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A study to assess the effectiveness of structured teaching programme on the Knowledge and practices of electrocardiogram among staff nurses working in critical care settings of dr. vitthalrao vikhe patil pravara rural hospital, loni Bk.

Author Information-

Mr. Rohidas Dnyandeo Tanpure, II MSc Nursing student, Smt. Sindhutai Eknathrao Vikhe Patil College of Nursing, Pravara Institute of Medical Sciences (DU), Loni

Mr. Swapnil Tambe, Assistant Professor, Smt. Sindhutai Eknathrao Vikhe Patil College of Nursing, Pravara Institute of Medical Sciences (DU), Loni

ABSTRACT

Background of study: In a recent study it was found that 80% of nurses had poor knowledge regarding ECG interpretations also revealed that ER nurses have a low competency level regarding ECG interpretations. The implications of nurses' poor knowledge and practices regarding ECG interpretation extend beyond individual competency to encompass patient safety and outcomes. Structured teaching programs tailored to enhance nurses' knowledge and practices regarding ECG interpretation are designed to address specific learning objectives, competencies, and performance outcomes.

Objectives: 1.To assess the existing knowledge and practices of electrocardiogram among staff nurses working in critical care settings. 2. To evaluate effectiveness of structured teaching programme on level of knowledge and practices of ECG among staff nurse working in critical care settings. 3. To determine association between post-test level of knowledge and practices of ECG among staff nurses working in critical care settings with selected demographic variables.

Material and methods: A pre-experimental one group pre-test post-test study design was used to evaluate the effectiveness of structured teaching programme on knowledge and practices of electrocardiogram among staff nurses working in critical care settings of Dr.Vittalrao Vikhe Patil Pravara Rural Hospital, Loni Bk. The sample consisted of 60 critical care setting staff nurses working in selected hospital. Sampling technique used for the current study was non probability convenient sampling. The level of knowledge is assessed by structured questionnaire regarding electrocardiogram lead placement and emergency abnormal electrocardiogram interpretations and the level of practice is assessed by using a standardised checklist of electrocardiogram procedure guidelines by the nurses. An interventional procedure of structured teaching programme regarding electrocardiogram lead placement and emergency abnormal electrocardiogram interpretations and electrocardiogram nursing procedure was provided to the critical care setting staff nurses. The results were

analysed by descriptive and inferential statistics.

Results: Regarding level of knowledge in the pretest majority 72% had average knowledge, 25% had good knowledge and 3% had poor knowledge regarding electrocardiogram. As that of in the post-test majority 79% had good knowledge, 21% had average knowledge and no one had poor knowledge. The mean post-test knowledge score 21.96 ± 1.69 is greater than that of mean pretest score 18.68 ± 2.5. The mean difference between pretest and post-test is 3.28. The mean post-test practice score 22.01 ± 1.39 is greater than that of mean pretest score 19.1 ± 1.56. The mean difference between pretest and post-test is 2.9. The paired t test value for knowledge is 19.325 at 0.05 level of significance which is greater than that of tabulated t value while the paired t test value for practice is 23.657 at 0.05 level of significance which is greater than that of tabulated t value confirming that structured teaching programme was effective in improving knowledge and practices among critical setting staff nurses regarding electrocardiogram.

Key words: evaluate, effectiveness, structured teaching programme, knowledge, practice, electrocardiogram, staff nurse, critical care setting.

I Introduction

In healthcare settings, staff nurses are frontline caregivers responsible for a myriad of tasks, including administering ECG tests, monitoring patients during the procedure, and documenting findings accurately. Their role in the ECG process extends beyond mere technical execution; it encompasses patient education, quality assurance, and preliminary interpretation of ECG tracings. During ECG acquisition, nurses ensure proper electrode placement, electrode skin preparation, and patient positioning to obtain artifact-free recordings. They also assess patient readiness, addressing any concerns or contraindications before initiating the procedure. Throughout the test, nurses monitor patient comfort and vital signs, promptly addressing any adverse reactions or technical issues. [1]

Assessing nurses' proficiency in ECG interpretation aids in delineating their scope of practice and fostering interdisciplinary collaboration. While nurses play a crucial role in preliminary assessment, complex or ambiguous ECG findings may necessitate consultation with cardiology specialists for definitive interpretation and management. By delineating clear roles and responsibilities, healthcare institutions can streamline workflows, improve communication channels, and ultimately enhance patient outcomes. [2]

It ensures adherence to standardized protocols and best practices in ECG acquisition, interpretation, and documentation, thereby minimizing errors and variability in clinical practice. [3]

Inaccurate interpretation of ECG tracings can lead to delayed diagnosis, inappropriate interventions, and potentially life-threatening consequences for patients. Moreover, miscommunication or mismanagement of critical ECG findings may compromise interdisciplinary collaboration and continuity of care, jeopardizing the overall quality of healthcare delivery. [4]

I.1 Statement of problem

A study to assess the effectiveness of structured teaching programme on the Knowledge and practices of electrocardiogram among staff nurses working in critical care settings of dr. Vitthalrao vikhe patil pravara rural hospital, loni bk.

I.2 Objectives

1. To assess the existing knowledge and practices of electrocardiogram among staff nurses working in critical care settings.
2. To evaluate effectiveness of structured teaching programme on level of knowledge and practices of ECG among staff nurse working in critical care settings
3. To determine association between post-test level of knowledge and practices of ECG among staff nurses working in critical care settings with selected demographic variables.

I.3 Hypothesis

- **H1:** There is a significant difference between the mean pre and post test score on levelof knowledge regarding ECG among critical setting staff nurses.
- **H2:** There is a significant difference between the mean pre and post test score on levelof practices regarding ECG among critical setting staff nurses.
- **H3**: There is a significant association between the post-test level of knowledge regarding ECG among staff nurses with selected demographic variables.
- **H4**: There is a significant association between the post-test level of practice regardingECG among staff nurses with selected demographic variables.

II Methodology

II.1Research design and approach

A pre-experimental one group pretest post-test design was taken into consideration to assess the level of knowledge and practice among critical care setting staff nurses regarding electrocardiogram.

II.2Setting of the study

The study was conducted in staff nurses working in critical care unit of DRVVPPRH, Loni which is a 1275 bedded multispecialty trust hospital at Loni village.

II.3Sample

Staff nurses working in critical care unit who fulfils inclusion and exclusion criteria.

II.4Sample size

Sample size for present study was 60 out of which 30 samples were in experimental group and 30 samples were in control group.

II.5Sampling technique

A non-probability convenience sampling technique was used for the study.

II.6Sampling Procedure

Samples were screened for eligibility of inclusion and exclusion criteria. Patients eligible and willing to participate were included in the study.

II.7Inclusion and Exclusion criteria

Inclusion criteria: staff nurses working in critical care who are

- Able to write and understands English and Marathi.
- Willing to participate.
- Available during time of data collection.
- Registered with State nursing council.
- With minimum experience of 3 months in critical care settings.
- Provide written informed consent for study participation.

Exclusion criteria: staff nurses working in critical care who are

- Working as administrative staff nurse in critical care settings.
- Not providing direct patient care.
- Want to withdraw from the study at any point of time.

II.8Tools and techniques

Interview method was used to collect the data from the participants, which consists of following sections;

Section A: It comprised of socio-demographic variables of housewives including Age, Gender, Education, and Area of working, Experience, Monthly income and Source of information.

Section B: It comprised of 25 structured questionnaires on knowledge regarding ECG lead placement and common ECG interpretations and 30 items structured checklist to assess practices of ECG among critical care setting staff nurses.

Data collection procedure Ethical aspects

a) Ethical clearance: Proposal was presented before Institutional Ethics Committee of PIMS (DU), Loni and ethical clearance was obtained.

b) Permission from concerned authority: Written permission was obtained from Medical Superintendent of the DRVVPPRH, Loni Bk.

c) Informed written consent: The study participants were contacted on one-on-one basis and explanation regarding study objectives, confidentiality of their data, their willingness to participate and right to withdraw from the study were provided to them. Informed written consent was obtained from participants of the study.

Data collection: After self-introduction and informed written consent the data was collected from the participants using interview method.

II.9Data Analysis

Data was coded in the Microsoft excel sheet. Descriptive and inferential statistics were used to analyse the data according to objectives. The demographic variables were analysed by using descriptive statistics (frequency and percentage). The pre-test and post-test level of knowledge was analysed by using descriptive statics(mean, standard deviation).The effectiveness of structured teaching programme on level of knowledge and practice was analysed by using inferential statistics (Mean differences, paired 't' test) Association between post-test level of knowledge and practice among critical care setting staff nurses and their selected demographic variables was analysed by (chi square analysis).

III Results

III.1 Assessment of socio-demographic characteristics of the study participants

The demographic findings concludes that in, majority (28)46% were from 31-40 years of age, (33)55% samples were female, (25)41% were completed with PB BSc Nursing, (14)24% were working in ICCU, (29)48% were having experience of more than 3 years, (29)48% had their monthly income more than 20001/-, (29)48% were having information from curriculum.

III.2 Assessment of level of knowledge and practice among critical care setting staff nurses

Table:2.1 - Frequency and percentage wise distribution of pretest and post-test level of knowledge score regarding electrocardiogram among critical care setting staff nurses.

SN	Level of knowledge	Pre test				Post test			
		Frequency	%	Mean	SD	requency	%	Mean	SD
	Poor	02	3	18.68	2.5	)	)	21.96	1.69
2	Average	43	72			13	21		
3	Good	15	25			47	79		

the pretest and post-test level of knowledge regarding electrocardiogram among critical care setting staff nurses in Dr.Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.which concludes that in the pretest majority of the staff nurses 43(72%) were having average knowledge, 15(25%) were having good knowledge and 02(3%) were having poor knowledge. The mean pretest score was 18.68 ± 2.5. Whereas in the post-test majority of the staff nurses 47(79%) were having good knowledge, 13(21%) were having average knowledge and no one was having poor knowledge. The mean post-test score was found out to be 21.96 ± 1.69.

Table:2.2 - Frequency and percentage wise distribution of pretest and post-test level of practices score regarding electrocardiogram among critical care setting staff nurses.

SN	Level of practices	Pre test				Post test			
		Frequency	%	Mean	SD	frequency	%	Mean	SD
1	Poor	1	2	19.1	±1.56	0	0	22.01	±1.39
2	Fair	45	75			11	18		
3	Good	14	23			49	82		

Pretest and post-test level of practices regarding electrocardiogram among critical care setting staff nurses in Dr.Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.which concludes that in the pretest majority of the staff nurses 45(75%) were following fair practices, 14(23%) were following good practices and 01(2%) were following poor practices. The mean pretest score was 19.1 ± 1.56. Whereas in the post-test majority of the staff nurses 49(82%) were found to be following good practices, 11(18%) were following fair practices and no one was found
to be with poor practices. The mean post-test score was found out to be 22.01 ± 1.39.

III. Effectiveness of structured teaching programme on knowledge and practices of electrocardiogram among critical care setting staff nurses.

Table: 3.1 - Mean, Standard Deviation, Mean Difference and Standard deviation of mean difference on pre-test and post-test knowledge and practices of electrocardiogram among critical care setting staff nurses.

	Mean	S.D.	Mean difference	SD (Mean difference)	't' test value	P value
Post test	21.96	±1.69	3.28	±1.31	19.325	0.0001*
Pre test	18.68	±2.5				

Electrocardiogram on pretest and post-test level of knowledge among critical care setting staff nurses. The mean difference was found out to be 3.28 with the standard deviation of mean difference was found out to be ±1.3. The calculated 't' value was found to be19.325 with 'p' value 0.0001* which is highly significant concluding that the structured teaching programme on electrocardiogram was found to be effective in improving knowledge among critical care setting staff nurses. Hence the H1 hypothesis was accepted.

Table 3.2: - Mean, Standard Deviation, Mean Difference, Standard deviation of mean difference Paired't' test to evaluate the effectiveness of self-instructional module on electrocardiogram

	Mean	S.D.	Mean difference	SD (Mean difference)	't' test value	P value
Post test	22.01	±1.39	2.9	±0.68	23.657	0.0001*
Pre test	19.1	±1.56				

Electrocardiogram on pretest and post-test level of practices among critical care setting staff nurses The mean difference was found out to be 2.9 with the standard deviation of mean difference was found out to be ± 0.68. The calculated 't' value was found to be 23.657 with 'p' value 0.0001* which is highly significant concluding that the structured teaching programme on electrocardiogram was found to be effective in improving practices among critical care setting staff nurses. Hence the H2 hypothesis was accepted.

III.2 Association between post-test level of knowledge and practice regarding electrocardiogram among critical care setting staff nurses with selected demographic variables.

Table: 4.1 – Association between post-test level of knowledge and practice regarding electrocardiogram among critical care setting staff nurses with selected demographic variables

SN	Demographic Variables	Chi SquareValue	Df	P Value	Significance
1	Age	2.66	6	0.849	**Not Significant**
2	Gender	0.62	4	0.736	**Not Significant**
3	Education	7.09	6	0.312	**Not Significant**
4	Area of working	8.71	8	0.367	**Not Significant**
5	Experience	4.92	4	0.287	**Not Significant**
6	Monthly income	7.33	4	0.119	**Not Significant**
7	Source of information	4.31	6	0.634	**Not Significant**

In outcomes of association of post-test knowledge regarding electrocardiogram among critical care setting staff nurses with selected demographic variables. Chi square analysis was used to find out the association. The results concludes that there was no any significant association of post- test knowledge regarding electrocardiogram among critical care setting staff nurses with selected demographic variables such as age, gender, education, area of working, experience, monthly income, source of information

Table: 4.2 – Association between post-test level of practice regarding electrocardiogram among critical care setting staff nurses with selected demographic variables.

SN	Demographic Variables	Chi SquareValue	Df	P Value	Significance
1	Age	6.39	6	0.381	**Not Significant**
2	Gender	6.79	4	0.334	**Not Significant**
3	Education	7.11	6	0.322	**Not Significant**
4	Area of working	4.04	8	0.856	**Not Significant**
5	Experience	3.95	4	0.411	**Not Significant**
6	Monthly income	4.22	4	0.376	**Not Significant**
7	Source of information	4.72	6	0.581	**Not Significant**

The results concludes that there was no any significant association of post- test practices regrading electrocardiogram among critical care setting staff nurses with selected demographic variables such as age, gender, education, area of working, experience, monthly income, source of information.

IV Discussion

IV.1 Findings related to demographic characteristics.

The demographic findings concludes that in, majority (28)46% were from 31-40 years of age, (33)55% samples were female, (25)41% were completed with PB BSc Nursing, (14)24% were working in ICCU, (29)48% were having experience of more than 3 years, (29)48% had their monthly income more than 20001/-, (29)48% were having information from curriculum

IV.2 Level of knowledge and practices regarding electrocardiogram among critical care setting staff nurses.

The current study predicts that in the pretest majority 43% had average knowledge, 15% had good knowledge and
2% had poor knowledge regarding electrocardiogram. As that of in the post-test majority 47% had good knowledge, 13% had average knowledge and no one had poor knowledge. Regarding practices in the pretest majority of the
Staff nurses 75% were following fair practices, 23% were following good practices and 2% were following
Poor practices, whereas in the post-test majority of the staff nurses 82% were found to be following good Practices, 18% were following fair practices.

IV.3 Effectiveness of structured teaching programme on knowledge and practices regarding electrocardiogram among critical care setting staff nurses.

The current study reveals that mean pretest score was 18.68 ± 2.5 whereas the mean post test score was 21.96 ±1.69. The mean difference was found out to be 3.28 with the standard deviation of mean difference was found out to be ±1.3. The calculated 't' value was found to be 19.325 with 'p' value 0.0001which is highly significant which is greater than that of tabulated t value confirming that the structured teaching programme was effective in improving knowledge regarding electrocardiogram among critical care setting staff nurses. Whereas regarding level of practices mean pretest score was 19.1 ± 1.56 whereas the mean post test score was 22.01 ± 1.39. The mean difference was found out to be 2.9 with the standard deviation of mean difference was found out to be ± 0.68. The calculated 't' value was found to be 23.657 with 'p' value 0.0001 which is highly significant which is greater than that of tabulated t value confirming that the structured teaching programme was effective in improving practices regarding electrocardiogram among critical care setting staff nurses.

IV.4 Association of post-test knowledge score with selected demographic characteristics.

The current study revealed that there is no any significant association of post-test knowledge and practices regrading electrocardiogram among critical care setting staff nurses with selected demographic variables such as age, gender, education, area of working, experience, monthly income, source of information Conclusion

The study findings have shown that the structured teaching programme was effective in improving knowledge and practices among critical setting staff nurses regarding electrocardiogram.

Declaration by Authors

Ethical approval: The present study was approved by the Institutional Ethics Committee of Smt. Sindhutai Eknathrao Vikhe Patil College of Nursing of Pravara Institute of Medical Sciences (DU), Loni. [Ref. No. PIMS/SSEVPCON/2023/12)]

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