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SYNERGISTIC IMPACT OF WORKSHOPS, HANDS-ON TRAINING, AND VIDEO-ASSISTED TEACHING ON BLS COMPETENCY: A QUASI-EXPERIMENTAL STUDY

Medical Surgical Nursing

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ABSTRACT

Basic Life Support (BLS) is a vital lifesaving skill, and early development of knowledge and psychomotor competence among nursing students is essential for effective emergency response. This study assessed the effectiveness of a structured workshop incorporating hands-on training and video-assisted teaching on BLS knowledge and skills among B.Sc. Nursing 1st-semester students and examined associations with selected socio-demographic variables. A quantitative, non-randomized control group design was used, involving 60 students selected by convenience sampling (30 experimental, 30 control). Pre-test knowledge scores were comparable between experimental (9.8 ± 2.3) and control groups (9.5 ± 2.1; t = 0.54, p = 0.590), as were skill scores (4.5 ± 1.2 vs 4.2 ± 1.1; t = 1.09, p = 0.280). Post-intervention, the experimental group showed significantly higher knowledge (21.6 ± 2.5 vs 12.4 ± 3.1; t = 13.87, p = 0.001) and skill scores (14.9 ± 1.8 vs 5.0 ± 1.5; t = 22.74, p = 0.001). Good knowledge (86.7%) and high skills (83.3%) were achieved. No significant association was found with socio-demographic variables except prior BLS exposure. The study concludes that multimodal BLS training is highly effective for first-semester nursing students.

KEYWORDS

Basic Life Support; Cardiopulmonary Resuscitation; Nursing Students; Education, Nursing.

INTRODUCTION

Basic Life Support (BLS) is a fundamental component of emergency cardiovascular care and is crucial for improving survival outcomes in cases of cardiac arrest and other life-threatening emergencies. Early recognition of cardiac arrest, prompt initiation of high-quality cardiopulmonary resuscitation (CPR), and early defibrillation have been shown to significantly reduce mortality and improve neurological outcomes[1□2]. International resuscitation guidelines emphasize that effective BLS requires not only adequate theoretical knowledge but also well-developed psychomotor skills among healthcare providers[3□11]. Nurses, who are frequently the first responders in hospital and community settings, must therefore be competent in delivering BLS to ensure patient safety□□□.

Several studies have consistently reported inadequate baseline knowledge and poor CPR performance among undergraduate nursing students and other healthcare trainees□–□. First-year nursing students often enter training programmes with limited exposure to emergency care situations, resulting in low confidence levels and insufficient practical competence in BLS□□[1]□. Such deficiencies may negatively influence the quality of resuscitative care provided during real emergencies, underscoring the importance of early and effective BLS education in nursing curricula□□[12].

Evidence from educational research suggests that traditional lecture-based teaching alone is insufficient to achieve optimal learning outcomes in BLS education[13□1]□. In contrast, structured workshops, simulation-based learning, hands-on training, and video-assisted instruction have demonstrated superior effectiveness in enhancing both knowledge and skill acquisition[2□1□□1]□. Video-based learning enables repeated observation of correct CPR techniques, while hands-on practice promotes experiential learning and psychomotor skill development[1□□1]□. Blended and multimodal teaching approaches have also been associated with improved learner engagement and better retention of BLS concepts[2□□21].

Multiple studies involving nursing and healthcare students have shown significant improvements in BLS knowledge, skill performance, and confidence following structured and simulation-based training programmes[1□22□23]. Peer-assisted learning and instructor-guided hands-on sessions further contribute to improved CPR quality and adherence to recommended guidelines[2□□2]□. Additionally, early exposure to BLS training has been found to positively influence long-term skill retention and readiness to respond to emergency situations[2□2]□.

Despite growing evidence supporting innovative BLS teaching strategies, there remains a paucity of studies focusing specifically on first-semester B.Sc. Nursing students using a combined approach of structured workshops, hands-on training, and video-assisted teaching, particularly within the Indian educational context[2□□3]□. Given the novice status of first-semester students and their future role as frontline healthcare providers, it is essential to evaluate the effectiveness of such integrated educational interventions. Therefore, the present study was undertaken to assess the effectiveness of a structured workshop with hands-on training and video-assisted teaching on BLS knowledge and skills among B.Sc. Nursing 1st-semester students and to determine the association of post-test outcomes with selected socio-demographic variables[2□1□□3]□.

METHODS

Research Design and Setting

A quantitative research approach with a non-randomized (non-equivalent) control group design was employed. The study was conducted at a selected College of Nursing in Jammu.

Sample And Sampling Technique

Sixty B.Sc. Nursing 1st-semester students were selected using non-probability convenience sampling, with 30 students each in the experimental and control groups. Sample size was calculated using OpenEpi software (version 3.0) based on previous BLS studies, assuming a 95% confidence level and 80% power. Inclusion criteria included first-semester students available during data collection, without formal BLS training in the preceding six months, possessing a smartphone with WhatsApp access, and willing to provide informed consent. Students with physical limitations affecting BLS performance or those absent during intervention or post-test were excluded.

Data Collection Tools

Tool 1: Socio-Demographic Data Sheet

A structured socio-demographic questionnaire developed by the researcher was used to collect baseline data on age, gender, residence, family type, education and occupation of the head of the family, and socio-economic status assessed using the Modified Kuppuswamy Scale. Content validity was established by 12 experts, yielding an S-CVI of 0.93.

Tool 2: Structured Knowledge Questionnaire On BLS

A researcher-developed 15-item multiple-choice questionnaire assessed cognitive knowledge of BLS, covering principles, CAB sequence, CPR quality, airway management, ventilation, and AED use. Each correct response was awarded one mark (maximum score: 15). Scores were categorized as poor (0–5), moderate (6–10), and good (11–15). Reliability was established using KR-20, with a coefficient of 0.79.

Tool 3: Structured Skill Assessment Checklist on BLS

A structured observational checklist assessed psychomotor skills related to BLS, including scene safety, responsiveness assessment, chest compressions, ventilation, and AED use. Each step was rated on a 0–5 scale, and overall performance was categorized as inadequate (0–40%), satisfactory (41–70%), or competent (71–100%). Inter-rater reliability assessed using Cohen's Kappa yielded a value of 0.82.

Intervention

The researcher, certified as a BLS provider, administered a one-day

multimodal BLS training program to the experimental group. The intervention included a structured workshop on BLS concepts, a video-assisted teaching session demonstrating high-quality CPR, and supervised hands-on practice using adult manikins in a skill laboratory. The control group continued with the routine institutional curriculum.

Procedure of Data Collection

After obtaining informed consent, pre-test assessments of knowledge and skills were conducted simultaneously for both groups. The experimental group then received the multimodal BLS training, while the control group received no intervention. Post-test assessments were conducted for both groups on the same day using the same tools.

Data Analysis

Data were analyzed using SPSS software. Descriptive statistics were used for demographic variables. Mean and standard deviation were computed for knowledge and skill scores. Independent t-tests assessed the effectiveness of the intervention, and Chi-square tests examined associations between post-test outcomes and selected socio-demographic variables. A p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Human Ethics Committee. Written informed consent was obtained from all participants, and confidentiality and anonymity were maintained.

RESULTS

1.Sociodemographic variables of Students

The socio-demographic characteristics of the participants revealed that most B.Sc. Nursing 1st-semester students in both the experimental and control groups were aged between 19 and 20 years, with females constituting the majority. A higher proportion of students belonged to urban areas and nuclear families. The educational status of the head of the family was predominantly at the high school and intermediate levels, while occupational status mainly included clerical, farming, skilled, and semi-skilled work. Based on the Modified Kuppuswamy Scale, most participants were classified under the lower middle and upper middle socio-economic classes.

2. Comparison of Knowledge Scores Between Experimental and Control Groups

Table 1 illustrates the comparison of pre-test and post-test knowledge scores between the experimental and control groups. At baseline, the experimental group recorded a mean knowledge score of 12.8 with a standard deviation of 3.1, while the control group had a mean score of 11.4 with a standard deviation of 2.8. The observed t-value of 2.12 and p-value of 0.038 indicate a statistically significant, though minimal, difference in baseline knowledge. Following the intervention, a substantial improvement was observed in the experimental group, which achieved a post-test mean score of 22.9 compared to 13.8 in the control group. This difference was highly significant, as evidenced by a t-value of 16.58 and a p-value of 0.001, demonstrating the effectiveness of the structured workshop, hands-on training, and video-assisted teaching in enhancing BLS knowledge.

Table 1: Comparison of Pre-test and Post-test Knowledge Scores Between Experimental and Control Groups With Independent sample t-Test Results (N = 60)

Knowledge Level	Category	Experimental Group (n=30)	Control Group (n=30)	t-value (p value)
Pre-test	Mean ± SD	9.8 ± 2.3	9.5 ± 2.1	0.54 (0.590) (NS)
	Poor (<10)	18 (60%)	20 (66.7%)	
	Average (10–15)	12 (40%)	10 (33.3%)	
	Good (>15)	0 (0%)	0 (0%)	
Post-test	Mean ± SD	21.6 ± 2.5	12.4 ± 3.1	13.87 (0.001**)
	Poor (<10)	0 (0%)	8 (26.7%)	
	Average (10–15)	4 (13.3%)	18 (60%)	
	Good (>15)	26 (86.7%)	4 (13.3%)	

NS-Non-Significant **-Statistically significant

3.Comparison of Skill Scores Between Experimental and Control Groups

Table 2 presents the comparison of pre-test and post-test skill scores between the experimental and control groups. The pre-test findings revealed comparable baseline skill levels, with the experimental group obtaining a mean score of 4.5 and a standard deviation of 1.2, and the control group scoring a mean of 4.2 with a standard deviation of 1.1. The t-value of 1.09 and p-value of 0.280 indicate no statistically significant difference at baseline. Post-intervention analysis showed a marked improvement in the experimental group, which achieved a mean skill score of 14.9 compared to 5.0 in the control group. This difference was highly significant, with a t-value of 22.74 and a p-value of 0.001, confirming the strong effectiveness of the training programme in improving BLS psychomotor skills.

Table 2 : Comparison Of Pre-test And Post-test Skill Scores Between Experimental And Control Groups With Independent Sample T-test Results (N = 60)

Skill Level	Category	Experimental Group (n=30)	Control Group (n=30)	t-value (p value)
Pre-test	Mean ± SD	4.5 ± 1.2	4.2 ± 1.1	1.09 (0.280) (NS)
	Low Skill (<5)	18 (60%)	20 (66.7%)	
	Moderate Skill (5–10)	12 (40%)	10 (33.3%)	
	High Skill (>10)	0 (0%)	0 (0%)	
Post-test	Mean ± SD	14.9 ± 1.8	5.0 ± 1.5	22.74 (0.001**)
	Low Skill (<5)	0 (0%)	18 (60%)	
	Moderate Skill (5–10)	5 (16.7%)	12 (40%)	
	High Skill (>10)	25 (83.3%)	0 (0%)	

NS-Non-Significant, **-Statistically significant

4. Association of Post-test Knowledge and Skill Scores with Selected Socio-Demographic Variables

Chi-square analysis showed no significant association between post-test knowledge or skill scores and most socio-demographic variables. However, prior exposure to Basic Life Support information was significantly associated with higher post-test knowledge and skill levels.

DISCUSSION

The present study evaluated the effectiveness of a structured workshop combined with hands-on training and video-assisted teaching on Basic Life Support (BLS) knowledge and skills among B.Sc. Nursing 1st-semester students. The findings supported the study hypothesis, demonstrating that students exposed to the multimodal intervention achieved significantly higher post-test knowledge and skill scores compared to those receiving routine instruction. Baseline analysis confirmed that the experimental and control groups were comparable in socio-demographic characteristics, with most participants aged 19–20 years, predominantly female, residing in urban areas, belonging to nuclear families, and representing lower middle and upper middle socio-economic classes. This baseline similarity indicates that post-intervention differences were primarily attributable to the educational intervention rather than demographic variability, thereby strengthening internal validity, as reported in earlier nursing education studies□–□.

With respect to knowledge outcomes, baseline scores were largely comparable between the experimental and control groups, while post-test results showed a marked improvement in the experimental group compared to the control group. These findings suggest that structured workshops and video-assisted teaching significantly enhance cognitive understanding of BLS concepts. The results are consistent with previous studies reporting improved BLS knowledge following structured, video-based, and multimodal teaching strategies[1□2□1□□2□]. In contrast, studies relying solely on traditional lecture-based methods have demonstrated limited knowledge gains, emphasizing the added value of multimodal instructional approaches[13].

Improvement in psychomotor skills was particularly notable. Both groups demonstrated poor baseline skill levels, reflecting limited prior exposure to practical BLS training among first-semester nursing students. Following the intervention, the experimental group exhibited a substantial increase in mean skill scores, whereas the control group showed minimal improvement. This finding strongly aligns with existing literature highlighting the essential role of hands-on practice and simulation-based training in acquiring and refining CPR

skills[1,22,23]. Although some studies have reported rapid decay of CPR skills after training[2], such outcomes may be attributable to shorter training duration or lack of structured reinforcement, in contrast to the comprehensive multimodal approach employed in the present study.

Analysis of associations revealed no significant relationship between post-test knowledge and skill scores and most socio-demographic variables, a finding consistent with previous research[1,12].

Overall, the findings confirm that a structured, multimodal BLS training program incorporating workshops, video-assisted teaching, and hands-on practice is highly effective in improving both knowledge and psychomotor skills among first-semester B.Sc. Nursing students. Although the non-randomized design, single-center setting, and relatively small sample size limit generalizability, the standardized intervention and baseline group similarity enhance internal validity. Future research should focus on evaluating long-term retention of BLS knowledge and skills and exploring applicability across diverse educational and clinical settings.

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Conflict of Interest
The authors declare no conflict of interest.

CONCLUSIONS

The study confirms that a structured, multimodal BLS training program effectively improves knowledge and psychomotor skills among first-semester B.Sc. Nursing students.

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