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EFFECTS OF BASIC LIFE SUPPORT TRAINING ON THE KNOWLEDGE OF BACHELOR OF SCIENCE IN NURSING STUDENTS

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ABSTRACT

Background Basic Life Support training significantly enhances the skills, confidence, and retention of nursing students in emergency response, especially when simulation-based and interactive learning methods are used. Research shows that this type of training increases CPR proficiency, and ensures long-term competency.

Objective: To evaluate the impact of BLS training on the knowledge of bachelor of science in nursing students' and how BLS training effects the practical application of nursing students in lifesaving activities.

Method: A quasi-experimental study design with pretest, post immediate test and post test was conducted at Rashid Latif nursing college. Non-probability purposive sampling technique was used for the selection of 126 participants. The training included a power point presentation, hands on practice and video demonstration. Data were collected from the participants. Data analysis was performed via SPSS version 23 with Fredman's ANOVA used for statistical analysis.

Result: The findings show noteworthy improvement in BLS knowledge during assessment periods. During the pre-test, respondents were poor mean score **(mean=48.9%), (mean=68.3%)** average, and none good. Immediate post-test results indicated remarkable improvement, with good score **(mean=96.5%)** and poor **(mean=28.55%)**. Knowledge retention continued to be excellent at one-month follow-up showing good scores **(mean=91.6%)** and poor scorers reducing to **(mean=23.8%)** with average scorers rising to **(mean=81.0%).** Results suggest that BLS training succeeds in enhancing as well as retaining knowledge among nursing students.

Conclusion: After the training there was a significant effect on the knowledge of BS nursing students. However, there was a noticeable decrease in knowledge retention with time.

Background

Basic Life Support (BLS) training is essential for preparing medical personnel, especially nursing students, for life-threatening emergencies. Cardiopulmonary resuscitation (CPR), defibrillation, and the first actions for managing sudden cardiac arrests and other life-threatening situations are among the fundamental skills that students who complete effective BLS training programs acquire. It has been demonstrated that BLS training greatly enhances nursing students' knowledge and professional skills, lowering patient fatality rates and empowering them to react appropriately in emergency situations (Ashiq et al., 2024). According to recent statistics, nursing students who participate in structured BLS programs report significantly higher competency level and confidence in emergency situations (Lee et al., 2023). According to a randomized study by McCoy et al. (2019) nursing students' CPR skills improved by 32% when BLS training was combined with simulation approaches as opposed to just receiving traditional classroom teaching National Centre of biotechnology information (NCBI). Furthermore, Aydın & Doğru (2020) demonstrated that simulation-based BLS training significantly decreased students' anxiety levels during practice in addition to improving their cognitive understanding, indicating that practical, hands-on approaches are essential for successful skill acquisition (Aydın & Doğru, 2020; Abbas et al., 2025). Aksoy in 2019 underscored the persistence of knowledge retention following training. A six-month follow-up literature review shown that tablet and virtual reality-based BLS training improved students' retention of essential life-saving proficiency by 20% compared to traditional methods although infection can also be minimized among by utilizing the precautions (Hussain et al., 2024). These results underscore the efficacy of BLS training in enhancing skill levels both instantly and over time, assuring the retention of these abilities. Furthermore, better results in BLS training are also associated with higher-quality instruction. In comparison to lecture-based training alone, nursing students' short- and long-term memory of CPR skills increased by 41% in a randomized experiment by Berger et al., (2019) that integrated problem-based learning with high-fidelity simulations. Realistic practice scenarios combined with active learning strategies have been demonstrated to be particularly successful in strengthening procedural knowledge and boosting self-efficacy (Berger et al., 2019). This study is to evaluate the impact of different BLS training modalities on nursing students' knowledge, practical application, and long-term skill retention, given the life-saving

potential of successful BLS training and the continuous advancements in educational methodologies. Designing training programs that are tailored to equip nursing students to respond to emergencies with competence and confidence in their future practice will be made easier with an understanding of these consequences.

Objective

- ✓ To evaluate the impact of BLS training on the knowledge of bachelor of science in nursing students' and how BLS training effects the practical application of nursing students in lifesaving activities.

Hypothesis:

(H_0): There is non-significant effect of BLS training on the knowledge of BS nursing students in life-saving emergencies, as measured by pre- and post-test assessments**.**

(H_1): There is a significant effect of BLS training on the knowledge of BS nursing students in life-saving emergencies, as measured by pre- and post-assessment.

Methods and Material

The study included Bachelor of Science in nursing students of Rashid Latif College of Nursing, Lahore, Pakistan from October 2024 to April 2025. Non probability purposive sampling technique was used to select the participants. The sample size was determined with help of online software "sample size.net", the calculated sample size was 126 in this study with 95% confidence level and 5% Edge of error. The quasi-experimental study design was used in this study. The students enrolled in Bachelor of Science in Nursing at Rashid Latif College of Nursing who are willing to participate in this study including boys and girls with no age limit were included in this study. The students other than BS nursing program at Rashid Latif College of Nursing, the interns, the students who refuse to take this session, the students who were certified of BLS, and the students who were absent on the day of session were excluded in this study**.** An adopted questionnaire with permission from a reference article was used in this study (Jabeen et al., 2024). The reliability of questionnaire was found r = 0.780. Data collection method was done into three phases. Pre intervention phase, intervention phase and post intervention phase. The data was collected from Goggle form. The questionnaire was divided into two sessions. First section includes the demographic detail of the participant which is based on ten questions. It includes the following questions age, gender, level of education, marital status, fathers' job, anyone suddenly fainted in your presence, if yes explain, prior information about CPR, if yes how did you get the information and do you want learn about basic CPR. The 2nd section included 10 questions based on four multiple choice options about assessment of knowledge of BLS which was divided into 3 sections. The score 1-3 (below 60%) categorized as poor, 4-7 (60%-80%) categorized as average and 8-10 (above 80%) categorized as good**.** The data collected including demographic information, pretest, post immediate test and post-test after one month was compiled and organize for statistical analysis. The data was assessed using statistical package for social sciences (SPSS) version 23. The ethical committee of Rashid Latif College of Nursing Lahore established the rules and regulations for conducting the research, and the rights of the research participants would be protected. Participation in this study was entirely up to the participant. Participants have the choice not to participate and can withdraw at any moment.

Results

Table 1: Demographic data of BS Nursing students

Items	Response Option	Frequency (n)	Percentage (%)
Age Group	21-25 years	126	100%
Gender	Male Female	44 82	35% 65%
Education Level	University	126	100%
Marital Status	Single	126	100%
Father's Occupation	Farmer Government Employee Retired Worker Businessman	26 19 10 71	21% 15% 08% 56%
Interest in Learning BLS	Yes	126	100%
Emergency Response Experience	Nothing happened Didn't know what to do Called for help Provided immediate first aid	7 19 48 52	6% 15% 38% 41%
Prior BLS Knowledge	Yes	126	100%
BLS Information Sources	TV Internet Books	72 2 52	57% 2% 41%
Want to learn about CPR	yes	126	100%

The above table shows the demographic survey results among 126 participants capture a consistent population background in the sense that all the participants were university-educated singles aged between 21-25 years. Gender unbalance was observed in the sample with women making up the majority of 65.1% respondents compared to 34.9% men. As regards family background, 56.3% of respondents identified their fathers as businessmen, 20.6% identified as farmers, 15.1% identified themselves as government officers, and 7.9% as retired workers. Notably, all respondents expressed interest in learning basic life support (BLS) and reported previous exposure to BLS skills, with television as the primary source of information (57.1%) significantly larger than internet sources (1.6%). In emergency situations, 41.3% of respondents interviewed confessed to providing immediate first aid, 38.1% called for help, though shocking percentages did nothing at all (5.6%) or did not know what to do (15.1%). The extremely high self-report of having ever seen someone faint (100%) underscores the appropriateness of BLS training for this demographic. These results both verify the extremely high baseline desire for

BLS training and suggest the necessity of more in-depth training in order to continue building emergency response capabilities among young adults.

Table 2: BLS Knowledge among BS Nursing Students

Sr. #	Question	Pretest score n (%)	Post immediate test score n (%)	Post-test after one month score n (%)
1	Primary goal of CPR	27(21.4%)	96(76.2%)	96(76.2%)
2	First action at injury scene	55(43.7%)	118(93.7%)	121(96%)
3	First action during cardiac arrest	52(41.3%)	118(93.7%)	102(81%)
4	Hand placement for compressions	38(30.2%)	124(98.4%)	117(92.9%)
5	Golden time for CPR	51(40.5%)	123(97.6%)	106(84.1%)
6	Compression rate per minute	60(47.6%)	122(96.8%)	115(91.3%)
7	Compression effectiveness	45(35.7%)	124(98.4%)	117(92.9%)
8	Hand/elbow position	41(32.5%)	122(96.8%)	117(92.9%)
9	Compression depth	42(33.3%)	42(33.3%)	117(92.9%)
10	Airway obstruction	64(50.8%)	123(97.6%)	117(92.9%)

The table 2 presents pretest, post-immediate and one-month posttest results, showing the percentage of correct responses for each question.

Pretest knowledge was limited; only 21.4% knew CPR's primary goal, 43.7% identified the initial injury response, and 41.3% correctly responded during cardiac arrest. Low scores were observed for hand placement (30.2%), golden time (40.5%), and compression rate (47.6%), and compression efficacy aspects (around 32-36%). Airway obstruction had the highest correct responses at 50.8%, but overall understanding was minimal. Post-immediate results improved dramatically. Correct identification of CPR's goal rose to 76.2%; nearly all knew initial injury and cardiac arrest responses (93.7%). Hand placement, golden time, compression rate, and airway obstruction scores neared 97-98%. Compression depth remained unchanged at 33.3%, indicating a training gap. One-month posttest retention remained strong for most concepts, with the CPR goal at 76.2% and airway obstruction at 92.9%. Awareness of initial injury response slightly declined to 96%, and response during cardiac arrest decreased to 81%. Hand placement and golden time responses remained high (~92-94%), with minor declines, demonstrating good knowledge retention over time.

Table 3: Level of Knowledge of BS Nursing Students Regarding BLS

Level of knowledge	Pre test		Post immediate		Post 1 month	
	Frequency	Mean score	Frequency	Mean score	Frequency	Mean score
Poor	94	48.9%	42	28.55%	30	23.8%s
Average	32	68.3%	0	N/A	21	81.0%
Good	0	N/A	84	96.50%	75	91.6%

Table 3 shows significant improvement in participants' BLS knowledge across three intervals: pre-test, post-immediate, and post-test. Initially, 48.9% had poor knowledge, 68.3% were average, and none were rated good. After the intervention, poor knowledge decreased to 28.55%, while 96.50% achieved a good rating, with no one in the average category. At the second post-test, poor knowledge further declined to 23.8%, the average rose to 81.0%, and the good level increased to 91.6%. This reflects a substantial and sustained increase in knowledge, demonstrating the intervention's effectiveness in both improving and retaining BLS skills.

Figure 1: Knowledge Ranks of BS Nursing Students Against Each Test

The figure 1 above shows the mean ranks of three various test periods: pre-test, post-immediate, and post-test. The pre-test has the lowest mean rank (1.67), meaning that it was most often ranked first (as lower ranks indicate improved performance or preference). The post-immediate test has the greatest mean rank (2.37), meaning it was ranked last among the three, while the post-test is in between (1.96). This suggests that preference or performance was better during the pre-test than the post-test but fell a bit short in the post-immediate test before settling down. Overall, the trend as seen from the results is such that the pre-test was most preferred, and then the post-test, and least preferred or effective was the post-immediate phase.

Discussion

This study included 126 BS nursing students of Rashid Latif nursing college Lahore. this study, BS nursing students with the average age of (21–25 years), gender-biased (65% female, 35% male), all were university students , with the father occupation business 56%, Govt. employee19%, farmer 26%and 10% retired worker, all the participants were single, all had high prior BLS exposure, and 100% training aspiration. In contrast Requena-Mullor et al. (2021) study included 479 first-year nursing students (75.8% female, mean age 19.84) with minimal BLS exposure and high interest in BLS. The research study conducted by Farhan et al. (2023) comprised a majority of male nurses (55.7%) below the age of 40 (84.4%), According to Cartledge et al. (2020) study conducted in Australia surveyed 1076 diverse Australian adults (50.6% female, 49.4% male, aged 35–64). According to Alnajjar et al. (2020) study conducted in King Abdulaziz University and Jeddah University, both in Jeddah, Saudi Arabia, 1053 predominantly female students (71.2%, mean age 21), and mostly high-achieving undergraduates. Mekonnen & Muhye. (2020) used a representative, older, predominantly male, married, urban population with minimal BLS training (35.09 ±8.737 years. A quasi-experimental study conducted by Jabeen et al. (2024) in a private sector college the target female students with the mean age of (15–17 years) with fathers who are government or agriculture workers, low CPR exposure (13.7%), and high learning desire (96.3%).

The findings show noteworthy improvement in BLS knowledge during assessment periods. During the pre-test, 48.9% of respondents were poor (mean=48.9%), 68.3% average, and none good. Immediate post-test results indicated remarkable improvement, with 96.5% good (mean=96.5%) and 28.55% poor (mean=28.55%). Knowledge retention continued to be excellent at one-month follow-up with 91.6% showing good scores (mean=91.6%) and poor scorers reducing to 23.8% (mean=23.8%) with average scorers rising to 81.0%. Results suggest that BLS training succeeds in enhancing as well as retaining knowledge among nursing students. Requena-Mullor et al. (2021) demonstrated significant gains in knowledge (pre-test 12.61 to post-test 15.68, $p<0.001$) in nursing students who had initial BLS unawareness (66.4%) (Requena-Mullor et al., 2021). Farhan et al. (2023) registered substantial pre-post score improvements (6.16±1.97 to 9.19±1.64) among Palestinian nurses and observing noticeable practice improvement. Cartledge et al. (2020) found that there were low levels of awareness among the general public (16% knew cardiac arrest as opposed to heart attack) and training (22%) in recent times, with disparities related to age, ethnicity, and education. Alnajjar et al. 2020 identified 71.3% of non-medical students as not having CPR training and only 45% identifying "no response to verbal stimuli" as an indication of cardiac arrest. Mekonnen & Muhye. (2020) research indicated weak BLS knowledge in non-medical groups (mean score 18.84±4.22), with a mere 8.5% being trained, the results highlighted the positive effect of training (trained scored 21.20±2.21 vs untrained 18.84±4.22). Jabeen et al. (2024) reported considerable short-term but knowledge gains in rural Pakistani students (median score change from 3 to 6.5 on completion of training, declining back to 4 after 3 months), where previous CPR experience improved outcomes.

Limitation

- ✓ Single-site study limits generalizability to other institutions or patient groups
- ✓ Self-reported measure of knowledge that does not include evaluation of actual clinical performance
- ✓ Short follow-up period may not reflect long-term retention of knowledge
- ✓ Potential testing bias due to repeated measures influencing outcomes
- ✓ Lack of control group reduces capacity to attribute outcomes to intervention only
- ✓ Homogeneous sample (students nursing) does not represent broader healthcare providers
- ✓ Fixed curriculum that has no provision for adaptive learning rates or learning styles

Conclusion

The research results revealed a significant impact of BLS training on nursing students' knowledge as indicated by the Friedman test outcomes. Descriptive statistics indicate improving scores from pre-test to immediate post-test and persistent retention in follow-up post-test, with mean ranks depicting an analogous increasing pattern. Although the immediate post-test revealed higher score variability than other tests, the repeated rise in mean scores in all testing periods assures that BLS training significantly enhanced and preserved nursing students' knowledge, validating the positive effect of the intervention on learning. Such findings add to the importance of systematic BLS training in augmenting and preserving life-supporting knowledge in nursing students, thus therefore this result concludes that there is significant effect on knowledge and alternative hypothesis is accepted.

Recommendations

- ✓ Multi-center studies maximize generalizability by broadening research across several institutions.

- ✓ Skill-based assessments measure not just knowledge, but real BLS performance in actual or simulated settings.
- ✓ Extended follow-up Periods test at 6–12 months to quantify long-term loss of knowledge.
- ✓ Control group inclusions include control trained vs. untrained groups to isolate intervention effects.
- ✓ Adaptive training methods apply tailored learning approaches to control variability in knowledge retention.
- ✓ Refresher interventions examine the impact of repeated reinforcement classes on competency duration.
- ✓ More representative healthcare populations engage doctors, paramedics, and community responders to provide more generalizability for the broader population.
- ✓ Mixed learning models examine combined (hands-on + web-based) training for scalability and use.

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