

Influence of Prior Emergency Training Experience on Responsiveness to Nurse-Led Basic Lifesaving Skills Intervention Among School Teachers

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Abstract: *Basic Lifesaving Skills (BLSS) are time-critical emergency procedures required to sustain life during cardiac arrest, respiratory failure, choking, and sudden collapse before advanced care is available. Teachers often serve as first responders in school settings, yet many lack adequate BLSS competence. This study examined the influence of prior emergency training experience on responsiveness to a nurse-led BLSS knowledge and skills intervention among secondary school teachers in selected government schools in Ibadan, Nigeria. A quasi-experimental pre-test–post-test control group design was used. Ninety-two eligible teachers were selected through multistage sampling and assigned by educational zones to intervention and control groups. Baseline BLSS knowledge and practice were assessed, and prior emergency training experience was recorded as a moderator variable. The intervention group received a structured nurse-led programme comprising a two-day intensive training and repeated supervised practical sessions over ten weeks, while the control group received no training during the study period. Data were collected using validated knowledge instruments and practical skills checklists and analyzed using ANCOVA. Results showed significant main effects of nurse-led intervention on BLSS knowledge and practice, significant main effects of prior experience, and a significant treatment × prior experience interaction effect. The findings indicate that nurse-led BLSS training is effective for teachers, with responsiveness varying by prior training background.*

Keywords: basic lifesaving skills, prior training experience, nurse-led intervention, teachers, cpr training, emergency preparedness

INTRODUCTION

Basic Lifesaving Skills (BLSS) are a structured emergency care action that will be carried out when an individual develops a life-threatening event, this will include cardiac arrest, respiratory arrest, choking or sudden collapse with the aim of maintaining circulation and oxygenation until advanced medical support is available. Core elements of BLSS are cardiopulmonary resuscitation-CPR techniques; relief maneuvers for obstructed airways; activation of emergency response systems; rapid activation of emergency response systems; use of automatic external defibrillators-AEDs. The present study attached underlines the fact that survival in cardiac and respiratory emergencies is strongly time-dependent and that early BLSS by a nearby responder improves the outcomes considerably. Evidence

cited demonstrate that the earlier BLSS is initiated, the greater the probability a person will survive and reduce the amount of neurological damage, but the sooner response, the quicker the deterioration will occur (Merchant et al. 2020, Lott et al., 2021, Pivac, et al., 2020).

Out-of-hospital cardiac arrest is a major cause of death worldwide and outcomes are especially poor in the developing world in which emergency response infrastructure is more limited. The document provides awareness of the fact that bystander action is a decisive determinant of survival and that communities having high BLSS training penetration exhibit better emergency outcomes (Aliyu et al., 2020). Research cited in the study shows that survival rates can be doubled or tripled by early CPR and defibrillation, the value of which in operational use provides the population with lifesaving competence aiming non-medical (Fukushima & Bolstad, 2020; Rea et al., 2021). Consequently, the focus has moved toward institutional first responders - including school teachers - who in many cases are in the area when emergencies happen.

Schools are high density, high exposure environments in which acute health events may arise in the course of routine academic or sporting activities. Teachers are generally the people closest to students to make the first critical minutes of difference. The work attached highlights that, as a direct result, teachers are the first responders in many school emergencies and their preparedness has an impact on student safety (Onabanjo et al., 2023). However, the results of the literature reviewed in the document indicate consistent low BLSS competence of teachers in many parts of the world. Studies cited show deficiency both in knowledge and skill in practice with small proportion of teachers having received formal BLSS instruction and even smaller one showing confidence in the application of skills in real incidents (Ike & Onyema, 2020). This lack of connectivity between responsibility and preparedness presents an operational risk in school systems.

Professional resuscitation bodies have therefore extended their recommendations to include the inclusion of BLSS training of lay institutional caregivers such as teachers. The guidelines for routine BLSS education in schools and community settings are reported within the study attached for the article (American Heart Association, 2020). Evidence cited also suggests that persons with previous population education from BLSS or AED implementation are more likely to intervene appropriately in the emergency (Ng et al., 2023). Yet, previous exposure is not necessarily the hallmark of continued competence. Several sources that are cited in the document mention that while previous training can be useful in raising baseline awareness, the quality of performance is very much influenced by how recent and how often the training has to be reinforced (Ogundele, 2020). This raises an important analytical question about the effectiveness of pre-existing emergency training experience as an influence for responsiveness to novel structured BLSS interventions; or if all participants experience common similar benefits regardless of background exposure.

The patterns for prior experience are mixed in the reviewed literature. Some of the studies cited in the attached document report enhanced baseline knowledge, confidence, and perceived competence in study participants who have been previously trained with BLSS. On the other hand, other evidence shows that the absence of periodic refresher training can lead previously trained individuals to not experience adequate maintenance of their practical proficiency, and not have a significant difference in performance from those who had no prior exposure (Ogundele, 2020). Additional evidence encountered in the document stresses that BLSS psychomotor skills decay at a faster rate than theoretical knowledge and therefore need repeated supervised practice to keep the skills operationally

ready (Ahmed et al., 2021; Schroeder et al., 2023). These contrasting results make prior experience a critical variable to be actually predicted empirically instead of being assumed to protect.

There is a technique sensitivity to effective BLSS performance. High-quality CPR involves correct compression depth and rate, correct sequencing, little interruptions and correct ventilation ratios. Attached document highlights the fact that these are procedures skills and motor skills, that must be learned through demonstration, guided rehearsal, and feedback, rather than through a passive (Berg et al., 2020; Perkins et al., 2021; Ogundele, 2020). Training models where practice does take place, and these practices involve return demonstration are therefore more likely to generate measurable competence gains. This type of training structure also presented an opportunity to investigate whether those participants with previous emergency training experience progress faster or perform higher post-training numbers if exposed to reinforced, nurse-led instruction.

Nurse-led BLSS interventions are an example of a practical and scalable delivery model for non-medical groups, which are highlighted in the attached study. Nurses bring together clinical emergency proficiency and instructional capability, and are in a position to provide structured and skill-focused training. The document states that nurse-led programmes enhance knowledge, practical performance and confidence with hands-on sessions and supervised return demonstrations (Serena et al., 2020; Longenecker et al., 2024). In the context of the Nigerian public school setting - where a large number of schools do not have health personnel on site - this model makes special sense. The study suggests that the majority of teachers are not formally trained in BLSS but are willing to participate if programmes are offered (Srinivasana et al., 2019; Olofin-Samuel, et al., 2024; Oluwasanmi et al., 2025). This provides an appropriate environment to assess the influence of prior experience on response to nurse-led BLSS training of a novel nature.

The main objective is to examine how prior emergency training experience influences responsiveness to a nurse-led BLSS knowledge and skills intervention among secondary school teachers 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' knowledge and practice of Basic Lifesaving Skills;
2. examine the main effect of prior experience on teachers' knowledge of Basic Lifesaving Skills;
3. examine the main effect of prior experience on teachers' practice of Basic Lifesaving Skills; and
4. assess the interaction effect of nurse-led intervention and prior experience on teachers' BLSS knowledge and practice outcomes.

METHODOLOGY

This study employed a quasi-experimental pre-test–post-test control group design to examine the influence of prior emergency training experience on responsiveness to a nurse-led Basic Lifesaving Skills (BLSS) knowledge and skills intervention among secondary school teachers in selected government secondary schools in Ibadan, Nigeria. The design enabled comparison of outcomes across intervention and control groups while also testing the main and interaction effects of prior BLSS experience and treatment exposure on post-intervention knowledge and practical performance. Baseline assessments were conducted before the intervention, followed by structured training for the experimental group and post-test evaluation for both groups using the same instruments.

The study setting comprised public secondary schools within selected educational zones in Ibadan. The target population included all secondary school teachers in the area, while the study population consisted of teachers in selected government schools who met the eligibility criteria. Inclusion criteria required that participants were currently teaching, had at least one year of teaching experience, gave informed consent, and scored below the defined threshold on the BLSS screening test at baseline. Teachers on leave, those unwilling to participate, and those with less than one year of service were excluded. Prior emergency or BLSS training experience was measured at baseline through the demographic and background section of the study instrument and was later used as an independent moderator variable in the analysis.

Sample size determination followed the Charan and Biswas formula for proportions at a 95% confidence level and 80% power, with parameters drawn from prior BLSS training studies cited in the document. The calculated minimum sample size was approximately 110 after allowing for attrition; however, 92 eligible teachers completed the study and were included in the final analysis. A multistage sampling procedure was used: educational zones were first selected, followed by random selection of public secondary schools within those zones. Eligible teachers were then screened and recruited. Participants from one zone were assigned to the nurse-led intervention group and those from the other zone to the control group to minimize contamination.

The intervention consisted of a structured nurse-led BLSS training programme combining theory and intensive practical instruction. The experimental group received a two-day initial training covering recognition of cardiac arrest, emergency activation, CPR, choking management, and AED use, followed by repeated supervised practical demonstrations and return-demonstration sessions of about 45 minutes per day over ten weeks. The control group received no BLSS training during the study period. Data were collected using a validated BLSS knowledge questionnaire and a practical skills checklist used to score simulated performance steps. Reported reliability coefficients ranged from 0.89 to 0.92. Data were analyzed using descriptive statistics and ANCOVA to test main and interaction effects of treatment and prior experience at a 5% significance level. Ethical approval and institutional permissions were obtained, and participation was voluntary.

RESULTS

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

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	55	59.4
	Male	37	40.6
Total	—	92	100.0

Table 1 shows that a total of 92 secondary school teachers participated in the study, with females constituting the majority of respondents. Specifically, 55 participants (59.4%) were female, while 37 participants (40.6%) were male. This indicates a gender distribution skewed toward female teachers within the sampled government secondary schools.

Table 2: Estimated Marginal Means of Post-Knowledge by Treatment

Group	Adjusted Mean
Nurse-Led Intervention	16.96
Control	15.53

Teachers exposed to nurse-led intervention recorded higher adjusted BLSS knowledge scores than controls.

Table 3: ANCOVA of Main Effect of Nurse-Led Intervention on BLSS Practice

Source	df	F	p-value	Partial Eta ²
Treatment	1, 91	8.87	< .05	0.097

Treatment accounted for approximately 9.7% of variance in post-practice scores (Adjusted R² ≈ 0.35).

Table 4: Estimated Marginal Means of Post-Practice by Treatment

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

Table 5: ANCOVA Main Effect of Prior Experience on BLSS Knowledge

Source	df	F	p-value	Partial Eta ²
Prior Experience	1, 91	7.17	.009	0.080

Prior emergency/BLSS experience showed a statistically significant main effect on teachers' BLSS knowledge. This indicates that prior experience explained about 8% of the variance in BLSS knowledge outcomes.

Table 6: ANCOVA of Main Effect of Prior Experience on BLSS Practice

Source	df	F	p-value	Partial Eta ²
Prior Experience	1, 91	5.78	.018	0.065

Results also showed a statistically significant main effect of prior experience on BLSS practice performance. Prior experience accounted for about 6.5% of variance in post-practice BLSS scores, indicating that teachers with prior exposure differed significantly in practice outcomes compared with those without prior exposure.

Table 7: ANCOVA of Interaction Effect of Treatment × Prior Experience on BLSS Outcomes

Source	df	F	p-value	Partial Eta ²
Treatment × Prior Experience	1, 91	5.78	.018	0.065

Factorial ANCOVA showed a statistically significant interaction between nurse-led intervention and prior experience for BLSS outcomes. This indicates that responsiveness to the nurse-led intervention differed significantly depending on whether teachers had prior BLSS/emergency training experience. Approximately 6.5% of outcome variance was attributable to this interaction effect.

DISCUSSION OF FINDINGS

The results of the second study results show that the nurse-led intervention resulted in a significant improvement in both the Basic Lifesaving Skills (BLSS) knowledge and practical performance of secondary school teachers. Participants who received the structured nurse-led training had higher adjusted post-test scores in the two domains than did the control group. This supports the position in the attached literature that instructor-led and nurse-led BLSS programmes are effective for non-medical population when they combine theory and supervised practical sessions. The document quotes several intervention studies showing that structured BLSS training has led to significant improvements to the knowledge and skills of the participants in the short-term as well as enhancing emergency readiness (Gabriel & Aluko, 2020; Dalhat et al., 2022; Stella et al., 2020). It further adds that school nurse-led models and instructor-led models are effective and scalable methods for teacher training in emergency response, which is in line with the present results showing measurable gains after nurse-led instruction (Suss-Havemann et al., 2020).

The study also found that previous emergency or BLSS training experience had a significant main effect for both BLSS knowledge and BLSS practice outcomes. Teachers with prior exposure differed significantly on post-intervention scores as compared with teachers with no prior exposure. This supports the evidence cited in the attached review that participants who have previously undergone BLSS training are often able to demonstrate a greater baseline level of knowledge, greater confidence and better initial skill levels. However, the attached literature also offers a word of caution: the importance of prior training does not guarantee sustained competence in the future because skill retention is dependent upon frequency and recency of practice. Reports cited in the document indicate that without refresh courses the previous trained personnel may still demonstrate inadequate preparedness thereby bearing in favour of retraining even for experienced participants (Ogundele, 2020; Eajem, 2020). Thus, the present results reinforce and update evidence from earlier studies - prior experience counts, but organized retraining is still needed.

Importantly, the results also showed a significant interaction effect between nurse-led intervention and prior experience on results of BLSS, suggesting that responsiveness to intervention varied based on people's prior training background. This implies that prior experience is a moderating and not a background characteristic. The attached document supports this interpretation as some previously trained teachers are identified to have a much better readiness, but performance appears to be strongly influenced by the way training is delivered, and from follow-up activities. There is an emphasis in the literature cited regarding the rapid decline of psychomotor BLSS skills compared to injuries to athletic abilities - specifically skills related to technique and knowledge deteriorate much more slowly than skills related to movement, day to day actions, and skills must be practiced repeatedly with supervision in order for them to remain useful skills (Ahmed et al., 2021; Schroeder et al., 2023). The extended and demonstration-based nurse-led training, which was employed in the study, was therefore likely to have benefited both previously trained and untrained teachers, but not in equal amounts, leading to the observed interaction effect.

Overall, the findings strengthen the argument made throughout the attached study supporting the role of nurse-led BLSS interventions as an evidence-based approach to bolstering emergency preparedness in school areas, in addition to demonstrating that prior experience influences - but does not supplement

- the importance of structured training. The discussion in the document focuses on the fact that regular and supervised BLSS's instruction leads to confidence, reduces panic in an emergency and a culture of preparedness among teachers, who may in turn transmit these skills within the school community (Greif et al., 2020). The combined pattern of significant treatment, prior-experience, and interaction effects therefore supports a dual policy implication derived from the attached work as follows: BLSS training should be universal for teachers but models for refraining and reinforcement should be built in to deal with difference in prior exposure and retention.

CONCLUSION

The results of the second study showed that the nurse-led BLSS intervention played a significant role in improving the knowledge and practical performance of the Basic Lifesaving Skills by the secondary school teachers, whereas the previous emergency training experience also had a significant effect on the post-intervention results. Teachers with prior exposure demonstrated differential responsiveness, and that the presence of a significant interaction among prior experience, intervention, and training so that training impacts by background experience level. However, the evidence presented in the attached study also makes it clear that previous training is not enough to ensure long-term competence because the BLSS skills must be re-enforced to achieve and maintain competence.

Recommendations

1. Nurse-led BLSS training should be rolled out to all secondary school teachers, irrespective of previous emergency training experience, to provide good consistency of minimum competence.
2. Teachers who have received training in BLSS or emergency first-aid should be invited as structured follow-up and reinforcement sessions since the mere discussed experiences do not necessarily guarantee the retention of the practical proficiency.
3. BLSS programmes for schools to have demonstration and return-demonstration formats with multiple supervised practice to overcome difference in prior experience and decay of skills.
4. Education authorities should institutionalize periodic retraining cycles in BLSS as well as competency retesting for teachers to maintain knowledge and psychomotor behavior.

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