Simulation Based Training on Compression only Life Support in Terms of Knowledge and Skill among General Duty Assistants

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ABSTRACT

Introduction: Compression Only Life Support (COLS) is a medical emergency training that is being conducted among non-medical personnel to stimulate the chain of response to activate code until medical help arrives.

Aim: This study aimed to evaluate the Simulation-Based Training on Compression-Only Life Support in terms of Knowledge & Skill among General Duty Assistants.

Methodology: A pre-experimental study using one-group pre-test post-test research design was conducted at ILBS, Vasant Kunj, India. The total enumeration sampling technique was used among 139 GDAs. On the first day, Knowledge & Skill were assessed by using the Structured Knowledge questionnaire &structured Observational Checklist. The simulation-based training on COLS was given by the trained researcher followed by an interactive discussion and return demonstration. On the seventh day, GDAs reassessment of knowledge, skill, and the training acceptability were assessed by using a questionnaire, checklist, numerical rating scale & written statements.

Results: The analysis was done by descriptive & inferential statistics. The results showed that the mean post-test knowledge score (12.30±2.84) was significantly higher than the pre-test knowledge (8.09±2.86). The paired-t value was 16.76 was significant at 0.05. The mean post-test skill score (15.56±2.77) was significantly higher than the pre-test skill (6.71±3.24). The paired-t value was 31.07 was significant at 0.05. There were improvements in knowledge and skill after the simulation-based intervention on COLS which were found to be statistically significant at 0.05 level. A statistically significant, weak positive correlation was found between post-test Knowledge scores and post-test Skill scores with the maximum gain in the domain of chest compression. No association was found between knowledge and skill with selected demographic variables.

Keywords: General Duty Assistants, Simulation-Based Training, Compression-Only Life Support, Knowledge, Skill

INTRODUCTION

In the efforts in saving human lives, no technique super-cedes cardiopulmonary resuscitation (CPR), the most basic and essential life-saving Skill. However till 1954 there were only individual reports, when it was proved that external cardiac massage was as equally effective as internal cardiac compressions. This was then followed by a wave of change [1]. Most of the cardiac arrest happens at home and 90% of individuals who undergo cardiac arrest out-of-hospital die. Each minute's delay in chest compressions reduces the chance of survival by seven to ten percentage. [2] CPR is the most basic and essential life-saving Skill. There is a lack of pre-medical emergency service system and procedures, limited medical gear and funds, insufficient physical organization, lack of skilled manpower, lack of awareness in terms of Skills and Knowledge of CPR among laypersons, is a barrier in India [3]. The

obstacles are recognized for bystander CPR-Practice-related barriers & message-related barriers, Information for CPR (Skills deficits; personal factors (disability; patient's situation, position, and Emotional factors). [3] Attitude regarding COLS in the community had issues, that could only be improved by training, issues were because people had never been trained for the same. [4] COLS is an easy to understand training module for lay persons/bystanders. The training would up-Skill and makes them aware of how to manage cardiac arrest situations at point of call. [5] Training modules, based on its guidelines, are being developed by the ISA. There is an important need to develop a large number of CPR trainers and hence for the chain growth, train-the- trainer programs are now developed. This pathway to active participation by every person involves awareness programs and continuous education to run across all social platforms, printed and via audio-visual media. Successful interventions and acceptance of the guidelines would be achieved when the layperson is aware of the guideline. [6]

Problem Statement

A study to evaluate the Simulation-Based Training on Compression-Only Life Support in terms of Knowledge and Skills among General Duty Assistants working at Institute of Liver and Biliary Sciences, New Delhi.

Objectives of the Study
Primary objective
1) To evaluate the SBT on COLS in terms of Knowledge and Skills among GDAs.

Secondary objectives:
1) To find out the correlation between Knowledge and Skills regarding SBT on COLS among GDAs.
2) To find out the association of Knowledge and Skills regarding SBT on COLS with the selected demographic variables among GDAs.
3) To assess the acceptability of the training program on SBT on COLS among GDAs.

Operational definitions
Evaluation

In this study, it refers to the implementation of systematically planned SBT to the GDAs, to assess the impact of training in terms of Knowledge and Skills regarding COLS as determined by a significant difference in pre-test and post-test Knowledge and Skills test scores.

Simulation-Based Training (SBT)

In this study, it refers to the planned and validated training session on COLS. The session was conducted by the principal researcher. Training sessions were of 30-45 minutes of duration in the skill lab of ILBS. Case-based scenarios on ISA guidelines were used with the aid of manikin. The principal researcher was certified in conducting SBT by a recognized institute (AIIMS) to impart knowledge and skills.

Compression-Only Life Support (COLS)

In this study, COLS refers to the SBT on chest compression-only- CPR to the GDAs working at ILBS. It included the chest compressions at the rate of 120 compressions/minute and the compression depth of 5 to 6 cm by using the manikin to make GDAs understand how to perform this type of resuscitation.

Knowledge

In this study, it refers to the correct responses by the GDAs to the items of the structured Knowledge questionnaire on COLS. The Knowledge scores ranged from (0-20). Knowledge was categorized into-
- Good (> x +1SD); Good (≥14)
- Average (x ±SD); Average (7-13)
- Poor (< x -1 SD); Poor (≤ 6)
(Here x is the mean and SD is the Standard Deviation).

Skills

This study refers to the ability to perform effective chest compressions by using the COLS algorithm. Skills were scored by using structured Observational Checklists which was developed by the principal researcher, which includes 23

items. GDAs were given one mark for correctly performing the item. A zero mark was given to those who did not perform or incorrectly perform the item. The skills scores were categorized into three-

- Good (x + 1 SD); Good (≥16)
- Average (x ± 1 SD); Average (6-15)
- Poor (x - 1 SD); Poor (≤ 5)

(Here x is the mean and SD is the Standard Deviation).

General Duty assistants (GDAs)

They work in a hospital environment and they may also work at homes of sick patients and may be called by similar names such as Orderlies, Nursing Assistants, Nursing Aides, or Bedside Assistants. Internationally, they are usually called Nursing Assistants or Patient Care Assistants. They do also work in the collaboration with (and usually under the supervision of) doctors, nurses, and other healthcare providers to deliver the prescribed healthcare services to their patients.[8]

Hypotheses

The following hypotheses were tested at 0.05 level of significance.

H1- There is a significant difference between means of pre-test and post-test Knowledge scores related to SBT on COLS among GDAs.

H2- There is a significant difference between means of pre-test and post-test Skills scores related to SBT on COLS among GDAs.

H3- There is a significant correlation between post-test Knowledge and post-test Skills scores related to SBT on COLS among GDAs.

H4- There is a significant association of gain in Knowledge with selected demographic variables among GDAs.

H5- There is a significant association of gain in Skills with selected demographic variables among GDAs.

Conceptual framework

It was based on Weidenbach's prescriptive theory.

MATERIAL AND METHODS
Ethical consideration

The study was conducted after scientific & ethical review board approval. The General Duty Assistants were given information sheets & informed written consent before the Simulation-based training. The gathered data from the GDAs kept confidential.

Study design

A pre-experimental study with one-group pre-test post-test research design was conducted at the Institute of Liver &Biliary Sciences, Vasant Kunj, and New Delhi-70.

Study Setting

The Skill lab of the Institute of Liver & Biliary Sciences was used for the simulation-based training on COLS.

Population: We planned to include all the GDAs working at ILBS in the study.

Inclusion criteria
- The GDAs working at ILBS hospital.
- Available during data collection.
- Qualified minimum 10th standard.

Exclusion criteria
- GDAs who refused to take part in the study.
- Were absent during data collection time.

Intervention

The pre-test on Compression only life support (COLS) in terms of Knowledge & Skill among GDAs on day-one was taken. An intervention on Simulation-based training (SBT) on COLS among GDAs was conducted by the trained author for 30-40 minutes on the same day. The training sessions included the scenarios for the lay-person for the outside hospital cardiac arrest. The post-test on COLS among GDAs in terms of Knowledge & Skill was taken on day seven, followed by the administration of participant's training acceptability form after the post-test.
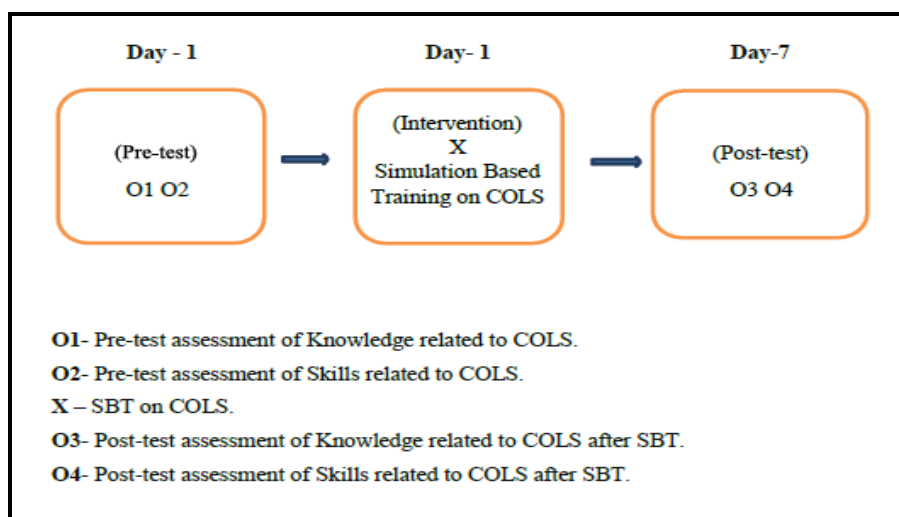
Figure1: Schematic diagram showing the procedure of data collection.

Study tool

A structured knowledge questionnaire was designed for the GDAs based on the Indian guidelines for CPR. The set domains for Knowledge (60%), comprehension (20%) & recall (10%) were maintained. It comprised of 20 questions-five true/false, 15 multiple-choice questions. The demographic details of the GDAs were also collected in the questionnaire. A structured observational checklist for COLS was also prepared by the author that comprised 23 items.

The validity and reliability were established. The same Knowledge Questionnaire and observational checklist were used in the pre-test & post-test. The participant's (GDAs) acceptability form was administered after the post-test. The numerical responses including positive and negative statements and written statements as feedback were gathered from the GDAs.

Statistical methods

Data was collected & entered into MS excel 2013. Data were analysed using SPSS 22.0. Descriptive statistics using frequency, percentage, & inferential statistics using t-test, ANOVA & correlation coefficient was computed

RESULTS

Section 1: Description of the demographic characteristics of the GDAs

Table1: Frequency and percentage distribution of selected demographic variables n=139

Demographic variables	f	(%)
Age in groups (in years)		
15-30	78	56.1
31- 45	55	39.6
46- 60	06	4.3
Gender		
Male	90	64.8
Female	49	35.2
Education		
10th	52	37.4
12th	64	46.0
Diploma	01	0.7
Graduation	22	15.9
Residence		
Urban	40	28.7
Rural	99	71.3
Experience (in years)		
<1	13	9.4
1 to 2	35	25.2
>2 to 3	84	60.4
> 3	07	5.0
Area of working		
OPDs	20	14.4
General ward	94	67.6
SICU/TICU/HDU/LCICU/ Emergency)	25	18.0
Witnessed COLS outside		
Yes	40	28.8
No	99	71.2
Source of information		
Never Heard	44	31.7
T.V.	06	4.3
Online Video	16	11.5
Medical trainer	31	22.3
Any course	05	3.6
Hospital sources	37	26.6
Training on COLS		
Yes	25	17.99
No	114	82.01
Reason for not taking training		
Don't know where the training is	87	76.2
Lack of time	26	23.0
Lack of money for the course	01	0.8

A total of 164 GDAs were enrolled for the training, where 25 GDAs did not give a post-test and the data was collected

from 139 GDAs who completed the training.

In the data depicted in Table-1, the age category there were more than 50%, i.e. 56.1% GDAs were in the age category of 15-30 years, 39.6% in the category of 31-45 years and only 4.3% were in the age category of 46-60 years. In terms of gender 64.8% GDAs were male and 35.2% were females. In terms of education, majority of 46% of the GDAs were 12th pass, then 37.4% were 10th pass and 15.9% were graduated, while only 0.7% of the GDAs were diploma holder. Majority of the GDAs, 71.3% belonged from the rural areas. In terms of experience, 60.4% of the GDAs had the experience of more than two years up to three years. 25.2% of GDAs had experience of one to two years. 9.4% of the GDAs had experience of less than one year. While, only 5% of the GDAs had an experience of more than three years.

In terms of the area of working, 67.6% of the GDAs were working in general ward, 18% of the GDAs were in critical areas (SICU/TICU/ HDU/ LCICU/ Emergency) and 14.4% of the GDAs were working in OPDs. It was seen that the majority of the GDAs (71.2%) did not witnessed the COLS outside the hospital. On asking about source of information regarding COLS, 31.7% GDAs had never heard about COLS, 26.6% heard from hospital sources, 22.3% from the medical trainer,11.5% heard from the online video, 4.3% heard from the T.V. and remaining 3.6% heard from any other course. On asking weather, training taken on COLS, 82.01% GDAs were not trained for the COLS.

There were only 17.99% GDAs who were trained for COLS. When the reason for not taking any training on COLS was asked from 114 GDAs, it was seen that 76.2% GDAs were unaware about the trainings, 23% responded that they had lack of timings for the training and only one GDA 0.8% responded that it was a cost issue for not getting any training.

Section 2: Comparison of descriptions for the pre-test-post-test Knowledge score and Skill score of the GDAs

Table 2: Comparison of Knowledge & Skill scores using paired t-test. n=139

Variable	Range		Pre-test Mean ± SD	Post-test Mean ± SD	Mean difference	t	p
	Pre-test	post-post					
Knowledge	2-15	3-19	8.09±2.86	12.30±2.84	4.21 ± 0.02	16.76	<0.001**
Skill	1-15	8-21	6.71±3.24	15.56±2.77	8.85 ± 0.47	31.07	<0.001**

P<0.001**; paired-t-test (Knowledge; Max marks: 20, Skill; Max marks: 23)
The difference in the mean score before and after training

Table 3: Description of category wise distribution of Knowledge & Skill scores n=139

Knowledge Scores	f	%
Pre-test		
Good (≥14)	05	3.6
Average (7-13)	95	68.3
Poor (≤ 6)	39	28.1
Post-test		
Good (≥14)	47	33.8
Average (7-13)	88	63.3
Poor (≤ 6)	04	2.9
SKILL SCORES	f	%
Pre-test		
Good (≥16)	0	0
Average (6-15)	43	30.9
Poor (≤ 5)	96	69.1
Post-test		
Good (≥16)	83	59.7
Average (6-15)	55	39.6
Poor (≤ 5)	01	0.7

Table-2 depicts the mean difference between Knowledge scores. There was an average increase of 4.21 in mean Knowledge scores and 8.85 in mean skill scores after training, which was statistically significant (p <0.001**).

For easy interpretation, the scores were categorized as per the level of Knowledge percentage as a group in Table-3. In the pre-test, only 5(3.6%) had good Knowledge scores, whereas 95(68.3%) scored average & 39(28.1%) scored poorly. While in post-test 47(33.8%) had scored good, 88(63.8%) scored average and only

04(2.9%) scored poor in Knowledge scores after post-test.

In terms of Skill scores, in pre-test 0% scored good, 43(30.9%) scored average while the majority of 96(69.1%) scored poorly. While in post-test 83(59.7%) scored well, 55(39.6%) scored average and only 01(0.7%) scored poorly even after the training.

Table4: Correlation of Post-test Knowledge score with Post-test Skill scores using person's correlation coefficient   n=139

Variable	Mean ± SD	r	p
Post-test Knowledge	12.30 ± 2.84		
		0.321	<0.001**
Post-test Skill	15.56 ± 2.77		

Table 4 showing a week positive correlation between post-test knowledge and post-test skill among GDAs after simulation-based training

Table5: Domain wise mean gain in Knowledge scores of SBT on COLS among GDAs. n=139

No	Domain	No of items (20)	Mean pre test scores	Mean post test scores	Mean gain in Knowledge (%)	Rank
1	Basic Anatomy & physiology	02	1.33	1.72	29.32	V
2	COLS Basics	08	3.46	4.94	42.77	III
3	Scene safety	03	0.93	1.49	60.21	II
4	Cardiac activity & recognition	03	1.23	1.70	39.02	IV
5	Chest compressions	04	1.21	2.36	95.02	I
	Minimum score-0; Maximum scores-20					

Table-5 depicting that the mean percentage scores of post-test Knowledge scores were increased after the SBT on COLS in all the domains. It was found that the maximum Mean percentage gain in Knowledge score of GDAs was in the 5th domain (chest compression).

Table-6 depicting that the mean percentage scores of post-test skills scores were increased after the SBT on COLS in all the domains. It was found that the maximum Mean percentage gain in skill score of GDAs was ranked 1st in the domain (chest compression).

Table 6: Domain wise mean gain in Skill scores of SBT on COLS among GDAs   n=139

No	Domain	No of items (23)	Mean pre test scores	Mean post test scores	Mean gain in Skills (%)	Rank
1	Scene safety	01	0.41	0.53	29.26	V
2	Response checking	03	1.31	2.21	68.70	II
3	Emergency medical activation	02	1.02	1.62	58.82	III
4	Chest compressions	13	0.46	0.88	91.30	I
5	Post COLS response check	04	0.06	0.09	50	IV
	Minimum score-0; Maximum scores-23					

Section 3: Association of gain in knowledge and gain in skill scores with selected demographic variables.

Table 7 presenting the association of the gain in Knowledge with the selected demographic variables namely-Age, Gender, Education, Residence, and work experience The one way ANOVA and independent t- test were computed as the data was parametric F and t values with respect to Age (F=1.72, p=0.18), Gender (t=1.35, p=0.17), Education, (F=0.50, p=0.67), Residence (t=0.46, p=0.64, Experience (F=0.87, p=0.45). it also shown that 'p' value was (p≥0.05) for all the demographic variables.

As the 'p' value was (p≥ 0.05) thus it can be interpreted that research hypothesis is rejected, as no significant association was found between the gain in Knowledge scores with selected demographic variables namely Age, Gender, Education, Residence, and work experience.

Table 7: Association of gain in Knowledge scores with selected demographic variables n=139

Demographic Characteristics	Gain in Knowledge scores	t/F	df	p value
Age (in years)				
15-30	3.87 ± 2.04			
31-45	4.68 ± 3.75	1.72	2	0.18
46-60	4.51 ± 0.41			
Gender				
Male	3.90 ± 2.65			
Female	4.59 ± 3.27	1.35	137	0.17
Education				
10th	4.36 ± 2.24			
12th	4.17 ± 2.92			
Diploma	2.00 ± 0.00	0.50	3	0.67
Graduation	3.63 ±1.78			
Residency				
Urban	4.32 ± 3.59			
Rural	4.07 ± 2.57	0.46	137	0.64
Experience				
<1 years	5.38 ± 3.27			
1 to 2 years	4.02 ± 3.42			
2.1 to 3 years	4.01 ± 2.68	0.87	3	0.45
>3 years	4.00 ± 1.29			
p ≤0.05; *Significant				

Table 8: Association of gain in Knowledge scores with selected demographic variables (Contd) n=139

Demographic Characteristics	Gain in knowledge scores	t/F	df	p value
Area of working				
OPD	4.35 ± 3.60			
General ward	4.04 ± 2.88	0.17	2	0.84
Critical area	4.36 ± 2.37			
(SICU/TICU/LCICU/HDU)				
Witnessed COLS outside				
Yes	4.06 ± 2.77			
No	4.31 ± 3.17	0.48	137	0.63
Source of information				
Never heard	4.31 ± 3.17			
T.V.	5.50 ± 3.39			
Online video	3.25 ± 3.00			
Medical trainer	3.90 ± 2.24	0.88	5	0.49
Any COLS course	3.00 ± 2.00			
Hospital sources	4.45 ± 3.01			
Training taken				
Yes	3.88 ± 2.47			
No	4.20 ± 2.98	0.52	137	0.61
Reasons for not taking training				
Don't know where the training is	3.88 ± 2.47			
Lack of time	4.10 ± 3.20	0.72	2	0.54
Cost issues	8.00 ± 0.00			
p≤ 0.05; *Significant				

In the Table 8 association of gain in Knowledge is assessed with the selected demographic variables among GDAs in terms of-Area of working, Witnessed COLS outside, Source of information, training taken, Reasons for not taking any training.

F and t values with respect to-Area of working (F=0.17, p=0.84), witnessed COLS outside (t=0.48, p=0.63), source of information (F=0.88, p=0.49), training taken on COLS (t=0.52, p=0.61) and reason for not taking training (F=0.72, p=0.54).

Hence, association of the gain in Knowledge with selected demographic variables among GDAs, it was seen that in every aspect there were no significance level found, because the values were more than 0.05.

As the 'p' value was (p≥ 0.05) thus it can be interpreted that research hypothesis is rejected, as no significant association was found between the gain in Knowledge scores with selected demographic variables namely-Area of working, Witnessed COLS

outside, Source of information, training taken, Reasons for not taking any training.

Table 9: Association of mean gain in Skill scores with selected demographic variables n=139

Demographic Characteristics	Mean gain in Skill scores	t/F	df	p value
Age (in years)				
15-30	3.74 ± 2.04			
31-45	4.67 ± 3.75	0.19	2	0.82
46-60	3.90 ± 2.65			
Gender				
Male	9.02 ± 3.29			
Female	8.53 ± 3.48	1.35	137	0.42
Education				
10th	8.21 ± 3.29			
12th	9.07 ± 3.17			
Diploma	7.00 ± 0.00	1.39	3	0.24
Graduation	9.77 ± 3.90			
Residence				
Urban	8.59 ± 3.47			
Rural	9.47 ± 2.98	0.16	137	0.22
Experience				
<1 years	8.84 ± 3.57			
1 to 2 years	9.51 ± 3.11			
2.1 to 3 years	8.89 ± 3.40	0.93	3	0.42
>3 years	7.42 ± 3.55			
p ≤ 0.05: *Significant				

Table 10: Association of mean gain of Skill scores with selected demographic variables (Contd) n =139

Sample characteristics	Mean gain in Skills scores	t/F	df	p value
Area of working				
OPD	4.35 ± 3.60			
General ward	4.04 ± 2.88	0.17	2	0.83
Critical area	4.36 ± 2.37			
(SICU/TICU/LCICU/HDU)				
Witnessed COLS outside				
Yes	8.58 ± 3.35			
No	9.40 ± 3.34	1.34	137	0.50
Source of information				
Never heard	9.40 ±3.34			
T.V.	9.83±2.48			
Online video	7.93±3.66			
Medical trainer	8.22 ±2.95	0.88	137	0.49
Any COLS course	5.20 ±2.25			
Hospital sources	9.43 ±3.48			
Training taken				
Yes	7.20 ± 3.58			
No	9.21 ± 3.21	0.52	137	0.61
Reasons for not taking training				
Don't know where the training is	3.88 ± 2.47			
Lack of time	4.10 ± 3.20	0.72	3	0.54
Cost issues	8.00 ± 0.00			
p ≤ 0.05: *Significant				

The data in the Table 9 and Table 10 showing, that the association of gain in Skills with the selected demographic variables to test the association.

The demographic variables where the one way ANOVA and independent t test was applied in order to test the null hypotheses at the level of 0.05 level of significance. The F/t value for demographic characteristics, it was seen that the demographics characteristics are not significant to the Skill at 0.05 of significance because the values are more than 0.05.

After testing the association of gain in Skill with demographics by applying the independent t-test and ANOVA, in the demographic variable- Area of working (F=0.17, p=0.83), Witnessed COLS outside (t=1.34, p=0.50), Source of information (F=0.88, p=0.49), Training taken (t=0.52, p=0.61) and reason for not taking any training (F=0.72, p=0.54).

Hence, it can be concluded that there is no association of Skill with the

demographic variables among GDAs- Age, Gender, Education, Residence, Experience, Area of working, Source of information and Training taken, reasons for not taking training, therefore null hypothesis is accepted at 0.05 level of significance.

Section 4: Analysis and interpretations of the participant's acceptance for SBT on COLS after the training sessions.

Table 11: The levels of participant's acceptance for SBT on COLS among GDAs n=139

Level of acceptance	Frequency (f)	Percentage (%)
Not acceptable (10-20)	04	2.9
Moderately acceptable (21-39)	33	23.7
Highly acceptable (40-50)	102	73.4
Total	**139**	**100**
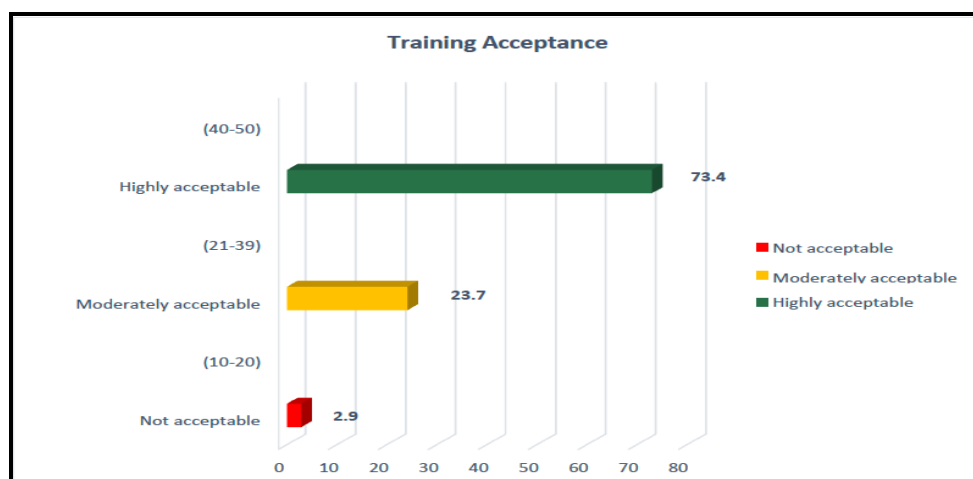
Figure 2: participant's training acceptance for SBT on COLS after training.

In the Figure-2, the Frequency percentage distribution is showing that 2.9% of the GDAs did not accepted the SBT on COLS, 23.7 % of the GDAs gave moderate level of acceptance towards the SBT training on COLS, while 73.4 % of the GDAs gave highly acceptance towards SBT on COLS.

Section 5: Transcription of the Verbatim by the GDAs after SBT on COLS.

1) What did you like the most in the CPR training?

Participant 26

"At the time of training, we were explained to the mannequin, this helped us to learn ways to save the life of another person. This thing was very good".

Participant 42

"Trainer told each step in detail which was quite good. The trainer explained to me and her way of training was excellent".

Participants- 30

"I found training beneficial, because all the information was enlightening. It was also necessary for me to know, that if any accident happens in the house, then anyone's life can be saved.

Participants- 12

"During training, every step in CPR was explained and shown to be done. This thing was very informative, I also took such training for the first time. I got to learn a lot of good things, such training should be repeated for us and if anyone's life is saved after this training, then it will be a virtuous work and the trainer will also get a lot of blessings".

Participants- 18

"A person can be in trouble anywhere. It is very important for us to know CPR and everyone should get training, so that every person's life can be saved."

Participant-89

"After this training, I got a good information about CPR, so that we can call

an ambulance outside the hospital we also can save a person's life… This thing is very good and every worker should have these things in every hospital."

2) On asking, will you be able to perform COLS outside the hospital, after this training? The GDAs answered in 'Yes' and 'No' form. The details were analysed and shown in the figure-3

It was seen that 68.3% GDAs responded "yes" and 31.07% answered "No" to the question.
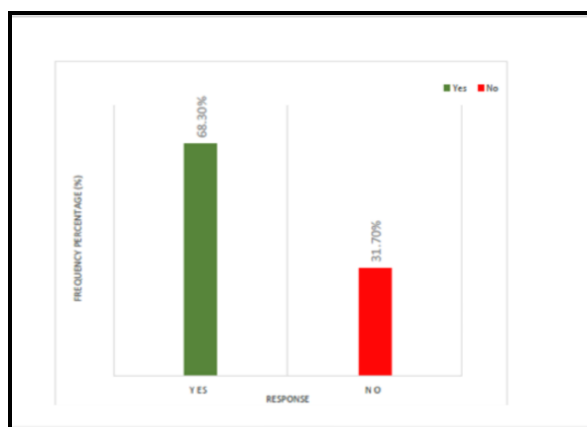

Figure3: Vertical Column graph showing the Frequency percentage distribution of participant's responses after SBT on COLS.

DISCUSSION

This study has shown the improvement of Knowledge & Skill after training on COLS based on Indian guidelines. The GDAs in our hospital doesn't have a formal training program for CPR as such. As the ISA guidelines for CPR for the laypersons had been published in 2017. Though the principal researcher implemented the guidelines to aware of the GDAs about laypersons CPR. The simulation-based training was planned and implemented to the GDAs for 30-40 minutes duration. To analyse the effectiveness of the study the pre-test and post-test were conducted and data were statistically analysed.

The present study included 139 GDAs for SBT on COLS.A review study conducted by, Salunkhe and Dias (2014), showed the data where in terms of age group (in years), it was the majority of the participant's i.e. 84% of the total were

between the age group were between (18-30) years, 6% were between (31-40), 4% were in age group (41-50) and 6% were between (51-58 years)[9].

In the present study, 64.8% of the GDAs were male and 35.2% of the GDAs were females. In a review of a study, Nikam and Shinde (2018) it was noted that 57.5% of the housekeeping staff were males and 42.5% were the females. A study conducted by, Salunkhe and Dias (2014), shows in terms of gender, the majority of the samples i.e. 92 % of subjects were males and 8% were females[9].

In this study, 71.3% of the GDAs belonged to the rural areas and 28.7% of the GDAs belonged to the urban areas. (Birkun & Kosova, 2018) conducted a study where 59.4% of the samples were from the urban place and 40.6% were from the rural place. [10]

Experience (in years)

In the present study, experience (In years), more than half of the GDAs (60.4%) were having the experience of more than two years to up to three years, 25.2% of the GDAs were having the experience of one to two years, 9.4% of the GDAs were having the experience of less than one year, only 5% of the GDAs were having the experience of more than three years. In a similar Study conducted by (Kaihula et al., 2018) shown that there were 44% of the health care providers were having experience of fewer than five years, 30% of the health care providers were having experience of five to ten years, 26% of the healthcare providers were having experience of more than ten years[11].

In the present study, about sources of information about COLS, 31.7% of the GDAs had never heard about COLS, 26.6% of the GDAs heard about from the hospital sources, 22.3% of the GDAs heard from the medical trainer, 11.5% heard from the online videos, 4.3% of the GDAs heard from the T.V. while only 3.6% of the GDAs heard from any other courses. In a similar study by Nikam and Shinde (2018)

revealed, about the information of CPR. It was seen that there were the following sources of information mass media (27.5%), newspapers (11%), television (9%), others (25 %) [11]. A study conducted by (Khademian et al, 2020), showing that (7.6%) of the villagers had prior information about CPR, while (42.4 %) did not know about it [13].

In this study, training on COLS has taken or not, it was seen that 82.01% of the GDAs did not take any training, while 17.99% of the GDAs had training on COLS. In a similar study conducted by (Ko et al., 2018) There were 14.1% of the laypersons who had prior training and 85.9% were not trained [14]. In the present study, among 114 (82.01%) of the GDAs, who did not take any training on COLS were being asked regarding the "cause of not taking the training". It was seen that 76.2% of the GDAs were not knowing where the training is given, 23% of the GDAs had a lack of time for taking the training, while only 0.8% of the GDAs had a lack of money for training courses.

According to (Oman & Bury, 2015) there are few common reasons why people don't learn the CPR is people are not sure, where they can get the training, they don't have the idea about the training costs, afraid about the difficulty of learning CPR.[15]. In the current study, Range for the pre-test Knowledge and post-test Knowledge were (2-15) and (3-19) respectively. The Median for the pre-test Knowledge was 08 and the post-test Knowledge was 12. In the present study, the pre-test means Knowledge scores among GDAs were 8.09 ±2.86 for day-1 and post-test mean scores were 12.30±2.84 at day-7. The mean difference between Knowledge scores was 4.21±0.02. There was a significant difference between mean scores of post-test and pre-test Knowledge scores as the t value found 16.76 at p value <0.001** level, which concluded that SBT on COLS was effective in terms of gain in Knowledge scores among GDAs.

In the present study, the pre-test means Skill scores among GDAs were 6.71

± 3.24 for day-1 and post-test mean scores were 15.56 ± 2.77 at day-7. The mean difference in Skill scores was 8.85 ±0.47. There was a significant difference between mean scores of post-test and pre-test Skill scores as the t value found 31.07 at 'p'< 0.001** level, which concluded that SBT on COLS was effective in terms of gain in Skill scores among GDAs.

A similar study supported by Khademian et al, (2020) to see the effect of basic CPR training on Adults Knowledge and performance in Rural areas of Iran‖, the study revealed the pre-test Knowledge scores were 2.78 ± 1.74, and post-test Knowledge scores were 6.78 ±1.23 (z=5.86,p<0.001). In terms of Skill, the pre-test Skill scores were 0.8± 0.77 and post-test Skill scores were 8.22±1.65 (z=26.67, p<0.001), as the study findings were statistically significant at 0.05 level. Which concluded that CPR training was effective in improving Knowledge and Skills. [13]

In the current study, in terms of Skill after SBT on COLS, there was about 0.7% of the GDAs who had poor Skill regarding COLS, 39.6% of the GDAs were having the average Skill. While there were only 59.7% of the GDAs who had good Skill regarding COLS. While in terms of Knowledge after SBT on COLS, there were about 2.9% of the GDAs who had poor Knowledge regarding COLS, 63.3% of the GDAs were having the average Knowledge. While there was only 33.8% of the GDAs who had good Knowledge regarding COLS.

A similar study supported by (Vandali et al., 2018) to assess the knowledge regarding (CPR) among 1st Year GNM students. The results have shown that no one student had poor knowledge of CPR. There were about 38% of the students who had average knowledge of CPR. Among the total students, 62% of the students were having good knowledge of the CPR.[16] The current study reveals the domain wise, the mean gain in the percentage of Knowledge and Skill after SBT on COLS. In the domains of Knowledge, there was a maximum gain of 95.02% in the fifth

domain of - Chest compression‖ and ranked first. While in terms of the Skill domain there was the maximum gain in the percentage of 91.30% in the fourth domain of - Chest compressions and ranked as first. A similar study conducted by Goduhan et al (2017) revealed that in terms of Skill the percentage of effectiveness was 93% in the domain of - Steps and techniques of CPR", whereas in terms of Knowledge maximum gain in percentage was seen in the domain of post-resuscitation care [17].

In the current study, the post-test mean Knowledge and Skill scores of the GDAs were 12.30± 2.84 and 15.56± 2.77 respectively. The correlation was computed by Karl Pearson's coefficient of correlation. The computed value was (r=0.32, p= <0.001**), found statistically significant at 0.05 level of significance. A Similar findings supported by a study conducted by Lavanya, V. (2016). According to the study, there was a positive correlation between post-test Knowledge and Practice scores. [17]

In the current study, there was no significant association of gain in Knowledge and gain in skill with selected demographic variables. Similarly, Salunkhe and Dias (2012) also revealed the results between Practices with the selected demographic variables by using ANOVA test [9]. According to the study, demographics- Age, Education, and work experience were significant and associated with the pre-test Practice scores. In terms of gender and previous information about CPR were not statistically significant, hence were not associated.

In the present study for the feedback purpose, the participants were asked about the SBT on COLS after the training sessions. The few participants (GDAs) responded to the following statements.

Participant- 30
"I found the training beneficial because all the information was enlightening. It was also necessary for me to know, that if any accident happens in the house, then anyone's life can be saved.

Participant- 18
"A person can be in trouble anywhere. We need to know CPR and everyone should get training so that every person's life can be saved."

Participant-89
"After this training, I got a piece of good information about CPR, so that we can call an ambulance outside the hospital we also can save a person's life… This thing is very good and every worker should have these things in every hospital."

Similar findings was collected by (Andrews et al., 2018) in a qualitative study and quoted the statements about the perception of CPR training among young high school graduates.
"There should always be at least one person with the skills in a situation where it's needed. Everyone, ideally.
"CPR is important, and can save a life, or at least help until ambulances or somebody else helps, that kind of thing."

In the current study, the mean pre-test scores of Knowledge & Skills among GDAs in our study were 8.09 from 20 and 6.71 from 23 respectively. The probable reason for low Knowledge and Skill could be the lack of training sessions in the hospital and unavailability of training sessions for non-medicos laypersons. In a similar study, conducted on the Administrative employees they found very enthusiastic and interested for training with a significant gain in Knowledge & Skill after the training session, significantly more & adequate compression's proportion was demonstrated by the simplified group comparatively to standard group [19]. Re-current educational courses can improve attitudes toward CPR [4]. Training increased layperson's readiness & confidence to do bystander CPR on an unfamiliar person. [5]

In our study as the GDAs level of Knowledge and Skill were improved and after training its acceptability was also found good among more than 70% of the GDAs. There were positive responses towards training sessions, which showed

that the CPR training based on Indian guidelines with short duration simulation-based scenarios, are much acceptable & effective among GDAs or non-medical laypersons.

Usually, the American based CPR guidelines are always used in the Indian healthcare systems, which is fit & considered for western counties. These AHA guidelines require frequent updates and costly certifications, which could be the biggest reason for not updating the guidelines among health care workers. Though these ISA generated Indian guidelines help them to get updated. We aimed to make the non-medico laypersons (GDAs) about CPR based on Indian guidelines.

The simplified simulation-based training for short duration 30-40 minutes among GDAs helped to significantly improve the Knowledge and Skill and increased the acceptability towards the training. Studies have proved the COLS are an easy to understand training module for laypersons/bystanders. The training would up-Skill and makes them aware of how to manage cardiac arrest situations at point of call [6].

No upgrading in skill after video training was perceived due to short intervals of 8 minutes training, which failed to put an impact. In our study, we emphasized early assessment, emergency activation, and chest compressions on simulation-based scenarios. The laypersons outside the hospital guidelines focus only on chest compressions. Additional sessions of training increased the theoretical Knowledge & self-confidence in performing CPR [8].

Limitations: The study was conducted on GDAs working at ILBS hospital available during data collection & was qualified minimum 10th standard; hence findings may not be generalized. In our study, we also could not assess the long term retention of knowledge and skills after training sessions, as the limitation of time for the study.

Future implications

This study can be conducted by using SBT on COLS for a different population like paramedical professionals, ambulance service employees, housekeeping staff, industry workers, corporate employees, school teachers & students, etc.

CONCLUSION

This study concluded that SBT on COLS was effective in terms of Knowledge & Skill among GDAs working at ILBS, It was evident that after SBT on COLS there was a significant improvement of Knowledge & Skill scores among GDAs. The acceptability of the SBT on COLS among GDAs of the ILBS was adequately accepted & positively appreciated.

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