

EFFECTIVENESS OF HANDS ON SKILL TRAINING PROGRAMME ON CARDIOPULMONARY RESUSCITATION AMONG THE BLUE COLLAR WORKERS OF SELECTED INDUSTRY OF MANGALORE, KARNATAKA.

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ABSTRACT

The incidence of occupational accidents is more frequent in the world as well as in our country. Occupational accidents occur due to the many reasons which cause injuries and the extent of death. Most of the deaths occur due to the sudden cardiac arrest and respiratory failure at work place. Death rate is high because of lack of knowledge on handling the emergencies among the workers. Cardiopulmonary resuscitation is an emergency life saving procedure which can be performed during fatal medical emergencies. Skill training the blue collar workers on CPR can reduce the occupational death rates at work place and also helps them to handle the emergency situation in meaningful way and save lives. Hands on skill training on CPR impart and improves the knowledge and skill of blue collar workers. Thus the blue collar worker can react to the emergency situation and handle medical casualty and can reduce the occupational mortality rate. Hence the investigator felt the need to assess the knowledge and skill of the blue collar workers on CPR and to check the effectiveness of hands on skill training program on CPR technique. **Aim:** The overall aim of the study was to assess the effectiveness of hands on skill training program on CPR technique. **Objectives of the Study:**

1. To determine the existing knowledge on CPR among the blue collar workers using structured knowledge questionnaire.
2. To determine the existing skills on CPR among the blue collar workers using observation checklist.
3. To find out the effectiveness of the hands on skill training program on CPR technique in terms of knowledge and skills among the blue collar workers using same structured knowledge questionnaire and observational check list.
4. To find out the association between pre-test knowledge and skills scores on CPR among blue collar workers with selected base line variables.

Method: An evaluator approach with a pre-experimental, one group pre-test – post-test Design was adopted in the present study to accomplish the objectives. A structured Knowledge questionnaire was used to assess the knowledge and observation check list for assessing skill of blue collar worker on CPR technique, followed by hands on skill training program. The reliability of the tool-I(structure knowledge questionnaire) was tested by using split half method. The tool-I was found reliable ($r = 0.82$; $p < 0.05$). The reliability of the tool-II (Observational checklist) was tested by using inter rated observer method. The tool-II was found reliable ($r = 0.94$; $p < 0.05$). Stratified random sampling technique was used to select a sample of 36 blue collars, show are working in selected industry. **Results:** The findings of the study revealed that the pre-test knowledge level of the Blue collar worker was moderately adequate (91%) and 3 % had inadequate knowledge. All the blue collar workers 100% had poor skill level on CPR technique. The post test knowledge score (24.53 ± 2.22) was higher than the pre-test knowledge score (17.72 ± 2.66). Paired 't' test was used to find the effectiveness. The calculated 't' value in knowledge (10.59 , $P < 0.005$) was greater than the table value (2.02). The post test skill score (21.50 ± 2.15) was higher than the pre-test knowledge score (4.47 ± 1.08). Paired 't' test was used to find the effectiveness. The calculated 't' value in skill level (42.63 , $P < 0.005$) was greater than the table value (2.00). This showed that the gain in the knowledge and increase in skill level on CPR among blue collar worker was significant after administering hands on skill training program. There was correlation with the post-test knowledge and post-test skill, concluding that as the knowledge increased the skill level on CPR will increases. Association between pre-test knowledge with personnel characteristics revealed that there was no significant association between the pre-existing knowledge and demographic variables on CPR. Association between pre-test skills with personnel characteristics revealed that there was significant association between the pre-existing skills on CPR and demographic variables.

Conclusion: The present study revealed that the blue collar workers have lack of knowledge and skills on CPR and the overall findings of the study revealed that there was highly significant increase in the knowledge and skill of blue collar workers on, CPR following the administration of the structured educational package. Therefore it was concluded that the hands on skill training program was highly effective in improving the knowledge and skill of blue collar worker.

KEYWORDS: Hands on skill training; cardiopulmonary resuscitation (CPR); blue collar works; production; industry.

INTRODUCTION

To stay alive we need an adequate supply of oxygen to enter the lungs and be transferred to the cells in the body the circulating blood. If a person is deprived of oxygen for any length of time the brain will begin to fail. As a result the casualty will eventually lose consciousness, breathing will cease, the heart will stop and death results. Cardiac arrest is one of the common causes of cardio-respiratory failure. Heart and lungs are the two important vital organs in which one works for the circulation of blood and another for respiration respectively. The heart receives the deoxygenated blood from all the parts of body and pumps it to the lungs. In the lungs the chemical regulation of oxygen takes place where the carbon dioxide moves to the alveoli, at the same time the oxygen moves to the blood stream. The oxygenated blood moves to the heart and then circulates to body.

As oxygen is very important component to the body, it is carried by the blood and delivered to the all cells of the body and it's a natural process. When any occurrence like cardiac arrest, automobile accidents, drowning, electrocution etc, in these situations the heart fails to pump the blood and mean while the respiration also fails. CPR is the procedure where external chest compression is given to heart which initiates the heart function mechanically and the rescue breath will be carried by the blood and delivered to the cells which keeps alive the vital organs.

Sudden cardiac arrest is the most prominent medical emergency in world. In India 0.55% of the deaths out of 1000 population is due to cardiac arrest. In addition drowning, suffocation, electrocution and drug intoxication causes cardiac arrest. Much death could be prevented if the victim got prompt life saving measure until trained EMS professionals take over. Cardiopulmonary resuscitation (CPR) is an initiation and maintenance of breathing and circulation. The purpose of the CPR is to maintain an adequate circulation and pulmonary ventilation until more definitive treatment can be administer to the victim.

In 1954, James Elam was the first to demonstrate experimentally that cardiopulmonary resuscitation (CPR) was a sound technique and, with Dr. Peter Safar, he demonstrated its superiority to previous methods. Peter Safar wrote the book ABC of resuscitation in 1957. In the United States, it was first promoted as a technique for the public to learn in the 1970s. It is a simple but effective procedure that allows victim to sustain life in the first critical minutes of cardiac arrest. CPR attempts to deliver the oxygenated blood to the brain and the heart, long enough to keep vital organs alive until the victim is transferred.

Resuscitation was attempted in the past through various methods e.g. slapping victims, making loud noises. The mouth –to mouth method was reported prior to 1970s but it has now become the most preferred method. And even recent years there are many changes in performing the CPR, where the circulation is given the prior impertinence, next the air way followed by breathing.

In previous years only the medical professionals use to perform the CPR procedure as there is external compression which may leads to internal injuries. Many previous studies show inaccuracies in knowledge and perceptions regarding cardiopulmonary resuscitation (CPR) among the general public. So the researcher decided to bring it to the community level especially the occupational area where the individuals are works at high risk.

MATERIALS AND METHODS

In view of the nature of the problem under study and to accomplish the objectives of the study, Evaluative Approach was found to be appropriate to describe the effectiveness of hands on skill training programme on cardiopulmonary resuscitation(CPR) among blue collar workers. The research design was Pre-experimental, i.e. One Group Pre-Test Post-Test Design was adopted. one group pre-test post-test pre-experimental design judges the effects of the treatment by the difference between the pre-test and post-test score without comparing with a control group.

VARIABLES

INDEPENDENT VARIABLE: In this study hands on skill training programme is the independent variable.

DEPENDENT VARIABLES:. In this study dependent variables are knowledge on CPR and skill performance on CPR.

BASE LINE VARIABLES: The base line variables in the study are age, educational status, working experience, place of residence occupation, previous knowledge Regarding CPR skills.

Stratified random sampling was found appropriate technique to select 36 Blue collar workers from a selected industry for the study. In this study the blue collar workers who are apprentices are divided as strata based on the different branches like electronics, fitter, turner, computer hard ware, civil and automobiles. From the each strata 6 subjects were selected randomly.

SELECTION AND DEVELOPMENT OF THE TOOL

Structured knowledge questionnaire and observation check list are used to assess the knowledge and skill level of blue collar workers on CPR. The Observation check list is prepared according to American heart association standard, hands on skill training program included teaching plan and Skill training programme. The method of instruction adopted for the instruction is lecture cum Discussion and demonstration method. The

data was collected and recorded systematically on each item and was organized in a way that facilitated

computer entry. The collected data was analyzed by using descriptive and inferential statistics.

RESULTS

Frequency and percentage distribution of sample according to personal Characteristics.

SI NO	PERSONAL CHARACTERISTICS	FREQUENCY	%
1.	AGE IN YEARS		
	18 – 25	36	100
	26 – 30	-	-
	31 – 35	-	-
	36 and above	-	-
2.	EDUCATIONAL STATUS		
	S. S. L. C	14	22
	P. U. C	-	-
	Diploma	39	61
	Degree	-	-
3.	WORK EXPERIENCE IN YEARS		
	< 1 year	36	-
	1 – 5 years	-	-
	6 – 10 years	100	-
	11 and above	-	-
4.	AREA OF RESIDENCE		
	Rural	20	16
	Urban	56	44
5.	UNDERGONE CPR TRAINING PREVIOUSLY		
	Yes	-	36
	No	-	100

N=36

Range, Frequency and percentage distribution of blue collar workers according to their pre test knowledge on CPR

Level of knowledge	Range of Score	Frequency	Percentage
Inadequate	0	1	3
Moderately adequate	12	33	91
Adequate	23	2	6
Total		36	100

N=36

Overall mean, SD and Mean percentage of pre-test knowledge scores of blue collar workers on CPR.

Pre – Test Knowledge Scores				
Overall Knowledge	Mean	Mean Deviation	SD	Mean Percentage
	17.72	2.66	3.377	49.22

N=36

Range Frequency and percentage distribution of blue collar workers according to pre-test skill level on CPR

Skill Level	Range of Scores (%)	Frequency	Percentage (%)
Poor	0	36	100
Average	7		
Good	13		
Very Good	19		
Total		36	100

N = 36

Overall analysis of pre-test skill scores of blue collar worker on CPR.

Overall mean, SD and mean percentage of pre-test skill scores of Blue collar worker on CPR.

Pre – Test Skill Scores				
Overall Skill	Mean	Mean Deviation	SD	Mean %
	4.47	0.936	1.08	12.41

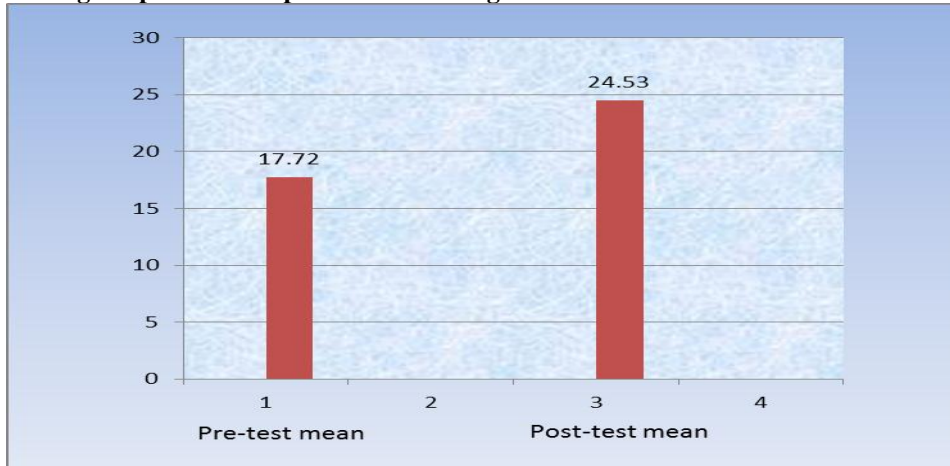
N = 36

Comparison of Overall Mean, Mean Deviation SD, Mean Difference of pre-test and post test knowledge scores of blue collar workers on CPR.

Knowledge Scores				
	Mean	Mean Deviation	SD	Mean Difference
Pre – Test	17.72	2.66	3.28	6.7
Post – Test	24.53	2.22	2.75	

N=36

Bar diagram showing the pre-test and post test knowledge score.



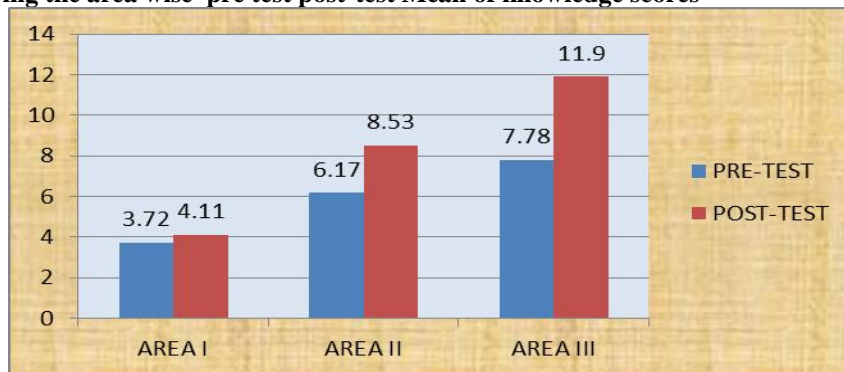
Section B: Comparison of area wise knowledge scores of blue collar worker in CPR.

This part deals with comparison of area-wise mean, SD, Mean and Means percentages of pre- test and post- test knowledge scores of blue collar worker on CPR.

Comparison of area wise efficiency of hands on skill training on CPR among blue collar workers.

Pre-Test Knowledge Scores		Post-Test Knowledge Scores		Effectiveness
Areas	Mean	Mean	Mean %	
Area I	3.72	4.11	1.08	
Area II	6.17	8.53	6.55	
Area III	7.78	11.9	11.55	

Bar diagram showing the area wise pre test post-test Mean of knowledge scores



Section C: Mean difference and ‘t’ value of pre test and post test knowledge score of blue collar workers on CPR.

Mean difference and ‘t’ value of pre test and post test knowledge score of blue collar workers on CPR.

	Mean	MD	SD	Mean Difference	‘t’ value
Pre – Test	17.72	2.66	3.28	6.81	10.592
Post – Test	24.53	2.22	2.75		

N=36.

t = 10.592, p<0.05

*Significant

Section D: Mean difference and ‘t’ value of pre test and post test skills score of blue collar workers on CPR.

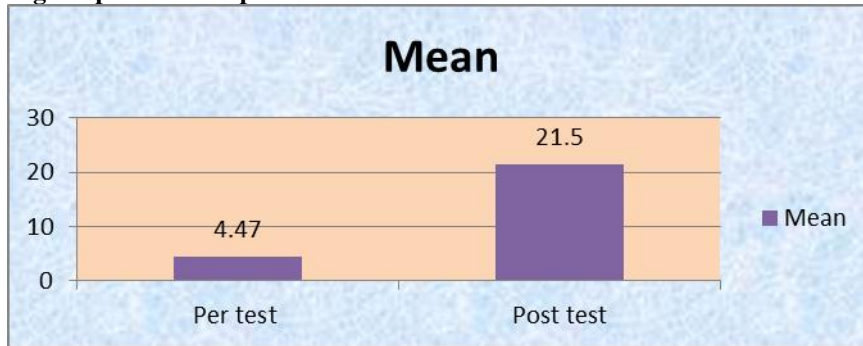
This part compares skill level, means of pre-test and post-test and also deals with mean difference in pre-test and post test and ‘t’ value thus finds the effectiveness on the study.

Mean difference and ‘t’ value of pre test and post test skills score of blue collar workers on CPR.

	Mean	MD	SD	Mean Difference	‘t’ value
Pre – Test	4.47	0.93	1.08	17.03	42.63
Post – Test	21.50	1.833	2.15		

N = 36

Bar diagram showing the pre-test and post test Mean skill score.



SECTION A: Correlation between the post knowledge and post skill score of the blue collar worker.

This part deals with the correlation between the post-test knowledge and post-test skill scores of the blue collar workers.

Mean, Mean Difference and Correlation of post-test knowledge and post-test skill scores of the blue collar workers on CPR.

	Mean	Mean Difference	r
Post – test Knowledge	24.53	3.03	0.096
Post – test skill	21.50		

N = 36

Section B: Association between pre-test knowledge and skill scores of blue collar workers on CPR

To find out the association between pre-test knowledge and skills score with personal characteristics and to test the null hypothesis.

H₀₃: There is no significant association between pre-test knowledge and skill scores of blue collar workers on CPR and selected variables.

Association Between the pre-test knowledge score with the base line variables.

Pre – test knowledge scores			
Personal Characteristics	Chi-square (χ^2)	DF	Inference
Age	0	3	NS
Education	0.114	2	NS
Work Experience	0	3	NS
Place of Residence	0.114	1	NS
Previous training	0	1	NS

N = 36

Section C: Association between pre-test knowledge and skill scores of blue collar workers on CPR

To find out the association between pre-test knowledge and skills score with personal characteristics.

Association between the pre-test skill score with the base line variables.

Pre – test skill scores			
Personal Characteristics	Chi-square (χ^2)	DF	Inference
Age	0	3	NS
Education	1.242	2	NS
Work Experience	0	3	NS
Place of Residence	5.783	1	S
Previous training	0	1	NS

N = 36

The present study shows that majority (91%) of the blue collar workers had moderately adequate knowledge on CPR and 2 (6%) of them had adequate knowledge. The Study findings are supported by a study conducted at Riyadh, Kingdom of Saudi Arabia on December 1, 2006. The study results show that 85% of the subjects had inadequate knowledge on CPR.

The present study results shows that in pre-test the subjects scored highest in the area III Resuscitation and after care of procedure with a mean \pm SD of 7.78 ± 1.98 and least in the area I I general concept of CPR with a mean \pm SD of 3.72 ± 0.974 . The study is supported by A study conducted on First Aid knowledge among industry workers in Greece 2005. The aim of the study was to evaluate the knowledge on first aid of industry workers through a questionnaire. Study concluded that the vast majority of workers had lack of knowledge and were unable to provide efficient first aid as long as they could no estimate vital signs and provide satisfactory CPR.

In the present study all (100%) the subjects had poor skill level on CPR technique. The study is supported by a study conducted by Sim MS, Jo II, Song HG Basic cardiac life support education for non-medical hospital employees. The study reveals that, according to total checklist scores, subjects achieved a mean (SD) score of 8.66 (3.57). 22.3% performed all 13 skills. The study results are shows the need for skill training.

The mean post- test knowledge scores of blue collar workers is 24.53 which is significantly higher than the mean pre-test knowledge scores 24.53. The calculated 't' value (10.597, $P < 0.05$) in knowledge aspect was greater than the table value (2.02) at 0.05. The study is supported by A study conducted by Sadoh WE, Osariogiagbon W at Nigeria. Knowledge and Practice of Cardiopulmonary Resuscitation Amongst Doctors and Nurses in Benin City. The results of the study revealed that There was poor knowledge of CPR amongst the respondents. It was significantly poorer amongst nurses than doctors and better amongst younger respondents. Only 73(50.3%) of the respondents would perform mouth to mouth resuscitation while 17(11.7%) respondents were aware of the 2005 guidelines.

The mean post- test skill scores of blue collar workers is 21.50 which is significantly higher than the mean pre-test skill scores 4047. The calculated 't' value (42.63, $P < 0.05$) in skill aspect was greater than the table value

(2.00) at 0.05. The study is supported by the a quasi-experimental and longitudinal study conducted by Dal U, Sarpkaya D Knowledge and psychomotor skills of nursing students in North Cyprus in the area of cardiopulmonary resuscitation. The results of the study revealed that Skill score of the students one month after the CPR skills training was 18.4 out of 21, and that this average decreased to 13.8 after six months ($p < 0.05$).

Correlation between the post knowledge and post skill score of the blue collar worker. The present study shows the moderately correlation between the post-test knowledge and post-test skill of blue collar worker as $r = 0.096$.

The findings are supported by the study conducted by Stefano Nava, Carmen Santoro in 1993 on The influence of the media on COPD patients' knowledge regarding cardiopulmonary resuscitation. The results of findings reveals that The patients overestimated the success rate of CPR (63% of them estimated a hospital survival $> 40\%$), Bi-variate correlations analysis showed significant correlation between the rate of correct responses and the viewing of educational television programs ($p = 0.039$), it shows the positive correlation between the information from the media and CPR sites increased the knowledge of COPD patients on CPR.

Similar study conducted by Rebecca Senior Lecturer England MAY 1996, A quasi-experimental research to investigate the retention of basic cardiopulmonary resuscitation skills and knowledge by qualified nurses following a course in professional development. The results of the findings reveals that retention of skill and knowledge after the training programme was with the significant of $p = 0.00$ (knowledge) and $p = 0.000$ (skill). The study shows negative correlation that as knowledge level decreases the skill also decreases.

Association between pre-test knowledge and skill scores of blue collar workers on CPR with selected baseline variables.

Association between pre-test knowledge and skill with selected variables reveals that the calculated chi-square value of all the variables in aspects on knowledge are not significant and there is no association between the pre-test knowledge scores. The calculated chi-square value of the variable place of residence (5.783) is greater than the table value (3.84), shows the association with the pre-

test knowledge scores of blue collar worker. Other variables like age, educational status, work experience and the previous training has no association with the pre-test knowledge score.

A study conducted in on Knowledge of cardiopulmonary resuscitation among the public in Hong revealed the association. Although the sex of the participant and the score were not associated ($P=0.24$), the younger and older respondents had significantly different score patterns, with younger respondents consistently scoring higher than older peers ($P=0.006$). Respondents also had significantly different score pattern depending on their educational attainment ($P<0.001$): those with more education seemed to score higher than those who are with less education. Compared with participants without prior training in CPR, those with prior training performed better: the total scores (mean + standard error) were $5.24 \pm 0.32 \pm 0.09$ ($P=0.001$).

CONCLUSION

When any medical emergency may occurs during occupation and it's very essential to know how to handle the causalities. Medical emergencies may be injuries or even fatal also which may occur at any place at any time. So it's very necessary that all ground level workers have to be trained with first aid and especially in the area of CPR.

The following conclusions were drawn keeping in mind the findings of the present study.

The assessment of the knowledge among blue collar workers working in selected industry on CPR revealed that majority (91%) of blue collar workers had moderately adequate knowledge and one (35) had inadequate knowledge on CPR. Only subjects had adequate knowledge n CPR. All the subjects (100%) had poor skill level on CPR.

The overall knowledge score was 17.72 ± 3.377 , with a mean percentage of 49.22% revealing that the overall knowledge of the blue collar workers was inadequate. Blue collar workers had highest knowledge in the area of resuscitation and after care procedure with a mean percentage of 21.61% and least in the area of types of general concept on CPR with a mean percentage of 10.33%.

The assessment of the skill level among blue collar workers working in selected industry on CPR revealed that all (100%) the subjects had poor skill level. The overall skill scores of the blue collar workers was 4.47 ± 1.08 , with the mean percentage of 12.41% revealing that the blue collar workers had poor skill level of CPR.

The assessment of effectiveness of hands on skill training programme revealed that total mean knowledge score is increased by 68.13% with mean difference \pm SD

of 6.7 ± 2.75 after the administration of hands on skill training programme. The pre-test mean was 17.72 with that of SD ± 3.377 and post-test mean was 24.53 with that of SD ± 2.75 . The pre-test knowledge of the blue collar workers was moderately adequate and the post-test knowledge scores indicate that all blue collar workers have adequate knowledge on CPR. The null hypothesis is rejected and accepts research hypothesis.

The hands on skill training programme also revealed that total skill score is increased by 59.72% with mean difference \pm SD of 17.03 ± 2.15 after the administration of hands on skill training programme. The pre-test mean was 4.47 with that of SD ± 1.08 and post-test mean was 21.50 with that of SD ± 2.15 . The pre-test skill level of the blue collar workers was poor and the post-test skill scores indicate that all blue collar workers acquired a very good skill level on CPR. The null hypothesis is rejected and accepts research hypothesis.

A significant (10.597, $p<0.05$) gain in knowledge and (42.63, $P<0.05$) gain in skill level was found among blue collar through hands on skill training programme. The study revealed that hands on skill training programme as highly effective in improving the knowledge and skill of blue collar worker on CPR.

The calculated correlation ($r=0.096$) shows that as the knowledge level increases the skill level is also increased which indicates the positive correlation among the knowledge and skill on CPR.

There is no association found between the any of the demographic variables with the pre-test knowledge scores. In case on skills, only the place of residency has association (5.783) with the pre-test skill score of blue collar workers. The Hypothesis 3 is partially accepted.

Hence the study concluded that prevalence of cardiopulmonary resuscitation was more effective among blue collar worker and. Moreover, the level of knowledge and skill about the CPR was very low. So there a essential to conduct hands on skill training programme for blue collar workers on CPR.

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