A PRE EXPERIMENTAL STUDY TO DEVELOP AND EVALUATE THE EFFECTIVENESS OF AN INFORMATION BOOKLET ON CARDIOTOCOGRAPHY (CTG) IN FETAL MONITORING IN TERMS OF KNOWLEDGE AMONG NURSING PERSONNEL WORKING IN MATERNITY UNITS IN A SELECTED HOSPITAL AT NEW DELHI

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ABSTRACT

A quantitative (pre experimental) research approach with “One group pre-test post-test design” study was based on systems model, sample: thirty (30) nursing personnel, Purposive sampling technique was used. Tool: .structured knowledge questionnaire. Findings: The mean post-test knowledge score (35.1) was significantly higher than mean pre-test knowledge score (18.3) with a mean difference (16.8) and standard deviation difference (2.8). The obtained mean difference(16.8) was found to be statistically significant as evident from ‘t’ value of 13.9, suggested the effectiveness of information booklet in enhancing the knowledge of nursing personnel on cardiotocography.

Introduction

Motherhood is a blessing that needs to be cherished with great care. Labor is a short but critical period in the life of an infant and mother. The provision of high quality care in labor with fetal monitoring is important and should be a basic provision by a health service. Nurses are the primary care providers during the perinatal period. A

nurse, who cares for women during labor, is responsible for observing and interpreting

The information from the electronic fetal monitor to assess the progress of labor and fetal well-being. So increased quality and regularity of all observations during labor are important. Cardiotocography (CTG) records the fetal heart rate, fetal movements and uterine contractions.

OBJECTIVES

- To develop an information booklet for nursing personnel working in maternity units regarding cardiotocography in fetal monitoring.
- To assess the knowledge of nursing personnel working in maternity unit regarding CTG before dissemination of information booklet.
- To assess the knowledge of nursing personnel working in maternity unit regarding CTG after dissemination of information booklet.
- To determine association between post test knowledge scores and demographic variables of nursing personnel, i.e. Age, Professional qualification working experience. In-service training.

Background of the Study:

WHO¹¹ stressed that strengthening of skilled midwifery services for the promotion of safe motherhood is essential. Survival of human kind as a whole is simply impossible without protecting motherhood and saving newborn lives. A woman's right to health includes her right to have a healthy baby. Government of India was committed to reduce the neonatal mortality rate to

approximately 20/1000 live births by 2010. Reduction of Maternal Mortality Ratio (MMR), India is projected to have an MMR of 149 by 2015 and 127 by 2017.

NEED FOR THE STUDY

World Health Organization¹⁴ stated that the pregnancy and children are special events in woman's lives and indeed in the lives of their families. In developing countries, each pregnancy represents a journey into the unknown world from which too many women never return, due to lack of care. All nurses who provide care to women in labor should be skilled in application of electronic monitoring equipment such as cardiotocograph and assessment of baseline and periodic changes. Viewing these concepts and data a nurse midwife should know the appropriate terminology, interpretation, documentation and communication with other health team members. Labor room is a place where the personnel working, need to be confident, knowledgeable and skillful because they are involved with taking care to two lives.

REVIEW OF LITERATURE

Cimil⁴² developed and evaluated effectiveness of care guide on

cardiotocography in fetal monitoring in terms of knowledge and practice of nursing personnel working in maternity unit in Mumbai, India by using evaluative research approach and one group pre-test and post-test design. Results showed significant increase in mean post-test knowledge score (31.11) with median 30 was higher than the mean pre-test knowledge score (21.74) with median 21. Mean practice score (19.06) was higher than mean pre-test practice score (12.27) with a mean difference of 6.09. Significant positive correlation was found between gained scores of knowledge and practice. Findings revealed that care guide on cardiotocography was effective in increasing knowledge and practice of nursing personnel.

Hindley¹⁵ have done a study in England to explore midwives; values, attitudes and beliefs when using Intrapartum fetal monitoring techniques in clinical practice. Study showed midwives lacked confidence to interpret the findings of CTG to accurately detect fetal compromise, but is aware that visual monitoring record is recognized as a valuable piece of legal evidence.

METHODOLOGY

To accomplish the objectives of the study, a quantitative, experimental approach was used. The research design selected for this present study was pre experimental “one group pre-test and post-test design. The dependent variable was information booklet on cardiotocography in fetal monitoring. The dependent variable is knowledge level of nursing personnel on CTG in fetal monitoring as assessed by knowledge score. ethical committee permission was taken for study. The study was carried out at maternity units Kasturba Hospital, New Delhi. After taking formal permission from competent authority of Kasturba Hospital. The population comprised of nursing personnel, sample size of 05 nursing personnel working in maternity units were selected for pilot study and 30 for the final study, purposive sampling technique was adopted. Data Collection Tools and Techniques are structured knowledge questionnaire prepared. Content validity was obtained by 10 experts. The reliability of the structured knowledge questionnaire was assessed internal consistency method using Kuder-Richardson formula (KR 20), which

was found to be ‘ 0.71’ indicating that the tool is reliable.

PROCEDURE

After taking the formal permission from, medical superintendent, and HOD Obstetrics & Gynecology. Kasturba Hospital, New Delhi and formal approval from Ethical Committee, Jamia Hamdard Institutional Review Board (JHIRB), New Delhi, a pilot study and final study was conducted from 20th January to 29th January 2013. Purpose of the study was explained to the nursing personnel Self introduction and establishment of rapport with the subjects maintained. On day one, the pre test of knowledge questionnaire was given to subjects. Information booklet was disseminated to the group same day after pre-test. Post-test for knowledge was carried out on 9th day. The details of the data collection are recorded in the master data sheet. No problem was faced during study. Data was tabulated, organized, analyzed and interpreted using descriptive and inferential statistics.

Operational Definitions

- **Assess:** It refers to measurement of knowledge, by means of correct responses

of staff nurses regarding cardiotocography.

- **Cardiotocography:** It refers to a procedure that is used for assessing fetal well being in which the fetal heart rate and uterine contractions are continuously monitored for 20 minutes or more by using electronic fetal monitor.

- **Information booklet:** It is a systematically written material for nursing personnel working in maternity unit regarding cardiotocography in fetal monitoring to enhance their knowledge and practice.

- **Knowledge:** It is the ability of nursing personnel to respond correctly to structured knowledge questionnaire regarding CTG in fetal monitoring.

- **Nursing personnel:** In this study nursing personnel refers to the nurses who have completed GNM, (PC) B.Sc. Nursing or Basic B.Sc., Post graduation nursing programme and who are registered and working in maternity unit at selected hospital, Delhi.

- **Maternity unit:** Specialized unit of the Kasturba Hospital designed and equipped

for the inpatient care of antenatal and intranatal pregnant women.

- **Effectiveness:** It refers to the power of information booklet to bring about change in knowledge of nursing personnel on fetal monitoring for prevention of complications, as expressed in numerical terms of knowledge scores.

Figure 1: Polygon diagram showing frequency distribution of level of knowledge of nursing personnel

Table-6

Fisher's exact value showing association between post test knowledge scores and professional qualification of nursing personnel
n=30

Professional Qualification	Knowledge Scores		Fisher's Exact value	p-Value
	Above Mean	Below Mean		
GNM	15	11	0.315	0.327
B.Sc./(PB)B.Sc. Nursing	1	3		
Post Graduation	0	0		
Any Other	0	0		

Table-7

Fisher's Exact Value showing association between post test knowledge scores and working experience of nursing personnel

Working Experience (In Years)	Knowledge Scores		Fisher's Exact Value	P-Value
	Above Mean	Below Mean		
< 1	2	0	0.700	0.520
1- 5	1	2		
6 - 10	3	3		
> 10	10	9		

Table-8

Fisher's Exact Value showing association between post test knowledge scores and in service training of nursing personnel
n=30

In Service/ Special training	Knowledge Scores		Fisher's Exact Value	p-Value
	Above Mean	Below Mean		
Yes	4	1	0.336	0.190
No	12	13

MAJOR FINDINGS OF THE STUDY

1. Findings related to description of sample characteristics:

- Maximum number of sample subjects, i.e. 11 (36.77%) were in the age group of 41-50 years, ten (33.33%) in the age group of 31-40 years, five (16.77%) were in the age group of 20-30 years and minimum number of subjects four (13.33%) were found in the age group of >50 years.
- Most of the subjects 25 (83.33%) were qualified General Nursing and Midwifery, followed by 4 (13.33%) were graduate and minority 1 (3.33%) of the subjects were in the any other category of qualification. There was none of the subject was post graduated.
- Majority of the subjects 19 (63.33%) had experience of more than 10 years, six (20%) had 6-10 years, three (10%) subjects had an experience of 1-5 years and two (6.7%) subjects had less than one year experience.
- Majority of subjects 25 (83.33%) had not attended any in-service training related to monitoring of women during labor whereas only five (16.77%) of

subjects had attended training related to monitoring of women during labor.

2. Findings related to knowledge scores of nursing personnel on cardiotocography in fetal monitoring:

- The mean post-test knowledge score (35.1) was significantly higher than mean pre-test knowledge score (18.3) with a mean difference (16.8) and standard deviation difference (2.8). The obtained mean difference (16.8) was found to be statistically significant as evident from 't' value of 13.9, which is greater than the table 't' value (2.05) at 29 degree of freedom at 0.05 level of significance suggested the effectiveness of information booklet in enhancing the knowledge of nursing personnel on cardiotocography.
- After dissemination of information booklet to nursing personnel, 26 (86.66%) fell into highly adequate category of knowledge, whereas four (13.33%) into adequate and none of them into inadequate category. It indicated that information booklet on cardiotocography in fetal monitoring

was effective in increasing knowledge of nursing personnel.

3. Findings related to association of post test knowledge scores with demographic variables:

There was no association found between post test knowledge scores and demographic variables i.e. age, professional qualification, working experience and in-service training.

DISCUSSION

Worldwide nearly four million new borns' die within the first week of the life and another three million are born dead. Perinatal deaths could be reduced by at least 50% worldwide if key interventions are applied for the new born. The perinatal mortality is less than 10 per 1000 total births in the developed countries (60/1000 in India). The national goal is between 30 and 35. Every mother has the right to conclude her pregnancy safely so also has the baby got a right to be born alive, safe and healthy².

The researcher in the present study tested the effectiveness of information booklet on cardiotocography in fetal monitoring in terms of knowledge among

nursing personnel working in maternity units. Various research studies have also suggested and concluded that this strategy is effective in enhancing the knowledge.

The present study revealed that initially the nursing personnel had a low level of knowledge on cardiotocography in fetal monitoring as evident from mean pre-test knowledge scores (18.3). After exposing them to information booklet, subjects mean post-test knowledge scores (35.1) was significantly higher than the mean pre-test knowledge scores. There was no association between post-test scores and demographic variables of nursing personnel.

A study conducted by Beckley⁴ on obstetrician and midwives for evaluation of a computer assisted teaching programme on CTG, results showed, teaching programme was effective in improving knowledge on CTG.

An evaluatory study conducted by Murphy, Halamek, Lyell, Druzin²⁰ on maternity staff nurses in Chicago regarding the effectiveness of instructional module on the use of cardiotocography, conducted among 125 staff nurses, one group pre test and post test design was used in the

maternity ward. The result showed that the mean pre-test knowledge score (18.20) was significantly lower than mean post-test knowledge score (30.26)($t=15.54$; $P< 0.001$) and instructional module was found to be effective in improving the knowledge of nurses.

A cross-sectional study carried out by Macechin, Lopez, Powell, Corbett³⁰ 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. Universal sampling method has been used in this study. 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. Result also indicated a significant association between frequency on CTG interpretation with knowledge on CTG ($p=0.01$). The study concluded that the need for an effective training program would help to improve CTG interpretation skill by midwifery nurses.

Cimil⁴³ mentioned in her study that care guide on cardiotocography was effective in increasing knowledge and practice of nursing personnel.

A study conducted by Dover⁵⁰ concluded that the training can increase midwives' fetal monitoring knowledge on cardiotocograph. On the basis of the findings of the study the following conclusions were drawn:

CONCLUSIONS

The present study shows that the information booklet on cardiotocography was found effective in increasing the knowledge of nursing personnel as evident from calculated frequency percentage scores of knowledge levels categorized as highly adequate, adequate and inadequate. The standard deviation difference (2.80) depicted the homogeneity of the group. There was no significant association found between post-test knowledge scores and demographic variables such as age, professional qualification, working experience and in-service training. The scarcity of obstetricians and family physicians serving disadvantaged populations in low- and middle-income countries, the use of midwives to provide maternal health care has the potential to

reduce inequities in access to antenatal and postpartum care in these settings. However, health systems would have to ensure that the midwives are recruited from, and retained in, underserved communities and are adequately trained, supported and supervised.

REFERENCES

01. Rao Kamini, A Textbook of midwifery and Obstetrics. New Delhi: Elsevier, 2011, pp 4-12
02. Dutta DC. Text book of obstetrics. 6th Edition. Kolkata: New central book agency Limited; 1983: 109-111, 605-606.
03. Larson JB and Stewart DB. Maternal New Born Nursing, "Care of the Growing Family" Little Brown and Co. 2nd ed. 1981. pp10-14.
04. Beckley Sarah, Elizebeth Stenhouse, Keith Green. The development and evaluation of a computer-assisted teaching programme for intrapartum fetal monitoring. British Journal of Obstetrics and Gynaecology. 2000 September;107(9),1138-1144. doi:10.4103 /0300-1652.104384.
05. Hafizur Rahman, Prachi Renjhen, Dutta Sudip. Reliability of admission cardiotocography for intrapartum monitoring in low resource setting. Niger Med J. 2012 Jul-Sep;53(3):145-9 , doi: 10.4103/0300-1652.104384.
06. WHO/10 facts on maternal health September 2010. women and newborns in India July 2009. Sexual and reproductive health (Available from [www.who.int/features/maternal_child/en / - 25k](http://www.who.int/features/maternal_child/en/-25k))
07. Odds SB, London ML, Ladewig PA. Maternal newborn nursing- A family centered approach. 3rd edition. California: Addison Wesley publication; 1988: 637- 3
08. Sinclair Marlene. Midwives attitudes to the use of the cardiotocograph machine. Journal of Advance Nursing . 2001; 35 (4): 599-606
09. Altaf S , Oppenheimer C, Shaw R, Waugh J, Woods D. Practices & views on fetal heart monitoring. A structured observation & interview study. 2006 April;113(4): 409-18 Available form: [http:// www. pubmed. com](http://www.pubmed.com).
10. Devane D, Lalor J. Midwives' visual interpretation of intrapartum

- cardiotocographs: intra- and inter-observer agreement. *Journal of Advance Nursing*. 2005 Oct; 52(2):133-41.
11. Trepanier MJ, Niday P, Davies B, Sprague A, Nimrod C, Dublerg C. Evaluation of fetal monitoring education programme. *Journal of Obstetric Gynecological Neonatal nursing*. 1996; February. 25(2): 137-44
 12. Polit D, Beck C T. *Nursing research principles and methods*. 7th ed. Philadelphia : Lippincott Williams and Wilkins; 2004: 88-9.
 13. Sinclair M. Midwives' attitudes to the use of the Cardiotocograph machine. *Journal of Advance Nursing*. 2001 Aug;35(4):599-606.
 14. Cimil Manual. Effectiveness of care guide among nursing personnel regarding cardiotocography in fetal monitoring. (M.Sc.dissertation):rackon, University of Delhi; 2008.
 15. Pehrson C, Sorensen JL, Amer-Wåhlin I. Evaluation and impact of cardiotocography training programmes: a systematic review. *BJOG*. 2011 Jul;118(8):926-35. doi: 10.1111/j.1471-0528.2011.03021.x
 16. McKevitt S, Gillen P, Sinclair M. Midwives' and doctors' attitudes towards the use of the cardiotocograph machine. *Midwifery*. 2011 Dec;27(6):e279-85. Epub 2011 Feb 3.
 17. Devane D, Lalor J, Bonnar J. The use of intrapartum electronic fetal heart rate monitoring: a national survey. *Ir Med J*. 2007 Feb;100(2):360-2.