

# Effectiveness of Structured Teaching Programme on Knowledge Regarding Advance Cardiac life support (ACLS) among undergraduate nursing students of Nobel Medical College and Teaching Hospital, Biratnagar

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## Abstract

**Background:** Cardiovascular diseases (CVDs) are one of the global causes of death mainly due to cardiac arrest and stroke which predicts that the death rate would reach 23 million by 2030. Advance life support includes the prevention and treatment of in-hospital and out-of-hospital cardiac arrest where the prompt response and necessary skills in nursing help in rapid recognition and treatment that doubles the survival rates of the victim.

**Objective:** To assess the existing level of knowledge and the effectiveness of a structured teaching program on Knowledge regarding Advanced Cardiac Life support.

**Methods:** A Pre experimental one group pre-test and post-test study design were conducted at Nobel Medical College Teaching Hospital (NMCTH). A total of 118 students were selected using the total enumerative non-probability sampling technique. A structured questionnaire was used to collect the data. The split-half method was used to find the reliability of the structured questionnaire. A pre-test was conducted by using a structured questionnaire to assess the pre-test knowledge. Immediately after the pre-test, a structured teaching programme on Advance Cardiac Life Support was administered for 25- 30 minutes. After 7 days post-test was conducted by using the same self-structured questionnaire to reassess the knowledge. Data were analyzed by SPSS version 20.0. Descriptive statistics including, frequencies, percentage, the mean and standard deviation was demonstrated by using tables, and texts. Inferential statistics like paired t-test was used for comparing the mean score of pre-knowledge test score and post-knowledge test score considering  $p < 0.05$  to be statically significant.

**Results:** In the pre-test assessment only 7.63% of the respondents had adequate (51-75%) knowledge while the majority (92.37%) of the respondents had inadequate knowledge ( $\leq 50\%$ ) and none of the respondents had adequate ( $\geq 76\%$ ) knowledge. Whereas, post-test knowledge of the respondents after educational intervention after one week, only (3.39%) of the respondents had an adequate level of knowledge while more than half (55.9.3%) of the respondents had a moderate level of knowledge and less than half (40.68%) of the respondents had an inadequate level of knowledge regarding ACLS. The knowledge score gained by respondents the in results shows that the mean value of knowledge in the pre-test score was  $5.72 \pm 1.91$  and at the post-test score was  $8.65 \pm 2.11$ . There is a highly statistically significant difference in undergraduate nursing students' knowledge pre & post-test scores regarding ACLS.

**Conclusion:** Thus the study concluded that STP was significantly effective in increasing the knowledge of Advance Cardiac Life support among undergraduate nursing students.

**Keywords:** Knowledge; Advance cardiac life support; Undergraduate nursing

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## I. Introduction

Cardiac arrest is a major public health issue and a cause of mortality worldwide where cardiopulmonary resuscitation (CPR) is regarded as the most important skill that increases the rate of survival when cardiac arrests are witnessed.<sup>1,2</sup>

Critically ill patients, especially those with cardiac arrest or respiratory arrest can be best rescued within a golden minute of onset; otherwise, it may cause physiological death which can be possibly saved on onsite first aid with Basic life support (BLS)<sup>3,4,5</sup> and time of defibrillation.<sup>6</sup>

The quality of CPR and minimized hands-off time<sup>7</sup> during rhythm controls and defibrillation frothy m CPR team manage a cardiac arrest by working with a multidisciplinary team in an emergency ensuring the highest possible quality of resuscitation under the recommended algorithm that prevents interruption in chest compressions and decreases the coronary and cerebral perfusion<sup>8</sup>. Therefore the chest compressions are unequivocal in this case and in an untold number of similar cases of patients who receive a second chance at life after receiving closed-chest compression, often in conjunction with artificial respiration, defibrillation, and other forms of advanced life support and post-resuscitation care<sup>9</sup>. American Heart Association (AHA) provides ACLS courses that involve reading, lectures, and practical instruction for the recognition and management of standard protocols and procedures.<sup>11</sup>The intention of this certification is to improve the chances of survival for patients suffering in-hospital cardiac arrest.<sup>10</sup>

## II. Material And Methods

This total enumerative study was carried out on under graduating nursing students of Nobel Medical College and Teaching Hospital from September 7 to November 30, 2021. A total of 118 nursing students aged  $\geq 18$ , years were included in this study.

**Study Design:** Pre experimental one group pre-test post-test research design

**Study Location:** This study will be conducted at Nobel Medical College and Teaching Hospital, Biratnagar, Morang, Nepal.

**Study Duration:** September 7 to November 30, 2021

**Sample size:** 118 undergraduate nursing students

**Sample size calculation:** The sample size was estimated using the total enumerative nonprobability sampling technique (consecutive method). The target population from which we selected our sample was 118 students. And the sample size obtained from the study was 118 only.

S.N	Level of students	No of Respondents
1.	Bachelor of Science in Nursing 2nd year (B.Sc. N)	21
2.	Bachelor of Science in Nursing 3rd year (B.Sc. N)	28
3.	Bachelor of Science in Nursing 4th year (B.Sc. N)	28
4.	Bachelor in nursing sciences 2 <sup>nd</sup> year (BNS)	12
5.	Bachelor in nursing sciences 3 <sup>rd</sup> year (BNS)	29
		Total 118

\* 1<sup>ST</sup>-year B.sc and Bachelor of sciences were excluded as there was no intake of students due to the COVID-19 pandemic

**Subjects & selection method:** The study population was drawn consecutively from undergraduate nursing students who were studying at Nobel Medical College and Teaching Hospital. Participants were 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-year B.Sc Nursing Students and 2<sup>nd</sup>, 3<sup>rd</sup> year Bachelor in nursing sciences students of Nobel Medical College and Teaching Hospital and meeting the eligibility criteria from September 7 to November 30, 2021.

### Inclusion criteria:

1. Age 18 years and above
2. B.Sc Nursing and Bachelor in nursing sciences students.
3. Nursing students studying at Nobel Medical College and Teaching Hospital, Biratnagar.
4. Who were willing to participate.

### Exclusion criteria:

1. Students who were on sick leave or maternity leave during the data collection period.

**Procedure methodology:** Data will be collected using a self-administered questionnaire comprising two parts. Part I of the questionnaire will consist of Socio-demographic variables formulated with the help of an extensive literature review using various online and offline resources like PubMed, GoogScholarlar, Cochrane, HINARI access, and peer review. Part II of the questionnaire will consist of knowledge of ACLS.

The questionnaire consists of Two Parts.

Part I: It consists of a Sociodemographic variable

Part II: It Consists of items that elicit information on knowledge regarding ACLS. It contains a 16-questionnaire related to knowledge of ACLS. The correct answer was awarded 1 score and incorrect answers were scored as 0 participants scoring more than equal to 75% will be considered to have adequate knowledge, 50-75% were

considered to have moderate knowledge, and participants scoring less than and equal to 50% were considered to inadequate knowledge. The collected data were analyzed using SPSS version 20, for descriptive statistics percentage, mean, and standard deviation was calculated and for inferential statistics, paired t-test was used to assess the difference between pre-test and post-test level of knowledge.

**Pretesting**

The researcher’s instrument reliability was maintained by pretesting in 10% of the estimated study sample who met the inclusion criteria in a similar setting and were excluded from the main study.

**Validity and reliability of the tool**

The content validity of the research instrument was maintained by reviewing the related literature and consulting with subject experts and linguistic professionals. For ensuring reliability, the internal consistency of the instrument was established by the Cronbach Alpha test with a 0.7 reliability coefficient.

**Statistical analysis:** Collected data will be coded and converted into SPSS (Statistical Package for Social Science) version 20 for statistical analysis. For descriptive statistics percentages, mean, frequency, and standard deviation were calculated. For inferential statistics, Paired T-tests were used to determine the mean difference between pre-test and post-test knowledge. The level  $P < 0.05$  was considered the cut-off value or significance

**III. Result**

**Table no 1: percentage and frequency distribution of socio-demographic variables**

S.N	Demographic variables		Frequency (f)	Percentage (%)
1	Age in years	20-25	110	93.2
		>25	8	6.8
2	Enrolled nursing program	B.Sc Nursing	77	65.3
		BNS	41	34.7
3	Education level	2 <sup>nd</sup> year	50	42.2
		3 <sup>rd</sup> year	40	33.9
		4 <sup>th</sup> year	28	23.7
4	Have you ever attended any teaching on ACLS?	Lectures	89	75.4
		Demonstration	4	3.4
		Stimulation	1	8
		ACLS guidelines	2	1.7
5	Have you ever performed CPR?	Yes	40	33.9
		No	78	66.1
6	If yes, specify	Hospital	40	100
		Community	0	0
		Roadside	0	0

Table no 1 shows socio-demographic information of the participants where the majority of the undergraduate nursing students were in the age group 20- 25 years (93.2%). More than half (65.3%) of them were enrolled in the B.Sc nursing program and less than half (42.2) were in the 2<sup>nd</sup> year nursing program. The majority (75.4%) had attended ACLS through the lecture method among them less than half (33.9%) had performed CPR before and in them, all had performed it in a hospital setting.

**Table no 2: Distribution of overall knowledge score (n=118)**

Knowledge score	Pre-Test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Inadequate ( $\leq 50\%$ )	109	92.37%	48	40.68%
Moderate (51-75%)	09	7.63%	66	55.93%
Adequate ( $\geq 76\%$ )	0		4	3.39%

Table no 2 shows that in the pre-test assessment only 7.63% of the respondents had moderate knowledge while the majority (92.37%) of the respondents had inadequate knowledge and none of the respondents had adequate knowledge. Whereas, post-test knowledge of the respondents after educational intervention, more than half (55.93%) of the respondents had an adequate level of knowledge while less than half (40.68%) of the respondents had a moderate level of knowledge and a few (3.39%) of the respondents had an adequate level of knowledge regarding ACLS.

**Table no 3: Distribution of undergraduate nursing student knowledge Level regarding ACLS on STP (n = 118)**

Observation	Mean	Mean Difference	Standard Deviation	t value	P-value	Remarks
Pretest score	5.72	-2.93	1.91	10.26	0.00	Significant
Posttest score	8.65		2.11			

Table no 3 shows that the knowledge score gained by respondents in the results shows that the mean value of knowledge in the pre-test was  $5.72 \pm 1.91$  and in the post-test was  $8.65 \pm 2.93$ . Since the “p” value for the test is 0.05. The calculated ‘t’ value was 10.26 which shows that there was a significant difference between the mean pre-test and mean post-test knowledge score. This shows that the obtained mean difference of pre-test and post-test knowledge scores was a true difference and not by chance and the p-value is less than 0.05. So, it can be concluded that the Structured Teaching Program is effective for imparting knowledge on ACLS.

#### IV. Discussion

Section I: Assessment of existing level of knowledge regarding Advance Cardiac Life Support (ACLS) among undergraduate nursing students.

In the pre-test assessment, only 7.63% of the respondents had moderate knowledge while the majority (92.37%) of the respondents had inadequate knowledge and none of the respondents had adequate knowledge. Whereas, post-test knowledge of the respondents after educational intervention, more than half (55.93%) of the respondents had an adequate level of knowledge while less than half (40.68%) of the respondents had a moderate level of knowledge and a few (3.39%) of the respondents had an adequate level of knowledge regarding ACLS.

Similar to the finding a study conducted by Karki AJ, Regmi S, Khakurel S, Baral BK (2020) in Bir Hospital and National Trauma Centre in specialist medical faculties shows that 22.6% of doctors had good knowledge, 36.4% had average knowledge and 40.8% had poor knowledge of ACLS. Knowledge of ACLS between ACLS trained and untrained doctors was not significant ( $p = 0.78$ ) and also faded with an increase in period  $p=0.034$ .

Similarly, a study conducted by Bhattarai SP (2017), shows the mean score of awareness-based questions among the respondents was 12.92 ( $SD \pm 7.812$ ) based on AHA guidelines. Only 10.06% of them passed the AHA standard scoring the remaining 89.4% were unaware.

Similarly, a study conducted by Ralapanawa D, Jayawickreme KP, Ekanayake EMM, and Kumarasiri PVR (2016) showed that 45 % of the medical officers and 34.6 % of the final year medical students were confident of saving lives with their current knowledge on ACLS and had recommended ACLS courses to be re-evaluated frequently.

Section II: Effectiveness of structure teaching programme on Knowledge regarding Advance Cardiac Life Support.

In the present study the mean value of knowledge in the pre-test was  $5.72 \pm 1.91$  and in the post-test was  $8.65 \pm 2.93$ . Since the “p” value for the test is 0.05. The calculated ‘t’ value was 10.26 which shows that there was a significant difference between the mean pre-test and mean post-test knowledge score.

Similarly, a study conducted by Kaur M, and Victor A (2020) showed that in the experimental group the pre-test mean was 21.60 and after giving a structured teaching programme the post-test mean increased to 32.53. The study has concluded that before educational intervention the nursing students had average and good knowledge levels and after administration of STP their knowledge levels increased to good and excellent.

Similarly, a study by Sodhi K, Singla MK, and Shrivastava A (2011) showed that successful resuscitation after cardiac arrest requires early recognition of cardiac arrest, rapid activation of trained responders, timely initiation of BLS, early defibrillation, and early ACLS of formal training of the CPR team drastically improves the survival rates and survival to hospital discharge rates of cardiac arrest victims.

Contradictory to the finding of a study conducted by Stiell IG, Wells GA, Field B, Spaite DW, Nesbitt LP, De Maio VJ, et al (2004), survival after advanced life support was 1.1 (95% CI, 0.8 to 1.5); after an arrest witnessed by a bystander, 4.4 (95% CI, 3.1 to 6.4); after cardiopulmonary resuscitation administered by a bystander, 3.7 (95 % CI, 2.5 to 5.4); and after rapid defibrillation, 3.4 (95% CI, 1.4 to 8.4). There was no improvement in the rate of survival after advanced life support in any subgroup.

#### V. Conclusion

In the light of the present study results, it can be concluded that planned teaching intervention was found to be effective in enhancing student nurses’ knowledge regarding ACLS. It is recommended for the nursing academy and administration to conduct retraining courses and other educational approaches for students and nurses. As Education is a key component for professionals involved in managing life-threatening crises to

ensure adequate skill levels which should be evidence-based, consistent, and frequent and a core component in the provision of knowledge and training to working and student nurse<sup>18</sup>

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Kabita Dhami, et. al. "Effectiveness of Structured Teaching Programme on Knowledge Regarding Advance Cardiac life support (ACLS) among undergraduate nursing students of Nobel Medical College and Teaching Hospital, Biratnagar." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 11(03), 2022, pp. 49-53.