"A Study to Evaluate the Effectiveness of Planned Teaching Programme (PTP) on the Knowledge of Recording and Interpretation of Electrocardiogram (ECG) Among Staff Nurses Working in Selected Intensive Care Units (I.C.Us) at Selected Hospitals of Shimla, Himachal Pradesh."

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Abstract

Background:- *Cardiovascular disease (CVD) is the world's leading killer, accounting for 16.7 million or 29.2 per cent of total global deaths in 2003. CVD alone accounts for one-quarter of all deaths in low mortality low-income countries. Non-communicable diseases such as cancers, neuro psychiatric and cardiovascular diseases now kill greater numbers of people in the lower-income countries than they do in high-income countries. Electrocardiograms are interpreted by Physicians and Nurses in many specialties, including cardiology, internal medicine, family practice, and emergency medicine. Interpretative skills vary among specialists .An adequate knowledge base should include the ability to define, recognize, and understand the basic pathophysiology of certain electrocardiographic abnormalities.*

AIM: *The study aim to evaluate the effectiveness of Planned Teaching Programme (PTP) on the knowledge of recording and interpretation of Electrocardiogram (ECG) among staff nurses working in selected Intensive Care Units (I.C.Us) at selected Hospitals of Shimla, Himachal Pradesh.*

METHODOLOGY: *A pre-experimental evaluative research approach was used for the study (one group pre-test, post-test design). A non probability, purposive sampling technique was used to select sample size of 55 staff nurses. The self structured knowledge questionnaire was developed and utilized for data collection.*

RESULT: *Only 11 (22.22%) had good knowledge 35(63.63) had average knowledge and 9 (16.36) had poor knowledge in the pre-test. After administration of planned teaching programme the post-test scores revealed actual gain scores in different areas namely-Anatomy and Physiology(25.62%), Electrophysiology (27.5%), Recording of ECG (24.4%) and Analyzing ECG strip (54.54%) proving a remarkable gain in knowledge and validating the effectiveness of PTP. The overall mean percentage in the pre-test was 20.8(47.27%) with standard deviation of 8.1 and in the post-test it was 33.6(76.36%) with the standard deviation 4.4 with a positive difference of 12.9(29.09%) and 3.7 respectively. This showed that there was a significant improvement in knowledge of staff nurses in the recording and interpretation of ECG.*

CONCLUSION: *The electrocardiogram (ECG) is one of the most widely used and useful investigations in contemporary medicine. Intensive Care Unit (ICU) nurses, peri-operative nurses are required to manage an increasing number of patients undergoing intravenous (i.v) conscious sedation who require ECG monitoring. Rapid ECG interpretation can reveal arrhythmias before a patient becomes, symptomatic.*

I. Introduction

Cardiovascular disease (CVD) is the world's leading killer, accounting for 16.7 million or 29.2 per cent of total global deaths in 2003.[1] CVD alone accounts for one-quarter of all deaths in low mortality low-income countries. Non-communicable diseases such as cancers, neuro psychiatric and cardiovascular diseases now kill greater numbers of people in the lower-income countries than they do in high-income countries.[2] While deaths from heart attacks have declined more than 50 per cent since the 1960s in many industrialized countries, 80 per cent of global cardiovascular diseases related deaths now occur in low and middle-income nations, which covers most countries in Asia. In India in the past five decades, rates of coronary disease among urban populations have risen from 4 per cent to 11 per cent.[1]

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adequate knowledge base should include the ability to define, recognize, and understand the basic pathophysiology of certain electrocardiographic abnormalities[7].

The electrocardiogram (ECG) is one of the most widely used and useful investigations in contemporary medicine. It is essential for the identification of disorders of the cardiac rhythm, in various general conditions like head injury, poisoning, accidents, drowning, surgical complications, electrolyte disturbance etc. But it is specifically useful for the diagnosis of abnormalities of the heart such as Myocardial infarction (M.I), Coronary artery disease etc.

Also changes in practice have made knowledge of the conduction system and basic ECG interpretation necessity because Intensive Care Unit (ICU) nurses, peri-operative nurses are required to manage an increasing number of patients undergoing intravenous (i.v) conscious sedation who require ECG monitoring. Rapid ECG interpretation can reveal arrhythmias before a patient becomes, symptomatic. An ECG can reveal underlying cardiac problems and uncover electrolyte imbalance that, if left untreated could cost the life of patient[3,4].

II. Objectives

1. To assess the pre-test knowledge of recording and interpretation of ECG among staff nurses working in selected I.C.Us.
2. To evaluate the effectiveness of PTP in terms of gain in post test knowledge scores among staff nurses working in selected I.C.Us.
3. To find an association between pre-test level of knowledge among staff nurses working in selected I.C.Us with selected demographic variables.

III. Methodology

A pre experimental design, with one group pre-test and post- test evaluative research approach was adopted for the study. The target population for the present study was staff nurses working in selected Intensive Care Units (I.C.Us) at selected Hospitals of Shimla, Himachal Pradesh. Sample for the study was 55 staff nurses using non probability purposive sampling technique. Staff Nurses, who were not present at the time of data collection, were not willing to participate in research study excluded from the study. The self structured questionnaire was developed and utilized for data collection. The tool consisted of two sections,Section I- consisted of five items related to demographic variables.Section II – consisted of part I, Part II, Part III and Part IV. Part I had eleven items on Anatomy and physiology of heart, Part II had seventeen items on Electrophysiology of heart, Part III had thirteen items on Recording of ECG and Part IV had five questions on Analyzing ECG strip.

To ensure the content validity of the tool (structured questionnaire), it was submitted to ten experts. Reliability of the tool on disaster and emergency preparedness was calculated using split half method, followed by the application of Karl Pearson's Correlation Coefficient. The 'r' was found to be 0.80.

The range of knowledge score was from 0- 40. Based on sum scores, level of knowledge was classified in 3 categories i.e. Good knowledge 65% - 100% , average knowledge 30% - 64% and poor knowledge 0-29%.

Ethical approval was taken from Principal IGMC& Hospital Shimla, Himachal Pradesh to conduct the study. Written informed Consent was taken for the study sample regarding their willingness to participate in the research study and the purpose for carrying out research study was explained to the participants. Confidentiality of the information of the sample was maintained.

Data was analyzed by descriptive and inferential statistics i.e. frequency and percentage distribution, mean percentage, median , chi square to determine the association between knowledge with selected variables T test used to evaluate the effectiveness of the Planned Teaching Programme.

IV. Result

Frequency and percentage distribution of Staff Nurses according to socio-demographic variables revealed that maximum number 36 (65.45%) of staff nurses belonged to the age group of 21-25 years, Most of the staff nurses 49 (89.09%) were diploma holders, Majority of staff nurses 21 (38.18%) had a total professional experience below one year, Majority of staff nurses 33 (60 %) had experience below one year in ICU and Only 13(23.64%) had attended in-service education.

TABLE 1: Frequency and Percentage Distribution of Pre-test knowledge scores in different areas of recording and interpretation of Electrocardiogram.

N=55

S.No	Areas of Knowledg	Level of knowledge					
		Good 65-100%		Average 30-64%		Poor 0-29%	
		f	%	f	%	f	%
1.	Anatomy & physiology	13	23.6	32	58.2	10	18.2
2.	Electrophysiology	17	30.91	28	50.91	10	18.2
3.	Recording of E.C.G	18	32.73	25	45.46	12	21.82
4	Analyzing of E.C.G strip	2	3.64	22	40	31	56.36

Table 1 revealed that In the area of Anatomy and physiology of heart, majority of staff nurses 32 (58.2%) had average level of knowledge, while 10 (18.2%) had poor knowledge. Regarding Electrophysiology of heart, majority of staff nurses 28(50.91%) fell in the category of average knowledge, while 17(30.91%) had good knowledge. In the area of Recording of ECG, majority of staff nurses 25 (45.46%) had average knowledge, while 18(32.73%) had good knowledge. More than half of all the staff nurses i.e. 31(56.36) found analyzing of E.C.G strip tough and procured poor knowledge scores while 2 (3.64%) obtained good knowledge scores.

TABLE 2: Frequency and Percentage Distribution of Post-test knowledge scores in different areas of recording and interpretation of Electrocardiogram.

N=55

S.No	Areas of Knowledge	Level of knowledge					
		Good 65-100%		Average 30-64%		Poor 0-29%	
		f	%	f	%	f	%
1.	Anatomy & physiology	50	90.9	5	9.1	-	-
2.	Electrophysiology	49	89.09	6	10.91	-	-
3.	Recording of E.C.G	51	92.73	4	7.27	-	-
4.	Analyzing E.C.G strip	47	85.45	8	14.55	-	-

Table 2 revealed that a remarkable increase in knowledge in all the areas of ECG recording and interpretation. In the area of Anatomy and Physiology 50(90.9%) had good level of knowledge while 5(9.1%) had average knowledge and none in the Poor category. Regarding Electrophysiology of heart 49(89.09) had good knowledge and 6(10.91) had average knowledge. In the area of Recording of ECG 51(92.73%) had good knowledge while 4(7.27) had average knowledge. Regarding Analyzing ECG strip 47(85.45%) had good knowledge and 8(14.55%) had average knowledge. Not a single staff nurse got scores in the poor category in any area.

Table 3: Data describing difference between pre- test and post -test mean and 't' value of knowledge scores.

N=55

S.No		Mean	SED	'df'	't' value	Significance
1.	Pre-test	20.8				
			0.087	54	20.03	Significant
2.	Post- test	33.6				
3.	Mean difference.(d)	12.8				

P<0.05, Table value 1.96

Table 4 revealed that there was a significant gain in the post- test scores. The gain in knowledge score is significant (t= 17.91). Since calculated value is higher than the table value (1.96) at 54 'df', research hypothesis is accepted. Therefore, findings revealed that the planned teaching programme on the recording and interpretation of ECG is effective.

No significant association found between knowledge score and selected socio-demographic variables

V. Conclusion

The present study assessed the knowledge of staff nurses regarding recording and interpretation of ECG and found that only 11 (22.22%) had good knowledge 35(63.63) had average knowledge and 9 (16.36) had poor knowledge in the pre-test. After administration of planned teaching programme the post-test scores revealed actual gain scores in different areas namely-Anatomy and Physiology(25.62%), Electrophysiology (27.5%), Recording of ECG (24.4%) and Analyzing ECG strip (54.54%) proving a remarkable gain in knowledge and validating the effectiveness of PTP.

The overall mean percentage in the pre-test was 20.8(47.27%) with standard deviation of 8.1 and in the post-test it was 33.6(76.36%) with the standard deviation 4.4 with a positive difference of 12.9(29.09%) and 3.7 respectively. This showed that there was a significant improvement in knowledge of staff nurses in the recording and interpretation of ECG. Thus proving that the planned teaching programme was effective method for improving the knowledge of staff nurses.

VI. Recommendations

1. A similar study on a larger and wider sample for a longer duration would be more applicable in making broad generalization.
2. An experimental study can be undertaken using a control, and experimental groups with a randomized sample.
3. A similar study can be replicated in different settings.
4. A follow up study can be done to determine the effectiveness of planned teaching programme in terms of changes that had been incorporated in practice regarding recording and interpretation of ECG.
5. A descriptive study can be done on knowledge, attitude and practices on Recording and interpretation of ECG.

References

[1]. Kumar N, Rastogi T. Cardiovascular disease in India and the impact of lifestyle and food habits. Health management .2004 Dec; 44-50.
[2]. Jason T.Campaign for fighting disease. Urbach 2006 Oct: 28-30.
[3]. Einthoven W. Weiteres. über das elektrokardiogramm. Arch Gesamte Physiol. 1908; 172:517.
[4]. Fisch C. Evolution of the clinical electrocardiogram. J Am Coll Cardiol. 1989; 14:1127–1138.
[5]. Friedberg CK, Zager A. "Nonspecific" ST and T-wave changes. Clin All Round. 1961;23:655–661
[6]. Rosenbaum DS, Jackson LE, Smith JM, Garan H, Ruskin JN, Cohen RJ. Electrical alternant and vulnerability to ventricular arrhythmias. N Engl J Med.1994;330:235–247.
[7]. 7.Mason JW, Hancock EW, Saunders D. American College of Cardiology report on ECGEXAM. J Am Coll Cardiol. 1997; 29:466–468.
[8]. Knight BP, Pelosi F, Michaud GF, Strickberger SA, Morady F. Clinical Consequences ofelectrocardiographic artifact mimicking ventricular tachycardia. N Engl J Med. 1999; 341:1270–1274.
[9]. Hurst JW. Images in cardiovascular medicine: "switched" precordial leads.Circulation. 2000; 101:2870–2871.
[10]. Levin M. Comments on Special report: recommendations for safe current limits for electrocardiographs'Circulation. 1997; 95:276–278.