

Effect of Competency Based Education on Infection Control Practices of Labour Room Nurses in Raigad District, Maharashtra

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ABSTRACT

Poor infection prevention practices in labor and delivery units also cause puerperal sepsis, neonatal sepsis and other infections of childbirth. The health workers are also at risk of contracting infections in labour room.

Objectives: To compare the practices among nursing personnel in related to medical, surgical asepsis and biomedical waste management in labour room before and after the competency based education. To find the association of Infection control practices of Labour room Nurses with the demographical variable.

Materials and methods: An evaluative research approach with pre experimental one group pre test post test design is used. The sampling technique used was probability random sampling. Data was collected from selected CHCs and PHCs at Raigad district. Data collection was done from 21/12/15 to 28/12/15.

Result: The mean post test knowledge score were 15.25 of nursing personnel working in labour room regarding infection control practices is significant higher than their mean pre test knowledge score were 9.55. Gain in knowledge scores was found to be highly significant at $p < 0.05$ level ($Z_{19} = 3.94$, $p < 0.05$). The data was also showed highly significant for attitude. The analysis of practices shows the pre test hand washing mean score before hand washing preparation 2, during 8.75 and after 2 had poor practice while post test mean score before 3, during 11.90 and after 2.70 is improved after competency based education. The calculated 'Z' value is significantly high than table value at 0.05. The pre test and post test practice score on per vaginal examination before, during and after steps of procedure is 3.82, 3.94 and 2 respectively is higher than the table value at 0.05. The pre and post test practices score on conducting labour of nursing personnel were before 9, during 12.05 and after 3 which were increased in post test respectively as before 10.85, during 13.25 and after 3.80.

Conclusion: Hence competency based education was affected of nursing personnel working selected Health care facilities regarding infection control practices during intranatal period in labour room.

Key words: Effective, Knowledge, attitude, practices, infection control practices, competency based education, nursing personnel, labour room)

INTRODUCTION

In 2000 the National Population policy and reproductive and child health program II set out the goals for 2010 including 80 % of all deliveries in institutions; 100% of deliveries attended by training personnel: and reduction of maternal mortality ratio to less than 100 per

100,000 live births. The NRHM (2005 – 2012) aimed to improve availability of the access to maternal and child health services. Increased deliveries in health facilities have been achieved through financial incentives provided to health workers and to women.

[1]

WHO reported that every minute a mother dies from complication of pregnancy and child birth. [2] In developed countries, the maternal mortality ratio is 27 per 100,000 live births and in the developing countries the ratio is 20 times higher. It varies between 167 and 230 per 100,000 live births depending on the regions. [3]

Many wound and genital tract infections can be introduced during childbirth. Puerperal sepsis is one of the most serious and life threatening. In India, maternal death from puerperal sepsis constitute the second most common cause after hemorrhage accounting for approximately 15% of all maternal death. A Sixteen year study from Northern India found that sepsis was responsible for 35% of maternal deaths and a study in Southern India revealed that sepsis was responsible for 41.9% of death. [4]

Studies have revealed that the major cause of maternal mortality is lack of intrapartum care. The place of delivery plays an important role in child survival and safe motherhood. The child born in unhygienic condition is more prone to get infection. A properly assisted delivery with skilled personnel and following aseptic precaution is highly advantageous to both mother and fetus during delivery.

Since the implementation of the infection control practices (biomedical waste management rules 1998 every concerned health personnel is expected to have proper knowledge, practice and capacity to guide others waste collection and management and proper handling techniques. Labour room generates a number of hazardous waste that can detrimental to the environment if not properly managed. This includes sharps, used disposable items, infectious waste (blood soaked cotton, gauze, sanitary pads) and anatomical waste i.e. placenta.

Contaminated hand could be vehicles for the spread of certain viruses and bacteria. A review of hand hygiene practices suggests that the compliance of health care personnel to recommended hand hygiene

procedures ranges from 5% to 89% with an average compliance rate of less than 50%. There is evidence that hand antisepsis reduces the transmission of health care associated pathogens and the incidence of Health Care Associated Infection.

Knowledge, attitude and practice act as three pillars, which make up the dynamic system of life itself. Knowledge is some information that is acquired or gained. It results in congeniality and advertence about an eclectic thing or a situation. Attitude accredits to thinking towards a proper situation. Practice means contemplation of rules and knowledge that lead to action. Thus, a right knowledge, a positive attitude and a good practice are imperative to guide and serve the right patient.

Competence is the ability of the midwives to function completely and proficiently on their own through knowledge and skills acquired throughout their training (Myles et al, 2004:4). [5] Professional competencies is an outcome, it describes what someone can do in order to measure reliably someone's ability to do something, there must be clearly defined and widely accessible standard through which performance is measured and accredited. "Core competencies in nursing" refers to a standard set of performance "domains" in which it is necessary to demonstrate proficiency to enter into professional practice.

Mehta and Mavalankar conducted a needs assessment on "Infection control in delivery care units Gujarat state, India". This study revealed a need for improved information system, protocols and procedures, and for training and research. Simply incentivizing the behavior of women to use health facilities for childbirth via government schemes may not guarantee safe delivery. [6]

Harley conducted a study on "labour and delivery" where he emphasized that there is a particular need for compliance with universal precautions although it must be recognized that some midwives may feel uncomfortable in using these precautions as

such a sensitive time. The findings of the research suggest that retention of skills and knowledge quickly deteriorates if not used or updated regularly. This research supports the importance of infection control strategies refresher courses on a regular basis.^[7]

The investigator was observed that, many a times staff nurses fail to practice aseptic techniques in labour room. Practices of hand washing, performing vaginal examination and conducting delivery are another important area of concern is where staff nurses should be careful. Asepsis precaution is very important to prevent introduction of infection for the mother. Hence keeping the above points in mind the researcher felt to assess the effectiveness of competency based education on infection control practices during intranatal period in labour room on knowledge attitude and practices of nursing personnel.

REVIEW OF LITERATURE:

Benita. D et al (2014) conducted study on Effectiveness of Infection Control Standards on Practice among Health Care Personnel Working in Labour Unit. Quantitative research approach with Pre-experimental one group pretest post test design was used to collect the data. The findings of the study revealed that the mean pre test level of practice on infection control was 21.47 with standard deviation of 1.92 and mean post test level of practice on infection control was 43.73 with standard deviation of 2.02. The calculated 't' value was 59.14 which was significant at $p < 0.001$ level. The result revealed that there was an enhancement in the level of practice after administration of Infection Control Standards among health care personnel.^[8]

Globalization and Health (2013), estimated that in industrialized countries, puerperal sepsis is rare, causing 2.1% of maternal death. In Latin America and the Caribbean, its contribution of maternal mortality is 7.7% whereas in Africa and Asia, it is the second commonest cause of

maternal morbidity, causing 9.7% and 11.6% of death respectively.^[9]

OBJECTIVES:

- 1) To compare the practices among nursing personnel in related to medical, surgical asepsis and biomedical waste management in labour room before and after the competency based education
- 2) To find the association of Infection control practices of Labour room Nurses with the demographical variable.

MATERIALS AND METHODS

The study is adopted Quantitative Pre experimental evaluative one group pre test post test design for assessing knowledge, attitude and practices in labour room of selected Health care facilities of Raigad district.

The tool was developed based on review of literature consist of Section I – Section A: Demographic Variables, Section II – Checklist regarding Infection Control Practices in labour room – i) Hand hygiene (medical and surgical asepsis) ii) Pervaginal examination, iii) Conducting labour, iv).Cleaning and waste management v) Segregation of biomedical waste. Score of practices: 1 point score for performed and 0 point score for not performed is given.

Subjects were selected from two Nagar Parishad hospitals of Raigad district. Total 20 subjects were selected by random sampling technique. Nursing personnel working in labour room who were willing to participate were included in this study. The data collection was done strictly under the standard setting. The pre test practices observed on first day, interventions are given on the first and second day. Post test is carried out on seventh day and eighth day of observation. The interpretation was carried out at the end of the data collection. Wilcoxon test is used to analyse and assess the effect of competency based education during intranatal period on Practices of Nursing Personnel.

RESULTS

Table 1: Percentage distribution according to demographic variable of nursing personnel. N= 20

Parameter		No of nurses (f)	Percentage (%)
Age (Yrs)	≤30	9	45
	31 – 40	7	35
	41 – 50	4	20
Professional qualification	ANM	11	55
	GNM	6	30
	B Sc	3	15
Designation	S/N	19	95
	Senior S/N	1	5
Total years of experience	0 – 5	6	30
	6 – 10	6	30
	11 – 15	5	25
	>15	3	15
Years of experience in Labour room	0 – 5	12	60
	6 – 10	5	25
	>10	3	15
Delivery conducted per month	≤5	6	30
	>5	14	70
Receive any operation training on ICP	Yes	11	55
	No	9	45
Formal training on ICP within last yrs	Yes	4	20
	No	16	80
If Yes, Specify (n=4)	DHC	2	50
	ICTC	1	25
	DTHC	1	25
		1	25

Among the nursing personnel majorities (45%) were in the age group of 31 – 40 years followed by 45% were in the age group of ≤ 30 years. Professional qualification wise, majority of nurses (55%) qualified as ANM while 30% were qualified as GNM. Majority of subjects (95%) were working as a staff nurse. 30% subjects had experience around 5 – 10 yrs while 25% subjects had 15 years experience. Among the nurses 60% were working around 5 years in labour room while 15% nurses were working more than 10 years in labour room. Majority of nurse (70%) were conducted deliveries more than 5 per month. Among the nurses only 20% had received formal training on infection control practices within last year at district health centre, Alibag.

Table 2: Practice score on hand washing wise distribution of nurses in study group

Practice score	Pre test	%	Post test	%
0 – 7 (Poor)	0	0	0	0
8 – 14 (Average)	17	85	0	0
15 – 21 (Good)	3	15	20	100

From the above table it was evident that 85% nurses showed average hand washing practice and it was increased 100% after competency based education.

Table 3: Practice score on Per Vaginal examination wise distribution of nurses in study group

Practice score	Pre test	%	Post test	%
0 – 9 (Poor)	0	0	0	0
10 – 19 (Average)	14	70	0	0
20 – 28 (Good)	6	30	20	100

Table 3 reveals 70% nurses scored average Pervaginal examination practices in pretest which was increased 100% in posttest after competency based education.

Table 4: Practice score on conducting labour wise distribution of nurses in study group

Practice score	Pre test	%	Post test	%
0 – 10 (Poor)	12	60	0	0
11 – 21 (Average)	8	40	14	70
22 – 31 (Good)	0	0	6	30

Table 4 reveals 60% nurses performed poor practices on conducting labour and 40% showed average score in practices. After competency based education 70% nurses showed average practices score and 30% showed good practices score.

Table 5: Practice score on cleaning and waste management wise distribution of nurses in study group

Practice score	Pre test	%	Post test	%
0 – 7 (Poor)	0	0	0	0
8 – 14 (Average)	10	50	0	0
15 – 21 (Good)	10	50	20	100

From the above table it showed that 50% nurses score average and 50% scored good in cleaning and waste management practices in pretest while 100% showed in posttest.

Table 6: Comparison of pre and post test practice score of staff nurses in study group

Practice score on	Pre test		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Hand washing	12.75	1.585	17.60	1.273	3.96	<0.0001
PV examination	18.50	1.277	24.85	1.755	3.95	<0.0001
Conducting labour	24.05	1.669	27.90	1.373	3.94	<0.0001
Cleaning & waste management	14.20	1.508	20.15	0.745	3.95	<0.0001

Table 6 depicts the comparison of pre and post test practice score on infection control practices in labour room of nursing personnel. When comparing the pre and post test level of practices, the post test

mean score was higher than pre test mean score. The calculated 'Z' value greater than the table value and this indicated that there was statistically highly significant difference at $p < 0.001$.

Table 7: Comparison of pre and post test practice score on hand washing of staff nurses in study group

Practice score on Hand washing	Pre test		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Before	2	0	3	0	4.47	<0.0001
During	8.75	1.585	11.90	1.252	3.96	<0.0001
After	2	0	2.70	0.470	3.74	<0.0001

The table 7 depicts the pre test hand washing practice mean score before hand washing preparation 2, during 8.75 and after 2 had poor practice while post test mean

practice score before 3, during 11.90 and after 2.70 is improved after competency based education. The calculated 'Z' value is significantly high than table value at 0.0001.

Table 8: Comparison of pre and post test practice score on per vaginal examination of nursing personnel in study group

Practice score on PV examination	Pre test		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Before	8.70	0.470	9.60	0.598	3.82	<0.0001
During	4.50	0.946	9.75	1.552	3.94	<0.0001
After	5.30	0.801	5.50	0.607	2	0.046

Table 8 shows comparison of pre test and post test practice score on per vaginal examination before, during and after

steps of procedure. The calculated 'Z' value is 3.82, 3.94 and 2 respectively is higher than the table value at 0.0001.

Table 9: Comparison of pre and post test practice score on conducting labour of nursing personnel in study group

Practice score on conducting labour	Pre test		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Before	9.00	1.257	10.85	0.813	3.62	<0.0001
During	12.05	0.945	13.25	1.070	3.52	<0.0001
After	3	0	3.80	0.410	4	<0.0001

This section reveals comparison of pre and post test practices score on conducting labour of nursing personnel. Pre test practice mean score before 9, during 12.05 and after 3 which were increased in post test respectively as before 10.85, during 13.25 and after 3.80. The calculated 'Z'

value was significantly higher than table value at 0.0001.

Table 10 represent area wise mean percentage score. It shows that in pre test and post test the subjects obtained maximum score. The calculated 'Z' value is significant greater than the table value at 0.0001 level.

Table 10: Comparison of pre and post test practice score on cleaning and waste management of staff nurses in study group

Practice score on cleaning & waste management	Pre test		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Preparation	0.55	0.51	1	0	3	<0.0001
Segregation	2.55	0.510	3	0	3	<0.0001
Decontamination	1	0	3	0	4.47	<0.0001
Cleaning	2.40	0.503	3	0	3.46	<0.001
Sterilization	3	0	3	0	0	1
Needles & syringe	3	0.858	4.70	0.470	3.99	<0.0001
Cleaning area of labour room	2	0.562	2.45	0.510	3	0.003

Table 11: Association of Infection control practices of Labour room Nurses with the demographical variable

		Practice score (Hand washing)				
Age (Yrs)	n	Mean	SD	F Value	p Value	Inference
≤30	9	13.22	1.093	1.27	0.31	>0.05
31 – 40	7	12.00	1.915			NS
41 – 50	4	13.00	1.826			
Professional qualification						
ANM	11	12.36	1.567	0.71	0.50	>0.05 NS
GNM	6	13.17	1.941			
B Sc	3	13.33	.577			
Total years of experience						
0 – 5	6	17.67	1.033	1.29	0.31	>0.05
6 – 10	6	18.83	1.169			NS
11 – 15	5	18.80	1.643			
>15	3	19.00	1.000			
Years of experience in labour room						
0 – 5	12	12.92	1.379	0.81	0.46	>0.05
6 – 10	5	12.00	1.871			NS
>10	3	13.33	2.082			
Practice score (Per vaginal examination)						
Age (Yrs)	n	Mean	SD	F Value	p Value	Inference
≤30	9	17.89	1.167	2.26	0.14	>0.05
31 – 40	7	18.86	1.345			NS
41 – 50	4	19.25	0.957			
Professional qualification						
ANM	11	18.55	1.572	0.84	0.45	>0.05
GNM	6	18.83	.753			NS
B Sc	3	17.67	.577			
Total years of experience						
0 – 5	6	17.67	1.033	1.29	0.31	>0.05
6 – 10	6	18.83	1.169			NS
11 – 15	5	18.80	1.643			
>15	3	19.00	1.000			
Years of experience in labour room						
0 – 5	12	18.17	1.337	1.02	0.38	>0.05
6 – 10	5	19.00	1.225			NS
>10	3	19.00	1.000			
Practice score (Conducting labour)						
Age (Yrs)	n	Mean	SD	F Value	p Value	Inference
≤30	9	23.56	1.944	0.80	0.47	>0.05
31 – 40	7	24.29	1.380			NS
41 – 50	4	24.75	1.500			
Professional qualification						
ANM	11	23.82	1.834	1.81	0.19	>0.05
GNM	6	25.00	1.265			NS
B Sc	3	23.00	1.000			
Total years of experience						
0 – 5	6	23.50	2.345	0.39	0.76	*S <0.05
6 – 10	6	24.00	1.549			
11 – 15	5	24.60	1.140			
>15	3	24.33	1.528			
Years of experience in labour room						
0 – 5	12	23.50	1.784	2.10	0.15	>0.05
6 – 10	5	25.20	.837			NS
>10	3	24.33	1.528			
Practice score (cleaning and waste management)						
Age (Yrs)	n	Mean	SD	F Value	p Value	Inference
≤30	9	14.56	1.509	0.66	0.53	>0.05
31 – 40	7	14.14	1.464			NS
41 – 50	4	13.50	1.732			
Professional qualification						
ANM	11	14.64	1.629	1.03	0.38	>0.05
GNM	6	13.67	1.506			NS
B Sc	3	13.67	.577			
Total years of experience						
0 – 5	6	14.17	1.472	0.94	0.44	>0.05
6 – 10	6	15.00	1.414			NS
11 – 15	5	13.60	1.342			
>15	3	13.67	2.082			
Years of experience in labour room						
0 – 5	12	14.25	1.545	0.22	0.81	*S <0.05
6 – 10	5	14.40	1.342			
>10	3	13.67	2.082			

From the above table summary table it is clear that demographical variable such as age, professional qualification had no significant association with practices related to hand washing, Per vaginal examination, conducting labour and cleaning and waste management in labour room.

There was high level of significance found between practices and total year of experience ($F = .39, p < 0.05$) and year of experience in labour room ($F = .22, p < .05$).

DISCUSSION

Infection control practices are a common problem all over the world. Therefore up to date knowledge and nursing skills can play important role in infection control. This study was conducted at selected government hospitals in Raigad district.

The result of our study showed that one third of the studied sample aged between 31 to 40 years old. This finding is in concordance with that of (Dr Ayed Ahmad et al 2014, Sijo Koshy 2014) emphasizing the need to protect this group of workers in the prime of their from hospital infection.

The result also showed that approximately 80% of the study group hadn't had previous courses on infection control. Education is a critical element in the training of all health care workers where there is a lack of formal and well organized infection control programs.

About majority of nursing personnel were found to have average practices score on infection control in pre test which showed improved in post test.

Comparison of pre test and post test mean score difference showed significant on infection control practices after competency based education ($Z_{19} = 3.76, p < 0.0001$)

Concerning assessment of practices regarding infection control of nursing personnel, the current study demonstrates that the majority of the studied subjects had good practices level after competency based education. Practices was found to be higher significant ($Z_{19} = 3.96, p < 0.001$). In this

regard Sijo Koshy et al (2014) indicated that, there is significant difference observed between mean difference of pre test and post test knowledge and practices score of staff nurses regarding infection control measures in labour room. Hence planned teaching program was effective regarding infection control practices in labour room.

The result also showed that demographical variable such as age, professional qualification had no significant association with practices related to hand washing, Per vaginal examination, conducting labour and cleaning and waste management in labour room. There was high level significance found between practices and total year of experience ($F = .39, p < 0.05$) and year of experience in labour room ($F = .22, p < .05$).

Recommendations

Based on results of the present study it was recommended that; periodic training program should be provided to Labour room nurses at health centres to update their knowledge and practices regarding infection control precautions. It contain the following items sterilization, hand washing, universal precaution, cleaning and disinfection. Further studies needed to be performed with different variables, subjects and on large population.

CONCLUSION

Assessment of practices on infection control practices during intranatal period in labour room among nursing personnel and improve it through competency based education is the main concept of this study. Based on the finding of the study it can be concluded that nurses have average knowledge on infection control practices. After the competency based education the post test knowledge and practices mean score showed that there is a significant increase regarding infection control practices in the labour room. Increase in the knowledge attitude and practices can bring changes and this will prevent them from spreading infection in labour room.

The Health care Personnel play a critical role in controlling infection that begins with early detection and surveillance technique, so effective training is essential to ensure that these concepts are understood and put into practice wherever health care is provided. Health care Personnel must be educated in the basic principles of infection control and acquire new knowledge and skills because the quality of nursing care depends to a large degree on the knowledge, skills, attitudes and activities of the practicing Health care Personnel (Ahmed, et al., 2012).

Sources of financial support: Self funding

Conflict of interest: Nil

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How to cite this article: Rarawagh A, Mshif M, Fnjum MS. Effect of competency based education on infection control practices of labour room nurses in Raigad district, Maharashtra. *Int J Health Sci Res*. 2017; 7(5):224-231.
