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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME (STP) ON KNOWLEDGE AND BEGINNING SKILLS OF STAFF NURSES ON PEDIATRIC ADVANCED LIFE SUPPORT (PALS) IN SELECTED HOSPITALS OF SURAT DISTRICT, GUJARAT.

Nursing

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ABSTRACT

Pediatric Advanced Life Support (PALS) training course covers emergency procedures for infants and children which includes assessment, maintenance or management of pulmonary and circulatory function in the period before, during, and after instance of cardiopulmonary arrest in children. The training is designed for health professionals such as staff nurses and doctors and it addresses important life-saving actions for critically ill children. Here, the knowledge and beginning skills of staff nurses were assessed before and after the Structured teaching programme (STP) of PALS in order to determine the association between the post-test knowledge and beginning skill scores regarding PALS among the staff nurses.40 individuals comprising of staff nurses working at pediatric ward, NICU and PICU were selected. Out of 40 staff nurses, 50 percent of the participants had very good knowledge and another 50 percent had excellent knowledge. And in post test beginning skills of the staff nurses, 47.5 percent of the participants had very good skill and another 52.5% had excellent skill. The study concluded that the Structured Teaching Programme (STP) was effective to increase the knowledge and beginning skills of staff nurses on PALS among the staff nurses.

KEYWORDS

Effectiveness, Structured Teaching Programme (STP),Pediatric Advanced Life Support (PALS) and beginning skills.

INTRODUCTION

Growth is an essential feature that distinguishes a child from an adult. Growth is a period of development from the time of conception to a full developed mature adult. Growth denotes a net increase in the size of mass of tissues. It is largely attributed to multiplication of cells and increase in the intracellular substances. And child development specifies maturation functions, entails the biological, psychological and emotional changes that occur in human beings between birth and the end of adolescence as the individual progress from dependency to increasing autonomy.[1]

In children, health is very much important because good health can put through a large amount of work in a short time and also children are the basic resources of the future of mankind. Therefore, the health of children has historically been one of the vital importance to all societies. But current report from WHO related to the child health stated that there are some common emergencies seen in children which lead to major causes of death for infants and children. The emergencies are respiratory failure or distress as resulting from obstruction of airway and other causes like submersion or drowning, progressive respiratory failure or shock if these are not treated quickly and appropriately then it leads to cardiopulmonary arrest. For such condition quick identification and management is very important. And most important to overcome such situation is to understand Pediatric advance life support (PALS). [2]

Pediatric advanced life support (PALS) refers to the assessment, maintenance or management of pulmonary and circulatory function in the period before, during and after instance of cardiopulmonary arrest in a child with providing basic and advanced treatment of seriously ill or injured infants and children according to different age group.Therefore PALS covers a lots of basics because it focuses on younger patients. The componentsof PALS are similar in many respects to those of adult Advanced Cardiac Life Support (ACLS) and include,

- Basic life support
- Use of adjunctive equipment and special techniques to establish and maintain effective oxygenation, ventilation and perfusion.
- Establishment and maintenance of vascular access.
- Identification and treatment of reversible causes of cardiopulmonary arrest.
- Treatment of patients with trauma, shock, respiratory failure, or other pre arrest conditions. [3]

According to UNICEF reports, India tops the list of high under-five mortality rate. Cardiac arrest incidence in India can arise from several reasons. Main causes are respiratory problems (56%), cardio vascular disorders (33%). In the state of Gujarat, child mortality rate was 30/1000 live births in 2016 and 33/1000 live births in 2017(WHO). These are due to respiratory distress syndrome and shock. The optional care of critical ill infant or child should emphasize on a seamless service beginning with recognition of potential critical illness and initiation of early resuscitation interventions, escalating to advanced life support and skilled transfer to an appropriate location where an intensive care can be continued. This will surely help to reduce the under five mortality rate of India and at present Gujarat. [4]

Therefore, the main aim of present study is to provide the knowledge and basic skills on PALS to the staff nurses who are working in the pediatric critical unit, NICU and pediatric wards of Civil Hospital, Surat, Gujarat because they are the medical personal who may come across the situations of child health problems where the identification, intervention, and management is highly required.

A descriptive study was conducted to assess the effect of teamwork and collaboration among the interprofessional at Rady Children's Hospital-San Diego, California. The purpose of the study was to analyze the practicability of combining teamwork training for establishing Pediatric Advanced Life support Programme. All participants in this study had received PALS recertification training, the intervention group received an additional 2-hour training. Essential curriculum with didactic and video critique including role-play on error, communication behaviors, and standard terms were given. Data was collected on perceptions of teamwork and collaboration. χ, Mann-Whitney U, and t tests were used to analyze the study. High perception of teamwork, collaboration, situational awareness and decision making were found to be in the intervention group. The study concluded that integrating brief team training into an existing PALS program is a feasible, cost-effective, and sustainable method to provide interprofessional team training and positively influence the culture of safety. [5]

MATERIALS AND METHOD

The methodology adopted for the study was to analyze the outcome of knowledge and beginning skills of staff nurses on Pediatric Advanced Life Support (PALS) in selected hospitals of Surat district, Gujarat. These includes research approach, research design, variables, research setting, population, sample size, sampling technique, criteria for sample selection, tool and technique of data collection, content validity, reliability, pilot study, method of data collection and data analysis. Research Approach used in this study is Quantitative research approach. The research design used for the study was Pre-experimental one group pre-test post-test design which is an experimental research design.

The schematic representation of research design used by the researcher is given below.

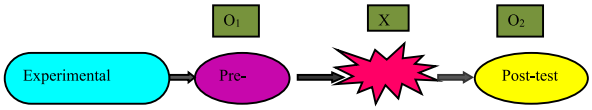

Figure 1: Schematic representation of research design

The sampling technique used in the study was non probability convenient sampling technique which is one of the most common and simplest form but rather effective of all the techniques used during sampling. Criteria for selecting the sample was based on practical concern, design and the staff nurses availability to participate in the study. The study had two criteria namely inclusion criteria and exclusion criteria.

The data collection tool consists of socio demographic proforma, structured knowledge questionnaire, observational and inventory checklist. To proceed with the research study, the researcher underwent PALS training program at Charles Training Institute, Mumbai, qualified and received certification. About the content validity of the tool. Content validity index (CVI) obtained were: Socio-demographic proforma = 0.88, Structured knowledge questionnaire = 0.98, Observational checklist = 0.99, Inventory checklist = 1.00. Number of percentage (%) agreed in-Socio-demographic proforma = 92%,Structured knowledge questionnaire = 98%,Observational checklist = 100%,Inventory checklist = 100%.

Reliability of the study for structured knowledge questionnaire was calculated by Karl Pearson's coefficient of correlation(r).

$$R = \frac{N(\sum xy)-(\sum x)(\sum y)}{\sqrt{[N\sum x^2-(\sum x)^2]\,[N\sum y^2-(\sum y)^2]}}$$

Coefficient of correlation (r) should be within 0 to 1, where: 1= perfect reliability > 0.9 = excellent reliability, 0.8-0.9 = good reliability, 0.7-0.8=acceptable reliability, 0.6-0.7= questionable reliability, 0.5-0.6 = poor reliability, <0.5 = unacceptable reliability and 0 = no reliability. The calculated value for "r" was 0.83. Thus the tool was found statistically reliable.

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Reliability of the observational and inventory checklist was done by using inter-rater method. Two people observed the procedure. The finding was analyzed using Cohen's Kappa (k).

$$\text{Formula, } k = \frac{[Pr(a)-Pr(e)]}{1-Pr(e)}$$

Where, Pr (a) = Probability of agreement
Pr (e) = Probability by chance

The calculated value of 'k' was found to be 1.00 which showed that the observational checklist and inventory checklist were highly reliable.

The pilot study was done at Shree Sardar Smarak Hospital, Bardoli. A formal letter of permission was obtained from Maniba Bhula Nursing College for conducting the pilot study. Permission was taken from the Medical Officer of the hospital, staff nurses working at the NICU and pediatric ward of this hospital were selected for the study. The pre-test was conducted on 06/04/2019. Researcher took consent of the participants and thereafter STP was administered. After a gap of 7 days, post-test was conducted on 14/04/2019 by adjusting the duty hours of staff nurses with the help of nursing incharge of pediatric ward. Finding of the pilot study showed that the structured teaching programme was effective. There were no major problems faced during the pilot study except mild problem in adjusting the duty hours. Sister-in-charge resolved the issues and pilot study was conducted successfully. And based on the findings and item analysis of the pilot study, no modification were made in the main tool. Thus, researcher found that the research study was feasible.

In Data gathering Process, the researcher obtained written permission from the concerned authority, Medical superintendent of New Civil Hospital, Surat. Each participants were taken consent and assured confidentiality of their responses. Sample collection was done from three specific areas that were NICU, PICU and pediatric wards (G4, H4 and E4) in their respective seminar rooms. Each day of data collection took maximum of two and half hours of duration to conduct both the pre-test and providing STP with skill practices. Through the permission of nursing incharge of respective units, STP for the participants were done in the demonstration or seminar rooms of that respective units.

Table No.1: Data Collection Schedule.

Group-1	Pre-test with STP			Post-test	
	Date	Day	No. of participants	Date	Day
	08/04/19	D_0	14	17/04/19	D_7
Group-2	09/04/19	D_1	11	18/04/19	D_8
Group-3	10/04/19	D_2	9	19/04/19	D_9
Group-4	11/04/19	D_6	6	20/04/19	D_{10}

Numbers of staff nurses from the respective wards involved in the data collection were:-NICU= 30 staff nurses, PICU= 4 staff nurses and PW (Pediatric ward) = 6 staff nurses.

Plan for data analysis

The analysis of data is the most skilled task in the research process. It calls for the researcher's own judgment and skill.

For the present study, the data was obtained and analyzed in respect to the objectives of the study by using descriptive and inferential statistics. To calculate the data, a master sheet was prepared by the researcher.

Descriptive analysis:

- Frequency and percentage distribution of socio-demographic proforma.
- Frequency and percentage distribution of knowledge and beginning skills of the staff nurses regarding PALS before and after STP.
- Frequency and percentage distribution of beginning skills of the staff nurses regarding PALS before and after STP
- Mean and standard deviation to assess the pretest and post-test knowledge and beginning skills of the staff nurses regarding PALS before and after STP.

Inferential analysis:

- Effectiveness of STP on knowledge and beginning skill will be assessed using paired t-test.
- Correlation between knowledge and skills of the staff nurses regarding PALS and for testing the hypothesis was calculated by using paired t-test.
- Chi-square was used to find out the association of the post-test knowledge and beginning skills scores of the staff nurses with their selected socio demographic variables.

RESULT

In socio-demographic characteristics, among the characteristics of the age group, 95% of the participants belongs to the age group of 21-30 years. In the gender characteristics, 95 percent were females. In the marital status, 67.5 percent unmarried. Among the religion, 80 percent of the participant were hindus. In characteristics of type of family, 50 percent of participants were belongs to nuclear family. In monthly income, 47.5 percent of participants got their income of Rs.1000-15,000/month. And in educational qualification, 80 percent of participants completed their GNM course. In total clinical experience, 45 percent of participants were having an experiences of 1-3 years. In previous training in pediatric CPR, participants who completed their training on CPR were 77.5 percent. In Source of information related to PALS, 27.5 percent of participants from print media.

Table no.2: Description of mean, median, mode, standard deviation, range and difference of knowledge scores of staff nurses regarding pals.

n=40

Analysis	Mean	Median	Mode	Standard Deviation	Range
Pre-test	22	21.50	18	5.08	21
Post-test	37	37.50	37	4.55	19
Difference	15	16	19	0.53	2

Table no.3: Description of pretest and post test level of knowledge score of the staff nurses.

Level of knowledge	Pre-test		Post-test	
	n	%	n	%
Poor	0	0%	0	0%
Good	30	75.5%	0	0%
Very Good	10	25%	20	50%
Excellent	0	0	20	50%
Total	40	100%	40	100%

Table no.4: Mean, median, mode, standard deviation and range of beginning skills scores of staff nurses regarding pals.

Analysis	Mean	Median	Mode	Standard Deviation	Range
Pre-test	10	9.00	5	5.55	22
Post-test	24	25.00	27	3.11	13
Difference	14	16.00	22	2.39	9

Table no.5: Pre-test and post-test level of beginning skills scores of the staff nurses regarding pals.

Level of beginning skills	Pre-test		Post-test	
	n	%	n	%
Poor	23	57.5%	0	0%
Good	10	25%	0	0%
Very good	7	17.5%	19	47.5%
Excellent	0	0%	21	52.5%
Total	40	100%	40	100%

Table no.6: Correlation between knowledge and beginning skill scores of staff nurses on pals.

Analysis	Correlation between	Mean score	Karl Pearson Correlation coefficient (r)
Pre-test	Knowledge Vs beginning skills score		**r=0.19 P=0.32**
Post-test	Knowledge Vs beginning skills score	36.87 Vs 24.47	**r=0.39 P=0.01**

Above table shows that in post-test, there is a fair correlation between staff nurses knowledge score and beginning skill score. It means when knowledge score increases their beginning skills score of the staff nurses are also increases. Thus, it is positively correlated which shows that there is a significant correlation between the knowledge and beginning skills of staff nurses after STP regarding PALS. And this has confirmed by using Karl Pearson's correlation coefficient, "r".

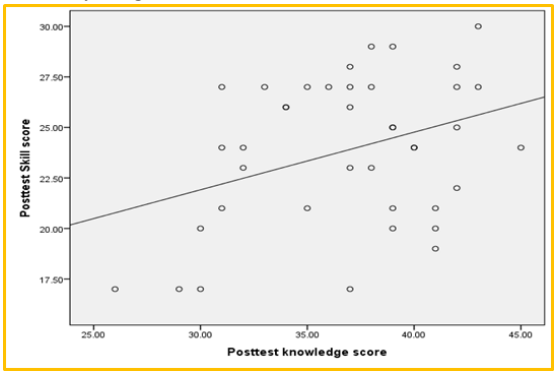

Figure 2: Scatter diagram shows the positive, fair correlation between post-test knowledge score and post-test beginning skills score of staff nurses

The association of post- test knowledge and beginning skills score regarding PALS among the staff nurses with selected demographic variables. It has divided into two sections and shown by below two tables. Chi-square(2) formula has used in this section to find out the association of staff nurses with their socio-demographic variables.

Table no.7: Significant association of staff nurses post test knowledge scores with their demographic variables.

n=40

Demographic Variables	Very good		Excellent		df	Chi-square (2)		
	n	%	n	%		Cal. value	Tab. value	S
Marital status								
a) Married	10	25%	2	5%	2	8.14*	5.59	S
b) Unmarried	10	25%	17	42.5%				
c) Others(widow/divorce)	0	0.00	1	2.5%				
Types of family								
a) Nuclear family	6	15%	14	35%	2	6.40*	5.99	S
b) Joint family	14	35%	6	15%				
c) Others	0	0.00%	0	0.00%				
Total clinical experience								
a) ≤ 1year	7	17.5%	2	5%	2	6.76*	5.99	S
b) 1-3 years	10	25%	8	20%				
c) 3 years and above	3	7.5%	10	25%				

(*indicates p<0.05 level of significance)

The above table depicts the association of staff nurses post-test knowledge scores with their demographic variables. Among the nine socio-demographic variables, unmarried staff nurses, staff nurses under the group of nuclear family and more clinical experience staff nurses are significantly associated with the post test knowledge scores Other variables like age, gender, religion, monthly income, educational qualification, previous training in pediatric CPR and source of information does not have significant association with the post-test knowledge score.

Table no.8: Significant association between staff nurses post test beginning skill scores with their demographic variables.

n=40

Demographic Variables	Very good		Excellent		df	Chi-square (2)		
	n	%	n	%		Cal. value	Tab. value	S
Type of family								
a) Nuclear family	6	15%	14	35%	2	4.91*	3.84	S
b) Joint family	13	32.5%	7	17.5%				
c) Others	0	0.00	0	0.00				
Total clinical experience								
a) ≤ 1year	7	17.5%	2	5%	9	6.46*	5.99	S
b) 1-3 years	9	22.5%	9	22.5%	18			
c) 3 years above	3	7.5	10	25%	13			

(*indicates p<0.05 level of significance)

The above table shows the association between staff nurses post-test level of beginning skills and their demographic variables. Staff nurses from nuclear family and staff nurses with more clinical experience are the variables that are significantly associate with the post-test beginning skills scores.

DISCUSSION

The present study on knowledge of staff nurses regarding PALS before and after STP shows that overall knowledge mean score in pre-test was 22 and in post-test was 37. Supportive study is a survey study on knowledge of staff nurses on PALS. Thus the present study suggested the need for continued and systemic education strategies to ensure better performance of the nursing team. Related with the beginning skills of the staff nurses regarding PALS before and after STP shows that during the pre-test majority (17.5%) had very good skill and 25 percent had only good skill. And in post-test majority (52.5%) participants had excellent skills and remaining 47.5 percent participants had very good skill which shows that after providing STP participants beginning skill level increased. Overall beginning skills mean score in pre-test was 10.27 and post-test was 24.47. The present study findings is supported by a prospective study which was conducted in Netherlands to assess the effectiveness of Pediatric Advanced Life Support course on perceived self-efficacy and use of resuscitation skills. But in the supportive studies increasing skill level among the participants was lacking this is due to the opportunity provided to them was inadequate.

CONCLUSION

The findings of the study showed that STP on PALS was effective to improve the knowledge and beginning skills of staff nurses. Therefore, STP can be considered in instituting the in-service education to improve the knowledge and beginning skills of the staff nurses regarding PALS or any other emergency measures related to children.

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