



A study to assess the effectiveness of an informational booklet on knowledge regarding electrocardiography interpretation among nursing officers working in selected areas of Indira Gandhi Medical College & Hospital, Shimla, Himachal Pradesh, 2020-2022”.

Ms. Sabnam Kumari¹, Dr. Pallavi Pathania², Ms. Ritika Soni³

Author's Affiliation

¹Postgraduate Student, Department of Medical Surgical Nursing, Shimla Nursing College, Shurala, Shimla, H.P. India.

Name Of Institute Working In– “Department of Nursing Foundation, M.M. College of Nursing, Maharshi Markandeshwar (Deemed To Be University), Mullana- Ambala, Haryana, India 133207.

²Associate Professor, Department of Medical Surgical Nursing, Shimla Nursing College, Shurala, Shimla, H.P. India.

³Associate Professor, Department of Mental Health Nursing, Shimla Nursing College Shurala, Shimla, H.P. India.

Background of study: Electrocardiography is termed as the non-invasive diagnostic test in cardiology used to record electrical changes in the heart and it helps in the diagnosis and management of patients suffering with cardiac disorders. An electrocardiogram interprets the series of waves that relate to the electrical impulses which occur during each beat of the heart. Cardiovascular diseases are the commonest cause of death globally and they cause approximately 12 million deaths annually. Developing countries account for 80% of the burden. ECG was introduced by William Einthoven in 1901. In 1924 Einthoven received the Nobel Prize for his life's work in developing the ECG. As per clinical experience researcher found that cardiac diseases are the most common problem identified in the hospital. If they cannot be identified earlier, they may cause serious illness or even death. Therefore, for early identification of cardiac disease electrocardiography interpretation should be done. Nursing officers play a key role in the identification of changes in heart rhythms by performing an ECG. It must be necessary that they should have knowledge regarding electrocardiography interpretation. That's why researcher conducted the study on nursing officers to improve their knowledge related to

electrocardiography interpretation.

Objective/Aim: The aim of the study was to assess the knowledge regarding electrocardiography interpretation among nursing officers.

Design: Quasi-experimental one group pre-test and post-test design

Setting: Selected Areas of Indira Gandhi Medical College and Hospital Shimla **Participants:** 80 nursing officers.

Methods: Quantitative research approach with Purposive sampling technique was used in the study.

The data collected through self- The structured knowledge questionnaire.

Result: The findings of the study revealed that mean post-test knowledge score 40.6 with standard deviation 3.693 was Statistically significantly higher than the mean pre-test knowledge score 28.3 with standard deviation 5.291 as evident by paired ‘t’ test 24.583 (p value- < 0.001*) at 0.05 level of significance among nursing officers. It showed that the informational booklet was effective in increasing knowledge of the nursing officers.

Conclusion: The study findings revealed that an informational booklet was highly effective to enhance the knowledge regarding electrocardiography interpretation among nursing officers.

Key Words: Assess; Effectiveness; Informational Booklet; Knowledge; Electrocardiography interpretation; Nursing Officers

DOI Number: 10.48047/nq.2023.21.7.nq23076
882

NeuroQuantology 2023;21(7):875-

What is already known?

Nursing Officer are the major part of health care.
They needed to have knowledge related to electrocardiography.

What this paper adds?

Assessed the previous knowledge of Nursing Officers related to electrocardiography.
Informational booklet provided to enhance the knowledge level of Nursing Officer.

BACKGROUND OF THE STUDY

Abbreviations: CVDs: Cardiovascular diseases; American heart association (AHA) ; Sudden Cardiac Arrest (SCA);

ECG: Electrocardiogram; Coronary Heart Disease (CAD); Exercise Stress Test (EST).

INTRODUCTION

The occurrence of Heart disease is 2 to 4 times higher among persons who have Diabetes. As per WHO, Coronary artery disease death rates are 3 times higher than Coronary vascular diseases. The burden of cardiac diseases is around the world is increasing with great pace. The mortality due to cardiac disorders is projected to increase to 23.4 million in 2030.¹ Cardiovascular diseases (CVDs) have now become the leading cause of mortality in India. The Global Burden of Disease study estimated that CVD death rate in India is 272 per 1,00,000 population which is higher than the global average of 235 per 1,00,000 population.² The current status of heart diseases in India is alarming. About 29 seconds, an Indian die with heart problems. As many as 20,000 new heart patients develop every day in India. By 2020, India will have the largest coronary heart disease burden in the world and will account for one third of all deaths; it is estimated that 17.5 million people die each year in India from cardiovascular diseases, amounting to a staggering 31% of all deaths worldwide.³ A recent report in 2010 shows

that 60% of the world’s heart patients are in India. Approximately 60% of all cardiac deaths occur due to arrhythmias leading to Sudden Cardiac Arrest (SCA) in India. As such, nursing staff need to develop their skills and knowledge to care for their client group. Competency in cardiac rhythm monitoring is beneficial to identify changes in cardiac status, assess response to treatment, diagnosis and postsurgical monitoring.⁴ According to the American Heart Association's 2017 heart disease and Stroke Statistics Update, the number of adults living with heart failure increased from about 5.7 million (2009-2012) to about 6.5 million (2011-2014). Globally, 80% of CVD 2 deaths take place in low- and middle-income countries and occur almost equally in males and females.⁵ According to World Health Organization, ischemic heart disease and stroke takes the first position globally among the top 10 causes of death, which accounted for a combined 15 million deaths in the year 2015.⁶ Electrocardiographs detect the electrical signals associated with cardiac activity and produce an ECG, a graphic record of the voltage versus time. They are used to diagnose and

assist in treating some types of heart disease and arrhythmias, determine a patient's response to drug therapy, and reveal trends or changes in heart function.⁷ P waves represent atrial depolarisation. In healthy individuals, there should be a P wave preceding each QRS complex. The PR interval begins at the start of the P wave and ends at the beginning of the Q wave. It represents the time taken for electrical activity to move between the atria and the ventricles. The QRS complex represents depolarisation of the ventricles. It appears as three closely related waves on the ECG (the Q, R and S wave). The ST segment starts at the end of the S wave and ends at the beginning of the T wave. The ST segment is an isoelectric line that represents the time between depolarisation and repolarisation of the ventricles (i.e., ventricular contraction). The T wave represents ventricular repolarisation. It appears as a small wave after the QRS complex. The RR interval begins at the peak of one R wave and ends at the peak of the next R wave. It represents the time between two QRS complexes. The QT interval begins at the start of the QRS complex and finishes at the end of the T wave. It represents the time taken for the ventricles to depolarise and then repolarise.⁸ Normally ECG can be performed by three different types. In resting ECG patient may lie down. No movement is allowed during the test, as electrical impulses generated by other muscles may interfere with those generated by your heart. This type of ECG usually takes 5 to 10 minutes. If patient have an ambulatory or Holter ECG patient wear a portable recording device for at least 24 hours. Patient are free to move around normally while the monitor is attached. This type of ECG is used for people whose symptoms are intermittent (stop-start) and may not show up on a resting ECG, and for people recovering from heart attack to ensure that their heart is functioning properly. Patient can record their symptoms in a diary, and note when they occur so that their own experience can be compared with the ECG. Exercise stress test (EST) is used to record patient ECG while patient ride on an exercise bike or walk on a treadmill. This type of ECG takes about 15 to 30 minutes to complete.⁹

NEED OF THE STUDY

The educated and qualified nursing officers play an important role in identifying the occurrence of arrhythmias in patient. Difficulties in interpreting the ECG of the patients with cardiac problems may delay the treatment and affects their prognosis. American heart association (AHA) reveals that there is a prevalence of 11.5% of American adults (27.6 million) been diagnosed with heart disease and mortality is increasing every year since 1919. Coronary artery disease is accounted for more deaths than any other major cause of death in the United States. Among Indian women, Coronary Heart Disease continues to be a major public health problem that represents a leading cause of death and disability. Also, the presence of diabetes, hypertension, high levels of total cholesterol, and low levels of high-density lipoprotein, low-density lipoprotein and triglycerides all are correlated with Coronary Heart Disease (CAD).¹⁰ By going through all the review of literature related to knowledge regarding electrocardiography interpretation it was identified that cardiac diseases are the most common problem identified in the Hospital. If they cannot be identified earlier, they may cause serious illness or even death. Therefore, for early identification of cardiac disease through electrocardiography interpretation should be done. Nursing officers plays a key role in the identification of changes in heart rhythms by performing an ECG. It must be necessary that they should have knowledge regarding electrocardiography interpretation That's why researcher want to conduct the study on nursing officers to improve the knowledge related to electrocardiography interpretation.

REVIEW OF LITERATURE

Sasikala, A, Latha Venkateasn, Sasikala. D (2022), conducted a descriptive study to assess the knowledge and practice on ECG skills among Emergency Nurses at Selected Hospital, Chennai. The main aim of the study was to examine the emergency nurse's knowledge and practice about ECG skills. Research design used for the study was descriptive correlative design. The study sample was 30 nurses selected through purposive sampling technique. The data was collected through self- structured knowledge questionnaire and observation checklist. The study

results revealed that more than half of nurses had moderately adequate knowledge score (53.3%) and (46.6%) of nurses have inadequate knowledge score regarding ECG. Majority of nurses (70%) had average practice scores and (30%) poor practice scores regarding ECG. The study concluded that the majority of the nurses having moderately adequate knowledge regarding ECG and majority of nurses had average practice score regarding ECG.

RESEARCH METHDOLOGY

RESEARCH APPROACH

Quantitative Research Approach was used for this study.

RESEARCH DESIGN

The research design selected for the study was Quasi-experimental (one group pre-test post-test design).

RESEARCH SETTING

Indira Gandhi Medical College & Hospital Shimla, Himachal Pradesh

STUDY POPULATION

TARGET POPULATION: The target population of the study was nursing officers working in Indira Gandhi Medical College & Hospital, Shimla.

ACCESSIBLE POPULATION: The accessible population was nursing officers of selected areas of Indira Gandhi Medical College & Hospital, Shimla.

SAMPLE SIZE

The sample size was 80 Nursing officers. The sample size was calculated by Yamane formula.

SAMPLING TECHNIQUE

Non- probability Purposive sampling technique.

INTERVENTIONAL PROTOCOL

Information

Booklet.

RESULTS

N=80

S.No.	Demographic Variables	Frequency (f)	Percentage (%)
1.	Duration of Clinical Experience		
a)	< 1 years	6	7.5%
b)	1-3 years	23	28.8%
c)	4-6 years	19	23.8%
d)	7-9 years	6	7.5%
e)	10-12 years	6	7.5%
f)	>12 years	20	25.0%
2.	Type of job		
a)	Regular	39	48.8%
b)	Contract	33	41.3%
c)	Outsource	8	10.0%
3.	Area of Working		
a)	Female Surgical Ward	9	11.3%
b)	Male Surgical Ward	10	12.5%
c)	Emergency and Trauma Ward	14	17.5%

d)	Medicine and Respiratory ICU	14	17.5%
e)	Cardiology Ward	5	6.3%
f)	Cardiac Care unit	8	10.0%
g)	Medical Ward	20	25.0%
4.	Previous Knowledge		
a)	Yes	77	96.3%
b)	No	3	3.8%
5.	Source of information		
a)	Mass Media	12	15.0%
b)	Education/Training	37	46.3%
c)	Books	27	33.8%
d)	Others	4	5.0%
6.	Training		
a)	Yes	8	10.0%
b)	No	42	90.0%

Table 1. Depicts Frequency and percentage distribution among nursing officers based on demographic variables such as Duration of clinical experience, Area of working, Previous knowledge, source of information, training regarding electrocardiography interpretation

N= 80

S. N O.	Level of knowledge	Range of knowledge	Pre-Test knowledge score		Post-test knowledge score	
			Frequency (f)	Percent (%)	Frequency (f)	Percent (%)
1.	Fair Knowledge	0-16	1	1.3%	0	0%
2.	Good Knowledge	17-33	62	77.5%	2	2.5%
3.	Very Good Knowledge	34-50	17	21.3%	78	97.5%

Maximum Score=50

Minimum score=0

Table2. Depicts Frequency and Percentage distribution of assessment of Pre-test and Post-test knowledge scores.

N=80

Group	Pre-test Knowledge scores		Post-test Knowledge scores		Mean Difference	df	Paired ‘t’ test		
	Mean	S.D.	Mean	S.D.			‘t’ test	T value	p-value
Research group	28.83	5.29	40.6	3.69	11.770	79	24.583	1.99	<0.001*

*Significant, ^{NS}Non-Significant

*Significant at 0.05 level

Table 3. Showed the Comparison of Pre-test and post- test Knowledge scores to regarding Electrocardiography Interpretation among nursing officers by using paired ‘t’ test.

N=80

S.No.	Variables	Very good knowledge	Good knowledge	Fair knowledge	df	χ ²	T value	P value
a)	20-25 years	6	2	0	4	18.462	0.488	0.001*
b)	>25-30 years	32	0	0				
c)	>30-35 years	27	0	0				
d)	>35-40 years	10	0	0				
e)	>40-45 years	3	0	0				
2. Religion								
a)	Hindu	74	2	0	2	0.108	5.991	0.108 ^{NS}
b)	Muslim	0	0	0				

c)	Christian	2	0	0				
d)	Sikh	2	0	0				
e)	Others	0	0	0				
3.	Residential Area							
a)	Urban	52	2	0	2	0.988	5.991	0.988 ^{NS}
b)	Semi-Urban	14	0	0				
c)	Rural	12	0	0				
4.	Marital Status							
a)	Married	56	1	0	2	0.533	5.991	0.766 ^{NS}
b)	Unmarried	21	1	0				
c)	Divorced	0	0	0				
d)	Widow	1	0	0				
5.	Professional Qualification							
a)	G.N.M.	43	0	0	5	9.670	7.815	0.022 [*]
b)	B.Sc. Nursing	22	0	0				
c)	Post B.Sc.Nursing	12	2	0				
d)	M.Sc. Nursing	1	0	0				
e)	Others	0	0	0				
Contd.								N=80

S.No.	Variables	Very good knowledge	Good knowledge	Fair knowledge	df	χ^2	T value	P value
6.	Duration of clinical experience							
a)	<1 year	5	1	0	5	6.570	11.070	0.255 ^{NS}
b)	1-3 year	22	1	0				
c)	4-6 year	19	0	0				
d)	7-9 year	6	0	0				
e)	10-12 year	6	0	0				
f)	>12 year	20	0	0				
7.	Type of Job							
a)	Regular	39	0	0	2	4.320	5.991	0.115 ^{NS}
b)	Contract	32	1	0				

c)	Outsource	7	1	0				
8.	Area of Working							
a)	Female Surgical Ward	9	0	0	6	6.154	12.592	0.406 ^{NS}
b)	Male Surgical Ward	10	0	0				
c)	Emergency and Trauma Ward	14	0	0				
d)	Medicine and Respiratory ICU	14	0	0				
e)	Cardiology Ward	5	0	0				
f)	Cardiac Care Unit	8	0	0				
g)	Medical Ward	18	2	0				
9.	Previous Knowledge							
a)	Yes	75	2	0	1	0.080	3.841	0.777 ^{NS}
b)	No	3	0	0				
10.	Source Of Information							
a)	Mass Media	11	1	0	3	11.624	7.815	0.009*
b)	Education/Training	37	0	0				
c)	Books	27	0	0				
d)	Others	3	1	0				
11.	Training							
a)	Yes	7	1	0	1	3.647	3.841	0.056*
b)	No	71	1	0				

*Significant, NS- Non-Significant

* Significant at 0.05 level

Table 4. Showed the Association of Post-test Knowledge scores regarding electrocardiography interpretation among nursing officers with selected demographic variables was using chi square test.

DISCUSSION:

The collected data was analysed by using descriptive and inferential statistics. In pre-test, majority of nursing officers i.e., 62 (77.5%) had good knowledge, followed by 17(21.3%) of nursing officers had very good knowledge, least of 1(1.3%) of nursing officers had fair knowledge. Whereas in officers post-test majority of nursing i.e., 78 (97.5%) had very good knowledge, 2(2.5%) had good knowledge, none of nursing officer had fair knowledge. Overall mean pre-test

knowledge score was 28.83 and standard deviation was 5.291, whereas mean post-test knowledge scores was 40.60 and standard deviation was 3.693. The result had shown that pre-test knowledge score as evident from paired-t test 24.583 at 0.05 level of significance. It showed that an informational booklet was found effective to enhance knowledge regarding electrocardiography interpretation among nursing officers.

LIMITATIONS:

The research group was only limited to nursing officers of selected areas.

Study was limited to a fixed sample and it cannot be generalized to all.

CONCLUSION:

Electrocardiography is a common invasive procedure performed in hospital. The present study was to assess the effectiveness of an informational booklet on knowledge regarding electrocardiography interpretation among nursing officers working in selected areas of Indira Gandhi Medical College & Hospital, Shimla, Himachal Pradesh. The results of the present study showed that an informational booklet was found effective in improving the knowledge of nursing officers.

CONFLICT OF INTEREST: There are no conflict of interest

FUNDING SOURCE: None

REFERENCES

1. Pareek S, Kaushik NK (2018) Implementation and Outcomes of Cardiac Rehabilitation Educational Package: A Tertiary Center Study. *Int J Nur Edu Res* 6(4): 401-403.
2. Leanne A, Brannigan D (2003) Cardiac Monitors - friends or foe. *Nur Times* 4(5): 25-26.
3. Funket M (2010) Deficiencies in nurses 'knowledge and substandard practice related to ECG monitoring. *European J Cardio Nur* 12(9): 12-15 (2002) Together for health, Publication assessment global health, Switzerland.
4. Basanshrieh D, Iawim R, Chetia P. A Study To Assess The Knowledge And Practice Regarding Interpretation Of Electrocardiogram (ECG) among nurses working in cardiac care unit (CCU) in selected hospitals, Guwahati, Assam. 2019; 10:4
5. *Electrocardiograph.pdf* [Internet]. Available from: https://www.who.int/medical_devices/innovation/electrocardiograph.pdf.
6. Updated DLP. 1 - Understanding an ECG | ECG Interpretation | Geeky Medics [Internet]. Available from:

- <https://geekymedics.com/understandinganecg/>
7. ECG test - Better Health Channel [Internet]. Available from: <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/ecg-test>
8. Philip NG, Chauhan K. A Study To Assess The Knowledge Regarding Ecg Interpretation During Cardiac Emergencies Among The Staff Nurses Of Selected Cardiac Hospitals Of Bathinda In Punjab. *Res Reserv.* 2020 Jun 25;6(1):39–45.
9. Sasikala. A, Venkatesan L, D S. A Descriptive Study to Assess the Knowledge and Practice on ECG Skills among Emergency Nurses at Selected Hospitals, Chennai. *International Journal of Nursing* 882 Education and Research.