Evaluation of Nurses Knowledge and Practical of Electrocardiogram Toward Adolescent Patient

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Abstract: *Electrocardiography is the measurement of electrical activity in the heart.*
Amis of Study.1)*To identify   nurses' knowledge of ECG, 2).To evaluate nurses' practices concerning ECG, 3)To find out the relationship between nurses' socio-demographic characteristic of age ,gender , level of education, level of their knowledge and practices related to ECG,*

Methodology: *A descriptive study (cross-sectional design) had been done on nurses knowledge and practices with ECG toward Adolescent Patent study was carried out during the period from the 1st of November , 2014 to 1st of January , A random sample comprised of (102) nurses was worked in CCU,ICU, Emergency Unit , divided into four groups , first study group consisted of (30) nurses at Hospital of Heart Center, second group of (30) at AL Hussein Teaching Hospital , third group of (17) at AL Suq Hospital and the 4th group including (25) nurses at AL Shatra a Hospital . exposed to questionnaire of(30) items this study in Thi are Al Nasiriyah – IRAK.*

The selection of present sample based on special criteria which include;   discriminating between the levels of practical and knowledge of those who came from preparatory schools and institutes and colleges and training courses in electrocardiography   such as   preparation the ECG machine; Location limb leads and pericardial electrodes placement.   For the purpose of data analysis   and nursing interventions during the ECG application, and identification of any change in ECG related to procedure error .It was consisted of two parts: Self-administered questionnaire sheet related to demographic characteristics of the nurses, and observational checklist for nurses' practice regarding   (ECG implementation, nursing intervention) .

Reliability of the questionnaire is determined through a pilot study and the validity through a panel of (5) experts.

The data were described statistically and analyzed through the use of the descriptive and inferential statistical analysis procedures

The findings of the present study indicate that the Electrocardiogram Toward Adolescent Patent   affect the knowledge and practices domains. The maximal effect presented by the Demographic data in Levels of education, followed knowledge items failure   In case of ventricle fibrillation with T & P, followed practices maximal failure to hand lead that should be applied a little above, the left hand item .

Result: *►The study shows that the percentage of successful Knowledge about electrocardiogram is 74.5 %, While the proportion of failures 25.5%.*

►For the practical part of questionnaire the number of successful was 93.1%. While the proportion of failures 6.9%.)►There is no significant association of knowledge and Practices with demographic data.

Recommendation: *The involvement of nurses in intensive training courses under the supervision of specialized staff, training courses to staff outside.*

Keywords: *Electrocardiography, Adolescents, Nurses Knowledge and Practical Descriptive study, Cross-sectional design, Data collection.*

I.   Introduction

Electrocardiography (ECG or EKG from Greek: kardia, meaning heart)   is a transthoracic (across the thorax or chest) interpretation of the electrical activity of the heart over a period of time, as detected by electrodes attached to the surface of the skin and recorded by a device external to the body, (2) Electrocardiography is the measurement of electrical activity in the heart (using an electrocardiograph, e.g. cardiac monitor, ECG machine) and recording it as a visual trace, either on paper or on an oscilloscope screen, by placing electrodes on the skin (1,2). . As a first line diagnostic tool, health care providers at different levels of training and expertise frequently find it imperative to have the ability to interpret electrocardiograms; however, a high rate of misinterpretation has been noted among non-specialized physicians especially among trainees.(2,4)ECG monitoring must be meticulously undertaken. Potential consequences of poor technique include misinterpretation of cardiac arrhythmias, mistaken diagnosis, wasted investigations and mismanagement of the patient (10,8).

Table (1): Summary Statistics of Frequencies, Percentage, and Cumulative Percentage of Nurses' Demographic Data

Demographic Data	Rating And Intervals	Frequency	Percent	Cumulative Percent
Age / years	<= 20	4	3.9	3.9
	21 - 27	55	53.9	57.8
	28 - 34	34	33.3	91.2
	35 - 41	6	5.9	97.1
	42+	3	2.9	100
Sex	Male	45	44.1	44.1
	Female	57	55.9	100
Levels of education	Nursing course	4	3.9	3.9
	Secondary nursing school	37	36.3	40.2
	Institute	40	39.2	79.4
	College of nursing	21	20.6	100
Years of experience	1-4	45	44.1	44.1
	5-9	38	37.3	81.4
	10-14	13	12.7	94.1
	15-19	3	2.9	97.1
	20+	3	2.9	100
Training sessions	Yes	78	76.5	76.5
	No	24	23.5	100
Location of the training sessions	Inside of Iraq	62	60.8	60.8
	Outside of Iraq	16	15.7	76.5
	No training sessions	24	23.5	100
Duration of the training sessions	No training sessions	24	23.5	23.5
	1 week	62	60.8	84.3
	2 weeks	16	15.7	100.0
Residence	Rural	49	48	48
	Urban	53	52	100
Learning Methods	Books And Journals	7	6.9	6.9
	Internet	46	45.1	52
	Interview	23	22.5	74.5
	Physicians Communication	9	8.8	83.3
	No Body	17	16.7	100

Table (2) Distribution of the study sample by their responses to the knowledge items

Items of knowledge	rating	Frequency	Percent	Cumulative Percent	m.s	Assessment
The p wave represents the activity of the left atrium	I Don't Know	7	6.9	6.9	2.8	Pass
	Not Sure	3	2.9	9.8		
	Know	92	90.2	100		
QRS complex represents a contraction of the ventricles.	I Don't Know	25	24.5	24.5	2.3	Pass
	Not Sure	19	18.6	43.1		
	Know	58	56.9	100		
T wave represents the period of relaxation of atria	I Don't Know	31	30.4	30.4	2.1	Pass
	Not Sure	26	25.5	55.9		
	Know	45	44.1	100		
The period from the end of T wave to the beginning of P wave in the following period a period of relaxation	I Don't Know	32	31.4	31.4	2.1	Pass
	Not Sure	28	27.5	58.8		
	Know	42	41.2	100		
In the case of convergence of QRS waves, it means slow heart beat	I Don't Know	32	31.4	31.4	2.1	Pass
	Not Sure	27	26.5	57.8		
	Know	43	42.2	100		
V wave is one of the ECG	I Don't Know	36	35.3	35.3	2.0	Pass
	Not Sure	25	24.5	59.8		
	Know	41	40.2	100		

ECG can detects cardiac hypertrophy	I Don't Know	37	36.3	36.3	2.0	**Pass**
	Not Sure	26	25.5	61.8		
	Know	39	38.2	100		
The period of the end of T wave to the beginning of B wave in the following cycle is the depolarization of the heart muscle	I Don't Know	41	40.2	40.2	2.0	**Pass**
	Not Sure	19	18.6	58.8		
	Know	42	41.2	100		
Any changes in the ECG can indicate the presence of myocardial infarction , old or new	I Don't Know	42	41.2	41.2	1.9	**Failure**
	Not Sure	17	16.7	57.8		
	Know	43	42.2	100		
Pregnancy may lead to little changes in the results of ECG	I Don't Know	38	37.3	37.3	2.2	**Pass**
	Not Sure	29	28.4	65.7		
	Know	35	34.3	100		
The ECG can not measure the power of heart pumping so that Echocardiogram is used	I Don't Know	32	31.4	31.4	2.1	**Pass**
	Not Sure	17	16.7	48		
	Know	53	52	100		
T long wave is and QRS wide wave seen in case of hypokalimia	I Don't Know	30	29.4	29.4	2.0	**Pass**
	Not Sure	28	27.5	56.9		
	Know	44	43.1	100		
ECG helps in the diagnosis of abnormal rhythm (abnormal rhythms) of the pulse resulting from tissue damage carrying electrical signal	I Don't Know	34	33.3	33.3	1.9	**Failure**
	Not Sure	25	24.5	57.8		
	Know	43	42.2	100		
In case of ventricle vibration , the period of T & P appear distorted and convergent	I Don't Know	32	31.4	31.4	1.9	**Failure**
	Not Sure	42	41.2	72.5		
	Know	28	27.5	100		
T wave is one of the positive waves in ECG	I Don't Know	34	33.3	33.3	1.9	**Failure**
	Not Sure	38	37.3	70.6		
	Know	30	29.4	100		

As shown in table, the mean for Frequencies, Percentage, and Cumulative Percentage of Nurses' Demographic Data, most item it is pass

Table (3): Summary Statistics: frequencies, Percents, Mean of score, and evaluation for practices Components to nurses'

| Practice	Rating	Frequency	Percent	Cumulative Percent	m.s.	Evaluation
After the patient's lying for ten minutes , the ECG examination takes place	i don't know	36	35.3	35.3	2.0	pass
	not sure	26	25.5	60.8		
	know	40	39.2	100		
Gel should be applied below the lead at connecting	i don't know	46	45.1	45.1	1.8	failure
	not sure	21	20.6	65.7		
	know	35	34.3	100		
Using the tip as an indication for applying the chest leads	i don't know	47	46.1	46.1	1.9	failure
	not sure	19	18.6	64.7		
	know	36	35.3	100		
When applying the (V6) the hand should move to the side a little	i don't know	46	45.1	45.1	1.7	Failure
	not sure	24	23.5	68.6		
	know	32	31.4	100		
The (V6) lead should be a little higher than the level of the fifth lead	i don't know	33	32.4	32.4	2.6	pass
	not sure	30	29.4	61.8		
	know	39	38.2	100		
The VI and V2 should be away from the sternum	i don't know	36	35.3	35.3	2.1	pass
	not sure	29	28.4	63.7		
	know	37	36.3	100		
Lead V1 placed to the right side of the second and third ribs.	i don't know	23	22.5	22.5	2.3	pass
	not sure	20	19.6	42.2		
	know	59	57.8	100		
V3 should be placed a little below V2 and at the same vertical level	i don't know	28	27.5	27.5	2.2	pass
	not sure	22	21.6	49		
	know	52	51	100		

It is not necessary to take the patient's name & sex and the date of examination	i don't know	55	53.9	53.9	1.7	failure
	not sure	23	22.5	76.5		
	know	24	23.5	100		
the patient's body should not have any electrical device or metal pieces.	i don't know	37	36.3	36.3	2.5	pass
	not sure	23	22.5	58.8		
	know	42	41.2	100		
In case that the patient's heart is on the right side of the chest, the leads of chest should be changed	i don't know	36	35.3	35.3	2.1	pass
	not sure	19	18.6	53.9		
	know	47	46.1	100		
Asking the patient about the drugs he takes before the examination takes place	i don't know	37	36.3	36.3	2.1	pass
	not sure	32	31.4	67.6		
	know	33	32.4	100		
In case there is an amputation in the right hand, the lead should be applied a little above, the left hand remains in its place	i don't know	24	23.5	23.5	1.9	failure
	not sure	31	30.4	53.9		
	know	47	46.1	100		
It is possible to put the leads of the hands on the shoulders and those of the arms near pelvic	i don't know	41	40.2	40.2	2.2	pass
	not sure	27	26.5	66.7		
	know	34	33.3	100		
when connecting the leads of the hand . lipid layers of skin should be avoided.	i don't know	41	40.2	40.2	1.9	failure
	not sure	31	30.4	70.6		
	know	30	29.4	100		

As shown in table, the mean for most items it is failure of nursing practice .

Table (4): distribution of the study sample by their overall knowledge and practice

Main domains	Rating	Frequency	Percent	Cumulative Percent
Knowledge	Pass	76	74.5	74.5
	failure	26	25.5	100
Practice	failure	7	6.9	6.9
	Pass	95	93.1	100
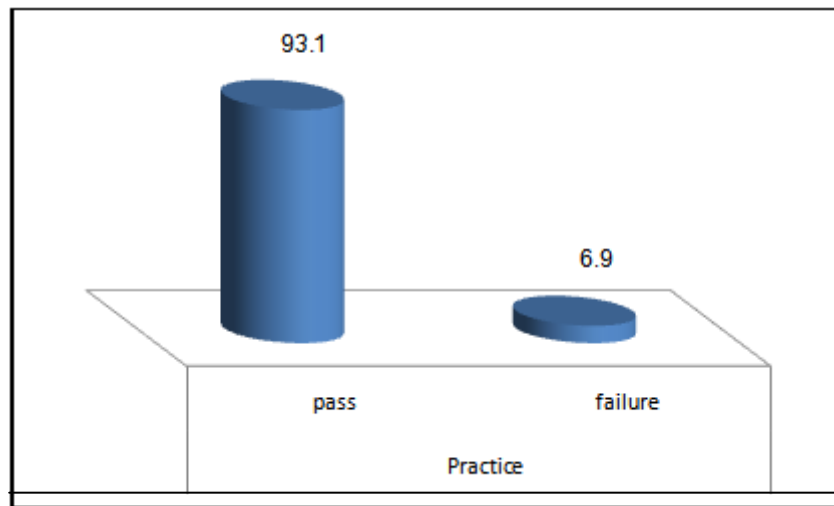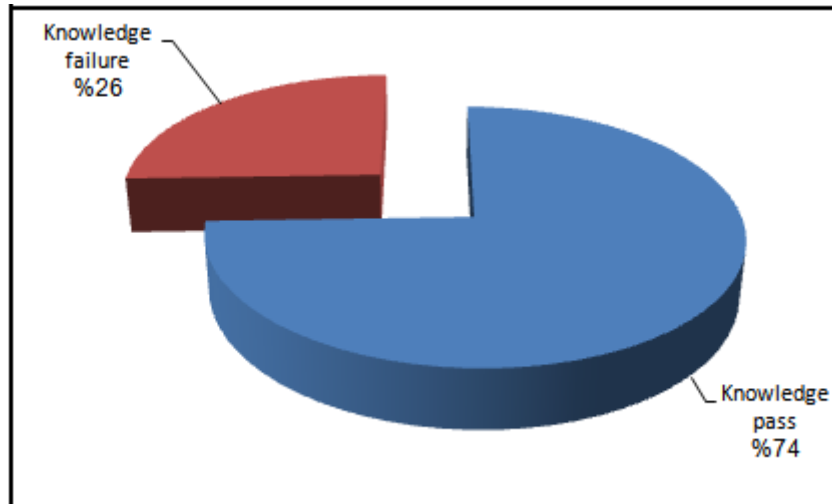
Figure(-1-) of overall knowledge and practice.

As shown in table and figure of overall knowledge and practice

Knowledge 26% failure 74% pass, about practice 6.9 it is failure and 93% it is pass.

Table (5) relationship between nurses knowledge and their demographic data

Demographic data	Rating	knowledge		Chi	d.f.	P(value)
		pass	failure			
Age / years	<= 20	4	0	4.310	4	0.366 N.S
	21 - 27	41	14			
	28 - 34	25	9			
	35 - 41	3	3			
Sex	male	35	10	0.453	1	0.501 N.S
	female	41	16			
Levels of education	Nursing courses	2	2	2.784	3	0.426 N.S
	Secondary nursing school	27	10			
	institute	29	11			
	College of nursing	18	3			
Years of experience	1-4	35	10	5.583	4	0.233 N.S
	5-9	24	14			
	10-14	11	2			
	15-19	3	0			
	20+	3	0			
Training sessions	yes	53	25	7.514	1	0.006 H.S
	no	23	1			
Location of the training sessions	inside	40	22	9.389	2	0.009 H.S
	outside	13	3			
Duration of the training sessions	no	23	1	9.389	2	0.009 H.S
	1 week	40	22			
	2 weeks	13	3			
Residence	rural	38	11	0.459	1	0.498 N.S
	urban	38	15			
Learning methods	books and journals	6	1	2.379	4	0.667 N.S
	internet	34	12			
	interview	18	5			
	physicians communication	5	4			
	no body	13	4			

N.S=More than 0.05

H.S=Less than 0.01

S. Less than 0.05

As shown in table nurses knowledge and their demographic data most result no significant

Table (6) relationship between nurses practice and their demographic data

Demographic	Rating	Overall practice		Chi	d.f	p.(value) level of significant
		failure	pass			
age / years	<= 20	0	4	7.940	4	0.094 N.S
	21 – 27	6	49			
	28 – 34	0	34			
	35 – 41	0	6			
	42+	1	2			
Sex	Male	1	44	2.713	1	0.1 N.S
	Female	6	51			
Education levels	Nursing courses	0	4	.834	3	0.841 N.S
	Secondary nursing school	3	34			
	Institute	2	38			
	College of nursing	2	19			
Years of experience	1-4	1	44	5.838	4	0.212 N.S
	5-9	4	34			
	10-14	1	12			
	15-19	0	3			
	20+	1	2			
Training sessions	Yes	4	74	1.560	1	0.212 N.S
	No	3	21			
Place of the training	Inside	4	58	2.389	2	0.303 N.S
	Outside	0	16			
	No training	3	21			
Duration	Monthly	3	21	2.389	2	0.303 N.S
	1 week	4	58			
	2 weeks	0	16			
Residence	Rural	4	45	.250	1	0.617 N.S
	Urban	3	50			
Learning methods	books and journals	0	7	1.265a	4	0.867 N.S
	Internet	4	42			
	Interview	1	22			
	physicians communication	1	8			
	no thing	1	16			

N.S=More than 0.05
H.S=Less than 0.01
S. Less than 0.05

As shown in table nurses practice and their demographic data most result no significant.

II.   Discussion of Result

Table 1 . (Demographic information)

Showed the highest percent in age .group (21 -27yrs.) while sex ,female represent 57% and this reflect their interest and familial Acceptance of this Job particularly after changing of political regimen on 2003 .(5,4)

Regarding learning and educational level .nursing institute graduation was the highest percentage .while Esperance was about 78% those who have training courses in Iraq for short period (1 -2 week) , the main source of their information was internet access rather than textbooks or medical discussions.(6,9)

Table 2 regarding nurses knowledge who working in CCU in major hospitals ,we see most nurses pass the question regarding knowledge Except question concerning ,ECG changes regarding new and old myocardial infarction . also we see failure in question regarding ECG rhythm changes , because the nurses have no enough information about rhythm changes in ECG also we see failure in question related to T wave in ECG recording

Table 3 (nursing practice in CCU)

We see failure in some items like gel application ,tips of chest leads like V6 . also we see failure even in collection of information regarding identity (like name , sex date of test). Also we see failure in ECG recording in those who have physical disability like limb amputation also we see failure in leads connection before ECG recording . other item in this domain had been passed successfully by nurse . in addition we see

some neglect ion in gel application and sometime they use water which may affect ECG Result . also we see poor practice with V6 lead application in it is right site.(7,8,9)

Table 4 overall knowledge and practice

In this table we see 25% failure rate regarding knowledge while 74 % have successful rate. While practice we have 95% have successful rate and 7% failure.(2,6)

Table 5 Comparism between nurse knowledge and Demographic information . in this table we see most result was no significant with P> 0.05 (6,9) .

But training show high significant and this is Explained by training courses was of great importance in improving educational level for nurses who working in CCU .

In spite of little no. of training courses while other item in this table have no significance like Age , sex and years of Experience .also we see no significant for residence ,rural or urban on the learning level (1)

Conclusion and Recommendation

1) The study shows that the percentage of successful Knowledge about electrocardiogram is 74.5 %, with 25.5%. failure rate
2) For the practical part of questionnaire the percent of success was 93.1%. While 6.9%. failure rate
3) There is no significant association of knowledge and Practices with demographic data.

III. Recommendation

1) The involvement of nurses in intensive training courses under the supervision of qualified well trained staff
2) Training courses for nurses abroad for knowledge and practice exchange

More detailed lectures about ECG in nursing schools

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