

Research Article

# An Intervention Study to Assess the Effectiveness of Hands-on Practice of Basic Life Support (BLS) Training on Knowledge, Attitude and Practices (KAP) among Teachers in Selected High Schools of Patna, Bihar

Hansmukh Jain<sup>1</sup>, Rahul Sharma<sup>2</sup>

<sup>1</sup>PhD Scholar (Nursing), Jaipur National University, Jaipur, Rajasthan, India.

<sup>2</sup>Associate Professor, Seeding School of Nursing, Jaipur National University, Jaipur, Rajasthan, India.

DOI: <https://doi.org/10.24321/2278.2044.202235>

## I N F O

### Corresponding Author:

Hansmukh Jain, Jaipur National University, Jaipur, Rajasthan, India.

### E-mail Id:

[hansmukhjain12@gmail.com](mailto:hansmukhjain12@gmail.com)

### Orcid Id:

<https://orcid.org/0000-0002-4739-7629>

### How to cite this article:

Jain H, Sharma R. An Intervention Study to Assess the Effectiveness of Hands-on Practice of Basic Life Support (BLS) Training on Knowledge, Attitude and Practices (KAP) among Teachers in Selected High Schools of Patna, Bihar. Chettinad Health City Med J. 2022;11(4):15-20.

Date of Submission: 2022-11-26

Date of Acceptance: 2022-12-10

## A B S T R A C T

*Introduction:* Basic Life Support (BLS) has recently received special attention because the majority of cardiac arrests occur outside of the hospital, The advancement of technology with medical research contributes to evidence-based care for critically ill patients. This study aimed to evaluate the effectiveness of Basic Life Support (BLS) on knowledge, attitude, and practice among high school teachers.

*Materials and Method:* This cross-sectional study was conducted among school teachers. A total of 112 participants were selected using a non-probability purposive sampling technique to evaluate the effectiveness of Basic Life Support (BLS) in terms of knowledge, attitude, and practice. A pre-test was conducted before the intervention and a post-test assessment was done at the end of the 5th day.

*Result:* On the assessment of demographic variables, the majority of participants were found to be male (86, 76.8%), aged between 20 and 30 years (54, 40.2%), and postgraduate (87, 77.7%). The pre and post-test mean, SD, mean difference, standard error, and paired test were employed. On assessing the knowledge of school teachers, the mean difference between pre and post-test was found to be 1.82, standard error was 0.03, and paired t-test value was 50.1. Similarly, in attitude, the mean difference between pre and post-test was 1.92 and paired t-test value was 1.43. Analysis of practice skills showed that the mean difference between pre and post-test was 2.00, standard error was 0.00, and paired t-test value was 0.00.

*Conclusion:* Basic Life Support (BLS) is a highly effective intervention for school teachers. Most of the school teachers improved their knowledge, attitude and practice after the intervention.

**Keywords:** Knowledge, Attitude, Practice, Basic Life Support (BLS), School Teacher

## Introduction

Immediate management of cardiac arrest is an emerging trend globally. The majority of cardiac arrest occurs outside the hospital with or without warning signs. Sudden cardiac arrest is a major public health issue that affects global income. According to the World Health Organization (WHO), approximately 17.9 million people succumb to death annually from Coronary Heart Disease (CVD) and that covers 32% of the total global mortality; out of this, 85% (15.2 million) of people die due to cardiac arrest.<sup>1</sup> Although, most people are afraid to provide first aid at a scene of a tragedy due to legal issues, the rate of survival after cardiac arrest is still under control; though most clients experience secondary heart attacks.<sup>2,3</sup> Globally, less attention has been given to early detection and management of sudden cardiac arrest. Thus the majority of developed nations place a strong emphasis on the prevention of cardiac arrests at all levels. Basic Life Support (BLS) is a well-organised procedure given by a trained person or any healthcare professional to a person experiencing cardiac arrest or respiratory obstruction.<sup>4</sup> The first responder or whoever gives first aid requires the basic knowledge of cardiopulmonary problems, basic life supports steps and Automated External Defibrillators (AED). The role of healthcare workers is crucial and essential in impacting the knowledge and quality of care provided to the population. Healthcare professionals are always integrated with other professionals in imparting health services to ground-level populations. Nurses are always part of multidisciplinary teams and have direct contact with people's lives, especially those who are working in remote areas.<sup>5</sup> A previous study has shown that physicians, nurses, physiotherapists, and other health workers should get BLS training. There are very few studies that reported the importance of BLS training programmes for the common person. However, a few studies reported that the BLS programme is the most important among school teachers because children spend the most time (approximately 6-8 hours) in school.<sup>6,8</sup> The study aimed to explore the knowledge of and attitude towards basic life support (BLS). This study aimed to assess the knowledge, attitude and practice skills of high school teachers and then evaluate the effectiveness of the teaching module and hand-to-hand demonstration on BLS among high school teachers.

## Methodology

This cross-sectional study was conducted among high school teachers working in Patna, Bihar, India. The objective of this study was to evaluate the effectiveness of basic life support on the knowledge, attitude and practice among high school teachers. Participants of this study were selected using

non-probability, purposive sampling technique. Those who were willing to participate and available at the time of data collection in higher secondary schools in Patna, Bihar were included in the study. We excluded those teachers who had already undergone BLS training. After the sample size calculation, a total of 112 subjects were chosen for data collection.

## Data Collection Instruments

Four data collection tools were employed namely, the demographic variable tool, structured knowledge questionnaires, attitude scales, and practice checklists. All these tools were verified by experts from various departments, who later checked the feasibility and reliability of the tool using ten percent of the population as the sample.

## Intervention

Basic life support certification is a relatively short training course required of many health professionals to give effective resuscitation or CPR to a person who is experiencing cardiac arrest. Basic life support is important for any person to learn. Understanding cardiac resuscitation processes helps to save lives in an emergency.

## Data Collection Method

We began collecting data after receiving authorisation from the appropriate authorities at the selected high schools. First, we approached the school's principal for permission. After obtaining approval from the principal, we contacted individual teachers for data collection. Prior to data collection, the investigator explained the procedure and obtained written consent from each participant. Pre-test knowledge, attitude and practice were assessed, and then a teaching session was organised to demonstrate basic life support. A post-test was conducted at the end of the fifth day of the intervention. The data were collected between May 2022 and October 2022.

## Ethical Issues

This project imparted knowledge and demonstrated practice skills on manikins and did not require ethical approval as no direct information or interventions were performed on humans. However, the author had taken written permission from the school authority and individual participants.

## Data Analysis Method

After coding, the data were transferred to the master coding sheet of Microsoft Excel. We used descriptive and inferential statistics for data analysis. Knowledge scores, attitude and practice skills were analysed in terms of frequency, percentage, mean, and mean difference. The

paired t-test was used to evaluate the efficiency of the BLS training between pre and post-test. Chi-square test was employed to measure the association between knowledge level and selected demographic variables. The test results

were subjected to testing at 0.05% level of probability. The outcome of the result was interpreted using diagrams and graphs.

**Table 1. Demographic Variables of Participants (n = 112)**

| S. No. | Variables                  | Categories          | Frequency | Percentage |
|--------|----------------------------|---------------------|-----------|------------|
| 1      | Age (in years)             | 20-30               | 54        | 40.2       |
|        |                            | 31-40               | 28        | 25         |
|        |                            | 41-50               | 21        | 18.8       |
|        |                            | 51-60               | 9         | 8.0        |
| 2      | Gender                     | Male                | 86        | 76.8       |
|        |                            | Female              | 26        | 23.2       |
| 3      | Qualification              | Graduation          | 20        | 17.9       |
|        |                            | Post-graduation     | 87        | 77.7       |
|        |                            | PhD                 | 5         | 4.5        |
| 4      | Experience (in years)      | 1-5                 | 2         | 1.8        |
|        |                            | 6-10                | 80        | 71.4       |
|        |                            | 11-15               | 11        | 9.8        |
|        |                            | > 15                | 19        | 17.0       |
|        | Religion                   | Hindu               | 80        | 71.4       |
|        |                            | Muslim              | 16        | 14.3       |
|        |                            | Christian           | 16        | 14.3       |
| 5      | Designation                | Science teacher     | 66        | 58.9       |
|        |                            | Mathematics teacher | 15        | 13.4       |
|        |                            | Physics teacher     | 31        | 27.7       |
| 6      | Residence                  | Urban               | 81        | 72.3       |
|        |                            | Rural               | 31        | 27.7       |
| 7      | Marital status             | Unmarried           | 22        | 19.6       |
|        |                            | Married             | 89        | 79.5       |
|        |                            | Widow               | 1         | .9         |
| 8      | Type of family             | Nuclear             | 32        | 28.6       |
|        |                            | Joint               | 80        | 71.4       |
| 9      | Previous knowledge         | Yes                 | 39        | 34.8       |
|        |                            | No                  | 73        | 65.2       |
| 10     | If yes, specify the source | Book                | 39        | 100        |

## Result

The assessment of demographic variables showed that the majority of participants were male (86, 76.8%), aged between 20 and 30 years (54, 40.2%), and postgraduate (87, 77.7%). Most of the participants were unmarried (89,

79.5%), belonged to the Hindu religion (80, 71.4%), had moderate teaching experience (80, 71.4%), and used to teach Science subjects (66, 58.9%). Most of the participants came from joint families (80, 71.4%) and resided in urban areas (81, 72.3%). Some of them had previous knowledge (39, 34.8%) on BLS from books (39, 100%) (Table1).

**Table 2. Pre-test and Post-test Knowledge of Participants (n = 112)**

| Knowledge | Pre-test |      | Post-test |     | Mean Difference | Paired T-test | Significance |
|-----------|----------|------|-----------|-----|-----------------|---------------|--------------|
|           | f        | %    | f         | %   |                 |               |              |
| Mild      | 20       | 17.9 | 0         | 0   | 1.82            | 50.1          | < 0.00001    |
| Moderate  | 92       | 82.1 | 0         | 0   |                 |               |              |
| Good      | 0        | 0    | 112       | 100 |                 |               |              |

Table 2 depicts the frequency, percentage, mean difference, and paired t-test values of pre and post-test knowledge on BLS among high school teachers. The majority of participants had moderate knowledge (92, 82.1%) and 20 (17.9%) participants had mild knowledge in the pre-test.

In the post-test, all participants (112, 100%) had good knowledge. The mean difference between pre and post-test knowledge was 1.82 and paired t-test value was 50.1. It was seen that the high school teachers improved their knowledge after the BLS intervention.

**Table 3. Effect of BLS on Attitude Before and After Intervention (n = 112)**

| Attitude | Pre-test |    | Post-test |     | Mean Difference | Paired T-test | Significance |
|----------|----------|----|-----------|-----|-----------------|---------------|--------------|
|          | f        | %  | f         | %   |                 |               |              |
| Negative | 103      | 92 | 0         | 0   | 1.92            | 1.43          | < 0.00001    |
| Adequate | 9        | 8  | 112       | 100 |                 |               |              |

Table 3 revealed the pre and post-test frequency, percentage, mean difference, and paired test values of attitude on BLS among high school teachers. The majority of participants had a negative attitude (103, 92%) and a few (9, 8%) participants had a positive attitude. All 112 (100%)

subjects had a positive attitude towards BLS in the post-test. The mean difference between the pre and post-test was 1.92 and paired t-test value was 1.43. All participants had a positive attitude after the BLS intervention.

**Table 4. Effect of BLS on Practice Skills Before and After Intervention (n = 112)**

| Practice Skills | Pre-test |     | Post-test |     | Mean Difference | Paired T-test | Significance |
|-----------------|----------|-----|-----------|-----|-----------------|---------------|--------------|
|                 | f        | %   | f         | %   |                 |               |              |
| Inadequate      | 112      | 100 | 0         | 0   | 2               | 00            | < 0.00001    |
| Adequate        | 0        | 0   | 112       | 100 |                 |               |              |

Table 4 summarises the pre and post-test frequency, percentage, mean difference, and paired t-test values of practice skills among high school teachers. During the pre-test, all participants had inadequate practice on BLS (112, 100%). On the other hand, in the post-test, all participants had adequate practice (112, 100%). Hence it is clear that the skills improved after BLS intervention among high school teachers.

## Discussion

Schools are vital places for teachers and students to exchange thoughts, emotions, and beliefs, and develop mutual understanding. Overall activities of schools are based on the teacher's interests and school's environment. The role of teachers is very important, especially at the high school level; many children reshape their behaviours in schools through effective teaching and learning.<sup>9</sup> On the other hand, practising a positive attitude towards

healthy habits like playing, personal hygiene, and nutrition is essential.<sup>10</sup>

Recent studies reported that about 40% of injuries that occurred in children were caused by sports and other events. Some injuries were severe and needed immediate care to save life, but most of the time, a cardiac arrest happened outside the hospital.<sup>11</sup> The findings of our study showed that high school teachers had inadequate knowledge of basic life support, and after basic life support teaching, they gained awareness and confidence. Our results support a previous study conducted in London that showed that majority of schools and teachers had poor knowledge of BLS, and Automatic External Defibrillation (AED). Only a few high school teachers had previous knowledge of BLS.<sup>12</sup> During the COVID pandemic, online BLS training videos and instructions were provided, which increased public awareness on BLS.<sup>13</sup>

Another supporting study was conducted to evaluate the knowledge, attitude and skills regarding professional achievement among school teachers. The mean values of knowledge, attitude, and practice skills were found to be 4.09, 3.69, and 3.98 respectively. The authors reported that the BLS programme conducted at the university level through the Web-2 applications improved teaching and learning in an effective manner that helped to demonstrate high skills and a positive attitude.<sup>14,15</sup>

A similar study was conducted among school teachers in Saudi Arabia. It was found that most teachers interested in BLS training wanted programmes (64.9%) and were willing to take a free course (78.4%).<sup>16,18</sup> A majority of educators or institutions lack the tools necessary to teach BLS. Therefore, the administration needs to be updated and compliant with the BLS training programme for school teachers and nurses should also take an active role while implementing this programme.<sup>19,20</sup>

This study recommended conducting further studies in large populations, especially in rural areas. Most teachers working in rural areas had less knowledge, attitude and skills regarding BLS. Hence healthcare authorities must collaborate with educational departments to organise in-service education on emergency care. The authors also recommended that BLS and CPR-related content should be included in the high school curriculum. Presently, many developed countries have initiated compulsory BLS training programmes.

## Conclusion

Basic Life Support (BLS) training was found to significantly improve knowledge, attitude, and practice skills. Teachers in the post-intervention group had a large improvement in their confidence and skills regarding BLS. The current study review indicates that there appears to be an insufficient learning resource available in schools in terms of practice skills and BLS manikins. Furthermore, a continuous supply of instructional materials and training from medical experts is recommended on a timely basis.

## Acknowledgement

The authors are thankful to Dr Pratap Patra, Additional Professor, Department of Paediatrics, All India Institute of Medical Sciences for his continuous support and guidance in reading the final draft of this manuscript and approving it.

**Source of Funding:** None

**Conflict of Interest:** None

## References

1. World Health Organization [Internet]. Cardiovascular diseases (CVDs); 2021 [cited 2022 Oct 21]. Available from: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
2. Wagner P, Schloesser S, Braun J, Arntz HR, Breckwoldt J. In out-of-hospital cardiac arrest, is the positioning of victims by bystanders adequate for CPR? A cohort study. *BMJ Open* [Internet]. 2020 Sep [cited 2022 Oct 21];10(9):e037676. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7513596/> [PubMed] [Google Scholar]
3. Marijon E, Uy-Evanado A, Dumas F, Karam N, Reinier K, Teodorescu C, Narayanan K, Gunson K, Jui J, Jouven X, Chugh SS. Warning symptoms are associated with survival from sudden cardiac arrest. *Ann Intern Med* [Internet]. 2016 Jan [cited 2022 Oct 21];164(1):23-9. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5624713/> [PubMed] [Google Scholar]
4. Halemani K, Harsvardhan R. Knowledge and practice on hepatobiliary disease among mothers' of under-five children in SGPGIMS Lucknow (UP). *Nurs J India* [Internet]. 2018 [cited 2022 Oct 22];109(4). Available from: <https://www.semanticscholar.org/author/Kurvatteppa-Halemani/67237200> [Google Scholar]
5. Kabene SM, Orchard C, Howard JM, Soriano MA, Leduc R. The importance of human resources management in health care: a global context. *Hum Resour Health* [Internet]. 2006 [cited 2022 Oct 23];4(1):20. Available from: <https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-4-20> [PubMed] [Google Scholar]
6. Abolfotouh MA, Alnasser MA, Berhanu AN, Al-Turaif DA, Alfayez AI. Impact of basic life-support training on the attitudes of health-care workers toward cardiopulmonary resuscitation and defibrillation. *BMC Health Serv Res* [Internet]. 2017 [cited 2022 Oct 21];17(1):674. Available from: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-017-2621-5> [PubMed] [Google Scholar]
7. Halemani K, Shashidharan YN. Knowledge, attitude and experience of mothers of under-five children on swine flu, selected village Uttar Pradesh. *Int J Pediatr Nurs* [Internet]. 2018 [cited 2022 Oct 21];4(2). Available from: [https://rfppl.co.in/subscription/upload\\_pdf/Kurvatteppa\\_Halemani\\_7485.pdf](https://rfppl.co.in/subscription/upload_pdf/Kurvatteppa_Halemani_7485.pdf) [Google Scholar]
8. Roshana S, Kh B, Rm P, Mw S. Basic life support knowledge and attitude of medical/paramedical professionals. *World J Emerg Med* [Internet]. 2012 [cited 2022 Oct 27];3(2):141-5. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4129799/> [PubMed] [Google Scholar]
9. Tony AC, da Costa Carbogim F, de Souza Motta D, Santos KB, Dias AA, Paiva AC. Teaching basic life support to schoolchildren quasi-experimental study. *Rev Lat Am Enfermagem*



- [Internet]. 2020 [cited 2022 Oct 21];28:e3340. Available from: <https://www.scielo.br/j/rlae/a/FKQd7s9sRcdmrJHwD8QpRjp/?format=pdf&lang=en> [PubMed] [Google Scholar]
10. Halemani K, Issac A, Mishra P, Dhiraaj S, Mandelia A, Mathias E. Effectiveness of preoperative therapeutic play on anxiety among children undergoing invasive procedure a systematic review and meta-analysis. *Indian J Surg Oncol* [Internet]. 2022 [cited 2022 Oct 21]. Available from: <https://link.springer.com/article/10.1007/s13193-022-01571-1> [Google Scholar]
  11. Saliccioli JD, Marshall DC, Sykes M, Wood AD, Joppa SA, Sinha M, Lim PB. Basic life support education in secondary schools: a cross-sectional survey in London, UK. *BMJ Open* [Internet]. 2017 [cited 2022 Oct 21];7(1). Available from: <https://bmjopen.bmj.com/content/7/1/e011436> [PubMed] [Google Scholar]
  12. Onan A, Turan S, Elcin M, Erbil B, Bulut ŞÇ. The effectiveness of traditional Basic Life Support training and alternative technology-enhanced methods in high schools. *Hong Kong J Emerg Med* [Internet]. 2018 Jun 14 [cited 2022 Oct 21];26(1):44-52. Available from: <https://journals.sagepub.com/doi/10.1177/1024907918782239> [Google Scholar]
  13. Halemani K, Dhiraaj S, Latha T, Mishra P, Issac A. The prevalence of COVID vaccine acceptance among pregnant women a systematic review and meta-analysis. *Clin Epidemiol Glob Health* [Internet]. 2022 [cited 2022 Oct 21];17:101144. Available from: <https://www.sciencedirect.com/science/article/pii/S2213398422001865> [Google Scholar]
  14. Sierra-Piedrahita AM. Developing knowledge, skills and attitudes through a study group: a study on teachers' professional development. *Leng Ikala, Rev Leng Cult* [Internet]. 2007 Nov 3 [cited 2022 Oct 25];12(1 SE-Articles):279-305. Available from: <https://www.semanticscholar.org/paper/Developing-Knowledge%2C-Skills-and-Attitudes-through-Sierra-Piedrahita/caf584653dc7802c27fb0b5a3f6cc627458f55c9>[Google Scholar]
  15. Leh FC, Anduroh A, Huda M. Level of knowledge, skills and attitude of trainee teachers on Web 2.0 applications in teaching geography in Malaysia schools. *Heliyon* [Internet]. 2021 Dec [cited 2022 Oct 24];7(12):e08568. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8686033/> [PubMed] [Google Scholar]
  16. Halemani K, Cheema M, Khatun S, Singh B, Gupta VK, Shrama A. An effectiveness of training program on COVID-19 among healthcare students across section study. *Int J Res Pharm Sci* [Internet]. 2020 [cited 2022 Oct 21];11(1):1250-4. Available from: <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-995062> [Google Scholar]
  17. Halemani K, Shashidhara YN, D'Souza SR. An evaluative study to assess the effectiveness of a video-assisted teaching module on knowledge and practice regarding home-based colostomy care of children among primary caregivers in selected hospital Lucknow, Uttar Pradesh. *Indian J Surg Oncol*. 2021;12(1):146-51. [PubMed] [Google Scholar]
  18. Al Enizi BA, Saquib N, Zaghoul MS, Alaboud MS, Shahid MS, Saquib J. Knowledge and attitudes about basic life support among secondary school teachers in Al-Qassim, Saudi Arabia. *Int J Health Sci (Qassim)* [Internet]. 2016 Jul [cited 2022 Oct 27];10(3):415-22. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003585/> [PubMed] [Google Scholar]
  19. Halemani K, Issac A, Mishra P, Mathias E. The impact of exercise on fatigue among patients undergoing adjuvant radiation therapy a systematic review and meta-analysis. *J Caring Sci* [Internet]. 2021 [cited 2022 Oct 26];11(January). Available from: <https://jcs.tbzmed.ac.ir/InPress> [PubMed] [Google Scholar]
  20. Bielec G, Klajman P, Pęczak-Graczyk A. Effectiveness of basic life support instruction in physical education students-a pilot study. *Teach Learn Med* [Internet]. 2014 [cited 2022 Oct 26];26(3):252-7. Available from: <https://pubmed.ncbi.nlm.nih.gov/25010236> [PubMed] [Google Scholar]