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Effect of a Structured Nurse-Led Training Programme on Teachers' Practical Competence in Basic Lifesaving Skills in Nigerian Secondary Schools

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Abstract: *Basic Lifesaving Skills (BLSS) are critical emergency response procedures required to sustain life during cardiac arrest, choking, respiratory failure, and sudden collapse before advanced care is available. Despite global recommendations that teachers should be trained as first responders in school settings, evidence shows that many lack adequate practical BLSS competence. This study evaluated the effect of a structured nurse-led intervention on the practice of BLSS among secondary school teachers in selected government secondary schools in Ibadan, Nigeria. A quasi-experimental pre-test–post-test control group design was adopted. Ninety-two teachers who met eligibility criteria were selected through multistage sampling and assigned to intervention and control groups by educational zones. The intervention group received a nurse-led BLSS training programme consisting of a two-day intensive session followed by repeated supervised practical demonstrations over ten weeks, while the control group received no training during the study period. Practical BLSS performance was assessed using a validated skills checklist (reliability = 0.87). Data were analyzed using descriptive statistics and ANCOVA at a 5% significance level. Results showed a significant main effect of nurse-led intervention on BLSS practice ($F(1,91) = 8.87$, $p < .05$, partial $\eta^2 = 0.097$). Gender differences were small, though a modest treatment–gender interaction was significant. The study concludes that nurse-led, practice-focused BLSS training significantly improves teachers' emergency response competence in school settings.*

Keywords: basic lifesaving skills, nurse-led intervention, teachers, cardiopulmonary resuscitation, school emergency preparedness

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INTRODUCTION

Basic Lifesaving Skills (BLSS) refer to a number of basic emergency response procedures that maintain life in a person experiencing a life-threatening event such as cardiac arrest, respiratory arrest, choking and sudden collapse until that person can be taken to advanced medical care. BLSS includes cardiopulmonary resuscitation (CPR), management of foreign body airway obstruction through the use of abdominal thrusts and other associated maneuvers, early activation of emergency response systems, and the use of automated external defibrillators (AEDs). These skills are well known as the cornerstone of early emergency care, and are known to play a critical role in improving survival and the prevention of unnecessary mortality in out of hospital emergency situations. Evidence discussed in the attached study suggested that early recognition of cardiac arrest and early initiation of BLSS is a significant factor in improving chances of survival and improving neurological outcomes (Merchant et al., 2020; Pivac, et al., 2020). Worldwide, cardiovascular emergencies and sudden cardiovascular arrest are major causes of death. Cardiac arrest is described as an abrupt halt in effective functioning of the heart resulting in loss of circulation and if untreated, a rapid death. Reports mentioned in the work given below link to the use of BLSS procedures in survival from OHC, as the survival rate is significantly dependent on immediate bystander action (Aliyu et al. 2020; Ng et al. 2023). Research evidence summarised in the document further suggests that when BLSS is given early, the survival rates can be doubled or tripled whilst delays just a few minutes significantly reduce the chance of survival (Fukushima & Bolstad, 2020; Merchant et al., 2020). These findings highlight the time-criticality of BLSS, which is important beyond healthcare professionals, particularly for widespread practical competence.

The school setting is one of a significant yet poorly prepared setting for emergency response. Secondary schools are home to large numbers of adolescence that may experience a medical emergency such as sudden cardiac event, choking, injuries, seizure and respiratory distress during academic/extracurricular activities. By virtue of their role in supervising their students, teachers have often been the first available responders in such circumstance. The study attached underscores the role educators play in the application of BLSS in schools and how prepared they are for implementing it has far-reaching implications for the safety of students. However, several studies in the document indicate that teachers in many developing settings including Nigeria have shown poor knowledge and poor hands-on competence in BLSS procedures (Onabanjo et al, 2023; Ike & Onyeama 2020). Reports from surveys have shown that very few teachers have been properly trained in BLSS and even fewer are confident in performing BLSS during an emergency, meaning students are vulnerable in times of a critical incident.

International resuscitation authorities and professional bodies have time and time again advocated for more widespread BLSS training amongst lay persons, teachers included. Guidelines cited in the study which is attached, from major resuscitation organizations, focus on regular BLSS skills training and early response education in the community and educational settings. Research evidence cited identifies bystander BLSS and AED use as being key determinants of cardiac arrest outcomes and prior BLSS training is highly associated with the likelihood of effective bystander resuscitation (Ng et al., 2023). These recommendations represent a change in perspective from BLSS as a purely clinical knowledge, which should be distributed, particularly among persons with group responsibility to ensure survival of community members (e.g., teachers).

This is despite growing awareness but BLSS knowledge and practice among non-medical populations remains rock bottom in many regions. In the literature reviewed in the attached document, there are recurrent reports of deficiencies in the knowledge, skills, and confidence of BLSS by both teachers and students and other non-health workers (Abelairas et al., 2020; Mousa et al., 2023). Even for healthcare workers under certain developing context, BLSS competency has been cited as less than optimal, suggesting a general training and retention problem (Tomas & Kachekele, 2023; Namukwaya et al., 2022). Importantly, several of the intervention studies cited show substantial improvement in both knowledge and skills as a result of structured BLSS training in the short-term supporting the noise of targeted training programmes (Stella et al., 2020; Gabriel & Aluko, 2020).

A highly important factor in the effectiveness of BLSS is the quality of the practical performing. High-quality CPR and BLSS include proper compression depth, proper compression rate, correct hand position, complete recoil of the chest, minimal interruptions and proper compression-to-ventilation ratios. The attached document outlines that high quality CPR is linked to better survival and that interruptions during compressions are strongly made or reduce the potential of successful resuspending actions (Berg et al., 2020; Ogundele, 2020). As they are psychomotor skills, they need to be demonstrated, practiced under supervision, and corrected with feedback rather than being taught by lecture. Evidence cited in the review demonstrates that skills degrade over time without reinforcement and repetition and refresher training is needed in order to be retained (Schroeder et al., 2023). Nurse led interventions have been identified as an effective model to provide structured BLSS education and skills training. Nurses are ideally placed as appropriate trainers because of their clinical background on emergency and experience in patient and community teaching. The attached study states that nurse-led intervention helps in developing greater theoretical understanding, psychomotor skills, confidence, and response to emergency through hands-on practice and guided practice (Serena et al. 2020). Such interventions usually incorporate the provision of demonstration and return demonstration to allow participants the opportunity to practice skills under supervision until an appropriate level of competence is achieved. Evidence which has been cited further states that nurse-led BLSS education is linked with the improvement of emergency preparedness and response performance by trainees.

The school situation in Nigeria calls for further urgency of such interventions. According to the attached study, many government secondary schools are without functioning sick bays and do not have school nurses, therefore placing the immediate burden of first response on teachers. At the same time, however, access to the BLSS training is scarce and awareness of courses available to educators is low. Studies cited show that the majority of teachers have never been trained in BLSS but strongly desire to be trained after being given opportunities (Onyeaso, et al., 2023; Olofin-Samuel et al., 2024; Oluwasanmi et al., 2025). This combination of high need, low preparedness, and high willingness helps make the case for the feasibility and relevance of structured, nurse-led BLSS training programmes within schools.

The study therefore investigates a structured nurse-led BLSS intervention delivered to secondary school teachers using a quasi-experimental pre-test/post-test control group design. The intervention combines initial intensive training with repeated practical demonstrations and supervised return demonstrations over several weeks, emphasizing measurable practice outcomes rather than knowledge alone. By focusing on practical BLSS competence among teachers, the study contributes evidence on scalable strategies for strengthening emergency preparedness in school environments and reducing preventable mortality through early bystander action (Onabanjo et al., 2023; Merchant et al., 2020).

The main objective is to assess the effect of nurse-led intervention on secondary school teachers' practice of Basic Lifesaving Skills in selected government secondary schools in Ibadan, Nigeria. Specifically, the study aims to:

1. determine the main effect of nurse-led intervention on secondary school teachers' practice of Basic Lifesaving Skills;
2. determine the main effect of gender on secondary school teachers' practice of Basic Lifesaving Skills; and
3. assess the interaction effect of nurse-led intervention and gender on teachers' practice of Basic Lifesaving Skills.

METHODOLOGY

This study adopted a quasi-experimental research design to evaluate the effect of a structured nurse-led training programme on the practical performance of Basic Lifesaving Skills (BLSS) among secondary school teachers in selected government secondary schools in Ibadan, Nigeria. The design followed a pre-test–post-test control group structure, enabling comparison between an intervention group that received nurse-led BLSS training and a control group that did not receive the training during the study period. This approach was appropriate because it allowed for the measurement of change in practical BLSS competence attributable to the intervention while maintaining a real-world school setting. The design included baseline assessment, intervention exposure, and post-intervention outcome assessment using standardized instruments and skills checklists.

The study setting comprised selected public secondary schools in Ibadan, Oyo State, Nigeria, organized under educational zones. The target population included all secondary school teachers in Ibadan. According to figures cited in the study, the estimated number of registered secondary school teachers across the schools in the area exceeded twelve thousand. The study population, however, consisted of teachers in selected government secondary schools who were accessible and met the eligibility criteria. Inclusion criteria required participants to be currently teaching in selected public secondary schools, have at least one year of teaching experience, provide informed consent, and score below a defined threshold (60%) on a baseline BLSS knowledge screening test. Teachers on leave, those unwilling to participate, and those with less than one year of service were excluded.

Sample size was determined using the sample-for-proportions formula described by Charan and Biswas (2013) at a 95% confidence level and 80% statistical power. Parameters for the calculation were drawn from prior BLSS training studies referenced in the document. The computed minimum sample size was approximately 110 participants after adjusting for an anticipated attrition rate of 10%. Within the actual study period, 92 eligible teachers were successfully recruited and completed participation requirements, with participants distributed across intervention and control groups.

A multistage sampling technique was used. First, two educational zones in Ibadan were selected. Second, public secondary schools were randomly selected within each chosen zone. Third, teachers in the selected schools were screened using a BLSS knowledge instrument, and those scoring below the threshold were considered eligible. Fourth, eligible participants from one educational zone were assigned to the experimental (intervention) group, while those from the second zone were assigned to

the control group. This cluster-based assignment helped reduce contamination between groups. Participants were then enrolled as cohorts and followed through the intervention and post-test phases. The intervention consisted of a structured nurse-led BLSS training programme focused on practical skills acquisition. The training was delivered by qualified nurses using standardized BLSS protocols. The intervention group received an initial two-day intensive training covering core BLSS components, including recognition of cardiac arrest, activation of emergency response, cardiopulmonary resuscitation, choking management techniques, and AED use. Training methods included lectures, demonstrations, and hands-on practical sessions. Following the initial training, participants underwent continued practical demonstration and supervised return-demonstration sessions lasting approximately 45 minutes per day over a ten-week period. This repeated practice model was designed to strengthen psychomotor competence and skill retention. The control group did not receive the BLSS training during the study timeframe but participated in the same pre-test and post-test assessments.

Data were collected using a practical skills checklist. The checklist was used by trained assessors to rate participants' practical BLSS performance during simulated scenarios. The checklist covered critical performance steps such as scene safety recognition, correct compression technique, compression rate and depth, airway management steps, and correct response sequencing. Instrument reliability reported in the study was 0.87.

Baseline (pre-test) assessments were conducted for both groups before the intervention. Post-test assessments were conducted after completion of the training and follow-up period using the same instruments and practical evaluation procedures. Data analysis involved descriptive and inferential statistics. Treatment effects on BLSS practice were tested using appropriate comparative statistics at a 5% significance level, including analysis of main and interaction effects for intervention, and gender variables. Ethical approval and institutional permissions were obtained, and participation was voluntary with informed consent from all teachers involved.

RESULTS

Table 1: Socio-Demographic Characteristics of Participants (N = 92)

Variable	Category	Percentage
Gender	Female	59.4
	Male	40.6
Total Sample	—	100

The study involved 92 secondary school teachers drawn from selected government secondary schools. Gender distribution reported in the study shows that females constituted the majority of participants
An ANCOVA test was conducted to determine the main effect of nurse-led intervention on teachers' post-practice scores in Basic Lifesaving Skills (BLSS). The results showed a statistically significant main effect of treatment on BLSS practice.

2: ANCOVA Summary of Main Effect of Nurse-Led Intervention on BLSS Practice

Source	df	F	p-value	Partial Eta Squared
Treatment (Nurse-led Intervention)	1, 91	8.87	< .05	0.097

The model showed that approximately 9.7% of the variance in post-practice BLSS scores was attributable to the nurse-led intervention effect. The adjusted R^2 of the model was reported as 0.35, indicating that 35% of the variance in post-practice scores was explained by the model, with treatment contributing a meaningful proportion. The null hypothesis of no treatment effect on practice was rejected.

To examine the magnitude and direction of the treatment effect, estimated marginal means were computed.

Table 3: Estimated Marginal Means of Post-Practice BLSS Scores by Treatment Group

Group	Adjusted Mean	Std. Error	95% CI Lower	95% CI Upper
Nurse-Led Intervention	88.89	0.99	86.93	90.85
Control Group	84.19	1.21	81.78	86.59

Teachers who received the nurse-led intervention had higher adjusted post-practice BLSS scores (Mean = 88.89) compared with those in the control group (Mean = 84.19), confirming that the intervention improved practical lifesaving skills performance. The study also tested whether gender had a significant main effect on BLSS practice scores. Estimated marginal means were computed and compared across male and female teachers.

Table 4: Estimated Marginal Means of Post-Practice BLSS Scores by Gender

Gender	Adjusted Mean	Std. Error	95% CI Lower	95% CI Upper
Male	86.92	0.98	84.97	88.88
Female	86.15	1.19	83.78	88.51

The adjusted mean post-practice score for male teachers (86.92) was slightly higher than for female teachers (86.15), but the difference was small. The study reports that gender alone did not produce a practically large difference in BLSS practice outcomes, indicating broadly similar performance levels across genders after adjustment.

The interaction between treatment (nurse-led intervention) and gender on BLSS practice was tested using factorial ANCOVA. The results showed a statistically significant interaction effect.

Table 5: ANCOVA of Interaction Effect of Treatment × Gender on BLSS Practice

Source	df	F	p-value	Partial Eta Squared
Treatment × Gender	1, 91	3.88	< .05	0.044

The interaction effect accounted for approximately 4.4% of the observed variance in BLSS practice scores. This indicates that the effect of the nurse-led intervention on practice differed modestly by gender. The corresponding hypothesis of no interaction effect was rejected.

DISCUSSION OF FINDINGS

The results obtained from this study have shown that the nurse led intervention resulted in a statistically significant improvement in the teachers' practical performance of Basic Lifesaving Skills (BLSS). Adjusted scores achieved by teachers following the structured nurse-led training were higher than those in the control group and the treatment effect accounted for a significant proportion of variance of the reported performance outcomes. This adds credence to the position advanced in the study in that instructor-led and nurse-led BLSS training models are effective in the non-medical population, especially teachers, who are first responders in school environments. The finding is consistent with cited intervention studies indicating improvements in the practical skills of participants and readiness to take action in emergencies as a result of structured BLSS training (Gabriel, & Aluko 2020; Stella, R., et al., 2020). The document also highlights that instructor-led approaches are scalable and effective for teacher training and that school nurse-led programmes show a positive impact on the BLSS knowledge and skills, when delivered in regular and well-timed sessions (Suss-Havemann et al., 2020). Together, these supporting studies are consistent with the current finding that a structured nurse-led model helps to strengthen the practical lifesaving competence of teachers.

The estimated marginal means further showed that the intervention group performed better than the control group in post-practice BLSS scores, which was consistent with the importance of the treatment effect. This finding is consistent with evidence summarised in the document that a combination of theoretical and repeated hands-on practice and return demonstration can help improve skill retention and performance under pressure. Prior cited work in the document emphasizes on the faster deterioration of BLSS psychomotor skills compared to knowledge if not reinforced, thus justifying the extended, practice-based training formats such as the one employed in the present study (Ahmed et al., 2021; Izquierdo-Condoy and Ortiz-Prado, 2024). The current results therefore provide support to the argument in the attached literature that periodic, supervised practical training - instead of one-time lectures - is essential for achieving measurable improvements in lifesaving skill performance among teachers and other lay responders.

With respect to gender, the results indicated only small differences between the adjusted post-practice BLSS scores of male and female teachers, suggesting that (both) groups benefited equally from the training. Although a statistically significant treatment x gender interaction effect was shown, the effect size was small, which suggests that gender was not a major barrier to skills acquisition under the condition that standardized nurse-led training was provided. This pattern is consistent in the literature cited in the document is - that BLSS competence gaps are widespread irrespective of gender and that comprehensive training programmes would need to target all teachers in a uniform manner. The post in the attached review refers to studies showing that (lack of BLSS competence) is found across gender

groups and that compulsory training can help bridge the gaps of preparedness without gender bias (Ogundele 2020). Thus, the present findings generally support - rather than contradict - previous evidence that BLSS training effectiveness is broadly gender-neutral as long as access and the quality of instruction are equal.

Overall, the results support the main argument of the attached study that nurse-led BLSS interventions constitute an effective strategy in enhancing the practice of emergency responses among secondary school teachers. The discussion sections in the document highlight that trained teachers not only change their own level of preparedness but also contribute to the development of a culture of preparedness at the school level and may further promote among students and colleagues the lifesaving skills they have learned. This concurs with studying work that demonstrates that already trained teachers promote retraining, maintain the use of abilities and increase emergency readiness of the institution (Frontiers, 2024; Olofin-Samuel et al., 2024). Consequently, the shown treatment effects on BLSS practice makes for empirical support of the recommendation in the attached study that nurse-led BLSS training is institutionalized and regularly repeated within school systems as a means to reduce preventable deaths during cardiac and other emergencies..

CONCLUSION

The results of the study have confirmed that a structured nurse-led training programme has a significant effect on the practical performance of Basic Lifesaving Skills (BLSS) among secondary school teachers such that the intervention group exhibited high post-practice test scores when compared with the control group with a meaningful treatment effect size. Gender differences in outcomes of practices were small, and despite a small treatment-gender interaction, practice effects were the same for female and male teachers.

Recommendations

1. Nurse-led BLSS training programmes should be institutionalised in the government secondary schools and conducted regularly to all the teachers to reinforce practical capacity in emergency response.
2. BLSS training should focus on hands-on practice, demonstration and return demonstrated methods instead of lectures for better skill performance and retention.
3. Periodic refresher and retraining sessions should be scheduled for teachers because BLSS skills get worse over time if not reinforced.
4. Both teacher males and females should be equally targeted for BLSS training as training benefits are evident across gender groups.
5. Education authorities and school management should recruit the presence of nurses and health professionals to adopt structured BLSS training and drills into routine staff development programmes.

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