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A PRE-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF ONLINE TEACHING PROGRAMME ON KNOWLEDGE OF B.SC. NURSING 3RD YEAR STUDENTS RELATED TO ECG AND ITS INTERPRETATION IN AMITY UNIVERSITY

***[1]Fazl Ur Rahman and Junaid Ahmad Bhat[2]**

[1]RN & RM, M.Sc. (Medical Surgical Nursing), ICU Interventionist and Trainer, Dr. Hassan's Hospital & Diagnostic Center, Abuja, Nigeria.
[2]RN & RM, M.Sc. (Medical Surgical Nursing), Critical Care Specialist, DRDO COVID Hospital, Srinagar.

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***Corresponding Author: Fazl Ur Rahman**

RN & RM, M.Sc. (Medical Surgical Nursing), ICU Interventionist and Trainer, Dr. Hassan's Hospital & Diagnostic Center, Abuja, Nigeria.

ABSTRACT

Background: The use of internet facilities and online teaching is becoming a popular trend among the institutions with higher education during this Covid 19 era. Digital media has improved the teaching and learning environment and has been becoming a common learning environment among the students and teachers at home. Online teaching is now available to everyone, anywhere, anytime irrespective of distance and time. Digital technologies are integrated more and more in our day-to-day life, so it is also included in classroom practice. Thus, the researcher felt need to prepare and administer an online teaching program among the BSC nursing 3rd year students on ECG and its interpretation. An ECG is a picture of the electrical conduction of the heart. It is often very difficult for the nursing students to tell the difference among different myocardial conditions, so it is very important to recognize the signs of heart attack, angina symptoms and heart attack symptoms and to immediately seek medical attention. In addition to this Nursing students should be finding easy to do basic ECG interpretation. **Aim:** Effectiveness of online teaching Programme on knowledge of B.Sc. Nursing 3rd year Students related to ECG and its interpretation in Amity University. **Methods:** The Pre experimental study following pre-test post-test design was conducted among 51 nursing students studying in B.Sc. Nursing third year in Amity University by using socio demographic data sheet, Descriptive statistics, 't' test and Chi square test. **Result:** In overall view of the present study findings, students belonged to the age group of 18-20 years were 23.5%, 20-22 years were 58.8% above 23 years were 17.6% of 3rd year B.Sc. Nursing students. Among all 66.7% were males and 33.3% were females. Nearly three fourth of 3rd year B.Sc. Nursing students were Hindus (78.4%). The study finding revealed mean percentage of pretest knowledge score was 49.00 and post test knowledge score was 78.90 P≤ .001. **Conclusion:** The present study results revealed the level of knowledge of B.Sc. Nursing 3rd year Students related to ECG and its interpretation has increases to 78.90 percentage. Thus, the method of teaching was found effective in providing online teaching Programme.

KEYWORDS: Conventional teaching and knowledge regarding ECG and Interpretation, effectiveness.

INTRODUCTION

"Practice always depends on knowledge
Knowledge promotes competence and confidence"

In 21st century, the dynamic use of internet facilities has shifted the teaching learning process from traditional classroom teaching to the Online learning environment. The use of internet facilities and online teaching programme is becoming a popular trend among the institutions with higher education during this Covid 19 era. These internet facilities help the students in communicating with other students and teachers electronically such as with the help of electronic Medias like discussion forums, e-mails, webinars, online teaching programme and chat sessions. Digital media has improved the teaching and learning environment and has been becoming a common learning environment among the students and teachers. In past decades, many institutions have made collaborative efforts to implement these E-learning systems in their institutions for a new learning environment. These efforts have resulted in the development of a dynamic virtual learning environment and ease of learning for the distant students, for example,

the use of learning management systems likes Moodle (Modular Object-Oriented Dynamic Learning Environment), College, Dokeos, WizIQ, BigBlueButton and Desire2Learn etc. These LMS (Learning Management System) are used as a complete learning system in the virtual environment to provide dynamic learning system.

Cardiovascular diseases are the major diseases that lead to high mortality in all over the world. In 2000 the American Heart Association reported the death rates of cardiovascular diseases, in which 53.6% were from heart attacks, 3.1 per cent were due to hypertension, 0.7 per cent was from rheumatic heart disease and 27.6 per cent from all other cardiovascular diseases. The current mortality rate of the United States reported that almost 66 million people have some form of cardiovascular diseases and further the mortality rates quoted that one dies with cardiovascular disease in every 32 seconds. The AHA estimates that the cost of nation for managing the cardiovascular disease was around $88.2 million.

Coronary Heart Disease is also a leading cause of morbidity and mortality in developed countries and is emerging as an epidemic in developing countries. It is predicted that there will be an increase of 111 per cent in cardiovascular deaths in India by the year 2021 when compared to the year 1990. This is much higher than that predicted to any other region both in Asia as well as outside Asia. In India, the prevalence of CHD is much higher in south India when compared to north India.

In America, in spite of high mortality and morbidity rates of cardiovascular diseases, death rates are declining through early identification of disease by using electrocardiogram which is old but best diagnostic tool and by proper treatment.

Electrocardiography is the process of producing an electrocardiogram (ECG or EKG), a recording - a graph of voltage versus time - of the electrical activity of the heart using electrodes placed on the skin. These electrodes detect the small electrical changes that are a consequence of cardiac muscle depolarization followed by repolarization during each cardiac cycle (heartbeat). Changes in the normal ECG pattern occur in numerous cardiac abnormalities, including cardiac rhythm disturbances (such as atrial fibrillation and ventricular tachycardia), inadequate coronary artery blood flow (such as myocardial ischemia and myocardial infarction)

In 1869-1870, Siphon Alexander Mairhead, an electrical engineer recorded a human electrocardiogram by using capillary electrometer. In 1891, William Bayliss and Edward Starling improved the capillary electrometer. They connected the terminals to the right hand and to the skin over the apex beat and showed a “triphasic variation accompanying each heart beat”. These deflections were later called as, ‘P, QRS and T’waves. There are three main components to an ECG: The P wave, which represents the depolarization of the atria; the QRS complex, which represents the depolarization of the ventricles; and the T wave, which represents the repolarization of the ventricles.

In a conventional 12-lead ECG, ten electrodes are placed on the patient's limbs and on the surface of the chest. The overall magnitude of the heart's electrical potential is then measured from twelve different angles ("leads") and is recorded over a period of time (usually ten seconds). In this way, the overall magnitude and direction of the heart's electrical depolarization is captured at each moment throughout the cardiac cycle.

Cardiac arrhythmias are the most common problems encountered in the coronary care unit (CCU) and represent a major source of hospital morbidity. Arrhythmias are dangerous conditions because they may lead to sudden death or heart failure, therefore an accurate and early identification and with prompt interpretation of arrhythmia are observed to be the important life saving measures. This depends on knowledge of the nurses about conduction system, electro cardio-physiologic principles, and process of analyzing electrocardiogram (ECG). It also reflects on the action undertaken by the nurses based on their professional training and experience. So, professional standards of care need to be revised periodically and implemented to ensure effective and safe care.

REVIEW OF LITERATURE

A large amount of research is available on the different types of e-learning technologies and infrastructures and how they contribute to education. Some research compares E-learning platforms while other research compares E-learning to the traditional face-to-face learning, or focuses on the design mode and application. The researcher recommended online teaching programme on knowledge of B.Sc. Nursing 3rd year Students related to ECG and its interpretation in Selected Colleges of Nursing at Delhi NCR.

A study was conducted to identify the impact of basic electrocardiogram training courses on qualified nurses. ECG plays a crucial role in helping to diagnose, follow-up, and detect any abnormalities in patients' conditions. Nurses often work on the frontline in hospitals and are the ones who initially assess patients' conditions. According to the British Heart Foundation, 26% of all mortality in the UK is attributable to heart and circulatory diseases. Methodology: A comprehensive, systematized review was undertaken using the AMED, EMBASE, CINAHL, and MEDLINE databases. Thematic analysis was then used to synthesis the findings from the studies selected. Ten papers were selected following the application of inclusion and exclusion criteria. Conclusion: Basic ECG training courses were found to improve nurses' knowledge, compared to those who did not possess ECG training, the quality of care was seen better among nurses who had

received ECG courses, and even patient outcomes were improved in the total number of myocardial infarction events in hospital which was decreased compared to before the intervention. Cardiac care nurses had better ECG interpretation skills than other nurses regardless if they took ECG courses or not.

(Neth Heart J. 2018)
A comparative study to assess the knowledge of degree and diploma staff nurses on electrocardiogram was conducted in Madurai. Sum of 60 sample were selected by using random sampling technique in which 30 graduate staff nurses and 30 diploma staff nurses. Data were collected by using statistical analysis. The results showed that mean score of degree nurses in the following areas were: 38.24 in introduction, 29.73 in procedure, 33.81 in interpretation, 31.52 in identification of cardiovascular disorders. The mean score of diploma nurses were 36.93 in introduction, 41.64 in procedure, 21.76 in interpretation and 19.45 in identification of cardiovascular disorders 24.

(Br J Gen Pract. 2016)
Aim of the study
A pre-experimental study was done to enhance knowledge among B.Sc.Nursing 3rd year students through online teaching method on ECG interpretation.

OBJECTIVES OF THE STUDY

1) To assess the Pre-test knowledge regarding electrocardiogram among 3rd year B.Sc. Nursing students.
2) To assess effectiveness of online teaching programme of Post-test knowledge regarding electrocardiogram, by comparing pre-test and post-test knowledge score among 3rd year B.Sc. Nursing students.
3) To find the association between level of knowledge with selected socio- demographic variables.

METHODOLOGY

Quantitative quasi-experimental research approach and non-equivalent control group pre-test post-test control group design was used in the study.

- Population: B. Sc. Nursing students
- Sample: 51 B.Sc. Nursing 3rd year students of Amity College of Nursing, Amity University, Haryana
- Sampling technique:
- HO1 = There will be a significant difference in the pre-test and post-test knowledge scores of B.Sc. Nursing 3rd year students regarding ECG interpretation.
- HO2 =There will be a significant association between the post-test knowledge score and demographic variables of B.Sc.Nursing 3rd year students regarding knowledge of ECG interpretation.

VARIABLES OF THE STUDY

Dependent variable
Knowledge level of the Nursing students regarding ECG and its interpretation.

Independent variable
Online teaching programme on ECG and its Interpretation.

Data collection tool and techniques based on objectives of the study, following tools were prepared:
Tool I: Demographic variables which included age, gender, religion, Exposure in assisting the investigative procedure, Previous knowledge on ECG and its interpretation, source of information etc.
Tool II: Self-structured questionnaires (Karl Pearson's correlation method, r = 0.89) to the assess the level of knowledge using online platform regarding ECG and its interpretation. Total number of questions were 33 on ECG and its interpretation (General information about ECG, ECG procedure, normal ECG and interpretation of ECG abnormalities). There were four alternate answers from which the participant had to choose one best alternative by encircling it. Knowledge was measured in terms of knowledge score. A score of "1" was allotted to each correct response.

Validity
The content validity of tools was done by a panel of five experts from medical and nursing field, who had expertise in developing such instruments and the necessary modification was done accordingly.

Scoring and Interpretation
Table-1: Criteria Measure of Pretest Knowledge Score.

Score Level (N= 51)	PRETEST f(%)
LOW(0-16)	29(56.9%)
AVERAGE(17-25)	21(41.2%)
HIGH(26-33)	1(2%)

Maximum Score=33 Minimum Score=0

Table 2: Criteria Measure of Posttest Knowledge Score.

Score Level (N= 51)	POSTTEST f(%)
LOW (0-16)	2(3.9%)
AVERAGE (17-25)	16(31.4%)
HIGH (26-33)	33(64.7%)

Maximum Score=33 Minimum Score=0

Ethical clearance
Ethical permission was obtained from the administrative Competent Authority of Amity Colleges of Nursing. Students were informed that participation in the study is voluntary and were guaranteed that data would be treated anonymously.

Data collection procedure
The study was conducted in Amity College of Nursing, Amity university, Haryana during the month of October

2020 after getting ethical clearance from the administrative authorities. Subjects were not under any obligation to give consent for participating in this study. All the questions and queries were discussed and sort out before actual data collection.

Statistical Methods: Data analysis included both descriptive and inferential statistics.

RESULTS

Distribution of demographic variables of participants
Data analysis revealed that the subjects were between 18-22 years. 33.3% were males and 66.6% were females, Hindus (76.47%), Muslims (13.7%) followed by Christians (7.8%).

Distribution of students by their religion
Distribution of students by their religion reveals that less than three fourth of 3rd year B.Sc. Nursing students were Hindus (76.47%) followed by Muslims (13.7%) followed by Christians (7.8%)

Distribution of students by their source of information
Knowledge on ECG based on the source of information depicts that of 51 subjects in experimental group, 35.49% has information from clinical experience 43.35% has information from books 21% has information from mass media.

Categories	Pre test		Post test	
	Frequency	Percentage	Frequency	Percentage
High knowledge	1	2	33	64.7
Average knowledge	29	56.9	16	31.4
Low knowledge	21	41.2	2	3.9

Table-3 represents the overall knowledge levels of 3rd year B.Sc Nursing students on electrocardiogram. In pre test, (41.2%) of 3rd year B.Sc Nursing students had low knowledge and (56.9%) of the sample had average knowledge 2% have high knowledge whereas the level of knowledge in post test indicated a marked increase in knowledge level i.e. majority of 3rd year B.Sc Nursing students had high knowledge (64.7%) followed by average knowledge (31.4%). 3.9% respondent had low knowledge. From this, it is evident that online teaching programme was effective and had more impact on 3rd year B.Sc Nursing students' knowledge regarding electrocardiogram.

Mean and Standard Deviation of pre-test and post-test knowledge scores of electrocardiograms.

	Mean	SD
Pre-test score	16.16	4.429
Post-test score	26.04	4.741

SD: Standard Deviation

Table-4 describers the overall knowledge in pretest mean difference was increased from 16.16 $\pm$ 4.429 to 26.6 $\pm$ 4.74 in posttest. From this, it is inferred that online teaching programme was effective in improving the knowledge of 3rd year B.Sc. Nursing students.

Table 5: Comparison of knowledge score on ECG before and after intervention (N=51).

Paired T Test	Mean±SD	Mean%	Range	Mean Diff.	Paired T Test	P value	Table Value at 0.05
PRETEST KNOWLEDGE	16.16±4.429	49.00	6-26	9.880	11.681 *Sig	<0.001	2.01
POSTTEST KNOWLEDGE	26.04±4.741	78.90	13-33				

SD: Standard Deviation ** Significance Level 0.05 Maximum=33 Minimum=0

Association of Pretest and Posttest Knowledge Scores of With Selected Socio-Demographic Variables.

Variables	Opts		HIGH	AVERAGE	LOW	Chi Test	P Value	df	Table Value	Result
Age (yrs.)	18 - 20 Years	Pretest	0	6	6	1.323	0.857	4	9.488	NS
		Posttest	6	5	1	2.295	0.682			
	20 - 22 Years	Pretest	1	12	17					
		Posttest	20	9	1					
	Above 23 Years	Pretest	0	3	6					
		Posttest	7	2	0					
Gender	Male	Pretest	0	14	20	2.069	0.355	2	5.991	NS
		Posttest	25	7	2	6.009	0.050			
	Female	Pretest	1	7	9					
		Posttest	8	9	0					

Religion	Hindu	Pretest Posttest	1 30	18 8	21 2	2.914 11.248	0.572 0.024	4	9.488	NS
	Muslim	Pretest Posttest	0 2	1 5	6 0					
	Christian	Pretest Posttest	0 1	2 3	2 0					
Exposure in assisting the investigative procedure	No	Pretest Posttest	0 3	1 2	5 1	1.963 3.052	0.375 0.217	2	5.991	NS
	Yes	Pretest Posttest	1 30	20 14	24 1					
Previous knowledge on ECG and its interpretation	No	Pretest Posttest	0 2	0 1	3 0	2.418 0.131	0.298 0.937	2	5.991	NS
	Yes	Pretest Posttest	1 31	21 15	26 2					
Source of information.	Clinical experience	Pretest Posttest	1 11	10 6	7 1	4.874 2.024	0.300 0.731	4	9.488	NS
	Books	Pretest Posttest	0 13	7 8	15 1					
	Mass media	Pretest Posttest	0 9	4 2	7 0					

NS: Not Significant

Table-6 shows that the association between the level of score and socio demographic variable. Based on the objectives used to Chi-square test used to associate the level of knowledge and selected demographic variables. The Chi-square value shows that there is significance association between the score level and demographic variables (gender and religion). There is no significance association between the level of scores and other demographic variables (age, Exposure in assisting the investigative procedure, Previous knowledge on ECG and its interpretation Source of information). The calculated chi-square values were less than the table value at the 0.05 level of significance.

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