

Effectiveness of an Education Program Concerning Cardiotocography on Nurse- Midwife's knowledge in Maternity Hospitals at Baghdad City

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Abstract:

Background: Cardiotocography (CTG) is a complex technology applied for surveillance of the fetus during pregnancy, labour and delivery. The fetal heart rate and the frequency of the uterine contractions can be continuously monitored and both are recorded in a continuous tracing on paper

Objectives: The aim of this study is to identify the effectiveness program concerning Cardiotocography on nurses- midwives knowledge .

Methodology: Aquasi-experimental design (pretest- post test approach) was conducted at three sector Al-Russafa directorate, AL- Karckh directorate and Medical City Directorate from the period of March, 26th 2014 to August, 30th 2015. sample were selected and divided into two groups (65) nurses-midwives (case group) who exposed to the educational program and (65) nurses-midwives who didn't expose to the program considered as control group . Designed to form questionnaire two part s include demographic characteristics, nurses and midwives knowledge concerning Cardiotocography

Result: Results of the study indicate that the highest percentage (21.6%) of nurses - midwives in the study group were (25-29) years old were graduated from nurses-miwives - school. Have experience (1-5) years . there were low Means in pre-test concerning knowledge CTG. While there were high mean scores in post test after the implementation of the instructional program with high statistical significant.

Recommendation: It was recommended in-services training program should be applied for nurses- midwives at the maternity hospital . Manual containing the basic needed information about important CTG, as well as how to counsel and teach nurses-midwives &PHC centers standardized protocols for Procedure involved emergency obstetric including CTG

Keywords: Nonstress test, External fetal monitoring, knowledge, CTG, uterine contraction.

I. Introduction

Cardiotocography is one of the most widely used technique for recording changes in fetal heart rate (FHR) and uterine contractions. Assessing cardiotocography is crucial in that it leads to identifying fetuses which suffer from hypoxia. This situation is defined as fetal distress and requires fetal intervention in order to prevent fetus death or other neurological disease caused by hypoxia ⁽¹⁾. EFM is a technique for fetal assessment based on the fact that the FHR reflect fetal oxygenation ⁽²⁾.

The NST can be performed by CTG easily procedure non invasive painless procedure, to perform and interpret relatively inexpensive, and has no known contraindication more than 85% of laboring women in the united states are monitored electronically by CTG for at least part of the labor ⁽³⁾.

The potential clinical value for a further reduction in perinatal morbidity and mortality is present in the antenatal period. With advancements in science and technology, medical research promises to elucidate information regarding developmental changes during this important antenatal period. Thus, fetal death remains a potentially preventable condition that has major personal, social and financial implications for both families and the broader community. Is the most common obstetric procedure in the United States. As of 2002, 85% of approximately 4 million live births were evaluated with electronic fetal monitoring. Despite this widespread use, there has been no decrease in neonatal cerebral palsy and neurologic injury ⁽⁴⁾

The main aim of recording the fetal heart rate (FHR) by CTG is to detect any changes might occur that put the fetus at risk of death or damage due to lack oxygen . Despite initial optimism that the CTG would prevent intrapartum fetal death and reduce long-term neurological handicap that promise has been difficult to realize. repeated randomized trials have shown that use of the CTG was associated with an increase in rates of both operative vaginal delivery and caesarean section, especially for deliveries where presumed 'fetal distress' was the indication. The benefit appears to be a reduction in neonatal seizures ⁽⁴⁾.

(NST) The test is described as reactive (Normal) if there are two fetal movements in 20 min with accelerations of the fetal heart rate of at least 15 bpm for at least 15 seconds. The test is described as nonreactive

in the absence of fetal movement or accelerations of the fetal heart rate. However, a reactive NST is reassuring⁽⁵⁾

Pierrat et al reported prevalence of birth asphyxia to be 0.86 per 1000 term live births. Nonstress test is a method of screening that is employed in pregnancy with the intention of identifying fetus at a danger of getting hypoxia, data obtained from observational researches offered the perception that cardiotocography might be an asset in checking initial poor fetus results and this point toward the requirement for interventions to assist in improving the opportunities of the survival of fetus who are newly born⁽⁶⁾.

The main objective of CTG is to check if the fetal heartbeats rate are at a regular rate and changeability, addition the evaluation of fetal health is to avoid fetal death and to reduce perinatal mortality. Nevertheless, research has pointed out that the use of CTG test by may result clinicians to make use of inappropriate or unnecessary interventions due to interobserver errors linked with its visual analysis., non-reactive Cardiotocography might be linked with the amplified mortality and fetal morbidity. Computerized system of study has been formed so as to give a more reliable and objective interpretation due to the errors linked with visual interpretation of Cardiotocography results According to Okusanya⁽⁷⁾.

Most clinical agencies require nursing providers to attend continuing education courses or provide evidence of competency in used CTG and management. From a safety perspective, an interprofessional training program would standardize and increase knowledge, skills, and attitudes for use performance, interpretation and management of EFM patterns⁽⁸⁾

Currently the main focus of maternal and fetus health is towards the evaluation of fetal health that is to assess the fetal well being. Because majority 80% of fetal death occur in the antepartum period due to various causes which include chronic fetal hypoxia, intrauterine growth retardation, maternal complications, diabetes mellitus, hypertension, infection and fetal congenital malformation etc⁽⁹⁾.When electronic monitoring is performed (CTG) without appropriate training the results are well known: an increased rate of caesarean sections and increased from avoidable intrapartum asphyxia. The Confidential Enquiry into Stillbirths and Deaths in Infancy .found that the incidence of intrapartum-related deaths has remained constant at about 1 in 1500. In just over half of these better care 'would reasonably be expected to' make a difference to the outcome recommended regular teaching sessions for obstetricians and midwives⁽¹⁰⁾ CTG training programmers increases the level of knowledge, skills, higher inter observer agreement, better management of intrapartum CTG and improved quality of care with Cardiotocography Training Program are conducted worldwide especially in abroad as an in-service or continuing nursing education program, but not much flourished in to empower the nurse and midwife to be competent enough in CTG interpretation. As nursing profession has an array of expanded roles which mainly includes independent nurse practitioner, certified nurse midwife and so on, it is compulsory to have a profound knowledge regarding CTG interpretation⁽¹¹⁾

Objectives of this study:

The objectives of this study are to identify the effectiveness program concerning CTG on nurses- midwives and to find out relationship between their knowledge nurse-midwives and demographic characteristic.

II. Methodology

A quasi-experimental design was carried out throughout the present study with the application of a pre-test and posts –test for their knowledge. nurses- midwives working in the maternity hospital (Fatemia AL-zahra, AL-Elwia , AL- Numan, AL-Karckh, AL-Karama, Imamein kadhimein medical city ,study group and Baghdad teaching hospital,private nursing home AL-Yarmok teaching hospital ,control group). A systematic random sample probability sampling of (130)nurse-midwives were selected the sample is divided into two group(65) Nurse midwives (case group)which exposed to the an education program and (65)nurses-midwives which don't exposed to the program consider the control group.

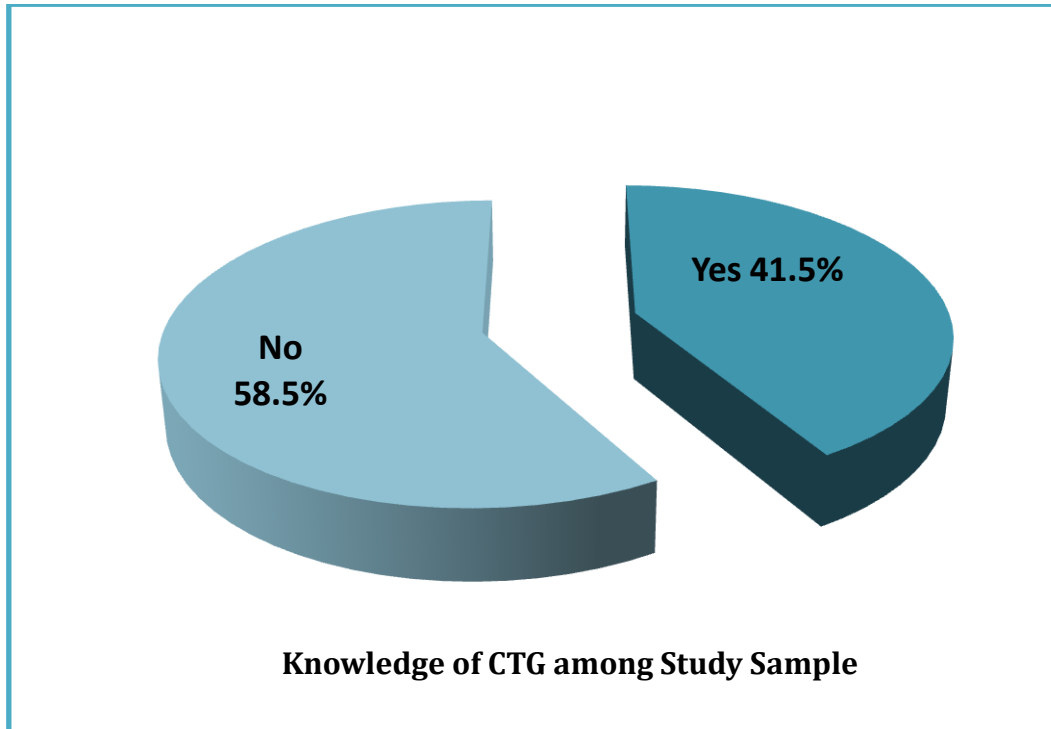
The questionnaire form was consisted of two parts which included nurse- midwives demographic data and the knowledge consisted of 138 questions which response were rating score of the instrument was(3)for agree,(2)uncertain and (1)for don't Agree with cut-off point=2. A pilot study was conducted on (10) nurse-midwives who were randomly choice. The nurses-midwives in the pilot study had same criteria of the original study sample it was conducted at IbnAlbalidy maternity and pediatric hospital the period of 27th August 12th September. the content validity of the program and study instruments were determined through panel of (19) expert. The data has been analyzed through the application of descriptive (frequency, percentage, mean score and relative sufficiency) and inferential (t- test) statistical analysis).

III. Result

Table (1): Distribution of Socio-Demographic Characteristic of Study Sample for both Study & Control Groups.

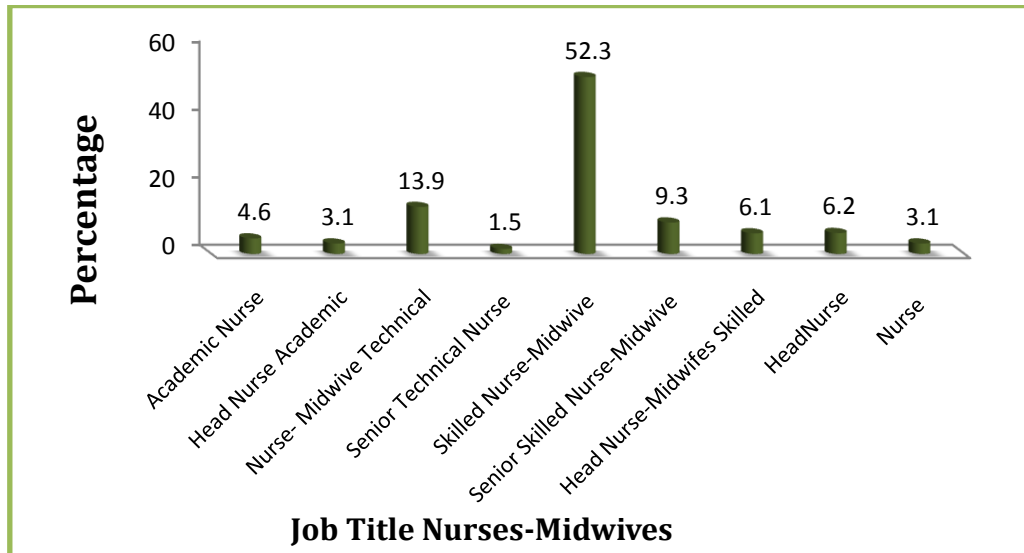
Socio-Demographic Variables	Study group (n=65)		Control group (n=65)		χ^2	df	P-value	C.S.
	No.	%	No.	%				
Age/years					38.92	6	0.33	NS
20-24	12	18.4	16	24.6				
25-29	14	21.6	11	17.0				
30-34	10	15.5	9	13.8				
35-39	12	18.4	6	9.2				
40-44	7	10.6	12	18.5				
45-49	6	9.2	3	4.6				
50 >	4	6.3	8	12.2				
$\bar{x} \pm SD$	33.32 ± 9.01		34.57 ± 11.04					
Level of Education					21.62	4	0.65	NS
Nursing school graduated	5	7.7	9	13.8				
Nursing secondary school	25	38.5	26	40.0				
Midwifery secondary school	20	30.8	17	26.2				
technical medical institute nursing & midwifery	10	15.3	10	15.4				
College of nursing	5	7.7	3	4.6				
Years of Experiences	No.	%	No.	%	8.640	4	0.927	NS
Less than 1 year	7	10.8	8	12.3				
1 – 5 years	27	41.6	29	44.7				
6 - 10 years	12	18.4	8	12.3				
11 -15 years	6	9.2	3	4.5				
16 years and above	13	19.8	17	25.7				
$\bar{x} \pm SD$	8.74 ± 8.57		9.95 ± 10.50					
Nursing Experience / years					31.98	5	0.158	NS
Non	4	6.2	7	10.8				
Less than 1 year	11	16.9	9	13.8				
1-5 years	27	41.5	26	40.0				
6 -10 years	11	20.0	10	15.4				
11-15 years	5	7.7	3	4.6				
16 years & above	7	10.6	10	15.2				
$\bar{x} \pm SD$	5.43 ± 7.20		6.54 ± 7.27					
Midwifery Experience / Years					11.373	5	0.936	NS
Non	23	35.4	26	40.0				
Less than 1 year	12	18.5	13	20.0				
1-5 years	21	32.5	14	21.6				
6 -10 years	8	12.3	8	12.3				
11-15 years	1	1.5	2	3.1				
16 & above	0	0	2	3.0				
$\bar{x} \pm SD$	2.29 ± 2.98		3.42 ± 5.89					

Table (1) shows that the highest percentage (21.6%) of nurses -midwives in the study group were (25-29) years old, while in the control group (24.6%) of nurses – midwives were (20-24) years old and with the mean with standard deviation (SD) of age for both groups were (33.32 ± 9.01),(34.57 ± 11.04) respectively. The highest percentages (38.5%)(40%) respectively for both study and control groups were graduated from nurses- midwives nursing secondary school. The highest percentages of nurses - midwives (41.6%)(44.7%) respectively for both study and control groups have (1-5) experience. that the highest percentage nurses-midwives (41.5 %)(40%) respectively for both study and control groups were have nursing experience (1-5) years. The highest percentages (32.5) (21.6%).The nurses - midwives respectively for both study and control groups have (1-5) years experience midwifery.



Figure(1) Illustration Knowledge of CTG among study group

This figure shows that the highest percentage (58.5%) of the nurses- midwives study group don't have knowledge regarding CTG, while the lowest percentage (41.5%) of nurses – midwives have knowledge of Cardiotocography.



Figure(2)): Illustration Job Title Nurses –Midwives - among study sample

This figure shows that the highest percentage(52 %) of the nurses- midwives in study group had skilled nurses-midwives as a job title, while the lowest percentage(1%) had senior technical nurse Study & Control Groups as a job title

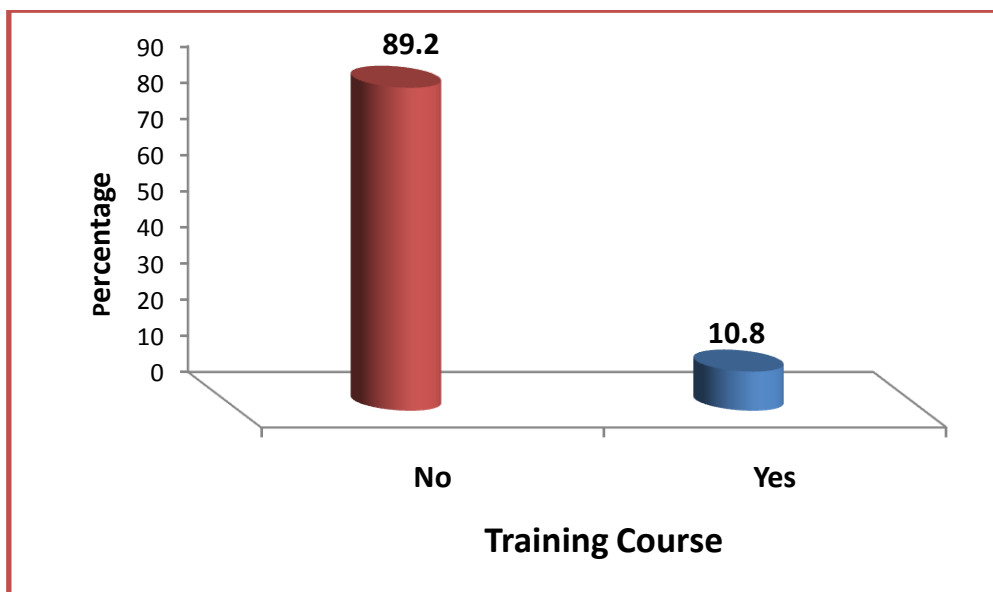


Figure (3)): Illustration Training ,Number Course, Setting and Duration Time Period among Study Sample

This figure shows that the majority percentage (89.2%) of the nurses - midwives in study group did not participate in the training courses for CTG , while the lowest percentage (10.8%) participated in the training courses for CTG and have one course training within country (6 .2%)of training course last from 1-3 days .

Table (2): Comparison Significant Between The Study and Control Group Related Nurse –Midwives' Knowledge at a Post Test

Domains		control group post test (n=65)	Study group (Posttest) (n=65)	Asymp. sig		
Main	Sub	MS	MS	Z ^(*)	(2-tailed)	C.S
A-anatomical aspect of the uterus (to maternal pregnant)	A.1.The uterus is composed of three layers	1.68	2.76	-10.07	0.00	HS
	A.2.The most important functions of the uterus	1.66	2.73	-9.88	0.00	HS
	A.3.Factors that increase the flow of blood from the uterus to the placenta	1.85	2.46	-5.99	0.00	HS
	A.4.Uterine contractions are three phases	1.85	2.81	-9.27	0.00	HS
	A.5.Assessment of the contractions of the uterus during childbirth	1.92	2.87	-9.34	0.00	HS
B. Anatomical aspect of placenta &	B.1.The main function of the placenta	1.86	2.57	-6.58	0.00	HS
	B.2.The umbilical cord is	1.72	2.43	-5.53	0.00	HS
	B.3.Factor that effect fetal heart beat	1.78	2.68	-7.69	0.00	HS
C. Cardiotocography	C.1.Definition CTG	1.84	2.93	-11.44	0.00	HS
	C.2.Components (CTG)	1.78	2.78	-9.80	0.00	HS
	C.3.Specifications electronic fetal monitoring (CTG)	1.55	2.47	-8.54	0.00	HS
	C.4.The importance of the use of CTG	1.74	2.71	-9.06	0.00	HS
	C.5.Types of CTG	1.71	2.79	-12.32	0.00	HS
	C.6.Advantage CTG	1.90	2.67	-6.96	0.00	HS
	C.7.Factors that affect the CTG	1.73	2.82	-11.37	0.00	HS
	C.8.Indication of CTG related women pregnant	1.84	2.81	-9.04	0.00	HS
	Reason C.9.Indication of CTG related fetus	1.74	2.77	-10.31	0.00	HS

Continue table(2)

Main	Domains	Post control	Post study	Asymp. Sig		C.S.
	Sub	MS	MS	Z ^(*)	(2-tailed)	
D.Patterns (FHR)	D.1.Pattern of the fetal heartbeat rate	1.59	2.64	-9.39	0.00	HS
	D.2.Normal patterns of fetal heart rate (Normal-Reassuring)	1.85	2.65	-7.24	0.00	HS
	Abn D.3.Abnormal patterns of (FHR)	1.62	2.77	-11.77	0.00	HS
	D.4 .Causes associated With deceleration	1.78	2.80	-11.01	0.00	HS
	D. 5.CTG features	1.70	2.93	-13.96	0.00	HS
	D.6.Methods of assessment of fetal movement	1.80	2.68	-7.60	0.00	HS
	Th D.7.Nursing intervention that will improve the fetal Heart beat rate	1.94	2.85	-9.55	0.00	HS
	D.8.Nursing Documentation	1.74	2.78	-10.86	0.00	HS

This table (2) shows that there were a high statistical significance between both study & control groups regarding all nurse –midwives' knowledge in post test after the implementation of the educational program .

Table (3): Effectiveness of an Educational Program concerning Cardiotocography on Nurses - Midwives knowledge of the study group at (pre, post-1 and post-2 periods

Periods	No.	Grand MS	RS	Matched Paired	P-value	C.S.	
Overall Domains Related to Knowledge	Pre	65	1.75	58	Pre X Post-1	0.000	HS
	Post-1	65	2.74	91	Pre X Post-2	0.000	HS
	Post-2	65	2.85	95	Post-1 X Post-2	0.000	HS

Table (3)indicated there were high significant obtained for the three matching (pre-post1,pre –post2, and post1 –post2)for overall of domains related to knowledge.

Table(4) Relative sufficiency and improvement percentages for study group of main Domains related to knowledge in pre-post2 Imp.:Improvement=(M_{post}-M_{pre})/2*100

Main Domain	Periods	No.	R.S	Ass.	Improvement. %
Overall Domains Knowledge	Pre	65	58	Under	55
	Post-2	65	95	Upper	

The finding of this table indicated that the assessment of nurses-midwives knowledge improved by different period for overall domain after the implement of educational program. The highest percentage(55%) of nurses –midwives improved concerning Overall Domains Related to Knowledge.

Table(5) : Relationship between Demographical characteristic and related studied variable and nurses- midwives' (knowledge & practice)both Study & Control Groups

Variables		Overall Domains Related to Knowledge							
		Control Group				Study Group			
Independent		R	F	Sig.	C.S.	R	F	Sig.	C.S.
Age		0.23	1.77	0.17	NS	0.32	3.54	0.035	S
Social Status		0.24	2.00	0.14	NS	0.29	2.96	0.059	S
Educational level		0.32	3.60	0.033	S	0.24	1.92	0.15	NS
Job Title		0.13	0.58	0.55	NS	0.09	0.27	0.75	NS
Years of Experiences		0.20	1.34	0.26	NS	0.22	3.59	0.021	S
Nursing Experience years		0.14	0.66	0.51	NS	0.26	2.36	0.10	NS
Midwifery's Experience Years		0.21	1.45	0.24	NS	0.05	0.08	0.91	NS
Years of Practice in the obstetric units		0.17	0.95	0.39	NS	0.38	5.49	0.005	HS
Do you have knowledge of (CTG		0.08	0.21	0.80	NS	0.10	0.35	0.70	NS
Are you using (CTG) during practice in the unit		0.12	0.46	0.63	NS	0.09	0.28	0.75	NS
Are you participated in training courses for(CTG)		0.15	0.73	0.48	NS	0.24	2.85	0.013	S
Duration training The time period of the course		0.24	2.01	0.14	NS	0.20	1.38	0.25	NS

Table (5) revealed that (age, Social Status , years of experiences, years of practice in the obstetric units , are you participated in training courses for(CTG)) was significant in relation with their knowledge in study group. For control group there is significant educational level in relation with their knowledge in control group. demographical characteristic when analyzed by using simple linear regression.

IV. Discussion

The result of present study that the highest percentage (21.6%) of nurses- midwives in the study group were ranged between (25-29) years old. while in the control group(24.6%) of nurses- midwives were ranged between (20-24) years old .This result agree with study was conducted by Beydag ⁽¹²⁾ has determined that 60.4% of nurses - midwives included in his research have been in the (20-30) years of age group and also agree with Collins .et al ⁽¹³⁾ who reported that the nurses - midwives were aged between 25-29 years .Chuny et al . ⁽¹⁴⁾ in china was conducted that all participants were age between 24-32 years. Regarding education level The highest percentages (38.5%) (40%) for both study and control groups were secondary nursing school graduated .This study in agreement with the study employed by Thamer ⁽¹⁵⁾ who reported that highest percentage 40.4% has been secondary nursing school graduated, Khudair ⁽¹⁶⁾ who reported that the highest percentage of nurses - midwives education (52.9%) were secondary graduates . Regarding experience years The highest percentages of nurses – midwives (41.6%) (44.7%) for both study and control groups were have (1-5) years . Thamer ⁽¹⁵⁾ stated that the highest percentage (30%) of study sample had experience years between (1-5) years. Also Bhaga ⁽¹⁷⁾ which reported that (42.43%) of respondent worked at Pretoria west hospitals for period (0-5) years. Also . MarieRosy & Princy ⁽¹⁸⁾ reported that the majority of nurses 65.5% had 1 to 5 years of working experience. Regarding knowledge of(CTG) the study present that the highest percentage (58.5%) of the nurses- midwives study group don't have knowledge of cardiotocography, while the lowest percentage (41.5%) of nurses –midwives have a knowledge of cardiotocography as shown in figure(1) Simpson-Cosimano ⁽¹⁹⁾ stated cardiotocography is the primary means for nurse to evaluate the status of the fetus during labor and delivery therefore Accurate interventions is the basis of safe care for a fetus and mother . nursing knowledge & advanced technology requires an exorbitant amount of training and experience before feeling confident and competent. Nurse with over two years of experience stated they felt confident in their abilities to read and understand fetal monitor tracings. Olsson and Adolffsson ⁽²⁰⁾ reported that shortage of midwives and low level of knowledge and experience facing heavy workload all these effect & improve on competence in their work .Regarding training CTG These findings were supported by a study conducted by MarieRosy & Princy ⁽¹⁸⁾ who reported that midwives had attended continuing nursing education programs regarding cardiotocography to provide the necessary knowledge and practice related to CTG and enable participant performance CTG and understand so that the researcher suggests that encouraging the nurses –midwives to attend any conference training course to extension of fetal monitoring knowledge and skills can be challenging

and confidences for nurses - midwives. Tomy⁽²¹⁾ reported that employees who are not given the chance to improve their knowledge and skills feel frustrated when faced with new technology and situation that affect their jobs because they do not have update knowledge to intervene in order to meet mothers' need. Dennison⁽²²⁾ implemented safety education program which resulted in significant improvement knowledge without any desirable impact on number of errors. Susanne et al.⁽²³⁾ reported that solid education can play an active part in the process of created increasing security and better care enhanced their own knowledge. Regarding job title The result in current study shows that the highest percentage (52.3 %) of the nurses- midwives in study group skilled nurses-midwives had job title, Kay⁽²⁴⁾ reported that midwives should have a clear Job description for indicating their responsibility in their work.

Regarding Comparison Significant Between The Study and Control Group Related Nurse –Midwives' Knowledge at a Post Test

There are a high statistical significance between both study & control groups regarding all nurse – midwives' knowledge in post test after the implementation of the educational program with high statistical significance. This result agreement with⁽²⁵⁾ who reported that lack of nurses knowledge regarding fetal investigations. before the training program one third of nurses gave wrong answers, while after the training program, more than three-quarters of them gave complete answers. Young et al.⁽²⁶⁾ that describe skills used in obstetric emergency situations and skills used for rare events in the labour ward on teaching, assessment, interpretation and action performance on electronic fetal monitoring by CTG. Two of the studies assessed performance in a simulated setting using standardized checklists and an observer blinded to the participant's prior training. Checklists were in accordance with guidelines and were tested in a small group of faculties .Evaluation of a training program should be an essential part of the educational process⁽²⁷⁾.

Regarding Effectiveness of an Educational Program concerning(CTG)

The result for the three matching related to Cardiotocography on Nurses - Midwives' knowledge of the study group show that there were significant or highly significant differences obtained for the three matching (pre-post1,pre –post2, and post1 -post2)for overall of domains related to knowledge. as shown in table(2) This finding was agreement with the finding obtained from random controlled trial teaching programmed for intrapartum fetal monitoring stated the obstetricians and midwives were randomly allocated to use the teaching program either early or late . the late group(control) used the teaching program three months after the early group to assess the effect the teaching programme, participants were tested on four occasions over eight month by a multiple choice questionnaire the result the mean score in early group improved from (50. 5%) test1 per-teaching program to (70.2%) test2 post - teaching program, the mean score in the control group was 50.3% (test1) and 54.8% (test2) knowledge was retained up to seven months the teaching program was effective in improvement knowledge. Cardiotocography can be used by all staff whilst on duty on labor ward⁽²⁸⁾. Straus and colleagues⁽²⁹⁾ stated that use of knowledge can be classified as conceptual ,which implies change in knowledge, understanding and attitudes ; instrumental , or the concrete application of knowledge that describes changes in behaviors or practice Regarding improvement percentages for study group of main domains related to knowledge in pre-post2 which indicated that the assessment of nurse –midwives' knowledge improved by different period for overall domain after the implement of educational program. The highest percentage(55%) of nurses –midwives improve concerning overall domains related to knowledge. Non stress test is a simple, painless procedure done during pregnancy to evaluate the fetal heart rate at rest and when the fetus is moving. Contraction stress test is method to assess the fetal well-being in response to uterine contractions⁽³⁰⁾. A study in Sweden showed that 76% of fetal distress and 70% of brain damage or death had occurred due to improper interpretation of fetal monitor tracings. This had occurred due to lack of knowledge and skill regarding electronic fetal monitoring using CTG among staff nurses Jonson et al.⁽³¹⁾.

The correlation reported that the improvement of the Nurse-midwives knowledge and practices) had relationship with their socio-demographical characteristics in the overall assessments of knowledge and practices program in multiple periods, in (age group, Years of Experiences, Midwifery's Experience Years, Years of Practice in the obstetric units, Training courses for CTG) was significant.⁽³²⁾ how conducted a cross-sectional study to determine the level of knowledge on the interpretation of cardiotocography (CTG) amongst midwifery nurses who are working at obstetric wards and labour & delivery units in selected hospitals in malaysia .Findings revealed that inadequate knowledge of respondents regarding interpretation and diagnosis of different graph in CTG and there were significant association between age (p=0.01), education level (p=0.05) and knowledge on CTGs interpretation.⁽³³⁾ reported that there is the finding revealed that there is a significant relationship between knowledge on interpretation of CTG and respondents age, educational level and work experience. Mamb⁽³⁴⁾ reported that the youngest ages were found with most knowledge for the reason that they are recently skilled and knowledge of high risk factor is relatively new to apply practices. Ethridge⁽³⁵⁾ explored the perceptions of new nursing graduates regarding clinical judgments and the education the investigator looked

at the experiences nurses considered helpful in learning to make clinical judgments and their beliefs about their role in these decisions. Walker et al⁽³⁶⁾ stated that there was significant between the nurses who employment in the hospital for a long period and their experience in hospital and improvement in the practice and knowledge. Stated that they midwives confident in their abilities to read and interpret fetal monitor tracings(CTG) after 2-3 years of experience Benner⁽³⁷⁾. Susanne et al.⁽²³⁾ reported that obstetric units have become larger with patients being knowledgeable and demanding also, established team works at maternity words require that midwives are experiences practices and security in their role. Larsson et al.⁽³⁸⁾ reported that the area of responsibility for midwives includes a great deal of collaboration with doctors and assistant nurses resulting in joint decision-making. Pehrson et al.⁽¹¹⁾ found that training can improve knowledge of cardiotocography (CTG) leading to better quality care team training courses. Also Beasley⁽³⁹⁾ improve the maternity teams knowledge and practical skill resulting in greater structure in acute situations as well as security.

V. Conclusion

In accordance with the results of this study the researcher can conclude the following:

Education program regarding CTG provide the basic knowledge to enable the nurses-midwives to understand and use CTG & performance it simply .

The highest percentage nurses- midwives in the study group their were ranged between (25-29) years old and graduated from secondary nursing school. There were low means in most items related to the knowledge and practices of nurse-midwives regarding Cardiotocography (NST) in pre-test ,while there were high mean scores in all items after the implementation of the an education program with high statistical significant, The assessment of nurse-midwives knowledge improved by different periods for overall domains after the implementation of an education program

VI. Recommendation

Improvement their knowledge and keep them update information provide an opportunity for nurses-midwives to be enrolled training sessions concerning Cardiotocography by in service education for all maternity hospitals. Guide booklets or information sheet should be printed and distributed to the nurse- midwives clarifying information about their CTG.

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