# Knowledge, Attitude, and Practice of Basic Life Support among Nurses in a Public Sector Tertiary Care Hospital in Pakistan

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*Abstract*

***Objective:*** *To assess the knowledge, attitude, and practice of basic life support (BLS) among nurses in a public-sector tertiary care hospital in Pakistan.* ***Methods:*** *A descriptive cross-sectional study was conducted at the Pakistan Institute of Medical Sciences (PIMS), Islamabad. 192 nurses were recruited using stratified random sampling. Data were collected via a structured questionnaire adapted from AHA guidelines and analyzed using SPSS version 25.* ***Results:*** *Among participants, 47.4% demonstrated excellent knowledge, 49.4% had positive attitudes, and 49.5% exhibited good practice in BLS. Only 35.9% had valid BLS certifications, and significant relationships were found between professional qualifications, clinical experience, and BLS knowledge (p < 0.05).* ***Conclusion:*** *Nurses showed moderately adequate knowledge and positive attitudes towards BLS but gaps in certification and practical skills remain. Regular training and policy implementation are recommended to enhance BLS competency.*

## INTRODUCTION

According to WHO(1), cardiovascular diseases (CVD) are the leading cause of death globally, accounting for 17.9 million deaths annually, representing 32% of all deaths worldwide. In "Benjamin et al.(2), it is observed that sudden cardiac arrest (SCA) is a critical emergency with a survival rate of less than 10% in most low- and middle-income countries (LMICs).

Timely intervention through basic life support (BLS), including cardiopulmonary resuscitation (CPR) and defibrillation is essential for improving survival outcomes. It is suggested that prompt CPR can double or triple the survival rates of heart patients(3). The concept of BLS encompasses the early recognition of cardiac or respiratory arrest, effective chest compressions, ventilation, and the use of automated external defibrillators (AEDs).

The chain of survival, as outlined by the AHA, emphasizes early intervention to prevent irreversible organ damage and death(4) However, significant gaps in BLS knowledge and skills among healthcare providers, particularly in LMICs, hinder its effective implementation(5)

In Pakistan, cardiovascular emergencies are responsible for nearly 29% of all deaths, yet public hospitals often lack adequate BLS training programs for healthcare providers(6). Whilst private institutions may offer periodic training and certification, public-sector facilities are frequently constrained by limited resources, resulting in low rates of BLS certification among nurses(7). A retrospective study in Pakistan reported that less than 2.3% of cardiac arrest cases received CPR, contributing to a survival rate of nearly 0% in out-of-hospital cardiac arrests (8).

This explains why it is important to have more nurses trained and equipped with BLS skills, The level of BLS knowledge and certification varies widely globally. In developed countries, over 75% of healthcare providers hold valid CPR certifications, with 80% demonstrating proficiency in

BLS skills(9). In contrast, studies in South Asia indicate that fewer than 50% of healthcare providers have received formal BLS training, and even fewer have retained the skills necessary for effective CPR (10). A cross-sectional study in Nepal revealed that 84% of healthcare providers had never attended BLS training, resulting in low confidence and poor practical skills.

Despite the growing burden of cardiovascular emergencies, there is limited research on BLS knowledge, attitude, and practices among nurses in Pakistan. Nurses play a crucial role in responding to cardiac arrests, making their proficiency in BLS essential for patient outcomes.

This study aims to assess the knowledge, attitude, and practice of BLS among nurses working in a public-sector tertiary care hospital in Islamabad. By identifying gaps and exploring the factors influencing BLS competency, the findings will inform targeted interventions to improve emergency care in Pakistan's public healthcare system

## METHODS

### Study Design and Setting

This descriptive cross-sectional study was conducted at the Pakistan Institute of Medical Sciences (PIMS), Islamabad, a tertiary care hospital serving a diverse patient population.

### Population and Sampling

The study targeted nurses providing direct patient care in inpatient and outpatient departments. Using stratified random sampling, 192 nurses were selected based on eligibility criteria: at least one year of experience and a valid practice license.

### Data Collection Tool

A structured questionnaire adapted from AHA guidelines was used to assess knowledge (BLS concepts and steps), attitude (perceived importance and willingness to perform BLS), and practice (CPR skills). Validity was ensured through expert review and a pre-test at a comparable hospital.

### Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics summarized participant characteristics, while chi-square tests determined associations between demographic factors and BLS knowledge, attitude, and practice. A p-value $< 0.05$ was considered statistically significant.

### Ethical Considerations

Approval was obtained from the Aga Khan University Ethical Review Committee, and informed consent was secured from all participants. Confidentiality and anonymity were maintained throughout the study.

## RESULTS

### Participant Demographics

Most participants were female (53.1%), aged 27–32 years (47.4%), and held post-RN qualifications (36.4%). Clinical experience varied, with 41.7% having more than 11 years of overall experience, though only 28.1% had similar tenure in public hospitals.

### *Demographic Characteristics*

| Variables | Categories | (%) |
|---|---|---|
| Age | 21-26 | 36(18.8) |
| | 27-32 | 91(47.4) |
| | 33-38 | 38(19.8) |
| | 39+ | 27(14.1) |
| Gender | Male | 90(46.9) |
| | Female | 102 (53.1) |
| Highest Professional qualification | General Nursing | 55(28.6) |
| | BScN | 49(25.5) |
| | Post RN | 70(36.4) |
| | MSN | 18(9.4) |
| Clinical experience | Less than 2 years | 17(8.9) |
| | 3-5 years | 31(16.1) |
| | 6-10 years | 64(33.3) |
| | more than 11 years | 80(41.7) |
| Clinical experience in the public hospital | Less than 2 years | 25(13) |
| | 3-5 years | 48(25) |
| | 6-10 years | 65(33.9) |
| | more than 11 years | 54(28.1) |
| Total | | 192(100) |

## Knowledge, Attitude, and Practice

- **Knowledge**: Only 47.4% demonstrated excellent knowledge of BLS, while 28.7% had poor knowledge.

### *Knowledge Level related to BLS*

| Variables | Categories | Very poor (less than 30%) | Poor (30-45%) | Average (45-55%) | Good (55-65%) | Very good (65-75%) | Excellent (more than 75%) | (%) |
|---|---|---|---|---|---|---|---|---|
| Age | 21-26 | 4(0.02) | 7(0.03) | 7(0.03) | 5(0.02) | 2(0.01) | 11(0.05) | 36(18.8) |
| | 27-32 | 7(0.03) | 17(0.09) | 9(0.04) | 7(0.03) | 5(002) | 46(0.24) | 91(47.4) |
| | 33-38 | 2(0.01) | 10(0.5) | 4(0.02) | 4(0.02) | 1(0.005) | 17(0.09) | 38(19.8) |
| | 39+ | 0(0.00) | 8(0.04) | 0(0.00) | 1(0.005) | 1(0.005) | 17(0.09) | 27(14.1) |
| Gender | Male | 4(0.02) | 18(0.09) | 11(0.05) | 10(0.05) | 3(0.01) | 44(0.22) | 90(46.9) |
| | Female | 9(0.04) | 24(0.12) | 9(0.04) | 7(0.03) | 6(0.03) | 47(0.24) | 102 53.1) |
| Highest Professional qualification | General Nursing | 3(0.01) | 24(0.12) | 6(0.03) | 4(0.02) | 3(0.01) | 15(0.07) | 55(28.6) |
| | BScN | 8(0.04) | 9(0.04) | 7(0.03) | 6(0.03) | 2(0.01) | 17(0.09) | 49(25.5) |
| | Post RN | 2(0.01) | 8(0.04) | 7(0.03) | 7(0.03) | 4(0.02) | 19(0.10) | 70(36.4) |
| | MSN | 0(0.00) | 1(0.005) | 0(0.00) | 0(0.00) | 0(0.00) | 40(0.20) | 18(9.4) |
| Clinical experience | Less than 2 years | 2(0.01) | 3(0.01) | 2(0.01) | 0(0.00) | 1(0.005) | 9(0.04) | 17(8.9) |
| | 3-5 years | 4(0.02) | 3(0.01) | 7(0.03) | 5(0.02) | 2(0.01) | 10(0.05) | 31(16.1) |
| | 6-10 years | 4(0.02) | 18(0.09) | 9(0.04) | 6(0.03) | 4(0.02) | 23(0.12) | 64(33.3) |
| | more than 11 years | 3(0.01) | 18(0.09) | 2(0.01) | 6(0.03) | 2(0.01) | 49(0.25) | 80(41.7) |
| Clinical experience in the public hospital | Less than 2 years | 4(0.02) | 3(0.01) | 4(0.02) | 3(0.01) | 2(0.01) | 9(0.04) | 25(13) |
| | 3-5 years | 4(0.02) | 7(0.03) | 12(0.06) | 6(0.03) | 2(0.01) | 17(0.09) | 48(25) |
| | 6-10 years | 4(0.02) | 18(0.09) | 3(0.01) | 4(0.02) | 5(0.04) | 31(0.16) | 65(33.9) |
| | more than 11 years | 1(0.005) | 14(0.07) | 1(0.005) | 4(0.02) | 0(0.00) | 34(0.18) | 54(28.1) |
| Total | | | | | | | | 192(100) |

**Attitude:** The majority (96.9%) believed BLS should be part of nursing curricula, and 98.7% considered BLS vital for patient care.

| Answer | Q17. Do you think BLS is necessary? | Q18. If yes, how necessary it is? | Q19. Would you perform CPR for person of opposite gender? | Q20. Would you like to undergo BLS training in a workshop / Centre with hands-on practice under supervision? | Q21. Do you think that BLS training should be a part of your curriculum? | Q22. Do you think BLS course is only for doctors? | Q23. Do you think AED should be present in all wards? | Q24. The correct sequence of the AHA "Adult Chain of Survival" is? |
|---|---|---|---|---|---|---|---|---|
| Yes BLS is vital. | 189 (98.7) | | 144(75.0) | 140(72.9) | 188(97.9) | 186(96.9) | 11(5.7) | 186(96.9) |
| No | 2(1.0) | | 44(20.8) | 49(25.5) | 2(1.0) | 0(0.0) | 180(93.8) | 3(1.6) |
| Not Sure | 1(0.5) | | | 3(1.6) | 2(1.0) | 6(3.1) | 1(0.5) | 3(1.6) |
| BLS is Very Much important | | 183(95.3) | | | | | | |
| Important | | 9 (4.7) | | | | | | |
| Hesitant to CPR of opposite gender | | | 8(4.2) | | | | | |

- **Practice**: While 49.5% exhibited good practice, 24.5% had poor practice levels, with only 35.9% having valid BLS certification.

**Table 6: BLS Practice Level among Nurses**

| Variables | Categories | Very poor (less than 30%) | Poor (30-45%) | Average (45-55%) | Good (55-65%) | Very good (65-75%) | Excellent (more than 75%) | (%) |
|---|---|---|---|---|---|---|---|---|
| **Age** | 21-26 | 1(0.005) | 10(0.05) | 7(0.03) | 2(0.01) | 2(0.01) | 14(0.07) | 36(18.8) |
| | 27-32 | 8(0.04) | 11(0.05) | 13(0.06) | 8(0.04) | 3(0.01) | 48(0.25) | 91(47.4) |
| | 33-38 | 4(0.02) | 6(0.03) | 3(0.01) | 7(0.03) | 1(0.005) | 17(0.09) | 38(19.8) |
| | 39+ | 1(0.005) | 6(0.03) | 2(0.01) | 2(0.01) | 0(0.00) | 16(0.08) | 27(14.1) |
| **Gender** | Male | 6(0.03) | 14(0.07) | 13(0.06) | 6(0.03) | 3(0.01) | 48(0.25) | 90(46.9) |
| | Female | 8(0.04) | 19(0.10) | 12(0.06) | 13(0.06) | 3(0.01) | 47(0.24) | 102 (53.1) |
| **Highest Professional qualification** | General Nursing | 6(0.03) | 15(0.08) | 9(0.04) | 8(0.04) | 2(0.01) | 15(0.08) | 55(28.6) |
| | BScN | 5(0.02) | 9(0.04) | 9(0.04) | 5(0.02) | 2(0.01) | 19(0.10) | 49(25.5) |
| | Post RN | 2(0.01) | 9(0.04) | 7(0.03) | 6(0.03) | 2(0.01) | 21(0.11) | 70(36.4) |
| | MSN | 0(0.00) | 1(0.005) | 0(0.00) | 0(0.00) | 0(0.00) | 40(0.20) | 18(9.4) |
| **Clinical experience** | Less than 2 years | 0(0.00) | 2(0.01) | 4(0.02) | 0(0.00) | 1(0.005) | 10(0.05) | 17(8.9) |
| | 3-5 years | 2(0.01) | 10(0.05) | 3(0.01) | 4(0.02) | 1(0.005) | 11(0.05) | 31(16.1) |
| | 6-10 years | 7(0.03) | 12(0.06) | 10(0.05) | 7(0.03) | 3(0.01) | 25(0.13) | 64(33.3) |
| | more than 11 years | 5(0.02) | 9(0.04) | 8(0.04) | 8(0.04) | 1(0.005) | 49(0.26) | 80(41.7) |

| **Clinical experience in the public hospital** | Less than 2 years | 1(0.005) | 7(0.03) | 5(0.02) | 0(0.00) | 1(0.005) | 11(0.05) | 25(13) |
| | 3-5 years | 3(0.01) | 8(0.04) | 12(0.06) | 6(0.03) | 2(0.01) | 17(0.09) | 48(25) |
| | 6-10 years | 6(0.03) | 12(0.06) | 6(0.03) | 7(0.03) | 2(0.01) | 32(0.17) | 65(33.9) |
| | more than 11 years | 4(0.02) | 6(0.03) | 2(0.01) | 6(0.03) | 1(0.005) | 35(0.18) | 54(28.1) |
| **Total** | | | | | | | | 192(100) |

## Key Associations

- Professional qualifications and clinical experience were significantly associated with knowledge (p = 0.001) and practice levels (p = 0.01).

- Age and gender were not significant predictors of BLS knowledge or practice

### *Chi-square test (demographics vs knowledge level)*

| **Variables** | **Categories** | **Knowledge level** | | | | | | **Chi-square (p-value)** |
| | | Very poor (less than 30%) | Poor (30-45%) | Average (45-55%) | Good (55-65%) | Very good (65-75%) | Excellent (more than 75%) | |
|---|---|---|---|---|---|---|---|---|
| **Age** | 21-26 | 4(0.02) | 7(0.03) | 70.03) | 5(0.02) | 2(0.01) | 11(0.05) | 16.79 (0.33) |
| | 27-32 | 7(0.03) | 17(0.09) | 9(0.04) | 7(0.03) | 5(002) | 46(0.24) | |
| | 33-38 | 2(0.01) | 10(0.5) | 4(0.02) | 4(0.02) | 1(0.005) | 17(0.09) | |
| | 39+ | 0(0.00) | 8(0.04) | 0(0.00) | 1(0.005) | 1(0.005) | 17(0.09) | |
| **Gender** | Male | 4(0.02) | 18(0.09) | 11(0.05) | 10(0.05) | 3(0.01) | 44(0.22) | 3.87(0.56) |
| | Female | 9(0.04) | 24(0.12) | 9(0.04) | 7(0.03) | 6(0.03) | 47(0.24) | |
| **Highest Professional qualification^** | General Nursing | 3(0.01) | 24(0.12) | 6(0.03) | 4(0.02) | 3(0.01) | 15(0.07) | 74.09 (0.001) * |
| | BScN | 8(0.04) | 9(0.04) | 7(0.03) | 6(0.03) | 2(0.01) | 17(0.09) | |
| | Post RN | 2(0.01) | 8(0.04) | 7(0.03) | 7(0.03) | 4(0.02) | 19(0.10) | |
| | MSN | 0(0.00) | 1(0.005) | 0(0.00) | 0(0.00) | 0(0.00) | 40(0.20) | |
| **Clinical experience** | Less than 2 years | 2(0.01) | 3(0.01) | 2(0.01) | 0(0.00) | 1(0.005) | 9(0.04) | 28.49 (0.01) * |
| | 3-5 years | 4(0.02) | 3(0.01) | 7(0.03) | 5(0.02) | 2(0.01) | 10(0.05) | |
| | 6-10 years | 4(0.02) | 18(0.09) | 9(0.04) | 6(0.03) | 4(0.02) | 23(0.12) | |
| | more than 11 years | 3(0.01) | 18(0.09) | 2(0.01) | 6(0.03) | 2(0.01) | 49(0.25) | |
| **Clinical experience in the public hospital** | Less than 2 years | 4(0.02) | 3(0.01) | 4(0.02) | 3(0.01) | 2(0.01) | 9(0.04) | 36.38 (0.002) * |
| | 3-5 years | 4(0.02) | 7(0.03) | 12(0.06) | 6(0.03) | 2(0.01) | 17(0.09) | |
| | 6-10 years | 4(0.02) | 18(0.09) | 3(0.01) | 4(0.02) | 5(0.04) | 31(0.16) | |
| | more than 11 years | 1(0.005) | 14(0.07) | 1(0.005) | 4(0.02) | 0(0.00) | 34(0.18) | |
| **Total** | | | | | | | | 192(100) |

### *Chi-square test (demographics vs practice level)*

| Variables | Categories | Very poor (less than 30%) | Poor (30-45%) | Average (45-55%) | Good (55-65%) | Very good (65-75%) | Excellent (More than 75%) | chi-square (p-value) |
|---|---|---|---|---|---|---|---|---|
| **Age** | 21-26 | 1(0.005) | 10(0.05) | 7(0.03) | 2(0.01) | 2(0.01) | 14(0.07) | 16.17 (0.37) |
| | 27-32 | 8(0.04) | 11(0.05) | 13(0.06) | 8(0.04) | 3(0.01) | 48(0.25) | |
| | 33-38 | 4(0.02) | 6(0.03) | 3(0.01) | 7(0.03) | 1(0.005) | 17(0.09) | |
| | 39+ | 1(0.005) | 6(0.03) | 2(0.01) | 2(0.01) | 0(0.00) | 16(0.08) | |
| **Gender** | Male | 6(0.03) | 14(0.07) | 13(0.06) | 6(0.03) | 3(0.01) | 48(0.25) | 2.93 (0.71) |
| | Female | 8(0.04) | 19(0.10) | 12(0.06) | 13(0.06) | 3(0.01) | 47(0.24) | |
| **Highest Professional qualification** | General Nursing | 6(0.03) | 15(0.08) | 9(0.04) | 8(0.04) | 2(0.01) | 15(0.08) | 54.24 (0.001) * |
| | BScN | 5(0.02) | 9(0.04) | 9(0.04) | 5(0.02) | 2(0.01) | 19(0.10) | |
| | Post RN | 2(0.01) | 9(0.04) | 7(0.03) | 6(0.03) | 2(0.01) | 21(0.11) | |
| | MScN | 0(0.00) | 1(0.005) | 0(0.00) | 0(0.00) | 0(0.00) | 40(0.20) | |
| **Clinical experience** | Less than 2 years | 0(0.00) | 2(0.01) | 4(0.02) | 0(0.00) | 1(0.005) | 10(0.05) | 20.29 (0.16) |
| | 3-5 years | 2(0.01) | 10(0.05) | 3(0.01) | 4(0.02) | 1(0.005) | 11(0.05) | |
| | 6-10 years | 7(0.03) | 12(0.06) | 10(0.05) | 7(0.03) | 3(0.01) | 25(0.13) | |
| | more than 11 years | 5(0.02) | 9(0.04) | 8(0.04) | 8(0.04) | 1(0.005) | 49(0.26) | |
| **Clinical experience in the public hospital** | Less than 2 years | 1(0.005) | 7(0.03) | 5(0.02) | 0(0.00) | 1(0.005) | 11(0.05) | 22.33 (0.09) |
| | 3-5 years | 3(0.01) | 8(0.04) | 12(0.06) | 6(0.03) | 2(0.01) | 17(0.09) | |
| | 6-10 years | 6(0.03) | 12(0.06) | 6(0.03) | 7(0.03) | 2(0.01) | 32(0.17) | |
| | more than 11 years | 4(0.02) | 6(0.03) | 2(0.01) | 6(0.03) | 1(0.005) | 35(0.18) | |
| **Total** | | | | | | | | 192(100) |

### *Chi-square test (knowledge vs practice level)*

| Variables | Categories | Very poor (less than 30%) | Poor (30-45%) | Average (45-55%) | Good (55-65%) | Very good (65-75%) | Excellent (more than 75%) | chi-square (p-value) |
|---|---|---|---|---|---|---|---|---|
| **Knowledge level** | **Very poor (less than 30%)** | 3(0.01) | 8(0.04) | 1(0.005) | 0(0.00) | 0(0.00) | 1(0.005) | 267.88 (0.001) * |
| | **Poor (30-45%)** | 9(0.04) | 20(0.11) | 8(0.04) | 4(0.02) | 0(0.00) | 1(0.005) | |
| | **Average (45-55%)** | 1(0.005) | 3(0.01) | 8(0.04) | 7(0.03) | 0(0.00) | 1(0.005) | |
| | **Good (55-65%)** | 1(0.005) | 2(0.01) | 6(0.03) | 4(0.02) | 3(0.01) | 1(0.005) | |
| | **Very good (65-75%)** | 0(0.00) | 0(0.00) | 2(0.01) | 3(0.01) | 3(0.01) | 1(0.005) | |
| | **Excellent (more than 75%)** | 0(0.00) | 0(0.00) | 0(0.00) | 1(0.005) | 0(0.00) | 90(0.47) | |
| **Total** | | | | | | | | 192(100) |

## DISCUSSION

This study assessed the knowledge, attitude, and practice of basic life support (BLS) among nurses in a tertiary care hospital in Pakistan. The findings highlight critical certification and training gaps affecting emergency care competency.

### Comparison with Existing Literature

The study found that 47.4% of participants demonstrated excellent BLS knowledge, while 49.5% showed good practice levels. These findings are consistent with similar studies conducted in low- and middle-income countries (LMICs) such as Nepal and India, where gaps in BLS knowledge and practice are prevalent due to limited access to training(5, 10).

However, in developed countries, higher competency levels have been reported. For instance, a study in Europe revealed that 79% of healthcare providers had active BLS certification and demonstrated higher knowledge scores(9).

The low proportion of nurses with valid BLS certification (35.9%). In this study aligns with findings from other LMICs, where periodic certification is often neglected due to resource constraints(7). In contrast, AHA guidelines emphasize the need for regular BLS training and recertification every two years to maintain competency(3).

### Implications for Practice

The results suggest a strong association between professional qualifications, BLS knowledge ($p = 0.001$), and practice levels ($p = 0.01$). Nurses with higher qualifications, such as Post-RN or MSN degrees, were more likely to demonstrate excellent knowledge and practice skills.

This underscores the importance of integrating BLS training into nursing curricula and continuing professional education. Despite the majority (96.9%) acknowledging the importance of BLS, the findings reveal significant gaps in practice readiness.

For example, only 49.5% of participants had excellent practice levels, and many lacked hands-on exposure to CPR. Previous studies suggest that lack of frequent training leads to skill decay, particularly for high-stakes skills like chest compressions and defibrillator use(11, 12).

### Recommendations

The findings highlight an urgent need for policy reforms in Pakistan's healthcare sector to prioritize emergency care training. Regular and mandatory BLS courses for nurses, aligned with international guidelines, can help bridge the knowledge-practice gap.

Additionally, institutional support in the form of funded training programs and accessible certification opportunities is crucial. Further research should explore barriers to BLS implementation in public hospitals and evaluate the effectiveness of training interventions over time. Comparative studies involving private hospitals could also provide insights into system-level differences in BLS competency.

### Strengths and Limitations

This study's strengths include its use of validated tools and stratified random sampling, which enhance the reliability and generalizability of the findings. However, it was conducted in a single tertiary care hospital, limiting its scope. Additionally, self-reported data may have introduced response bias, potentially overestimating actual knowledge and practice levels.

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