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Effect of Planned Teaching Programme Oncardiotocographyamong Midwives in Alappuzha

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Abstract:
***Back ground*:** The health of the fetus and the health of the mother areextensively linked with each other and thus midwife plays a major role in attaining this goal throughout pregnancy and after delivery.Care given during the intra-partum period is the cornerstone of midwifery practice which would help women both physically and emotionally. Continuous fetal heart monitoring during pregnancy and labour gives an impression of the fetal well-being or fetal compromise thereby promoting the newborn's health status after birth. The past few decades have shown a notable increase in the number of techniques used to assess fetal wellbeing that ranges from the relatively simple maternal assessment of fetal movement to more complex diagnostic tests guided by the ultrasound. One such technology developed is cardiotocography.`
***Objectives*:** The study was aimed to evaluate the effect of planned teaching programme on Cardiotocography among Midwives.
Objectives of the study were
- To assess the existing level of knowledge on Cardiotocography among Midwives.
-To evaluate the effect of Planned Teaching programme on Cardiotocography among Midwives
-Find out the association between the knowledge of Midwives on Cardiotocography and selected demographicvariables.
Methods: Study adopted a quantitative approach and one group pre-testpost-test design. The study population consisted of 60 Midwives working in maternity areas of selected hospital, selected by convenient sampling. The study was carried out at Women and child hospital, Alappuzha, Sree Narayana Medical Mission Hospital, Cherthala, K.V.M Hospital Cherthala and Sacred Heart General Hospital Cherthala. The tools used were Self-administered structured questionnaire to assess the socio demographic data and level of knowledge of Midwives regarding cardiotocography. Level of pre-test knowledge of midwives was assessed and Planned Teaching Programme on Cardiotocography was administered on the same day of pre-test. After seven days of Planned Teaching Programme Post test was conducted by using same questionnaire.
Results: Analysis was done by using descriptive and inferential statistics, which revealed that meanimprovement in knowledge 9.35 and the obtained'value t =20.51 was significant at 0.01 level .The result showed that the Planned Teaching Programme was effective in improving level of knowledge regarding Cardiotocography among Midwives and there was no association between midwives knowledge and their selected demographic variables.
Conclusion: Based on the findings the following conclusions were drawn Midwives had noadequate knowledge on cardiotocography and the planned teaching programme was effective in improving the level of knowledge regarding cardiotocography among Midwives.

Key words: .Effect; Cardiotocography,Planned Teaching Programme; Midwives,

INTRODUCTION

The major cause of peri-natal mortality is inadequate monitoring and care duringlabour by the skilled health professional. According to WHO 2013, peri-natal deaths has decreased from 4.6 million in 1990 to 3.3 million in 2010.It is identified that 99% of the perinatal mortality occurs in the developing country, out of which India has more than half of the deaths that accounts for about more than 9, 00,000new born deaths per year ie, 28% of the global total. Much has changed in antenatal, perinatal and postpartum care in recent decades, and many of the changes have arisen from a questioning and in some cases discarding of many of the interventions which had previously been considered appropriate or even essential.

The maternity health service plays a vital role in reducing the perinatal mortalityrate .According to the report released on 12th September 2013 by United Nations Children's Fund the global Infant Mortality rate decreased from 61 deaths in 1990 to 37 deaths in 2011.Annual infant deaths declined from 8.4 million in 1990 to 5 million in 2011.According to the report India's infant mortality rate shown a minor decline in 2012 compared to 2011. Infant Mortality rate decreased from 44 deaths for every 1000 live births in 2011 to 42 deaths for every 1000 live in 2012.According to latest report released in 2012 by Register General of India in 23rd May 2013Kerala is good performing state in India with Infant mortality rate of 12. According to 2011-2012 census, the perinatal mortality rate in Kerala was 12 and maternal mortality rate was 1.3.According to the data collected from Alappuzha about 30% cases reported as early detection of fetal complications such as fetal distress and cord compression with cardiotocography in the year 2013. The improvement in training has led to increased confidence among community midwives and improved team working.

The neonatal mortality rate in India is amongst the highest in the world and skewed towards rural areas. Non availability of trained manpower along with poor healthcare infrastructure is one of the major hurdles in ensuring quality neonatal care. A survey conducted by the Indian Academy of Paediatricians in 2013 found that the neonatal mortality rate in Kerala has come down remarkably due to the

empowerment of local healthcare workers through training programmes. This, along with Kerala's inherent superior healthcare infrastructure, have brought down the neonatal mortality rate to 7/1,000, the lowest in the country.

Cardiotocography is widely used, all over the world, for fetal heart rate and uterine contractions monitoring before and during labor, regarding the detection of fetuses in danger of death or permanent damage. However, analysis of cardiotocogram tracings remains a large and unsolved issue.

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 knowledge regarding cardiotocography interpretation. In the researchers clinical setting there were no teaching programmes or trainings were given to the midwives and almost all the midwives were poor in interpreting cardiotocography tracings. They usually seek the help of the doctors to interpret the findings in emergency also. Many of the staff nurses also think that, it is the responsibility of doctors to interpret cardiotocography findings and most of them were reluctant to study it. Hence the investigator got motivated to perform a training programme on cardiotocography with a view to promote knowledge and skill among nurses on cardiotocography and to evaluate its effectiveness.

METHODOLOGY

The study was conducted at Women and child hospital, Alappuzha, Sree NarayanaMedical Mission Hospital, Cherthala, K.V.M Hospital Cherthala and Sacred Heart General Hospital, Cherthala

The Women and child hospital, Alappuzha is exclusively meant for women and children and is the only maternity hospital under Government of Kerala in Alappuzha district. This hospital, provides all essential services under Directorate of Health Services. There are totally 306 beds in the hospital. The hospital has got different facilities such as outpatient departments in obstetrics, gynaecology and paediatrics, and inpatient facilities such as antenatal ward, postnatal ward, gynaecology ward, labour room, post-operative ward, pay ward, paediatrics ward, 24 hour casualty services, NICU, major and minor operation theatre, separate theatre for laparoscopic surgery, new born screening room, other facilities such as ultrasonography, laboratory, blood bank, pharmacy, ECG and 24 hours ambulance services. In the last year, total of 23500 obstetrical and gynaecological cases visited the outpatient department with an average of 98 patients per day. In the inpatient department, total of 7846 patients were admitted of which, 6813 includes obstetrical and gynaecological cases and 1033 were paediatric cases. Out of 3168 births, 1363 were normal vaginal deliveries,1536 LSCS, 241 vacuum extraction and 26 wereforceps delivery. Antenatal ward of this hospital consist of 35 beds and approximately 350 antenatal mothers are admitted every month as inpatients. The distance between KVM hospital and Women and Child hospital was around 21 km.

The Sree Narayana Medical Mission is a 250 bedded hospital under Sree NarayanaTrust. This hospital provides different facilities such as outpatient departments in medical, surgical, obstetrics and gynaecology, orthopaedics, paediatrics, and inpatient facilities such as medical ward, surgical ward, paediatric ward, obstetrics and gynaecologyward, well equipped labourroom, post-operative unit, cardiac intensive care unit, operation theatre and 24 hour Casualty Service, other facilities such as ultrasonography, laboratory, pharmacy, ECG and 24 hours ambulance services. In the last year, total of 18720 obstetrical and gynaecological cases visited the outpatient department with an average of 60 patients per day. In the inpatient department, total of 7200 patients were admitted of which, 2800 includes obstetrical and gynecological cases. Out of 540 births, 264 were normal vaginal deliveries, 260 LSCS, and 16 were vacuum extraction. Obstetric and gynaecologic inpatient department of this hospital consists of 25 beds and approximately 200 antenatal mothers are admitted every month as inpatients. The distance between KVM hospital and Sree Narayana Medical Mission Hospital was around 1.5 km.The Sacred Heart General Hospital is a 250 bedded hospital run by Sacred Heart sisters. The hospital has medical, surgical, gynecological ,Urology, Nephrology and paediatricfacilities, and inpatient facilities such as separate wards for all departments, postoperative unit, immunization clinics, labour room, medical ICU ,surgery ICU, 24 hour casualty service, Blood bank , and lab facilities,. In the last year, total of 19000 obstetrical and gynecological cases visited the outpatient department with an average of 68 patients per day. In the inpatient department, total of 8100 patients were admitted of which, 2750 includes obstetrical and gynecological cases. Out of 600 births, 280 were normal vaginal deliveries, 200 LSCS, and 20vaccum extraction. Obstetric and gynaecologic inpatient department of this hospital consists of 40 beds and approximately250 antenatal mothers were admitted every month as inpatients. The distance between KVM hospital and Sacred Heart General Hospital was around 1 km.

K.Velayudhan Memorial (K. V. M) Hospital is a 250 bedded multi-specialty hospital without patient departments in medical, surgical, gynecological,paediatrics, cardiology,ENT, ophthalmology, urology, Nephrology etc, and inpatient facilities, such as medical ward ,surgical ward, obstetrics and gynaecology ward, labour room post-operative unit, immunization clinics, medical ICU, NICU, Surgical ICU, and 24 hour casualty, cardiaccatheterization lab , psychiatry and nephrology department. And other facilities such as 24 hour laboratory, X ray, ultrasonography, pharmacy, ECG and 24 hours ambulance services. In the last year, total of 17000 obstetrical and gynecological cases visited the outpatient department with an average of 55 patients per day. In the inpatient department, total of 8000 patients were admitted of which, 2000 includes obstetrical and gynecological cases. Out of 620 births, 280 were normal vaginal deliveries, 300 LSCS, 40 were vacuum extraction. Antenatal ward of this hospital consist of 25 beds and approximately 180 antenatal mothers are admitted every month as inpatient.

The target population consisted of all the Midwives, were as the accessible populationincluded the Midwives working in the maternity areas of Selected Hospitals, Alappuzha and who were satisfying the inclusion criteria .60 Midwives

working in the Maternity areas of selected Hospitals at Alappuzha .Convenient sampling technique was used . The time schedule was arranged according to the collected duty schedules of the Midwives from nursing superintendent's office.

Tools/Instruments:

Tool 1: A Self-administered structured questionnaire was used to assess the socio demographic data of Midwives
Tool 2: Self-administered Structured questionnaire to assess the level of knowledge regarding cardiotocography among Midwives.
Tool 3: Planned Teaching Programme on cardiotocography among Midwives

The tools were developed on the basis of objectives of the study. To develop appropriate tool, investigator had review of literature from textbooks journals internet and unpublished dissertations related to fetal monitoring, cardiotocography, its indication, purposes, types, procedure and interpretation of graphs and discussion with subject experts, gynaecologists and nursing personnel. Based on the objectives of the study a self-administered structured questionnaire on cardiotocography was prepared in order to assess the knowledge on Cardiotocography among midwives. Investigator selected thesetools as they were considered to be appropriate instrument to collect adequate data.

The main steps included in the development of planned teaching programme regardingcardiotocography were review of literature regarding cardiotocography, preparation and organization of the content, development of criteria check list to validate the planned teaching programme regarding cardiotocography, establishment of content validity, editing the content, preparation of final draft of planned teaching programme regarding cardiotocography and pre testing the same. The planned teaching programme were simple and easily understandable by the Midwives.

Tool 1: The self-administered structured questionnaire to collect the socio demographicdata of the midwives prepared by the investigator. It consisted of 6 items which includes age, marital status, professional educational qualification, previous knowledge regarding cardiotocography, total years of experience and experience in maternity area

Tool 2: The self-administered structured questionnaire to assess the level of knowledge on cardiotocography among midwives. It consists of 35 items which covers introduction,definition, indications, types, working principle, procedure of Cardiotocography, explanation about the interpretation of Cardiotocogram and management of abnormalities. The samples were requested to answer each question.

Scoring and interpretation:

Each item had given three options with one correct answer for each correct response, score one was given and zero score for the wrong answer. Total highest possible score was 35 and least score was 0
Tool 3: The Planned teaching programme on cardiotocography contains 7 areas including definition, indications, and types, working principle, procedure ofCardiotocography explanation about the interpretation of Cardiotocogram andmanagement of fetal heart rate pattern.

Reliability of the tool:

Reliability of the questionnaire was established by split half method. The test was administered to 5 Midwives working in labour room of Kinder women's hospital, Cherthala after obtaining informed consent. Correlation was found using Karl Pearson correlation coefficient r = 0.93, which indicated that the tool is reliable. The internal consistency of the tool was assessed using Crohnbach's alpha 0.8which proved that the tool had a good internal consistency.

Data collection process:

After getting permission from the concerned authority of Women and Child Hospital, Alappuzha, K.V.M Hospital Cherthala, Sree Narayana Medical Mission Hospital Cherthala, and Sacred Heart General Hospital Cherthala and Institutional ethical committee of KVM College of Nursing, data was collected in the month of February 2014 .60 midwives were selected according to inclusion and exclusion criteria. The investigator established good rapport with them and gave a brief introduction about the study. Verbal and written consent were obtained. Privacy and confidentiality were assured. On the first half of the study, around 5-6 midwives were included. Initially the socio economic data of the Midwives were collected and the self-administered structured questionnaire was given to assess the pre-test level of knowledge on Cardiotocography .It took about fifteen minutes. On the same day planned teaching programme on cardiotocography definition, indications ,types, working principle, procedure of Cardiotocography explanation about the interpretation of Cardiotocogram and management of fetal heart rate pattern was administered for the same midwives, it last about 45 minutes including discussion and clarification. After two days another group of around 5-6 midwives from the same hospital had pre-test and planned teaching programme on cardiotocography. After 7 days of planned teaching programme a post test was conducted using the same self-administered structured questionnaire. So the same procedure was carried out in Women and Child Hospital, Alappuzha, K.V.M Hospital Cherthala, and Sacred Heart General Hospital Cherthala to include 60 participants. The investigator expressed gratitude to all Midwives who participated in the study.

RESULTS

♣Most of the respondent 38.34 % were in the age group of 30-39 years
♣Majority of the respondents 58.3% are married
♣Majority 86.7% of Midwives who were participated in the study had their professional educational Qualification up to General Nursing and Midwifery
♣None of the Midwives had attended any continuing nursing education programmes regarding cardiotocography
♣Majority of the Midwives 35% had less than 2 yearrs of clinical experience.
♣Majority 46.7% Midwives had less than one year of clinical experience in maternity area.

In the pre-test 71.7 % of Midwives acquired moderate knowledge and remaining 28.3% had inadequate knowledge regarding cardiotocography. 58.33% of Midwives had

knowledge less than or equal to median and remaining 41.67% had knowledge more than median standard deviation was 4.05 and mean percentage of knowledge was 54.95%.

In the post-test 48 percentage of Midwives had adequate knowledge and remaining 12 percentage had moderate knowledge regarding cardiotocography. 65 percentage ofMidwives have knowledge less than or equal to median and remaining 35 percentage had knowledge more than median ,standard deviation was 2.68 and mean percentage of knowledge is increased to 81.67 percentage after planned teaching programme .This shows a significant improvement in knowledge after the planned teaching programme.

Paired't' test was done to find out the effect of planned teaching programme oncardiotocography among Midwives. After planned teaching programme mean improvement in knowledge was 9.35 and the obtained'value t =20.51 is significant at 0.01 level. This showed that the average improvement in knowledge on cardiotocography 9.35, was significant. So it was conclude that the Planned Teaching Programme is effective in improving level of knowledge of Midwives regarding Cardiotocography.

71.7% of Midwives had moderate knowledge, and remaining 28.3% had inadequateknowledge in the pre-test and in the 80% of Midwives had acquired adequate knowledge and remaining 20% had moderate knowledge. Mean percentage of knowledge in the pre-test was 54.95% and that of the post test was 81.67%

Chi-Square ($\chi 2$) value is computed between knowledge and selected demographicvariables. In that there is no association between the demographic variables of the Midwives such as age $\chi 2 = 0.05$,marital status $\chi 2 = 2.512$, Professional Educational Qualification $\chi 2 = 0.215$,Total Years of Clinical Experience $\chi 2=1.95$, Experience in Maternity ward $\chi 2 = 0.992$ with their knowledge level regarding cardiotocography.

The results indicated that the Midwives had the pre-test level of knowledge of regarding cardiotocography in the areas such as basics of cardiotocography 71.67 %, meaning 60% purposes 60.63%, equipments 55.83%, procedure 61.67%, interpretation and management 52.68% and percentage of gain in knowledge in the post test was 13.33%, 37.67%, 29.17%, 26 11%, 27.5%, 26.96% respectively and majority of the Midwives 91.67% had acquired the knowledge on meaning of cardiotocography.

Table 1. Mean, Standard deviation and Mean percentage of area wise analysis of Pre-test and post test level of knowledge on cardiotocography among Midwives. n=60

Area wise analysis	**No:of items**	**Range**	**Mean**	**S.D.**	**Mean Percentage**	**% gain in knowledge**
Basics of Cardiotocography	**1**	0 – 1	0.7167	0.45	71.67	13.33
Meaning of Cardiotocography	**1**	0 – 1	0.6	0.494	60	37.67
Purpose of Cardiotocography	2	0 – 2	1.2167	0.715	60.83	29.17
Equipments needed for Cardiotocography	6	0 – 6	3.35	1.494	55.83	26.11
Procedure of cardiotocography	2	0 – 2	1.23	0.722	61.67	27.5
Interpretation And Management Of cardiotocography	23	2 - 20	12.117	3.435	52.68	26.96

EFFECT OF PLANNED TEACHING PROGRAMME ON LEVEL OF KNOWLEDGE REGARDING CARDIOTOCOGRAPHY AMONG MIDWIVES.

Table2 :- Mean, Standard deviation, Mean difference and 't' value of level of knowledge regarding cardiotocography among Midwives n=60

Level of knowledge	**Mean**	**S.D.**	**Mean improvement**	**S.E**	**. df**	**t**	***p- value***
Pre-test	19.23	4.05	9.350.4565920.51$p < 0.01$**.				
Post-test	28.58	2.68					

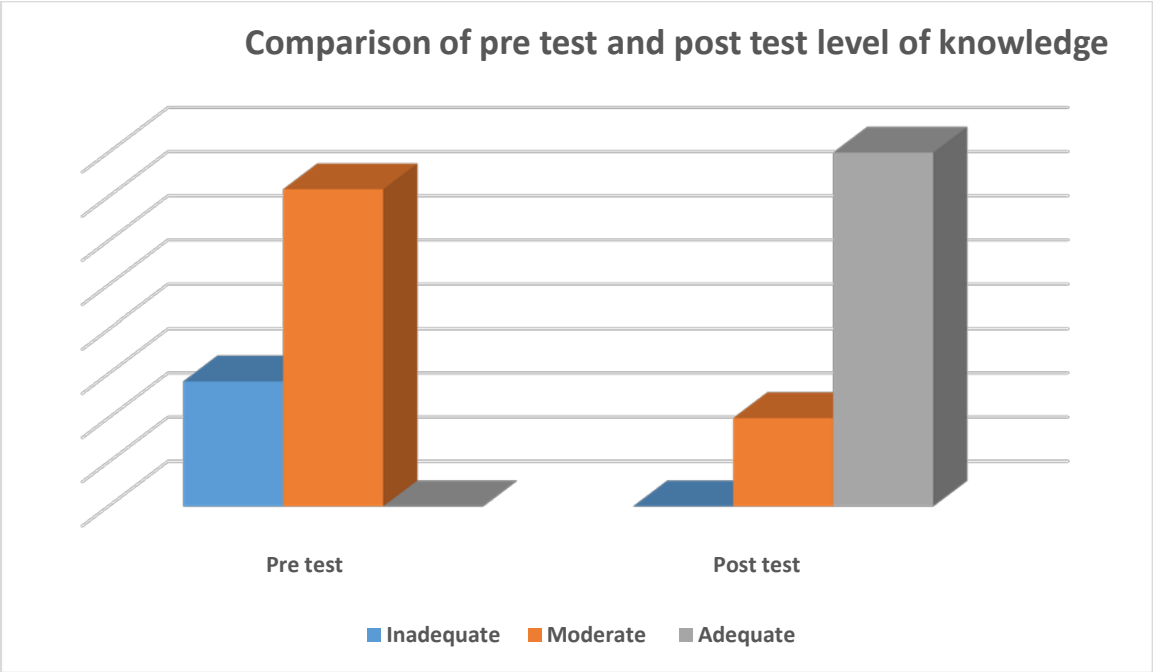

Figure 1 : Comparison of pre-test and post-test level of knowledge regarding cardiotocography among midwives

DISCUSSION

Most of the respondent 38.34 % were in the age group of 30-39 years.

- Majority of the respondents 58.3% were married
- Majority 86.7% of Midwives who were participated in the study had theirprofessional educational Qualification up to General Nursing And Midwifery.
- None of the Midwives had attended any continuing nursing education programmesregarding cardiotocography

These findings were supported by another study conducted by N.P.Pushpaveni to evaluatethe effect of Self Instructional Module on Fetal Wellbeing Measures among Nurses. Inthis study majority of the respondents 40 percentage were in the age group of 30 – 39years. Majority of respondents 92 percentage were married and 100 percentage ofrespondents had GNM qualification. 52 percentage respondents have not undergone inservice education in obstetrics and paediatrics.

Majority of the Midwives 35% had less than 2 yrs of clinical experience .Majority 46.7%Midwives had less than one year of clinical experience in maternity area These wereconsistent by another study conducted by Saadat Parhizkar to determine the level ofknowledge on the interpretation of Cardiotocography and its associated factors amongMidwifery nurses .In this study Majority of nurses 65.5% had 1 to 5 years of workingexperience and extremely half of them 57.6% were working in Labour and Deliveryunits.

Assessment of post test revealed that 48% of Midwives had adequate knowledge andremaining 12% had moderate knowledge regarding cardiotocography. 65% of midwives had knowledge less than or equal to median and remaining 35% had knowledge more than median and mean % of knowledge was increased to 81.67% after planned teaching programme and standard deviation was 2.68.This shows a significant improvement in knowledge after the planned teaching programme.

These were supported by another study conducted by Cimil Babu to evaluate the effect of care guide on cardiotocography among Midwives .The result showed that mean post test knowledge score 31.11 was higher than mean pre-testknowledge score 21.74 with mean difference 9.37 and 't' value of 11.29,which was significant at 0.05 level of significance.

After planned teaching programme mean improvement in knowledge was 9.35 and the obtained 't'value t =20.51 is significant at 0.01 level. This showed that the average improvement in knowledge on cardiotocography 9.35, was significant. So it was conclude that the Planned Teaching Programme is effective in improving level of knowledge of Midwives regarding Cardiotocography.

These findings were supported by a study conducted by Sowmya M. N.etal, to determine the level of knowledge on the interpretation of Cardiotocography and its associated factorsamongst midwifery nurses in Hospital Putrajaya and Hospital Serdang. The result showedthat the mean and Standard Deviation of the knowledge regarding general facts oncardiotocography and procedure in pretest,mean: 6.07, SD:1.780 and post-test mean:9.57,SD:0.568 showed a significant change at the level of $p < 0.001$.l There was asignificant difference in the level of knowledge on interpretation of cardiotocography withmean and Standard Deviation of 5.47 1.634 and 10.57 ,0.679 in pre-test and post-test whichwas significant at the level of $p < 0.001$.

71.7% of Midwives had moderate knowledge, and remaining 28.3% had inadequateknowledge in the pre-test and in the 80% of Midwives had acquired adequate knowledge and remaining 20% had moderate knowledge. These were supported by a study conducted by Gayathripriya etal, To determine the level of knowledge on the interpretation of Cardiotocography and its associated factors amongst midwifery nurses. The results showed that Comparison of overall level of knowledge on

cardiotocography showed 43.3% had inadequate and 56.7% nurses had moderately adequate level of knowledge in pre-test whereas in post-test, 93.3% had adequate level of knowledge on cardiotocography.

There was no significant association found between level of knowledge regarding cardiotocography and any of the demographic variables of the MidwivesThese findings were supported by another study conducted by N.P.Pushpaveni to evaluate the effect of Self Instructional Module on Fetal Wellbeing Measures among Nurses. It depicts that was significant impact of general education, type of family, in-service education onknowledge scores of the staff nurses. And there was no significant impact of age, maritalstatus, clinical experience and source of information on knowledge scores regarding the95.7% and non-stress test 79.3%.The post-test mean knowledge score was found higher 95.7%whencompared with pre-test mean knowledge score 66.1% .Overall enhancement of knowledgescore was 36.1%.

LIMITATION

a. The study was limited to registered Midwives working in maternity area only
b. The study consisted only planned teaching programme for Midwives regardingcardiotocography
c. The study did not aim to find out the attitude and practice of the Midwives
d. The study is limited about clinical experience in maternity area up to 10 years
e. The sample size is limited to 60
f. The study included the midwives working in Alappuzha district only

RECOMMENDATION

The study can be replicated in large samples
The similar study could be conducted with control group
An exploratory study could be conducted to identify the knowledge, practice, and attitude of Midwives regarding the methods of assessing fetal well being
A comparative study can be conducted in government and private sector
Replication of study can be done using different teaching aids

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CONTRIBUTORS

Research consultant undertook the analyses supervision. research guide contributed to study design and data interpretation , edited early drafts and approved the final manuscripts for publication. Experts and statistician contributed to thevalidity of the tool.

DATA SHARING STATEMENT

Data from the study would be available if authors are contacted subject to agreements within the ethical approvals for the study.

ETHICAL APPROVAL

Institutional ethical committee and KUHSUniversity.

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