International Journal of Research and Review
Vol. 9; Issue: 8; August 2022
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Assessment of Nurses' Performance Related to Postnatal Care Against the International Confederation of Midwives Competencies and Impact of Plan-Do-Check-Act Cycle in Maternity Unit of Selected Hospital, Medinipur

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DOI: https://doi.org/10.52403/ijrr.20220868

ABSTRACT

Postnatal period is a very vulnerable time because most of the maternal and neonatal death occur during this period. Nurses and midwives are the most important stakeholders in the health care delivery system in order to meet the quality care for the patients. PDCA cycle as a rapid improvement cycle is very helpful to build a standard practice of quality care within the facility. A study was undertaken to assess nurses' performance related to postnatal care against the International Confederation of Midwives competencies and impact of Plan-Do-Check-Act cycle in maternity unit of selected Hospital, Medinipur. Pre-experimental research design was adopted. Total 14 nurses working in postnatal ward of selected hospital were selected as study subjects by total enumerative sampling technique. Final data were collected by using validated and reliable semi-structured questionnaire (r=1), structured knowledge questionnaire(r=0.72), structured observation checklist(r=1) and semi-structured interview schedule(r=1). Three PDCA cycles were applied cyclically. The strategies undertaken in the PDCA cycle were identifying the gaps and reasons of gaps in postnatal care and rectifying them in the subsequent PDCA cycle. The main findings of the study revealed that in pretest, very few staff nurses (7.14%) had poor knowledge, more than half of the staff nurses (64.29%) had average knowledge and 28.57% staff nurses had good knowledge. So, gaps were present in nurses' knowledge on postnatal care as only 35.71% nurses had good knowledge. Majority of the nurses (85.72%) had average skill and very few of staff nurses (7.14%) had poor skill and also very few nurses (7.14%) had good skill in postnatal care. The gaps were identified in skill of checking BP, temperature, breast condition, uterine involution, PV bleeding of mother, checking temperature, respiration and related complications, reflexes, general conditions & other complications of baby, providing support for breast feeding, health education and counselling services. The stated reasons for these gaps were inadequate supply of articles and equipment, less manpower in relation to nurse patient ratio, inadequate space and area for postnatal examination & discharge, forgetting proper steps of some procedures, others (some parameters were checked by doctors, so nurses did not check such as uterine involution of mother, reflexes, general condition & other complications of baby). After taking appropriate strategies in PDCA cycle to reduce the gaps in nurses' performance it was seen that there was significant differences in mean values between pretest knowledge score with the posttest knowledge score in 3rd PDCA cycle [t=8.683 at df(13), p<005]. There were also significant differences in mean skill scores between pretest & 1st PDCA cycle, 1st & 2nd PDCA cycle, 2nd & 3rd PDCA cycle, pretest & 3rd PDCA cycle [t=16.312, t=8.0, t=6.624,

t=17.539 at df(13), p<0.05] respectively. The study can be replicated for other nursing practice area to improve quality patient care through PDCA cycle. So, the current study concludes that PDCA cycle is effective to increase nurses' knowledge and skill in postnatal care and to increase quality of postnatal care by reducing the gap in the administrative level, logistic level, human resource development (training on knowledge and skill), and infrastructure development.

Key Words: Nurses' performance, Postnatal care, The International Confederation of Midwives Competencies, Plan-Do-Check- Act cycle.

INTRODUCTION

Postnatal period is a six-week interval between the birth of a newborn and the return of the reproductive organs to their normal non pregnant state. Postnatal period is a very vulnerable time because most of the maternal and newborn deaths occur during this period.[1] Globally, over 500000 women die of child birth every year with over 90% of deaths occurring in the developing countries.[2]

Postnatal care is the most neglected area in the health care delivery system despite being very important time for the provision of interventions that are vital to the health of both the mother and the newborn. Consequently, serious complications which account for two third of all maternal and neonatal deaths occur during the postnatal period.[1]

Now WHO is raising the importance of postnatal care. Both postnatal women and newborns require support and careful monitoring after delivery. Most of the maternal and infant deaths occur in the first six weeks after delivery, still this remains the most neglected phase in the provision of quality maternal and newborn care. WHO provides the technical guidance for skilled health care personnel and all the community health workers who support postnatal women and newborns after birth.[3]

Maintaining and improving patient care for the postnatal mother and their newborn requires active involvement of everyone in the health care system. Nurses and midwives are the most important stakeholders in the health care delivery system who can identify whether effective and appropriate care has been provided to the mother or not. The quality is the major component of both postnatal and neonatal health care, and it demands participation from nurses rendering care.[4]

METHODOLOGY

Pre-experimental research design was adopted to collect data from the nurses working in the postnatal Ward of Debra Super Speciality Hospital, Paschim Medinipur, West Bengal. After getting permission from the hospital authority, the data were collected from the nurses during morning and evening shift. The data from night duty nurses were also collected after completion of their night duty and when they came back to morning and evening duty.

Semi-structured questionnaire was used to collect socio-demographic data, knowledge questionnaire was used to get information about nurses' knowledge in postnatal care and structured observation checklist was used to get the information about nurses' skill in postnatal care and gaps in postnatal care. Data regarding reasons of gaps in postnatal care were collected by interviewing through semi-structured interview schedule.

After collection of these data the investigator started PDCA cycle in the following manner-

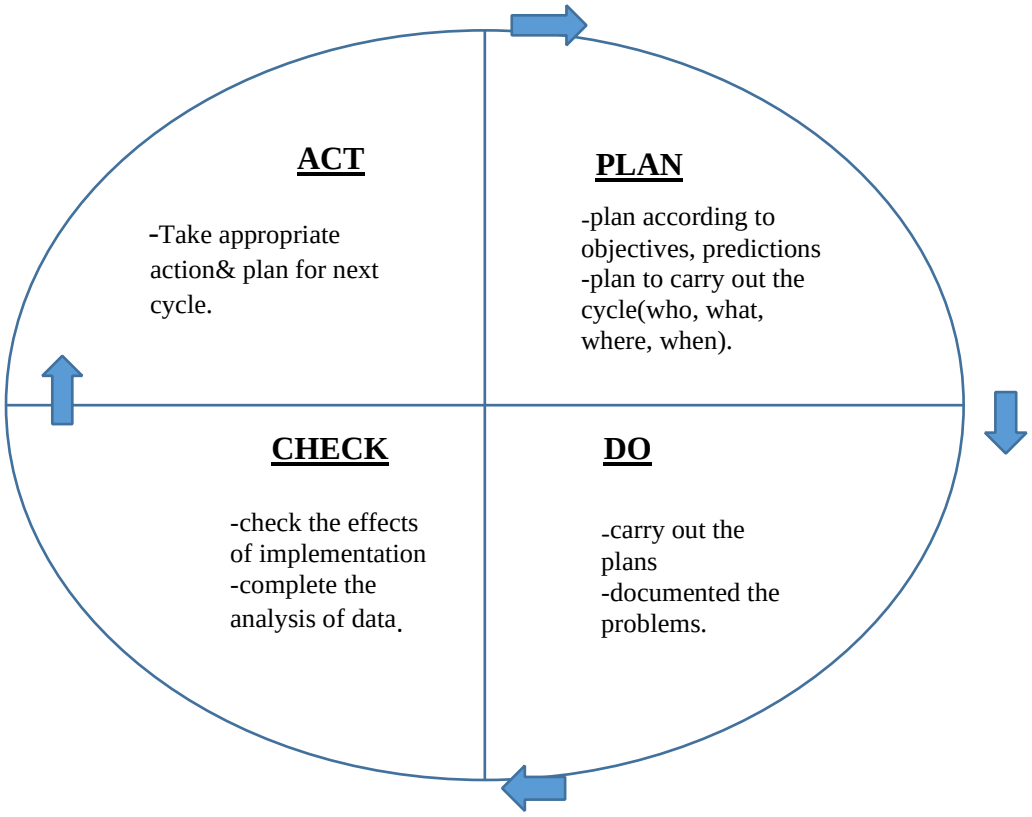

Fig. 1 : Diagram of PDCA cycle

After identifying the area of gaps and reasons of gaps regarding the area of postnatal care the investigator planned for the corrective measures to be taken. These planning were done in "PLAN' phase of the cycle. According to the planning, the measures were carried out in 'DO' phase. In 'CHECK' phase the effects of implemented measures were assessed by using the same tool used previously. In 'ACT' phase, further necessary actions were planned and also planned for next cycle.

In this way three PDCA cycles were continued cyclically and each cycle was continued for

7 days. After 1st PDCA cycle, 2nd PDCA cycle was started and after 2nd PDCA cycle, 3rd PDCA cycle was started.

The description of 1st , 2nd 3rd PDCA cycle are given below:

1st PDCA cycle from 17.01.21-23.01.21

PLAN- After pretest, gaps in knowledge and skill were identified and plan was prepared accordingly.

- Teaching was planned on identified gaps on knowledge regarding postnatal care against ICM guideline for the nurses.
- Planned for arranging more aneroid BP instruments, stethoscopes and thermometer in the ward.
- Planned for arranging another bed in the examination room with curtain to reduce the shortage of examination area.
- Planned for arranging a discharge table while giving discharge.
- Planned for allowing the nurses for documentation of baby's certain parameters like (reflexes, convulsion related information) in the available patient ticket or format after taking permission from the authority.
- Planned for giving hands on training on checking BP, temperature, breast condition, uterine involution, pv bleeding & perineal condition of the mother, checking respiration & related complications, reflexes, general condition and other complications of the baby.

- Planned to teach how to demonstrate breast feeding techniques to the mothers and how to provide health education and counselling to the mother and family as gaps were present in nurses' skill in this area.
- Planned to arrange more IEC material for giving for health education to postnatal women.

DO- Identified gaps and plan on the gaps were discussed with NS, DNS, ward in charge and doctor. The following arrangements were made to improve nurses' performance in
terms of knowledge and skill.

- Teaching was given on identified gaps in knowledge regarding postnatal care for 20 minutes session to the available nurses of the morning and evening shift after their handover time. Like this way teaching was given to all the nurses having gap on knowledge regarding postnatal care.
- Another 4 aneroid BP instruments and 4 stethoscopes and 2 thermometers were arranged so that the nurses could check BP and temperature by maintaining all the steps and they did not have to face a hurry to hand over the instruments to another staff or doctor for other patients.
- One extra bed was arranged in the examination room after taking permission from the authority to reduce the shortage of examination area.
- A discharge table with all necessary equipment was arranged so that the nurses could give health education & counselling in a proper way during discharge.
- As there was no scope of recording newborn reflexes and some other important information of baby in the available ticket or format, so they were allowed to document those parameters in a particular place of the available ticket or format after taking permission from the hospital authority and doctors.
- Hands on training was given to the nurses individually during their duty shift who had gap in skill on BP checking, breast examination, checking uterine involution & other complications, checking newborn reflexes and other complications.
- Taught the nurses how to demonstrate breast feeding techniques to the mothers so that the mothers could get support for breast feeding from the nurses in providing breast feeding to her newborn and also taught the nurses how to provide health education and counselling to the mother and the family during discharge.
- IEC were arranged in the ward for better health education purpose.

CHECK

- Checked if all the new arrangements were properly implemented.
- Data regarding nurses' performance in terms skill were again collected and analyzed.
- As the duration of the cycle was very short, the knowledge was not assessed in this cycle. A minimum time gap was given and planned to assess the knowledge in the 3rd cycle.

ACT

- Applied the changes in postnatal care during practice.
- After analyzing the data, planned for next cycle.
- In this way 2nd and 3rd PDCA cycle were completed.

2nd PDCA cycle from 24.01.21-30.01.21

PLAN- Fulfillment of existing gaps and their reasons according to the data collected during the 'check' phase of 1st PDCA cycle.

- Planned to observe sustainable arrangements and availability of all supply.
- Planned for again hands on training on those skill areas where gaps were again found.
- As the arrangement of two beds in the examination room were not sufficient for examination of all the mothers,

planned for arranging extra curtains at bed side to examine the patients.

DO

- All the necessary arrangement and supply of articles and equipment were available and sustainability was maintained.
- Again hands on training was given to the nurses individually who had gap in skill regarding BP checking, breast examination, checking uterine involution, pv bleeding & perineal condition, assessing general condition and other complications of baby.
- Taught the nurses how to provide health education and counselling to the mother and the family during discharge.
- Extra 4 curtains were arranged so that the nurses could do examination at bed side which saved the time as well as convenient for staff nurses to perform the procedure.

CHECK

- Observed the continuity of performance of skills practiced by staff nurses on postnatal care and data were again collected.
- Collected data were analyzed.

ACT

- Applied the changes or interventions in postnatal care.
- Planned for next cycle.

3rd PDCA cycle from 31.01.21-06.02.21

PLAN- Findings in 2nd PDCA cycle showed that there was improvement in most of the area but gaps were remaining in some skill areas.

- Planned to continue the changes done during previous two cycles.
- Planned for again hands on training for existing gap in nurses' skill.
- Planned to teach how to provide health education and counselling to the mother and family as gaps were still present in nurses' skill in this area.
- Planned for assessing nurses' knowledge in this cycle.

DO

- Continued all the changed done in previous two cycles.
- Again hands on training was given to the nurses who had gap in some areas of skill.
- Taught the nurses how to provide health education and counselling to the mother and the family during discharge.

CHECK

- Observed the continuity of performance of skills practiced by staff nurses on postnatal care and data were collected.
- Data regarding nurses' knowledge were collected after the teaching on identified gaps in knowledge regarding postnatal care, which was given in 1st cycle. After giving knowledge related intervention a time gap was given and nurses' knowledge was assessed in this cycle.
- Data regarding nurses' skill and knowledge were collected and analyzed.

ACT

- Applied the changes done during these three cycles in postnatal care.

Statistical Methods:

The data regarding sample characteristics, nurses' knowledge and skill, the gaps and reasons of gaps were described by frequency and percentage distribution. Paired 't' test was computed to identify the mean differences in knowledge score of nurses in pretest and in 3rd PDCA cycle and to identify the mean differences in skill score of nurses in pretest, during 1st, 2nd and 3rd PDCA cycle.

RESULTS

The analyzed data showed that more than half of the nurses (64.29%) were in the age group of 21-30years. More than average (64.29%) staff nurses were GNM and no one staff nurse was having academic qualification of MSc. Nursing. As regard

working experience, half (50%) staff nurses had <5 years of working experience, 35.71% had 5-10 years of working experience and 14.29% had >5 years of working experience. Majority of nurses (71.43%) had working experience of <5 years in maternity unit. All the nurses (100%) had received special training regarding maternity care (skill lab, immunization, NSSK, Maa) and most of them (92.86%) had (1-3) number of training.

Table 1: shows the frequency and percentage distribution of knowledge of nurses regarding postnatal care in pretest. n=14

Knowledge Score	Frequency	Percentage (%)
Poor knowledge (0-50%)	1	7.14
Average knowledge (51-75%)	9	64.29
Good knowledge (76-100%)	4	28.57

Data presented in Table 1 depicts that very few staff nurses (7.14%) had poor knowledge, more than half of the staff nurses (64.29%) had average knowledge and 28.57% staff nurses had good knowledge in postnatal care. Data also showed that majority of the nurses had gap in knowledge as only 28.57% nurses had good knowledge in postnatal care.

Table 2: showing the frequency and percentage distribution of skill of nurses in postnatal care in pretest. n=14

Skill Score	Frequency	Percentage (%)
Poor skill (0-50%)	1	7.14
Average skill (51- 75%)	12	85.72
Good skill (76-100%)	1	7.14

Data presented in Table 2 depicts that majority of the nurses (85.72%) had average skill and only 7.14% had poor and good skill and in postnatal care. So gap was there in respect of skill in postnatal care.

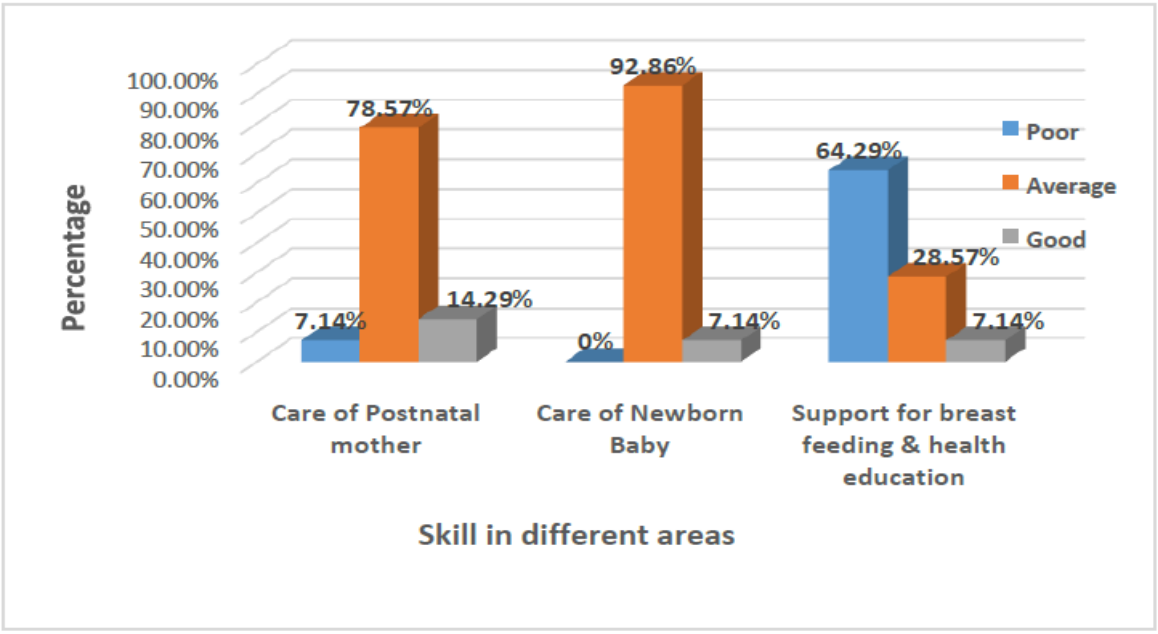

Fig 2: Bar diagram showing area wise distribution of skill of nurses before PDCA cycle (pretest).

Here it is depicted that the majority of the staff nurses (78.57%) had average skill in the area regarding care of postnatal mother, most of the nurses (92.86%) had average skill in the area regarding the care of newborn baby and no one nurses had poor knowledge in this area. Regarding support for breast feeding & health education, more than half of the nurses (64.29%) had poor skill, 28.57% of nurses had average skill and a minimum number of nurses (7.14%) had good skill in this area.

Table 3: shows frequency & percentage distribution of gaps and reasons of gaps regarding postnatal care before PDCA cycle. n=14

Gaps and reasons of gaps in postnatal care		
Care of Postnatal mother:		
Checking BP	**frequency**	**percentage**
Gap	13	92.86%
No gap	1	7.14%
Reasons of gap		
-inadequate supply of BP instrument & stethoscope	13	92.86%
-less manpower in relation to nurse patient ratio	9	64.29%
- forgot the steps of procedure	6	42.86%
Checking temp.		
Gap	12	85.71%
No gap	2	14.29%
Reasons of gap		
-all thermometers are not functioning	12	85.71%
Checking pulse		
Gap	0	0
No gap	14	100%
Breast Examination		
Gap	14	100%
No gap	0	0
Reasons of gap		
-inadequate separate area and bed for examination	13	92.86%
-less manpower in relation to nurse patient ratio	5	35.71%
-forgot the steps of procedure	6	42.86%
Checking uterine involution pv bleeding, episiotomy wound		
Gap	14	100%
No gap	0	0
Reasons of gap		
-inadequate separate area and bed for examination	13	92.86%
-less manpower in relation to nurse patient ratio	5	57.14%
-forgot the steps of procedure	6	42.86%
-others(checked by doctors)	7	50%
Care of newborn baby:		
Checking temp.	**frequency**	**percentage**
Gap	13	92.86%
No gap	1	7.14%
Reasons of gap		
-all thermometers are not functioning	13	92.86%
Checking respiration & related complications		

Gap	5	35.71%
No gap	9	64.29%
Reasons of gap		
-less manpower in relation to nurse patient ratio	5	35.71%
Checking newborn reflexes		
Gap	14	100%
No gap	0	0%
Reasons of gap		
-No nursing recording in structured format	14	100%
-Others(these parameters are checked by doctors)	9	64.29%
Checking general condition & complications		
Gap	14	100%
No gap	0	0%
Reasons of gap		
-Others(checked & recorded by doctors)	14	100%

Support for breastfeeding	**frequency**	**percentage**
Gap	12	85.71%
No gap	2	14.29%
Reasons of gap		
-less manpower in relation to nurse patient ratio	12	85.71%
Health Education & counselling		
Gap	14	100%
No gap	0	0%
Reasons of gap		
-less manpower in relation to nurse patient ratio	11	78.57%
-absence of proper discharge area and discharge table	10	71.43%
-not having sufficient knowledge and skill	8	57.14%
-Inadequate IEC materials	9	64.29%

Data on reasons of gaps are exhaustive but not mutually exclusive.

Data presented in table 3 depicts that most of the nurses (92.86%) had gap in checking BP of postnatal mother. All the nurses who had gap in checking BP (92.86%) explained that there was inadequate supply of sphygmomanometer and stethoscope in the ward, (only one stethoscope and sphygmomanometer was present which was also seen by the investigator). More than half of the nurses (62.29%) stated that there was less manpower in relation to nurse patient ratio as one nurse was allocated for more than five patients. For these reasons they had a hurry in work and they did not able to perform the procedure by maintaining all the steps. And 42.86% nurses said that they had forgot the proper

steps due to not practicing the procedure every day.

Majority of the nurses (85.71%) had gap in checking temperature of postnatal mother. And the same nurses (85.71%) stated that there was inadequate number of thermometers present in the ward as all the thermometers available were not working (only one thermometer was working). As there was a shortage of thermometer in the ward they had to hand over the thermometer for another patient, so they could not perform the procedure by maintaining all the steps.

No one nurse (0%) had gap in checking pulse of postnatal mother.

All the nurses (100%) had gap in performing breast examination of postnatal mothers. Most of the nurses (92.86%) explained that there was inadequate separate area and bed for breast examination by maintaining privacy of mother as only one bed was there in the examination room and curtains were also not available at bed side. 35.71% nurses stated that there was less manpower in relation to nurse patient ratio to perform breast examination for each patients. 42.86% nurses stated that they had forgot the steps of the procedure due to not practicing it regularly. For these above reasons, gaps were existing in breast examination of postnatal mother.

All the nurses (100%) had gap in checking uterine involution, pv bleeding, perineal condition & episiotomy (if present) of postnatal mothers. Most of the nurses (92.86%) explained that there was inadequate separate area and bed (only one bed was present in examination room for examination) for checking uterine involution, pv bleeding, perineal condition. So it was difficult for nurses to check every patient in that single bed. More than half of the nurses (57.14%) stated that there was less manpower in relation to nurse patient ratio for assessing each patient. 42.86% nurses stated that they had forgot the steps of the procedure due to not practicing the procedure regularly. Half of the nurses (50%) stated other reason that was uterine involution and pv bleeding were checked by doctors, so that they did not perform the procedure.

Most of the nurses (92.86%) had gap in checking temperature of newborn baby and they stated that there was inadequate number of thermometers present in the ward as all the thermometers available were not working (only one thermometer was working). As there was a shortage of thermometer in the ward they had to hand over the thermometer for another baby, so they could not perform the procedure by maintaining all the steps.

35.71% nurses had gap in checking respiration and related complications of newborn baby. They explained that there was less manpower in relation to nurse patient ratio and therefore, it was difficult to assess each baby.

All the nurses (100%) had gap in checking newborn reflexes and they stated that there was no place for nursing recording in structured format for this parameter, so that reflexes were not checked by them. 64.29% nurses explained other reasons that newborn reflexes were checked by doctors and that is why they did not check.

All of the nurses (100%) had gap in checking general condition and other complications of baby. They stated that all these parameters are checked by doctors. Therefore all these parameters were not checked by them.

Majority of nurses (85.71%) had gap in proving support for breast feeding to the mothers and they explained that there was less manpower in relation to nurse patient ratio as a reason.

All the nurses (100%) had gap in health education & counselling.78.57% stated that there was less manpower in relation to nurse patient ratio to provide health teaching and counselling to each patient & family, 71.43% nurses stated that there was no separate discharge area and discharge table to give discharge in a proper way, more than half of the nurses (57.14%) nurses stated that they did not have sufficient knowledge and skill in this area and 64.29% nurses

explained that there was inadequate supply of IEC materials in that ward which could help in health education & counselling.

Table 4: Mean, SD,'t', P value of pretest knowledge score and knowledge score in 3rd PDCA cycle. n=14

Knowledge score	Mean	SD	t-value	P value
Pretest	13.929	2.645	**6.863**	0.00001
3rd PDCA cycle	17.357	1.985		

't' df =(13) =2.160, p<0.05, significant

Data presented in Table 4 represent that there is significant differences in mean values between pretest knowledge score with the knowledge score in 3rd PDCA cycle as the mean knowledge score in 3rd PDCA cycle (17.375) is higher than mean pretest knowledge score (13.929). It is statistically significant as evident from calculated 't' value(6.863) at df(13) at 0.05 level of significance(p-value<0.05).

Table 5: Mean, SD and 't' and 'P' value of different skill score of nurses in pretest, 1st, 2nd and 3rd PDCA cycle. n=14

Skill score	Mean	SD	t-value	P value
Pretest	55.286	7.907		
			16.312	<0.00001
1st PDCA cycle	81.357	2.307		
			8.0	<0.00001
2nd PDCA cycle	84.786	1.762		
			6.624	<0.00001
3rd PDCA cycle	86.071	1.439		
			15.539	<0.00001
Pretest	55.286	7.907		

't' df=(13)=2.160, p-value<0.05, significant

Data presented in table 5 showed the significant difference of mean value of subsequent PDCA cycles. Mean difference was higher between pretest and 1st PDCA cycle(16.312), gradually mean difference was decreased between 1st and 2nd PDCA cycle (8.0) and between 2nd and 3rd PDCA cycle (6.624) and again higher mean difference observed between pretest and 3rd PDCA cycle (15.539) at 0.05 level of significance. Therefore, it can be said that PDCA cycle is effective to improve the skill related to postnatal care.

DISCUSSION

In present study it was found that very few staff nurses (7.14%) had poor knowledge, more than half of the staff nurses (64.29%) had average knowledge and 28.57% staff nurses had good knowledge in postnatal care. In regard to skill, majority of the nurses (85.72%) had average skill, very few of staff nurses (7.14%)
had poor skill and also very few staff nurses (7.14%) had good skill in postnatal care.
The similar findings were found in a study conducted by Nazir N, Chhugani M, Thokchom, Khan M[5] among student nurses in a college in Delhi. The study showed that the maximum students (80.35%) had inadequate knowledge related to postnatal care of mother and 64% students had inadequate knowledge related to postnatal care of newborn. In regard to skill, it was found that majority of the nursing students (73.21%) had inadequate practice or skill in postnatal care. Another study was conducted by Negussie B B, Hailu F B, Megenta A D[6] in Ethiopia to assess the knowledge and practice of essential newborn care among nurses and midwives working at health centers, in which the results showed that the mean knowledge score of study participants was 23.27. The study revealed that 52.2% and 47.8% had good and poor knowledge respectively. The mean score of practice was 32.82. 51.1% and 48.9% of the respondents had good and poor practice respectively.
In present study gaps were found in knowledge of the nurses regarding postnatal care as only 28.57% nurses had good knowledge and also they had gap in skill regarding postnatal care which were gaps in checking BP, temperature, breast condition, uterine involution, pv bleeding, perineal condition, checking temperature, respiration and related complications, reflexes, general condition and other complications of newborn baby, providing support for breast feeding to the mothers and providing health education and counselling to the mothers and her family. The reasons were identified from the nurses through interviewing and the stated reasons were inadequate supply of equipment, articles, less manpower in relation to nurse patient ratio, inadequate proper area and bed for examination, no space for recording certain newborn parameters in structured format, inadequate

IEC materials and some procedures were forgotten by nurses.

The study results were supported by a study conducted by Dlamini B R, Sandy P T, Gule W P[7], where serious gaps were identified in the knowledge and practices of the midwives.

42.0% of respondents were not measuring maternal pulse during this postnatal period,

43.2% of the respondents reported that they had monitored maternal respiratory rate, 56.8% did not check the respiratory rate at discharge. Uterine contraction assessment on every mother before discharge from hospital is very vital, however, 44.5% of the midwives did not offer this service to the mothers on discharge. About 26.1% reported that they did not conduct physical examination on mothers at discharge.

In the current study the reasons of gaps were identified regarding postnatal care. In this area similar study was conducted by Rayner J A, McLachan H, Della A. Forster, Peters L, Yelland J[8] in postnatal unit to find whether there is any adequate provision of quality care, to analyze the staff perspective from a state wide review of postnatal care. The study findings revealed that staffing was highlighted as a major factor impacting on the provision of quality postnatal care and there were significant issues associated with inadequate staff patient ratio, staffing mix, patient mix, prioritization of birth suits over postnatal units and the use of non-permanent staff. 43% of hospitals reported having only non-midwives providing postnatal care, therefore, staffing issues impact on hospitals' ability to provide continuity of care, the care providers reported that the postnatal care is provided in very busy environments and so that, meeting the aims of postnatal care (breastfeeding support, education of parents and facilitating rest and recovery for women following birth) was difficult in the context of increased acuity of postnatal care, high midwives –women ratio, and the number and frequency of visitors. Another study conducted in Texas[22] reported that the nurses perceived a number of barriers to implementing to The Ten Steps to Successful Breastfeeding including nurse staffing shortages, variations in nursing practice among nurses, lack of parental awareness and knowledge about breastfeeding, culture and postpartum issues such as maternal fatigue, visitors and routine required procedures during recovery care that interfered with skin-to-skin positioning.

The findings of the study indicates that the PDCA cycles was effective to improve nurses'

performance in terms of knowledge and skill in postnatal care.

No such study was found which has evaluated the effect of PDCA cycle on nurses' knowledge and skill but studies found regarding the impact of PDCA cycle on quality of patient care. Related studies also found that has evaluated the effect of some intervention related to knowledge and skill of nurses, which intervention or similar intervention was also done in the present study during PDCA cycle.

The present study result related to intervention on nurses' knowledge is supported by a study conducted by Devi Prasanna K, Yitayih G, Panerio W G, Zenem A[9] on evaluating the effectiveness of structured teaching programme on prevention and management of postpartum psychosis among registered nurse. The structured teaching programme administered proved to be effective as posttest knowledge score was higher than pretest.

Another study was conducted by Hiremath P, Mohte V R, Salimath G, Wesley C, Naregal P, Chendake M[10] to assess the effectiveness structured teaching program on knowledge of postnatal depression among the staff nurses in Tumkur. The results showed that the mean pre-test value was 8.22, SD 6.73. The mean knowledge score in the posttest was 23.94 which was higher than pre-test which concluded that there was a statistically significant improvement in the knowledge among the

staff nurses who underwent the structured teaching program.

In a study conducted in New Delhi[11], PDCA cycle was used to find out its effect on postpartum care which showed the result that the changes done in PDCA cycles led to an increase in the number of women who were identified with complications from 2 out of
1667 deliveries to 74 out of 3336 deliveries. There was no death in the postpartum ward in 2014 compared with 5 deaths in 2013. Another study conducted in India[23], regarding the effect of PDCA cycle on breast feeding practices showed the results that after conducting 1st PDCA cycle only 4% rise occurs from the base line. After completing 2nd PDCA cycle only 12% rise occurred from the base line. But finally, after the 3rd PDCA cycle, a dramatic rise in breast feeding practice up to 80% occurred.

Nursing Implications

Nurses' performance in postnatal care can be improved and a quality care can be rendered to both the postnatal mothers and newborns by applying PDCA cycle. It also helps to reduce the gaps of care in certain areas.

Nurse administrators play a vital role to conduct a Quality Initiative project using PDCA cycle to reduce gaps in terms of manpower management, infrastructure development, continuous supply of articles and equipment and to ensure quality care for the patients.

The study has some limitations, those are: The study was conducted on less number of subjects which limits the generalization, data could not be collected during night shift, the length of PDCA cycle was very short and as the ICM guidelines are not completely followed in this state the researcher could not able to assess all the components mentioned here.

CONCLUSION

The study concluded that PDCA cycle helps to improve nurses' performance in terms of knowledge and skill in postnatal care which is statistically significant as there is evidence of increased score of both knowledge and skill after the interventions done in the PDCA cycles. The study also concludes that PDCA cycle is effective to identify the gaps and reasons of gaps in postnatal care and helps to reduce the gaps by taking necessary actions.

Acknowledgement: None

Conflict of Interest: None

Source of Funding: None

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How to cite this article: Sanchari Samanta, Manasi Jana. Assessment of nurses' performance related to postnatal care against the international confederation of midwives competencies and impact of plan-do-check-act cycle in maternity unit of selected Hospital, Medinipur. *International Journal of Research and Review*. 2022; 9(8): 810-822. DOI: *https://doi.org/10.52403/ijrr.20220868*

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