offering more hands- on practice and simulation-based learning, educational institutions can better prepare nursing students to respond confidently and effectively in emergencies. Ultimately, improving BLS skills is essential for ensuring high-quality patient care and improving survival rates in critical situations. This research provides a valuable starting point for developing better BLS training strategies in nursing education.

Keywords: Basic Life Support, Nursing Student, Cardiopulmonary Resuscitation, Student's Knowledge, Cardiac Arrest.

Introduction

The term Basic Life Support (BLS) refers to maintaining the airway and supporting breathing and circulation. It comprises the following elements: initial assessment, airway maintenance, expired air ventilation (rescue breathing; mouth-to-mouth ventilation), and chest compressions. When all these elements are combined, the term Cardiopulmonary Resuscitation (CPR) is used. BLS implies that no equipment is used; however, when a simple airway or a face mask for mouth-to-mask resuscitation is

used, this is referred to as basic life support with airway adjuncts. The purpose of BLS is to maintain adequate ventilation and circulation until a means can be obtained to reverse the underlying cause of the arrest (A. J. Handley, 1997). CPR is a fundamental skill within 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, including performing CPR and using Automated External Defibrillators (American Red Cross, 2024). Despite advances in medical technology and training techniques, the survival rate for out-of-hospital cardiac arrests (OHCAs) remains low worldwide, with approximately 92% of OHCA patients dying due to lack of access to cardiac resuscitation services (Okonta K and Okoh B, 2015). BLS is a crucial component of CPR, which involves maintaining adequate ventilation and circulation during respiratory and cardiopulmonary arrest (Saquib SA, Al-Harthi HM, Khoshhal AA, Shaher AA, Al-Shammari AB, Khan A, et al., 2019). Cardiac or cardiopulmonary arrest can lead to severe morbidities or death if not attended to promptly. Early identification and intervention of cardiac arrest victims by performing CPR are the cornerstones of BLS, helping to sustain the patient's life until definitive medical care arrives, and the patient is transferred to a hospital for further management. BLS's purpose is to maintain airway, breathing, and circulation through CPR. CPR is an emergency procedure aimed at restoring cardiac and respiratory function after cardiac arrest (Arjyal B., Rajbanshi L. K., and Bajracharya A., 2019). Cardiopulmonary resuscitation is the first step in restoring life to individuals experiencing cardiac arrest. Successful CPR performed at the scene by healthcare providers can significantly reduce mortality rates associated with cardiac arrest (Perkins, G.D., et al., 2015). Time is a critical factor in determining the fate of a cardiac arrest victim. The first 10 minutes immediately after an arrest are often referred to as the "Golden Minutes" or the "Golden 10." If no action is taken within this time frame, the victim is unlikely to survive (Mani G, Annadurai K, Danasekaran R, Ramasamy JD, 2014). Cardiac arrest and accidents are the most common types of emergencies with severe consequences, but simple maneuvers, like CPR, can improve outcomes, doubling or tripling the chances of survival (Holmberg M, Holmberg S, Herlitz J, Gardelov B, 1998). Resuscitation science is complex and may vary depending on the country and culture in which it is applied. Resuscitation education primarily focuses on ensuring the widespread and uniform implementation of resuscitation science during practice by both laypersons and healthcare CPR providers. This is done to achieve optimal CPR performance. Examples include improving healthcare professionals' ability to recognize and respond to patients at risk of cardiac arrest, enhancing CPR performance (mainly chest compressions), and ensuring continuous quality improvement activities to optimize future performance through targeted education (Bhanji F, 2015). Basic Life Support (BLS) training recommendations in the 2015 American Heart Association (AHA) Guidelines include the use of high-fidelity manikins, simulations, feedback devices, more frequent training, and short online courses as resources for teaching and learning resuscitation skills (O'Leary FM, Janson P, 2010). However, an online course requires careful planning and organization to define educational objectives, select relevant content, and effectively distribute the workload (Uslu E, Buldukoglu K, Zayim N, 2014).

Background

The International Liaison Committee on Resuscitation (ILCOR) was formed in 1992 to coordinate global resuscitation efforts. ILCOR representatives come from various countries, including the United States, Canada, Australia, New Zealand, and other nations from Europe, Asia, and Africa. In 2000, the committee published its first resuscitation guidelines. In 2005, it released the International Consensus on Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) Science with Treatment Recommendations. Since 2010, ILCOR has provided materials for regional resuscitation organizations, such as the European Resuscitation Council and the American Heart Association, to develop their own guidelines (International Liaison Committee on Resuscitation, 2018). Since 2015,

ILCOR has utilized a new methodology called Consensus on Science with Treatment Recommendations (COSTR) to evaluate the quality of the latest evidence available and to identify the best treatments for resuscitation (CoSTERs, 2019). Using the COSTR methodology, ILCOR conducts yearly reviews and publishes updates on the latest evidence in resuscitation, a shift from the previous 5-year review cycle. Field-provided CPR increases the time available for advanced medical responders to arrive and provide Advanced Life Support (ALS) care. A significant advance in BLS is the availability of an Automated External Defibrillator (AED), which improves survival outcomes in cardiac arrest cases (Hallstrom, A.P., et al., 2004).

Objective

To assess the level of basic life support knowledge among undergraduate nursing students.

Research Methodology

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, surveys, or by manipulating pre-existing statistical data using computational techniques. The importance of the quantitative approach lies in its ability to provide clear, reliable, and measurable data. By using numbers, it helps researchers spot trends, test hypotheses, and compare different groups or time periods. This method results in data that is not only accurate but also applicable to larger populations, making it useful for drawing conclusions in fields such as health, economics, and social sciences. Ultimately, quantitative research supports better decision-making by offering solid evidence and a deeper understanding of the topic being explored.

Study Design

A descriptive cross-sectional study design was appropriate for this research because it allows for the identification of relationships among various variables within a specific period, rather than over an extended time (Beck, 2012). Furthermore, a descriptive cross-sectional design provides primary evidence for causal relationships and can help identify associations between causes and diseases (Alexander et al., 2015). For this research, a descriptive cross-sectional study design was adopted to assess the knowledge of undergraduate nursing students in private nursing colleges in Peshawar.

Study Area

This study was conducted in private nursing colleges in Peshawar, Khyber Pakhtunkhwa, Pakistan. There are several colleges in the area, but for the purposes of this research, 12 private nursing colleges were included based on the inclusion criteria.

Study Duration

The study was conducted over a five-month period, from August 2024 to December 2024. The topic was selected and confirmed in August, and the proposal was submitted to the Institutional Review Board (IRB) for approval. After receiving IRB approval, data collection commenced in September 2024 and concluded by the beginning of November. Data analysis was completed by the end of November.

Study Population

Undergraduate nursing students are those who are studying to become registered nurses. They are in the process of completing their nursing education, gaining both classroom knowledge and hands-on experience in healthcare settings. These students are working towards earning a nursing degree or diploma and are gaining practical skills to provide patient care under supervision as part of their

training. The participants of this research were undergraduate nursing students at private colleges of nursing at Peshawar.

Eligibility Criteria
Selection of participants was determined by certain inclusion and exclusion factors.

Inclusion Criteria
Every undergraduate nursing student was eligible and included in this research.

- Current students studying in Generic BSN
- Studying in Final year

Exclusion Criteria

- Those students who take BLS training in 2 months.

Sample Size
Sample size refers to the number of participants or observations included in a study. In this research, a 95% confidence level and a 5% margin of error were used to ensure the reliability and precision of the results. The required sample size was calculated using the Raosoft calculator. The final sample size for our study consisted of two hundred and eighteen (218) students from private colleges offering nursing programs.

Sampling Methods
Convenience sampling is a non-probability sampling method in which units are selected for inclusion in the sample because they are easily accessible to the researcher. Convenience sampling was used in this study as it provided a quick and simple way to collect data from a readily available population. Due to limited resources and geographical constraints, as well as participants' availability at a given time and their willingness to participate, this method was deemed appropriate.

Data Collection Procedure
Data collection began after obtaining approval from the Institutional Review Board (IRB). After approval from the private nursing colleges, written informed consent was obtained from each participant. Participants who agreed to participate were asked to complete the questionnaire. They were fully informed of their right to participate voluntarily and their freedom to withdraw from the study at any time. The researcher estimated that completing the questionnaire would take approximately 15 to 20 minutes of the participants' time.

Data Collection Tool
Data for this research was collected using an adopted questionnaire (Shaheen N et al., 2023). The Basic Life Support (BLS) questionnaire is designed to gather comprehensive information regarding individuals' knowledge, training, and experiences related to BLS practices. It is divided into three main sections: Socio-Demographic Information, General Information, and Knowledge Questions.

Ethical consideration:
The autonomy of participants was maintained by using written inform consent before the study process. Privacy keeps through keeping data in a sealed envelope on completion of whole process. Confidentiality was maintained by keeping the data in a specific folder and using a proper password to which access only the researcher and supervisor were accessing. Furthermore, anonymity is confirmed by requesting participants to keep consent into a closed box. After completion of a questionnaires, it will be kept in an envelope and wrapped by the respondents.

Validity and Reliability

Validity is a measure of specific things planned and explains that collected planned numbers cover the actual area of research (Taherdoost et al, 2017). Noteworthy face validity identifies the appearance or face vision of the tool constructed for specific purpose and the instrument appears to be relevant, practical and explicit and clear (Oluwataya, 2012). This study's content validity of the tool was achieved by reviewing tool through different educationalist, clinician and research experts along with proper measuring scale search in the form yes and no options. According to Taherdoost (2016), reliability is the extent to which a measurement of a phenomenon provides stable and consistent results and shows the same result under the same condition repeatedly. Studying can have a high reliability if it is high internal consistency. Hence seeing all these important, the researcher used pilot testing to test the reliability of the tool and cronbach alpha was tested. Cardiology professionals evaluated the questionnaire's clarity and validity as determined by Cronbach"s Alpha, internal consistency was 0.841(0.8 to 0.9: good reliability).

Data Analysis

The data was analyzed using Statistical Package for Social Sciences (SPSS) software, version 27. Initially the data was screened for completeness and then entered into SPSS by the primary researcher. Descriptive statistical analysis was performed, including calculations of mean and standard deviation for continuous variables and frequencies with percentages for categorical variables.

Results

Demographic Characteristics of Respondents

The analysis of the dataset comprising 218 respondents revealed significant comprehensions into the demographic characteristics of the participants. The following sections detail the findings related to age, gender, and living conditions.

Age Distribution

The age distribution of the respondents was categorized into two groups:

The respondent distribution is nearly evenly split between two age groups. **Specifically**, 110 respondents (50.5%) are below 22 years of age, **while** 108 respondents (49.5%) are above 28 years as shown below.

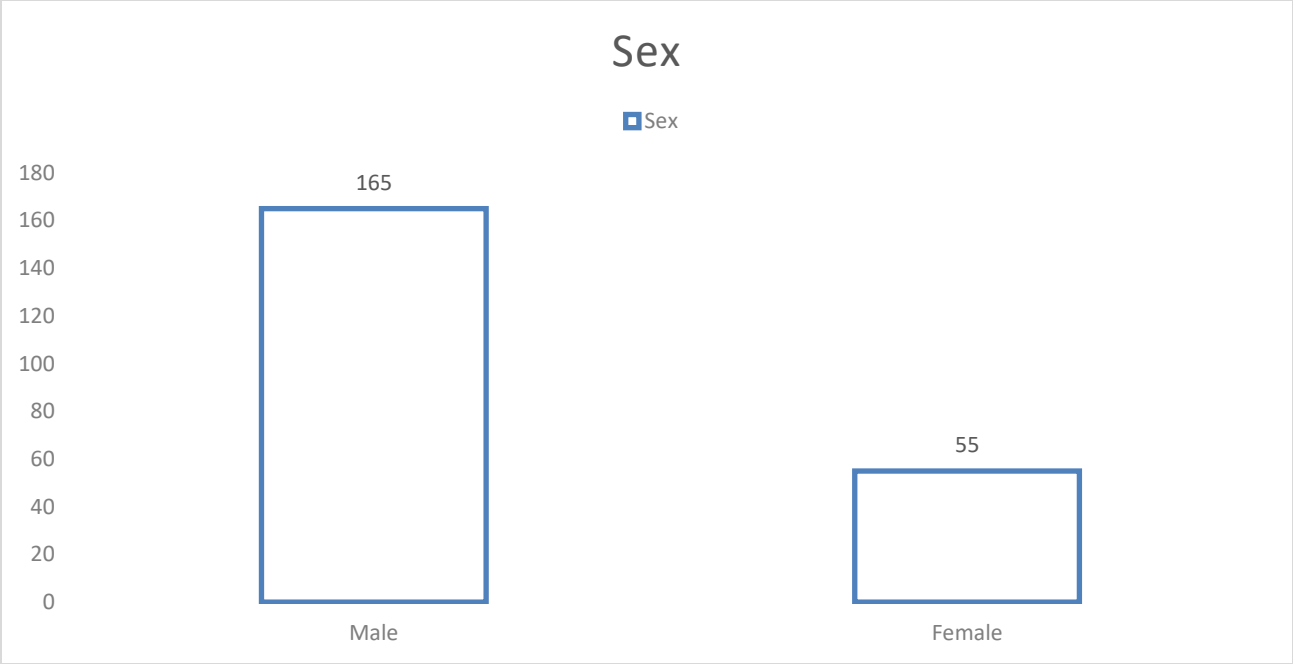
Table 1

Category	**Frequency**	**Percent**
below 22 year	110	**50.5**
Above 22 year	108	**49.5**
Total	**218**	**100.0**

Gender Distribution

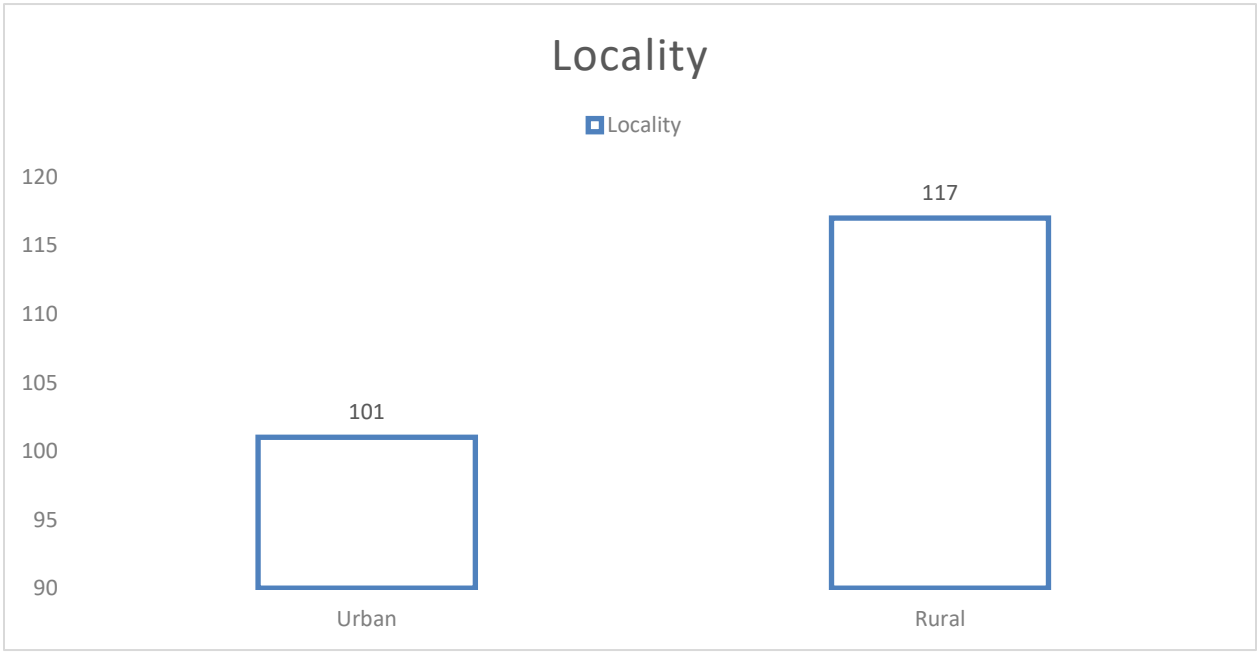
The gender breakdown of the respondents was as follows:

The gender distribution of the respondents shows a significant difference between males and females. Specifically**,** 163 respondents (74.8%) are male, while 55 respondents (25.2%) are female. As a result, the male group represents a dominant majority of the sample, with females making up a much smaller proportion as shown in graph



Living conditions

The distribution of respondents based on geographic location shows a slight predominance of rural participants. Specifically, 101 respondents (46.3%) are from urban areas, while 117 respondents (53.7%) come from rural areas. As a result, the rural group represents a slightly larger portion of the sample, reflecting a small but notable difference in geographic representation, as shown in graph.



A significant majority of participants recognized the importance of calling emergency medical services (1122) as a critical component of BLS. Among males, 94.5% affirmed this knowledge, while 89.1%

of females also acknowledged its importance. This indicates a strong awareness of the need for immediate professional assistance during emergencies as shown in table 2.

Table 2

Sex	Respond	Frequency	Percent
Male	Yes	154	**94.5**
	No	9	**5.5**
Total		163	**100.0**
Female	Yes	49	**89.1**
	No	6	**10.9**
Total		**55**	**100**

Rescue Breathing Techniques:

Knowledge of mouth-to-mouth and nose rescue breathing in infants was high, with 85.9% of males and 90.9% of females confirming their understanding of this technique. This suggests that participants are well-informed about essential infant resuscitation methods, as shown in table 3.

Table 3

Sex	Respond	Frequency	Percent
Male	Yes	140	**85.9**
	No	23	**14.1**
Total		163	**100.0**
Female	Yes	50	**90.9**
	No	5	**9.1**
Total		**55**	**55**

Understanding Ratio of CPR in Adult

In the analysis of responses based on gender, the Male group consists of 163 respondents. Of these, 148 males (90.8%) answered "Yes," while 15 males (9.2%) answered "No," indicating a strong majority of affirmative responses. Similarly, in the Female group, which includes 55 respondents, 49 females (89.1%) answered "Yes," and 6 females (10.9%) answered "No." as shown in the following table 4;

Sex	Respond	Frequency	Percent
Male	Yes	90.8	**90.8**
	No	9.2	**9.2**
Total		100.0	**100.0**
Female	Yes	89.1	**89.1**
	No	10.9	**10.9**
Total		**55**	**100.0**

Recognition of Cardiac Arrest Signs:
A significant majority of respondents acknowledged that the absence of circulation is a clear indicator of cardiac arrest. Specifically, 89.6% of male respondents and 83.6% of female respondents affirmed this statement, with only 10.4% of males and 16.4% of females disagreeing, as shown in table 5.

Table 5

Sex	Respond	Frequency	Percent
Male	Yes	146	**89.6**
	No	17	**10.4**
Total		163	**100.0**
Female	Yes	46	**83.6**
	No	9	**16.4**
Total		**55**	**100**

Similarly, the absence of breathing was recognized as a sign of cardiac arrest by 66.9% of males and 85.5% of females, indicating a strong awareness of this critical sign among participants, as shown in table 6.

Table 6

Sex	Respond	Frequency	Percent
Male	Yes	133	**81.6**
	No	30	**18.4**
Total		163	**100.0**
Female	Yes	44	**80.0**
	No	11	**20.0**
Total		**55**	**100**

Low level of knowledge
Recognition of the chest location as the Compression Site
The data reveals that a significant number of participants were unaware of the location for performing chest compressions. Among the Male group, a total of 112 participant**s** (representing 68.7%**)** responded "Yes," indicating that they were unaware of the correct location for chest compressions. This suggests that a majority of the male respondents lack knowledge about this crucial aspect of CPR. In contrast**,** among theFemalegroup, 32 participants (or 58.2%**)** answered "Yes," showing that a slightly lower percentage of females were unaware of where to perform chest compressions. Overall, the data highlights a concerning lack of knowledge regarding the proper location for chest compressions in both male and female respondents, with a larger proportion of males showing this gap in understanding, as shown in table 7.

Table 7

Sex	Respond	Frequency	Percent
Male	Yes	112	**68.7**
	No	51	**31.3**
Total		163	**100.0**
Female	Yes	32	**58.2**
	No	23	**41.8**
Total		**55**	**100**

Association with gender and residency

The analysis of the data shows that there is no significant link between gender and residency. In fact, the results suggest that these two factors are independent of each other, with no clear patterns or connections emerging. Additionally, the p-value for the relationship between gender and residency is less than 0.005, which means the differences observed are statistically insignificant. This implies that a person's gender doesn't seems to have any real impact on where they live. In conclusion, there's no evidence to suggest that knowledge, gender, and residency are related in any meaningful way, as shown in table 8.

Table 8
Chi-Square Tests

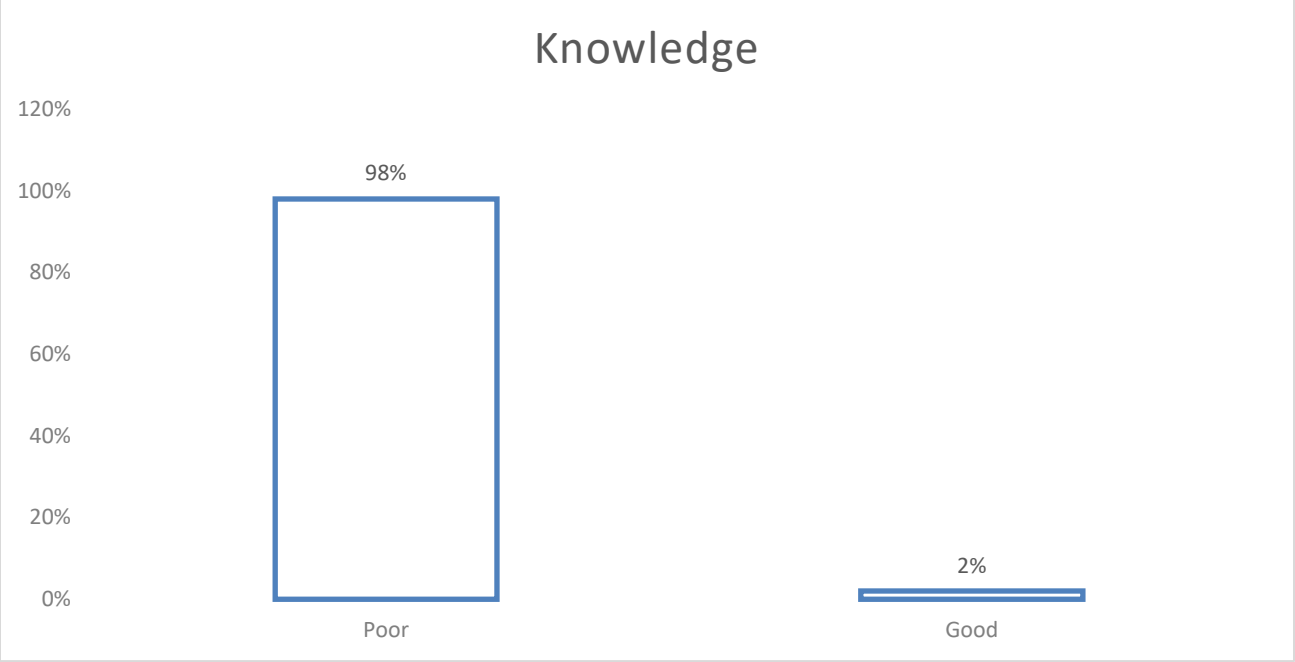
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	.013[a]	1	.909		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.013	1	.910		
Fisher's Exact Test				1.000	**.549**
Linear-by-Linear Association	.013	1	.909		
N of Valid Cases	**218**				

Overall Knowledge

The findings of this research indicate a generally low level of knowledge among the participants, with the majority displaying poor understanding of the subject matter. Specifically**,** a significant portion of respondents fall into the "poor" category, reflecting a widespread lack of comprehensive knowledge. In contrast**,** a smaller percentage of participants exhibited a "good" level of knowledge, but this group remains considerably outnumbered by those with limited understanding. Furthermore, it is notable that there were no participants who achieved an "excellent" rating, suggesting that despite the presence of some individuals with adequate knowledge, no one demonstrated a high level of expertise or mastery in the area being studied. Overall**,** this trend highlights the need for targeted educational interventions to improve knowledge and awareness, particularly in areas where understanding is currently lacking, as shown in table 9.

Table 9

Knowledge	Percentage
Poor	**98.0**
Good	**2.00**



Discussion

The results indicate that a significant portion of nursing students lacks adequate knowledge of BLS protocols. Reported that a high percentage (98%) of nursing students fall in poor category. Specifically, many students scored below the expected competency level, with findings suggesting that only a small percentage demonstrated comprehensive understanding. Previous studies, such as the one conducted by Chandrasekaran et al. (2010), reported that a high percentage (98.4%) of nursing students scored less than 50% on BLS knowledge assessments. This similarity suggests a persistent issue in nursing education regarding BLS knowledge retention and understanding.

Training and Educational Gaps

The study highlights that many nursing students have not received formal BLS training, which contributes to their lack of knowledge in performing BLS procedures. Tadesse et al. (2022) found that nearly half of health science students lacked adequate knowledge and skills in BLS, with many having never received training. This finding aligns with the current study, indicating a widespread gap in BLS education across different institutions.

Psychological Impact of Training

The study suggests that confidence levels among nursing students are low due to inadequate training, which affects their preparedness to respond in emergencies. George et al. (2023) noted that BLS training significantly boosts confidence and preparedness among students. The current study's findings highlight the need for effective training methods to enhance both knowledge and confidence, which is supported by literature.

Strengths

A Pioneering Study in Nursing Education in the Region

This is the first study in the province that focuses on the knowledge levels of nursing students, making it a significant contribution. Moreover, it fills an important gap in local research and, as a result, provides a solid foundation for future studies in the region.

Broad Representation and Generalizability

Data were collected from many private nursing colleges in the Peshawar region, ensuring a representative sample of the student population. This broad coverage enhances the generalizability of the findings, making them relevant to the wider nursing student population in the region.

Comprehensive Assessment of Knowledge Levels

This study takes a broad approach by assessing the knowledge levels of nursing students across several institutions. By including students from different colleges, it provides a well-rounded picture of their understanding in key areas of nursing education. As a result, the findings offer valuable insights into the overall knowledge of nursing students in the region.

Identification of Knowledge Gaps

The findings reveal a generally low level of knowledge among participants, highlighting the need for targeted educational interventions.

Limitation of research

Focus on Private Nursing Colleges

One limitation of this study is that it focused solely on private nursing colleges, excluding public institutions.

Recommendations

To improve the quality of Basic Life Support (BLS) education in nursing programs, several key recommendations can be implemented. These recommendations are given below.

Curriculum Enhancement

Integrate BLS Training: It is essential to incorporate comprehensive BLS training into the nursing curriculum. This should encompass both theoretical knowledge and practical skills training, ensuring that students are well- prepared for real-life emergencies.

Regular Updates: Additionally, advocating for regular updates to the curriculum is crucial. This will help reflect the latest guidelines and practices in BLS, ensuring that students receive current and relevant information.

Practical Training Opportunities

Simulation-Based Learning: Encouraging the use of simulation-based learning environments can significantly benefit students. By practicing BLS techniques in a controlled setting, students can enhance their confidence and competence in performing BLS.

Clinical Rotations: Furthermore, nursing programs should include clinical rotations in emergency departments or critical care units. This allows students to observe and participate in real-life BLS scenarios under supervision, providing invaluable hands-on experience.

Ongoing Assessment and Feedback

Regular Assessments: Implementing regular assessments of BLS knowledge and skills throughout the nursing program, rather than only at the end, is vital. This approach can help identify areas where students may need additional support or training.

Feedback Mechanisms: Establishing feedback mechanisms is also important. Students should receive constructive feedback on their BLS performance, allowing them to improve continuously.

Research and Continuous Improvement

Conduct Follow-Up Studies: Conducting follow-up studies to assess the long-term retention of BLS knowledge and skills among nursing students after graduation is essential. This can help evaluate the effectiveness of the training provided.

Explore Barriers to Learning: Further research should be conducted to identify barriers that nursing students face in learning BLS, such as time constraints, resource limitations, or lack of access to training materials.

By implementing these recommendations, nursing programs can significantly enhance the quality of BLS education. Ultimately, this will lead to better-prepared nursing graduates who are capable of responding effectively in emergency situations.

Conclusion:

This research thesis has critically examined the knowledge of Basic Life Support (BLS) among undergraduate nursing students in private nursing colleges in Peshawar, Pakistan, revealing significant gaps in their understanding and preparedness for emergency situations. Specifically, the findings indicate that a considerable proportion of participants demonstrated inadequate knowledge of essential BLS protocols, which highlights the urgent need for nursing education programs to prioritize comprehensive BLS training that integrates both theoretical and practical components. Furthermore, the study identified demographic factors influencing knowledge levels and emphasized the effectiveness of hands-on practice and simulation-based training in enhancing competency. To address these issues, it is recommended that nursing colleges incorporate robust BLS training into their curricula, implement ongoing assessments, and foster collaboration with healthcare facilities for real-life clinical exposure. Ultimately, this research contributes to the broader discourse on nursing education, advocating for reforms that ensure future healthcare professionals are well-equipped to deliver high-quality care and respond effectively in emergencies, thereby improving patient safety and outcomes in the healthcare system.

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