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Effectiveness of Structured Teaching Programme on Knowledge Regarding Adult Basic Cardiac Life Support among Nursing Staffs of Selected Ward in Nobel Medical College and Teaching Hospital, Biratnagar

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Abstract
Background*: Knowledge of Basic Life Support (BLS) and practice of simple cardio pulmonary resuscitation (CPR) techniques ensures the survival of the patient long enough till experienced medical help arrives and in most cases is itself sufficient for survival. Many studies observed that the knowledge about CPR and skills of performing CPR among many healthcare workers including medical officers, registered nurses is found to be inadequate. A study conducted in College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal to assess the knowledge of cardiopulmonary resuscitation among nurses showed that the overall mean knowledge score was low i.e., 11.45±2.67 and the researchers suggested a need for educational intervention.*
Objective*: To assess the effectiveness of structured teaching programme on knowledge regarding adult basic cardiac life support among nurses working in selected wards of Nobel medical teaching college hospital.*
Methods*: Pre experimental (one group pretest-posttest) study was conducted among the nursing staff working at Nobel Medical College and Teaching Hospital. Participants were selected using convenience sampling. Data were analyzed using SPSS versions 20.0, for descriptive statistics, mean, and standard deviations were calculated and for inferential statistics paired sample t test was used for comparing the mean pre- test score and post- test knowledge score*
Results*: the mean pre-test score was 8.65 ± 2.62 and the mean post-test score was 12.67 ± 3.22. The result showed a significant difference in pre-test and post-test knowledge scores (t=-9.790, p=0.00).*
Conclusion*: The study concluded structured teaching program was found to be effective in enhancing nurses' knowledge regarding adult basic cardiac life support*
Keywords*: basic cardiac life support, knowledge, staff nurses*

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I. Introduction

Sudden cardiac death (SCD) is a leading cause of mortality and is responsible for approximately half of all deaths from cardiovascular disease. Outcomes following a sudden cardiac arrest is still poor with most individuals not surviving. Sudden cardiac death accounts for 15-20% of deaths in Western societies. Survival from Out of hospital cardiac arrest is significantly higher i.e., 43.6% if layperson-initiated CPR occurs.[1] Successful resuscitation outcome after a cardiac arrest event depends on early recognition, immediate and effective CPR, and rapid defibrillation. The presence of a competent rescuer during life-threatening emergencies increases the chances of survival of the victims.[2]

Basic Life Support (BLS) includes recognition of signs of sudden cardiac arrest (SCA), heart attack, and foreign-body airway obstruction (FBAO); cardiopulmonary resuscitation (CPR); and defibrillation with an automated external defibrillator (AED). As nursing staff are frequently facing life-threatening situations, the knowledge of basic life support will definitely be useful.[3] Quality of cardiopulmonary resuscitation has a marked effect on survival. Administering BLS sufficiently early expands an individual's odds of surviving a cardiovascular arrest.[4]

Because of lack of confidence in knowledge and skills, and how to manage and operate equipment appropriately in a timely manner, many healthcare professionals experience a high level of anxiety and fear about being involved in cardiopulmonary resuscitation (CPR) scenarios.[5] Knowledge of BLS and practice of simple CPR techniques ensures the survival of the patient long enough till experienced medical help arrives and in most cases is itself sufficient for survival.[6] Proper practice of the techniques and maneuvers enable a person to effectively resuscitate a victim.[7]

Many studies observed that the knowledge about CPR and skills of performing CPR among many healthcare workers including medical officers, registered nurses is found to be inadequate.[8]

A study conducted in College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal to assess the knowledge of cardiopulmonary resuscitation among nurses showed that the overall mean knowledge score was low i.e., 11.45±2.67 and the researchers suggested a need for educational intervention.[9]

Likewise, another study conducted in Nepal Medical College to assess the knowledge of cardiopulmonary resuscitation among health personnel concluded that the overall knowledge of health personnel was inadequate.[8]

Similarly, a study was conducted to assess the knowledge concerning basic life support (BLS) among nursing professionals at Tanta University Hospitals which showed that the mean of total knowledge score was 10.92 ± 3.73. Nurses with previous BLS training had significantly higher mean knowledge score than untrained ones (12.99±3.27 vs. 9.37±3.27). The knowledge level of BLS was found to be inadequate among the majority of nursing staff and the researcher recommended regular in-service training and recertification of basic life support competency.[10]

CPR is a simple but effective procedure that allows almost anyone to sustain life in the early critical minutes after cardiac and respiratory arrest. Various studies have found structured teaching programme on BLS to be effective. One study conducted in Dehradun showed significant increase in mean knowledge score from 13.18 ± 3.3on pretest to 25.80±3.0778 after providing structured teaching on cardiopulmonary resuscitation.[11] Structured teaching programme on basic life support not only improve knowledge but is also effective in building positive attitude. Positive attitude towards cardiopulmonary resuscitation was seen in 53.4% of the respondents before BLS training whereas after BLS training positive attitudes was seen in 64.8% of the respondents in a study conducted in Saudi Arabia among health care workers.[12]

A marked improvement in survival and discharge of cardiac arrest victim was reported after formal BLS/ACLS training of registered nurses. Out of 102 cardiac arrest victims who had return of spontaneous circulation (ROSC), 52.9% were discharged compared to pre- BLS/ACLS training period where only 27.5% of 58 patients who survived cardiac arrest were discharged from the hospital. BLS and ACLS training courses for nurses are crucial in improving the outcomes of CPR[13].

Likewise, there was significant improvement in performance of basic life support skills after BLS simulation training was provided to registered nurses in Jordan (mean pretest score 46±2.9 compared to 75±1.7 on posttest).[5]

Basic Life Support Training significantly improved mean knowledge score of Nigerian dental students from 4.7±1.47 to 8.04±1.47. The results of this study suggested that the group of dental students' knowledge of BLS was very poor prior to the BLS training. This study also showed that the BLS training had a positive influence on the BLS knowledge of the participants.[2] Therefore, the knowledge and ability to perform CPR is an important determiner of the success of outcomes in cardiac arrest patients.[14] The more effective nurses are in providing BLS, the higher the survival rates.[15]

II. Material And Methods

Pre experimental (one group pre-test- post-test) study was conducted among staff nurses working at non critical areas (medical, surgical, orthopedic, neuro-medicine wards) of Nobel medical college and teaching hospital from September 19-27, 2021. A total of 43 nurses were included in this study who had at least 6 months of working experience.

Study Design: Pre experimental (one group pre-test- post-test) design was adopted for the study.

Study Location: This study was conducted at Nobel Medical College and Teaching hospital. This setting is chosen due to feasibility and adequacy of sample.

Study Duration: 19-27 September,2021

Sample size: 43 staff nurses.

Sample size calculation: Sample size was calculated using the formula n= $(Z_{1-\alpha/2} + Z_{1-\beta}/ ES)^2$. [15] where, α = the selected level of significance i.e., 0.05 ,Z 1-α /2 = the value from the standard normal distribution holding 1- α/2 below it i.e., 1.96, 1- β = the selected power i.e., 80%, Z 1-β = value from the standard normal distribution holding 1- β below it i.e., 0.84, ES= Effect Size which is calculated as (difference in standard deviation divided by standard deviation of pretest score) i.e., (2.300-1.245)/2.300 = 0.45 [16]

Therefore, n= (1.96+0.84/ 0.45)2, n= 38.71

Now adding 10% non-response rate, the required sample was 38.71+ 3.771 =42.58, therefore the total number of 43 participants was selected.

Subjects & selection method: Non-probability sampling technique was adopted for the study. Wards were chosen purposively and the participants meeting the eligibility criteria were selected using convenience sampling. Nursing staffs who were working in medical, surgical, orthopedic, neuro-medicine wards, and meeting the eligibility criteria were selected.

Inclusion criteria: Those who were willing to participate and provide written informed consent, those who have a minimum of six months of experience, and nurses working in medical, surgical, orthopedic, neuro-medicine wards were included in this study.
Exclusion criteria: Those with less than 6 months of working experience were excluded from the study

Procedure methodology: Permission for the study was taken from the Institutional Review Committee (IRC) of Nobel Medical College and Teaching Hospital. Prior to data collection, the nature and purpose of the study were explained to the nursing staff of selected wards, and those willing to participate voluntarily were selected after taking informed written consent. A self-administered questionnaire was distributed to the participants. The participants were given 30 minutes to fill up the questionnaire and after collecting the questionnaires, structured teaching on basic cardiac life support was administered using an interactive lecture method using PowerPoint presentation, and post-test knowledge was assessed after 7 days.
Statistical analysis: Collected data was coded and converted into SPSS (Statistical Package for Social Science) version 20 for statistical analysis. For descriptive statistics percentage, mean, and standard deviation was calculated. For inferential statistics Paired sample t-test was used to determine the mean difference between pre-test and post-test knowledge.

III. Results

Table no 1: Socio-demographic characteristics of the respondents (n=43)

Variables	Frequency (N)	Percentage (%)
Age (years)	**Mean ± Sd** =24.4 ±3.3	
Gender		
Female	43	100%
Educational qualification		
ANM	2	4.6%
Proficiency level	26	60.5%
Bachelor level	15	34.9%
Working Experience		
6months-1year	16	37.2%
1-3 years	18	41.9%
3-5 years	4	9.3%
>5years	5	11.6%
Previous Experience of Cardio Pulmonary Resuscitation		
Yes	19	44.2%
No	24	55.8%
Previous BCLS Training/Workshops		
Yes	3	7%
No	40	93%

Table no 1 shows that the mean age of the participants was 24.4 ±3.3. The majority of the participants (60.5%) had completed proficiency levels. More than two-fifths (41.9%) of the participants had 1-3 years of experience. More than half of the respondents (55.8%) had no previous experience of cardiopulmonary resuscitation and only 7% of the respondents had previous BCLS training/ workshops

Table no 2: Pretest and Post-test Level of Knowledge (n=43)

Knowledge score	Pre-Test		Post test	
	Frequency	Percentage	Frequency	Percentage
Inadequate (<50%)	25	58.1%	9	20.9%
Moderate (50-75%)	18	41.9%	23	53.5%
Adequate (>75%)	-	-	11	25.6%

Table 2 shows that on pre-test assessment (i.e., before structured teaching programme on basic cardiac life support), the majority of the participants (58.1%) had inadequate knowledge, more than two-fifths (41.9%) had a moderate level of knowledge and none of the respondents had adequate knowledge regarding adult basic cardiac life support. Post knowledge assessment (i.e., after a structured teaching programme on basic cardiac life support), the majority of the participants (53.5%) had a moderate level of knowledge, just over a quarter of the participants (25.6%) had adequate level of knowledge and less than a quarter of the participants (20.9%) had inadequate knowledge regarding adult basic cardiac life support.

Table no 3: **Comparison of mean pre-test and post-test knowledge score** **(n=43)**

Observation	Mean	Mean Difference	Standard Deviation	t value	P- value	Remarks
Pretest score	8.65	-4.023	2.62	-9.790	**0.00**	**Significant**
Posttest score	12.67		3.22			

Table no 3 shows that the mean pre-test score was 8.65 ± 2.62 and mean post-test score was 12.67 ± 3.22. The result showed significant difference in pretest and post test knowledge score (t=-9.790, p=0.00). Thus it can be concluded that structured teaching programme significantly increased nurse's knowledge regarding adult basic cardiac life support

IV. Discussion

Findings of the present study showed that a structured teaching program significantly increased nurse's knowledge regarding adult basic cardiac life support which is similar to the findings of the study conducted by Deen M., Ghosh G., in Era Hospital, Lucknow also showed that planned teaching program significantly increased nurses' knowledge.[16]

Present study showed that structured teaching programme significantly increased mean knowledge score from 8.65 ± 2.62 to 12.67 ± 3.22 which is supported by the findings of the study conducted at Tanta University Hospitals showed that nurses with previous BLS training had significantly higher mean knowledge score than untrained ones (12.99±3.27 vs. 9.37±3.27). [10]

A study conducted in College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal showed that the overall mean knowledge score was low i.e., 11.45±2.67 which is similar to the findings of this study which showed a low mean knowledge score of 8.65 ± 2.62 before educational intervention.[9]

Present study showed that only 20.9% of the participants had inadequate level of knowledge after educational which is in contrast to the findings of the study conducted by Nagarkoti L., Bajracharya S. at College

of Nursing, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal. showed that 65.3% had inadequate knowledge.[14]

V. Conclusion

On the light of the present study results it can be concluded that structured teaching program was found to be effective in enhancing nurses' knowledge regarding adult basic cardiac life support. Regular in-service training and recertification of BLCS competency are recommended to further improve nurses' knowledge and competencies.

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