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Knowledge, attitude, perceived confidence and barriers of non-medical staff following basic life support training at a tertiary private hospital

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Abstract

Introduction: Basic Life Support (BLS) is an essential skill required to effectively manage emergencies by maintaining cardiac, pulmonary, and cerebral circulation, thereby increasing the chances of survival. BLS training for non-medical hospital staff is extremely necessary, as cardiac arrests can occur anywhere, and immediate response during those critical first minutes determines survival. This study aimed to assess the knowledge, attitude, perceived confidence, barriers and t raining feedback of BLS training among non-medical staff of Norvic International Hospital.

Method: A cross-sectional analytical study was conducted using census method among 43 non-medical staff who had received BLS training at Norvic International Hospital. The structured questionnaire assessing the knowledge, attitude, perceived confidence, barriers, and training feedback was used to collect participant's data. Descriptive statistics and Fisher's exact test were calculated using SPSS version 27.

Result: Among the 43 participants, 32(74.4%) reported high knowledge, while 41(95.3%) demonstrated a positive attitude towards basic life support. Approximately 20(46.5%) stated the fe ar of making mistakes as the main barrier, and 18(41.9%) worried about legal concerns. However, majority participants 37(86.0%) showed perceived confidence in performing CPR in case of medical emergencies. No significant association was found between knowledge, attitude, and socio-demographic characteristics.

Conclusion: Although the participants demonstrated satisfactory knowledge, attitude, and perceived confidence, reluctance exists in real-life emergencies due to perceived barriers as fear of making errors and legal concerns. Therefore, addressing participants' concerns of fear and legal consequences is crucial in future sessions for strengthening the efficiency of such training.

Keywords: Barriers; Basic life support; Confidence; CPR knowledge attitude training

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Introduction

Basic Life Support (BLS) is defined as support provided to anyone experiencing medical emergencies with the competencies in the management of airway, breathing, and circulation.[1] It is reported that early BLS performed in out-of-hospital cardiac arrest was associated with a high s urvival rate before medical services arrived.[2,3] However, studies show insufficient BLS knowledge among non-healthcare hospital employees[4], with formal training markedly improving knowledge and skills.[5,6]

BLS training is essential for non-healthcare employees in hospital because medical emergencies can occur anywhere, and these staff often serve as first responders in areas such as OPD, elevators, washrooms, ultrasound rooms.[7] Their immediate actions, including initiating CPR, can bridge the critical gap until medical professionals arrive, as every minute without intervention reduces survival chances. The survival rate of out-of-hospital cardiac arrest reduces by approximately 7-10% per minute without bystander CPR or defibrillation.[8] More importantly, non-medical employees trained for BLS in hospital settings can assist medical professionals during emergencies, particularly when clinical staff are limited.[9]

This pioneering study at Norvic International Hospital fills a critical evidence gap in Nepal, where research on non-medical staff remains limited and mostly targets healthcare professionals. It assessed post-training knowledge, attitude shifts toward emergencies, self-reported confidence in responding, perceived barriers (e.g. attitudinal resistance), and training feedback. The hospital-specific findings also analyzed associations between sociodemographic factors (like age, education, and experience). The knowledge/ attitudes of BLS, might serve as a practical reference for other institutions to empower non-medical personnel, and ultimately improves survival rates inside and outside the hospital settings.

Method

A cross-sectional study design was utilized to assess the knowledge, attitude, perceived confidence, barriers, and training feedback of BLS among non-medical staff after two months of training. The study was conducted at Norvic International Hospital, a multi-specialty tertiary care facility situated in the central region of Kathmandu, Nepal. This hospital employs more than 300 non-medical staff members. The study population comprised non-medical staff who had received BLS training two months prior to the survey. For BLS training, the heads of each department selected participants based on convenience, prioritizing those without prior BLS training or formal medical education. A total of 43 non-medical staff who completed the BLS training program at Norvic International Hospital were included in the study. This represents the complete cohort of non-medical staff trained during the initial phase of the program; therefore, no sampling method was applied. It provides the initial assessment of knowledge, attitudes, perceived confidence, barriers and training feedback following the introduction of training for non-medical staff, and may serve as a baseline for future larger or longitudinal studies. Non-medical staff aged ≥ 18 years who had received BLS training two months prior to the survey were included. This timing falls in the grey zone with realistic knowledge and skill retention of two months post-training, but the long-term retention requires future investigation. Non-medical staff who had completed BLS training more than two months prior to the survey were excluded from the study. A self-structured survey questionnaire was used for the data collection procedure. The questionnaire included five sections with a total of 32 questions. Socio-demographic questionnaire included the participant's characteristics such as age, gender, educational status, designation, department, years of work experience. Knowledge, Attitude, Perceived Confidence and Barriers, Post-BLS Training Feedback related questions were also used to collect BLS training related information from participants. The knowledge section consisted of 6 questions. Items on compression-to-breath ratio, the first step in BLS, and adult compression depth were scored 2 points for correct responses and 0 for incorrect. Similarly, the questions on hand position for compressions, time to death without CPR, and AED received 1 point for correct and 0 for incorrect responses. The minimum knowledge scores that can be obtained from the questionnaire was 0 and the maximum score was 9 with the categorization as follows: high (7–9), moderate (4–6), or low (0–3). The attitude section contained 5 statements rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The statement "Performing BLS is only the responsibility of medical staff" used reverse scoring. The total attitude score ranges from 5 to 25. Average attitude scores (total sum divided by 5) were categorized as positive (4–5), neutral (2.5–3.9), or negative (1–2.4). This categorization draws on references from existing literature.[10,11,12]

The training course consisted of theoretical and practical classes. The sessions covered medical emergency recognition through victim assessment, trainer demonstrations of adult, child, and infant BLS, along with AED use at the end of each theoretical module. The instructor-student ratio was 1:7, with emphasis on hands-on training of two-step CPR. The training session was completed in a single day for

approximately 8 hours. The time duration of four hours was spent on demonstrating the procedures required for respiration, circulation, and airway management. The training session also included the management of foreign body obstruction among adults, children, and infants, including the Heimlich Maneuver. All participants had the opportunity to practice comprehensive BLS on adult and infant mannequins during or at the end of the sessions.

The questionnaire was developed following a comprehensive literature review, with items adapted and modified from prior studies.[11,13] The prepared questionnaire was reviewed by a consultant doctor with expertise in medical education workshops and a nurse specialized in BLS training. The questionnaire was pretested on 10% of the total sample size before data collection. Modifications were then made based on feedback from the trainers and trainees regarding its contents. A self-administered questionnaire was sent to each participant via a Google Form link to collect information on knowledge, attitude, perceived confidence, barriers, and training feedback. Data collection was carried out two months after the BLS training, over a period of three weeks from 2025 Dec 3 to 2025 Dec 18 at Norvic International Hospital.

Ethical approval was obtained from the Institutional Review Committee (IRC) of Norvic International Hospital and Medical College (Ref No: 48 - 082/083). Written informed consent was taken from the participants. The confidentiality and anonymity of participants' information were ensured throughout the study period.

Statistical analysis was conducted using SPSS version 27. The data analysis and presentation were done using Microsoft Excel, respectively. The descriptive statistics, such as mean, median, percentage and frequency were used to summarize participants' socio-demographic characteristics, knowledge and attitude level, perceived confidence, and barriers. Analysis of association was carried out using Fisher's exact test due to the smaller sample size. Even though the entire eligible cohort was included in the study, inferential statistics were used to explore potential associations between the variables.

Result

Socio-demographic characteristics of non-medical staff

The majority of the participants 20(46.51%), were between 26 and 40 years of age, followed by those aged 41–50 years, 14(32.56%). The median age of participants was 37 years (IQR: 28.0 – 45.0). More male staff 25(58.14%) were trained than female staff 18(41.86%). Among 43 participants, 31(72.09%) had an education of graduate level or higher, followed by 12(27.91%) with secondary-level education. Most respondents 9(20.93%) were from the outpatient department, followed by those from IT and housekeeping with 4(9.30%) each, and assets, finance, and biomedical engineering 3(6.98%) each. The median years of work experience of participants was 7 years (IQR: 3.0 – 10.0). Majority participants 28(65.12%) had more than 6 years of work experience, Table 1.

Table 1. Socio-demographic characteristics of non-medical staff

Characteristics	Category	*f* (%)
Age (in years)	18 -25	8(18.60%)
	26-40	20(46.51%)
	41-50	14(32.56%)
	51-60	1(2.32%)
M (IQR: Q1 – Q3): 37.0 (28.0 – 45.0)		
Sex	Female	18(41.86%)
	Male	25(58.14%)
Education level	Basic Level (1-8 grade)	0(0.0%)
	Secondary Level or Diploma	12(27.91%)
	Graduate Level or above	31(72.09%)
Department	Outpatient Department	9(20.93%)
	IT	4(9.30%)
	Housekeeping	4(9.30%)
	Biomedical Engineering	3(6.98%)
	Assets	3(6.98%)
	Finance	3(6.98%)
	QMS	2(4.65%)
	Customer Care	2(4.65%)
	Norvic International Centre for Health Evaluation (NICHE)	2(4.65%)
	Store	2(4.65%)
	Operations	2(4.65%)
	General Administration	2(4.65%)
	Procurement	1(2.33%)
	Physiotherapy	1(2.33%)
	Pathology	1(2.33%)
	Maintenance	1(2.33%)
	IPD	1(2.33%)
Work Experience	Less than 1 year	4(9.30%)
	1 to 3 years	8(18.60%)
	4 to 6 years	3(6.98%)
	6 to 20 years	28(65.12%)
M (IQR: Q1 – Q3): 7.0 (3.0 – 10.0)		

Knowledge Level of BLS among Non-medical Staff

Approximately 32(74.42%) of the participants demonstrated a high knowledge level, while 10(23.26%) had a moderate knowledge level, and only 1(2.33%) exhibited a low knowledge level. The median knowledge score was 8.0 (IQR: 6.0 – 9.0), Table 2.

Association of Socio-demographic Characteristics with Knowledge among Non-medical Staff

The Fisher's exact test was used to find the association

Table 2. Knowledge level of BLS among non-medical staff after training

Characteristics	Category	f (%)
Knowledge Level	Low Level	1(2.33%)
	Moderate Level	10(23.26%)
	High Level	32(74.42%)
M (IQR: Q1 – Q3): 8.0 (6.0 – 9.0)		

of knowledge with socio-demographic characteristics. It revealed that there is no significant association of the socio-demographic characteristics of non-medical staff with knowledge level, Table 3.

Attitude, Perceived Confidence and Barriers of BLS among Non-medical Staff Post-training

Almost all of the respondents 41(95.35%) reported a positive attitude, and 2(4.65%) showed a neutral attitude towards basic life support. The median attitude score was 22.0 with an IQR ranging from 21.0 to 23.0. Most participants, 42(97.67%), reported not having applied BLS skills in a real-life emergency. Similarly, nearly all of the respondents, 41(95.35%),

Table 3. Association of socio-demographic characteristics with knowledge

Variables	Category	Level of Knowledge		P-value
		High (%)	Low (%)	
Age (in years)	18-40	22 (78.57%)	6 (21.43%)	0.473
	41-60	10 (66.67%)	5 (33.33%)	
Sex	Female	12 (66.67%)	6 (33.33%)	0.480
	Male	20 (80.00%)	5 (20.00%)	
Education Level	Basic and Secondary Level	9 (75.00%)	3 (25.00%)	1.000
	University Level	23 (74.19%)	8 (25.81%)	
Years of Work Experience	0 to 3 years	8 (72.73%)	3 (27.27%)	1.000
	4 years and above	23 (74.19%)	8(25.81%)	

Table 4. Attitude, perceived confidence and barriers of BLS among non-medical staff post-training

Characteristics	Category	*f* (%)
Attitude Level	Positive Attitude	41(95.35%)
	Neutral Attitude	2(4.65%)
	Negative Attitude	0(0.00%)
M (IQR: Q1 – Q3): 22.0 (21.0 – 23.0)		
Ever applied BLS skills in a real-life emergency	Yes	1(2.33%)
	No	42(97.67%)
If yes, how confident were you at that time?	Very confident	1(100.00%)
	Somewhat confident	0(0.00%)
	Not confident	0(0.00%)
Regularly review or practice BLS skills	Yes	2(4.65%)
	No	41(95.35%)
If you are in a place where there are no medical personnel and a patient suddenly collapses and requires CPR, do you think you can conduct CPR to save the life?	Yes	37(86.05%)
	No	0(0.00%)
	Not sure	6(13.95%)
Barriers that prevent you from performing CPR in real-life situations **(Multiple Responses)**	Fear of doing it incorrectly	20(46.51%)
	Fear of infection	8(18.60%)
	Legal concerns	18(41.86%)
	Lack of confidence	7(16.28%)
	No barriers	12(27.91%)

Table 5. Association of socio-demographic characteristics with attitude

Variables	Category	Level of Attitude	P-value	
		Neutral (%)	Positive (%)	
Age (in years)	18-40	2 (7.14%)	26 (92.86%)	0.535
	41-60	0 (0.0%)	15 (100.0%)	
Sex	Female	1 (5.56%)	17 (94.44%)	1.000
	Male	1 (4.00%)	24 (96.00%)	
Education Level	Basic and Secondary Level	0 (0.00%)	12 (100.00%)	1.000
	University Level/above	2 (6.46%)	29 (93.54%)	
Years of Work Experience	0 to 3 years	1 (8.33%)	11 (91.67%)	0.485
	4 years and above	1 (3.23%)	30 (96.77%)	

Table 6. Post-BLS training feedback and review

Characteristics	Category	*f* (%)
Have you had the chance to perform BLS on someone post-training?	Yes	0(0.00%)
	No	43(100.00%)
Have you shared information or taught others about BLS post-training?	Yes	33(76.74%)
	No	10(23.26%)
If yes, to whom have you shared this knowledge? **(Multiple Responses)**	Friends	11(25.58%)
	Family	26(60.46%)
	Colleagues	9(20.93%)
	Community People	0(0.00%)
How helpful was the BLS training in increasing your confidence and skills?	Extremely helpful	28(65.12%)
	Moderately helpful	11(25.58%)
	Slightly helpful	4(9.30%)
	Not helpful at all	0(0.00%)
W hat do you think about the duration/length of the training session?	Short	2(4.65%)
	Long	7(16.28%)
	Adequate	34(79.07%)
What is your opinion about the length of practical sessions?	Too long	1(2.33%)
	Just right	41(95.35%)
	Too short	1(2.33%)
How often do you think BLS training should be repeated?	Every 6 months	19(44.19%)
	Every year	19(44.19%)
	Every 2 years	5(11.63%)
Do you think additional sessions or refresher courses should be mandatory?	Yes	42(97.67%)
	No	1(2.33%)
Would you recommend BLS training to others in your workplace or community?	Definitely	41(95.35%)
	Maybe	2(4.65%)
	No	0(0.00%)
Which part of the training did you find most useful?	Theory	0(0.00%)
	Practical hands-on	36(83.72%)
	Discussions	0(0.00%)
	All of the above	7(16.28%)

said that they were not able to regularly review or practice BLS skills. Approximately 37(86.05%) of the participants believed they could perform CPR to save a person's life if someone suddenly collapsed in the absence of medical personnel. A significant portion of the respondents, 20(46.51%), cited fear of doing CPR incorrectly as a barrier to performing CPR, and 18(41.86%) were worried about legal concerns. In addition, approximately 7(16.28%) respondents stated a lack of confidence as a barrier to performing CPR. However, about 12(27.91%) of the participants reported no barriers that prevent them from performing CPR in real-life situations, Table 4.

Association of Socio-demographic Characteristics with Attitude among Non-medical Staff

The Fisher's exact test was used to find the association of attitude with socio-demographic characteristics. It revealed that there is no significant association of socio-demographic characteristics of non-medical staff with attitude, Table 5.

Post-BLS Training Feedback and Review

All participants 43(100.00%) stated that they never had the opportunity to perform basic life support post-training. The majority of respondents, 33(76.74%), reported sharing information about BLS with others. Among them, 26(60.46%) shared the information with their family members, followed by friends 11(25.58%) and colleagues 9(20.93%). Similarly, most of the participants, 28(65.12%), stated BLS training to be extremely helpful in increasing their confidence and skills to handle emergencies. Of 43 respondents, only 7(16.28%) stated that the duration of the training session was long. Additionally, nearly all participants 41(95.35%) believed the duration of the practical session was appropriate. Almost all respondents, 42(97.67%), believed that the refresher sessions should be mandatory. The majority of the participants, 41(95.35%), were very certain that they would recommend the BLS training to others in their community or workplace. A significant proportion of respondents, 36(83.72%), were in favor of a practical hands-on session, Table 6.

Discussion

Basic Life Support plays a pivotal role in sustaining life during cardiac arrest, major trauma, and other emergencies, especially in prehospital settings where timely intervention is crucial.[14] A report indicated that approximately 90% of road traffic fatalities occur in low- and middle-income countries, highlighting the urgent need for BLS training in Nepal.[15] It equips individuals with essential skills for CPR, AED use, and choking relief to address life-threatening situations efficiently. It is mandatory for healthcare personnel to have a comprehensive knowledge and skills of BLS.[16] However, the expansion of BLS training for non-medical personnel is equally essential in fostering a chain of survival in case of the absence of immediate medical help.[17] The current study assessed the knowledge, attitude, perceived confidence, barriers, and training feedback among non-medical staff after participating in BLS training.

This study included diverse non-healthcare professionals, such as housekeeping attendants, OPD reception/support staff, IT personnel, and general administration staff, all of whom had no prior formal education in healthcare services. The knowledge score achieved by non-medical staff in our sample were high, probably due to structured hands-on BLS program that emphasized practical sessions. This result is consistent with a study from Indonesia, reporting high knowledge level among non-medical employees.[9] The similarities may be due to resemblances in study methodology and study population, such as the inclusion of non-healthcare workers with no prior medical training.

No participants demonstrated a negative attitude, and very few reported a neutral attitude; almost all reported a positive attitude towards basic life support, consistent with findings from Nepal and India.[18,11] These positive findings might reflect not only the training design but also the workplace culture, participants motivation to protect families, friends, colleagues and community people during life-threatening medical emergencies. The absence of pre-test evaluation of participants' knowledge, attitude, perceived confidence and barriers limits our ability to differentiate the pre-existing knowledge from training-induced improvements; however, the strong immediate results are consistent with study showing that focused, engaging BLS education can significantly improve knowledge and foster positive attitudes among non-medical workers.[11]

No socio-demographic factors were significantly associated with knowledge or attitude levels, suggesting that age, gender, educational status, and years of work experience did not strongly influence participants' BLS understanding or attitudes in this setting. This may be due to standardized, hands-on training using clear demonstrations and simple language, which minimized differences related to background. The findings contrast with a South Korean study among non-medical hospital employees, where younger age (<40 years) showed improved skill acquisition.[19] The variations in findings may be due to differences in training duration and intensity, as our 8-hour course combined theory with extensive hands-on CPR practice, whereas the South Korean study used a single 3-hour session of lectures, brief practice, and testing. A Nepalese study found that knowledge improved after training regardless of occupation, similar to our result, indicating that well-structured, practice-oriented BLS sessions can benefit diverse non-medical staff regardless of their socio-demographic profiles.[6]

Even though the opportunities to utilize BLS skills do not occur regularly, early preparedness remains very crucial for timely interventions during emergencies to save lives. However, more than 90% of non-medical staff reported never having applied BLS skills ever in real-life emergencies, consistent with a study in India revealing a similar proportion having no prior BLS performance.[13] Nevertheless, the majority of participants reported being confident in case of the sudden patient collapse, which is consistent with the findings from the same study, as they also reported a willingness to perform CPR if a person suddenly collapsed in front of them.[13] Additionally, the most common reasons that prevented participants from performing CPR were fear of doing CPR incorrectly and legal concerns. However, another study reported that a lack of confidence in BLS skills due to insufficient training was a major barrier.[11,13] These findings highlighted that participants continue to hesitate performing CPR due to various reasons despite recognizing the importance of BLS in emergencies. Therefore, it is necessary to structure the future training session to address the barriers reported by participants, especially fear of making errors, fear of legal concerns and lack of confidence.

Majority of non-medical employees (60.5%) shared the BLS knowledge and skills they acquired to their family members, followed by friends and colleagues which is consistent with existing evidence of secondary education or knowledge transfer after BLS training. Studies among family members and school-based BLS programs demonstrate that trained individuals tend to voluntarily transfer learnt skills to their closed social networks such as friends, family members and relatives.[20,21,22] This result emphasizes the idea that training non-medical personnel can expand the benefits beyond the hospitals settings like in households and communities.

More than half of the participants (65.1%) reported that BLS training was extremely helpful in boosting their confidence to handle emergencies. Almost all the participants found the practical hands-on session to be most useful component. A consistent findings from studies showed enhanced self-reported confidence and willingness to perform CPR among laypersons and non-medical workers particularly with hands-on practice rather than theory alone.[7,23,24] A follow-up study among non-medical personnel similarly reported that repetitive, skill-focused BLS training not only improved attitude and confidence but also enhanced the quality of CPR delivered, underscoring the importance of practical, experiential instruction in developing participants' readiness to respond to real-life emergencies.[7]

The majority of participants emphasized the need for regular refresher training to enhance the effectiveness of such training. According to the American Heart Association, it should be mandatory for all staff to attend refresher courses every two years to retain the skills and confidence of the participants.[25] Additionally, several participants advocated for the extension of this training to community members.

Nowadays, there is a growing recognition of placing AEDs in crowded public places such as malls, gyms, sports, and movie theaters to improve out-of-hospital cardiac arrest through rapid defibrillation during emergencies.[26] The training program of Norvic International Hospital incorporated AED education and hands-on practice, equipping participants with the knowledge and skills needed to respond effectively to cardiac arrest events in crowded public areas.[26] Subsequently, expanding BLS training to community members without healthcare backgrounds is essential to enable laypersons to respond promptly during emergencies in order to strengthen public health preparedness. In the cases of cardiac arrest due to reversible rhythm disturbances such as ventricular fibrillation, CPR alone can be effective by maintaining circulation until the heart spontaneously resumes a viable rhythm. Therefore, CPR alone can save a life or enable recovery on its own as it functions as a bridge to advanced care.

This study has several limitations that should be considered when interpreting the findings. First, this is a single center study with small sample size (n =43); limiting the generalization of the findings. Second, the cross-sectional design with no pretest assessment prior to training and only a single evaluation approximately two months post-training did not capture long-term competency. Future studies should address this limitation by adopting a longitudinal design that measures participants' BLS competence before training and at follow-up intervals of 6 and 12 months after training, to determine whether knowledge and skills are retained and sustained over time. Additionally, self-reporting bias generated by social desirability and subjective perceptions might result in over- or under-reporting of knowledge, attitude, and confidence. Minimization of this bias was done through clear instructions and ensuring participant anonymity, though complete elimination remains challenging. Finally, the use of inferential statistics with a small number of participants with census method might weakens the strength of associations, and potential threats such as history bias, testing effects, maturation, and non-practice bias may have influenced the results

Conclusion

It can be concluded that non-medical staff demonstrated satisfactory knowledge and positive attitude regarding basic life support following the training program. The findings suggest that BLS training is feasible and well accepted among non-medical hospital employees, irrespective of their socio-demographic background. It is very crucial to mandate BLS training for all non-medical hospital employees with refresher training every two years to empower them for effective management of medical emergency victims.

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Conflict of Interest

None

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None

Author Contribution

BLS Training Facilitation: PV, MM; Conceptualization, study tool development, and data collection: MM, AP, AR; Study design, data analysis, writing the manuscript: AP; Supervision or review of manuscript: PV, AR, MM; Revision of draft: AP, PV.

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