Original Article

Impact of training on community health worker regarding newborn care

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Abstract

Background: In India, an estimated four million deaths occur each year in the neonatal period. Effective intervention at primary care level can prevent a large proportion of these deaths. **Objective:** To assess the impact of training on knowledge and skill regarding newborn care among Auxiliary Nurse Midwife (ANM). **Methods:** A total of 180 ANMs who attended skilled birth attendant training program under RCH were included in the study. The study was conducted over a period of 2 years from May 2013 to June 2015. A 14 training sessions each lasting for 15 days were conducted in 2 years and each session had a batch of 12-15 ANMs. They were assessed for the impact of training at the end of training on semi-structured and pretested schedule. **Results:** The knowledge of health workers related to the care of a newborn at birth was not adequate. An average of 94.8 ANMs responded correctly to pre-test questions whereas after training there was a significant improvement in the post-test score. After training an average of 160.5 ANMs (p=0.001) responded correctly. A mean of 84 ANMs had adequate knowledge related to danger signs in the neonatal period before training. After training significant number of ANMs (mean=156, p=0.002) responded correctly. Baseline knowledge related to feeding of the newborn was also inadequate (mean=120), but after training there was a significant improvement, 164 ANMs respond correctly (p=0.02). **Conclusion:** Knowledge of ANMs in the rural area regarding essential newborn care is inadequate. The training of health workers need to be remodeled and updated to improve neonatal outcome.

Key words: *Auxiliary nurse midwife, Newborn care, Skilled birth attendant.*

In India, woman of childbearing age (15-44 year) constitute 22.2% and children under 15 years of age 35.3% of the total population. By virtue of their numbers, mothers and children demand a major proportion of health services [1]. An estimated four million deaths occur each year among children in the neonatal period [2]. The government of India is running various national programs to reduce mortality and morbidity among mothers and children. However, it had little impact on national neonatal mortality rate.

Current evidence-based interventions could prevent a large proportion of these deaths. However, health care workers involved in the neonatal care need to have knowledge regarding such practices before being able to put them into action. The Auxiliary Nurse Midwifes (ANMs) play an important role in reducing the neonatal mortality rate by working as skilled birth attendant (SBA) and by providing comprehensive antenatal care (ANC) and postnatal care (PNC). If these health workers have efficient knowledge, awareness and application of perinatal care, the morbidity and mortality can be reduced tremendously. To assess the knowledge and skills of peripheral health care workers, the present study was planned.

MATERIALS AND METHODS

This cross-sectional interventional study was undertaken at Department of Pediatrics of a tertiary care teaching hospital of Bilaspur, Chhattisgarh. This study was conducted over a period of 2 years from May 2013 to June 2015 after getting approved by the Institutional Ethics Committee. ANMs from different peripheral health centers were included in this study. SBA training program was organized in the hospital under National Rural Health Mission; now, National Health Mission.

Total 14 training sessions were conducted over the period of 2 years at an interval of 2-3 months. In each session, 12-15 ANMs were trained; therefore total 180 ANMs were included in this study. Total duration of each training session was 15 days, 3 days in the Department of Pediatrics and 12 days in the Department of Obstetrics and Gynecology. Basic information about ANMs was obtained such as age, qualifications, area and duration of services, etc. During training in Pediatric department, pretest assessment regarding knowledge and skills of newborn care was done on semi-structured questionnaire.

Questionnaire comprised of questions regarding following area of newborn care-neonatal resuscitation, care of umbilical cord, eye care, thermoregulation, breastfeeding, and recognition and basic management of danger signs such as hypothermia, neonatal jaundice, and feeding problems. Then ANMs received training on basic neonatal care including hands-on training on mannequin for skill improvement related to resuscitation, assessment of hypothermia, jaundice, etc. They were assessed again at the end of training on same semi structured and pretested questionnaire.

Data collection tool in this study was semi-structured knowledge-based questionnaire on newborn care and an observational checklist was used for assessment of skill. These tools were used to collect data from each study subject before and after training. Same semi-structured questionnaire based format was filled by each participant and observational checklist was filled by investigator. After collection of the data, it was processed and extensively reviewed. Data were compiled and analyzed using SPSS software. Mean and proportion were compared using Student's *t*-test. Odds ratio was calculated and $P < 0.05$ was considered to be significant.

RESULTS

Total 180 ANMs were interviewed on semi-structured format and basic information of study population is given in Table 1. The majority of them were in the age group of 31-50 years age (60%). Most of them (71%) were educated up to 10+2 (12^{th}), matriculation or below matriculation followed by graduates (16.2%) and post-graduates (12.2%). All the ANMs had received nursing training course. These ANMs were posted in peripheral health center and majority of them were from tribal areas (63.9%). The majority (51.6%) of ANMs service experience ranged from 1 to 5 years.

Table 1: Participant details (*n*=180)

Study variables	n (%)
Age group of ANM	
20-30 years	45 (25)
31-50 years	108 (60)
>51 years	27 (15)
Education status of ANM	
10+2 (12^{th}), matriculation or less	129 (71.6)
Graduate	29 (16.2)
Post-graduate	22 (15)
Nursing course	180 (100)
Working area	
Tribal area	115 (63.9)
Non-tribal area	65 (36.1)
Duration of service	
<1 year	49 (27.2)
1-5 years	93 (51.6)
>5 years	38 (21.1)

ANM: Auxiliary nurse midwife

The 97 (53.85%) ANMs knew umbilical cord care, 122 (67.7%) knew eye care and 66 (36.6%) had knowledge of correct baby bathing practices before training. About 113 (62.7%) ANMs had correct knowledge related to importance of weighing the baby at birth, categorization of baby on weight basis and which baby to refer. Only 76 (42.2%) ANMs answered correctly to questions related to meconium, frequency of stool and urine per day. Knowledge related to minor clinical problems such as vomiting just after birth without any other symptoms, vomiting just after feeding, vaginal discharge in female child, mastitis neonatorum, presence of Mongolian spots and its significance was poor. Post-training, assessment showed significant overall improvement from 85.5% to 91.6% (p=0.001) (Table 2).

ANMs were also assessed for danger signs in the neonatal period such as diagnosis of hypothermia and its symptoms, prevention and treatment methods adopted for hypothermia and point of referral. On pre-training assessment, only 83 (46.1%) ANMs had correct knowledge of the facts regarding hypothermia, which improved after training significantly (86.1%). Similarly before training, large number of ANMs had inadequate knowledge about prevention of infections in the neonatal period, hand washing techniques and its importance and vaccination, which improved significantly after training.

Only 102 (56.6%) ANMs responded correctly to questions regarding assessment for identifying a newborn that requires assistance for initiation of respiration, equipments, and procedure adopted for resuscitation and point of referral. After training, knowledge improved significantly (147, 86.1%). Before training knowledge related to neonatal jaundice and its causes, management and referral point was alarmingly low with significant improvement after training (36.1% vs. 90%). Only 66 (36.7%) ANMs had knowledge related to identification of sick neonate, signs of respiratory distress, abnormal movements/convulsion, assessment of capillary refill time and time and mode of transport. After training, significant number of ANMs responded correctly (153, 85%), (Table 3).

151 (83.95%) ANMs had correct knowledge related to breastfeeding of newborn in respect to initiation of breastfeeding, feeding of colostrum, advantages of breastfeeding and burping before training. Similarly, knowledge related to method of feeding, positioning and attachment was inadequate as was knowledge about feeding in special conditions like management of retracted nipples, feeding of sick baby and low birth weight babies. Overall this also knowledge improved significantly after training (p=0.02) (Table 4).

Table 2: Knowledge related to basic newborn care

Questionnaire	Before training (%)	After training (%)	P value
Care of umbilical cord: Cutting instrument, umbilical stump length, any application	97 (53.8)	163 (90.5)	t=7.89 df=5 P=0.001
Eye care: Eye cleaning, cleaning material, method, any other application	122 (67.7)	162 (90)	
Baby bath: Given or not, timing	66 (36.6)	163 (90.5)	
Birth weight: Timing of weighing, criteria for home management and referral, LBW and danger sign	113 (62.7)	165 (91.6)	
Passing of meconium, color, and frequency of stool and urine per day	76 (42.2)	156 (86.6)	
Minor clinical problem and their management: Vomiting/regurgitation, whitish vaginal discharge, breast engorgement and Mongolian spots	95 (52.7)	154 (85.5)	
Mean, SD	94.8±21.1	160.5±4.41	

SD: Standard deviation, LBW: Low birth weight

Table 3: Knowledge related to danger signs in neonatal period

Questionnaire	Before training (%)	After training (%)	P value
Hypothermia: Clinical feature, temp assessment technique, KMC, prevention and management and referral at PHC level	83 (46.1)	155 (86.1)	t=7.70 df=4 P=0.002
Infections: Neonatal tetanus, prevention of infections, technique of hand washing, vaccination	104 (57.7)	163 (90.5)	
Resuscitation: Indications, equipment, step wise technique - tactile stimulation, bag/mask ventilation and medication	102 (56.6)	147 (81.7)	
Neonatal Jaundice: Identification nature/type, when to treat and refer	65 (36.1)	162 (90)	
Sick neonate: Identification of respiratory distress, abnormal movement, assessment of capillary refill time	66 (36.7)	153 (85)	
Mean, SD	84±18.7	156±6.63	

SD: Standard deviation

Table 4: Knowledge related to breastfeeding

Questionnaire	Before training (%)	After training (%)	P value
Breast feeding: Initiation, timing interval, duration advantage, colostrums burping prelacteal feeding	151 (83.95)	169 (93.9)	t=4.24 df=3 P=0.02 (<0.05)
Breastfeeding in special condition: Sick baby, lactation failure, retracted nipple, LBW babies	106 (58.9)	163 (90.5)	
Position and attachment	97 (53.9)	162 (90)	
Top milk: Type method, sterilization of utensil	126 (70)	164 (91.1)	
Mean, SD	120±23.93	164±3.10	

SD: Standard deviation, LBW: Low birth weight

DISCUSSION

In the present study, an attempt was made to find out among ANMs related to the newborn care and also to study the impact of training on their knowledge. Care of the newborn at birth including care of umbilical cord, eye and skin care, maintenance of body temperature is very important. After delivery, cord should be tied, cut and cleaned, and no ointment/ dressing should be done, is the teaching for decades. However, in many rural areas where deliveries are conducted by untrained dais, guidelines for umbilical cord care are seldom followed. In the present study, only 53% ANMs knew about umbilical cord care and its importance. Similar results have been observed by various other researchers [3-5]. Even milking of cord is still in practice at the community level [6]. In this study, after training significant improvement in knowledge about cord care was seen. For the care of eye, all ANMs were aware that eye should be cleaned immediately after birth. However, only 67% ANMs knew about material to be used for cleaning and method of eye cleaning. Similar result has been reported by Nahrel in a study on PMW [3].

Maintaining normal body temperature is extremely important in newborns because of their large body surface area. It is a common practice in India to bath the newborn immediately after birth [7]. This puts the newborn at risk of hypothermia which gets worse with the lack of adequate drying and warm clothes. In our study, majority of the ANMs were of the view

that the first bath should be given soon after birth; however, training significantly improved their knowledge. Similar observation was also reported by Nahrel [3]. In our study, only 46.1% ANMs knew the facts related to hypothermia. Another study demonstrated that majority of the paramedical staff did not know the definition and clinical features of hypothermia and only 18.6% knew how to assess temperature in neonate [8]. In our study, significant improvement in knowledge was seen after training as compared to another study [9].

Most of the babies lose weight during first 2-3 days of life. Baby's birth weight should be recorded soon after birth but not later than 2 days. Importance of weighing the baby at birth, significance of categorization on weight basis and point of referral to the higher center are essential in preventing perinatal losses. In this study, the responses shown to queries in these areas were inadequate. Other observers also found similar result related to the significance of weighing of the newborn [3,5]. However, Harris et al. found there was no significant difference in infant characteristics of birth weight recording before and after training of health professionals [9].

The risk of labeling an otherwise normal baby who has frequent bowel movements, occasional regurgitation, vaginal discharge, neonatal mastitis, Mongolian spot, etc. as abnormal appears to be substantial. This may result in unnecessary medications and referral. Only 52.7% ANMs were aware of such knowledge and resultant health risk from inappropriate management. There was poor awareness (57.7%) about measures of prevention of infection such as meticulous asepsis at the time of delivery, proper hand washing, cord care, and immunization. Other studies have also shown similar results [5,6].

It is necessary for the field workers to know the need, and technique of neonatal resuscitation, as well as the point of referral of newborn. Only 56.6% ANMs in our study were aware of neonatal resuscitation, results similar to the results of other studies [3-6]. In our study, 81.7% ANMs demonstrated improved knowledge after training. Another study assessing knowledge, attitude and skill in neonatal resuscitation found significant improvement after training from 38.6% to 64.4% [10]. Information of ANMs related to the significance of jaundice, its severity and the need for referral was also not satisfactory. Another study found that only 45.5% health workers knew the complications of neonatal jaundice and 54% health workers preferred modern therapy like phototherapy and exchange blood transfusion [11].

The ability to pick up at risk baby and the timing and mode of transport are necessary to improve the intact survival of the newborns. However, inadequate response in our study indicates that the ANMs, who are in close association with family units, are unable to carry out this important function. Similar results have been shown in another study where only 55% health workers knew when to refer the newborn [5]. Other studies also showed poor knowledge of health workers to identify neonate at risk and danger signs [6,12].

Knowledge related to feeding of newborn in respect of initiation of breastfeeding, feeding of colostrum, method of feeding, management of retracted nipple and the introduction of top feed were inadequate. In the event of lactation failure, diluted cow milk was advised as the first preference by most of them and bottle feeding was considered convenient by most of them. Knowledge related to position and attachment during breastfeeding was also very low in ANMs. Other studies have also reported inadequate knowledge of health workers about prelacteal feeds, exclusive breastfeeding, advantage and correct technique of breastfeeding [5,13].

CONCLUSION

Most of the ANMs from peripheral health center are unaware even of the basic knowledge required for newborn care. Our findings suggested the improved knowledge of ANMs related to newborn care after intervention. Therefore, the training of health workers need to be remodeled and updated, not only in terms of knowledge and attitudes but also in the training technique relevant to rural location and needs of the ANMs.

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