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**Original Research Article**

# Unmet goals of neonatal nursing - an observational study

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## ABSTRACT

**Background:** Neonatal nurses are the backbone of any neonatal service, spending maximum time in the care of the sick New-borns in the Neonatal intensive care unit (NICU). Objective of the study was to know about the educational qualification and assess the self-reported confidence in various clinical skills among the nurses working in level 2 & 3 NICUs, preferred learning methodology and assess self-reported stressors among the nurses working in level 2 and level 3 NICUs
**Methods:** This cross-sectional study was done across Level II and Level III Neonatal intensive care units in urban areas of the city of Hyderabad, India over one year from January 2019 to December 2019. Individual questionnaires were distributed to each registered nurse working in the NICU for a minimum duration of six months who were willing to participate.
**Results:** A total of 217 respondents were enrolled. The majority of the nurses were having General Nursing and Midwifery (GNM) qualification 52% (n=112). Nearly 26% (n=58) of the nurses were not comfortable performing bag and mask ventilation. Learning from senior nurses/colleagues as the most preferred mode of learning 45% (n=98). Low salaries 45% (n=98) followed by absence of doctors in emergency situations 37% (n=81) and high documentation (paperwork) 36% (n=78) were most frequently reported stressors.
**Conclusions:** Most of the nursing participants qualified as GNM. Lacking skills of neonatal resuscitation. Mentor based learning needs to be facilitated by raising a cadre of neonatal nursing tutors in various nursing colleges. Paperless monitoring systems and other automation methods should be developed to reduce the documentation work of the staff.

**Keywords:** Burnout, Neonatal, Nurses, Nursing Skills

## INTRODUCTION

Neonatal nurses provide autonomous and collaborative care to neonates and their families in all settings.[1] For Neonates requiring specialized care in neonatal intensive care units, nurses are responsible for most everyday care procedures of the infants. However, the efficiency and effectiveness of service rely heavily on adequate numbers of highly skilled neonatal nurses.

Currently in India, a significant shortage of trained nurses.[2] Specifically, nurses caring for newborns lack the skills and confidence needed to ensure optimal care. This deficiency has been linked to a lack of expert faculty, standardized training and minimal or no exposure to newborn clinical care areas during pre-service education.[3] Evidence suggests this lack of an experienced and appropriately trained workforce within critical areas like ICU affects patient safety.[4,5] There is increasing international recognition of the growing gap between nurse's knowledge and skills and patient care needs. There is a pressing need to appropriately educate novice and inexperienced nurses within specialty practice environments.[6,7]

According to the literature, the work stress on nurses is one of the factors reducing the quality of patient care. The stress of nurses is influenced by multiple factors like the nature of critical care in intensive care units.[8] Planning strategies to reduce or eliminate neonatal nursing weaknesses and stressors can maximize the efficiency of human resources. Currently, there are no similar studies published in India in the past.

Primary objective was to know about the educational qualification and assess the self-reported confidence in various clinical skills among the nurses working in level 2 & 3 NICUs.

Secondary objective was to know about the preferred learning methodology and assess self-reported stressors among the nurses working in level 2 and level 3 NICUs.

## METHODS

### *Study design*

This cross-sectional study was done across Level II and Level III Neonatal intensive care units in urban areas of the city of Hyderabad, India over one year from January 2019 to December 2019.

### *Sample size*

A sample size of 217 was calculated to have a normal distribution and finite correction.

### *Methodology*

All registered nurses working in Level 2&3 NICU with a minimum experience of 6 months in level 2 and level 3 NICUs were eligible for the study. Nursing aides or nursing assistants were excluded. The data collection tool was a self-reported questionnaire. The first part of the questionnaire was about the demographic and educational qualification, the second part of the questionnaire was to know the preservice qualification and self-reported confidence in clinical skills and learning preferences. The third part of the questionnaire was developed using a four-point grading scale to cover work stressors in NICU.

### *Statistical analysis*

Data were analyzed using SPSS version 20 (IBM, Armonk, N.Y., USA). We compared the primary outcome and dichotomous secondary outcomes using Fisher's exact test /chi square test. We compared non-normally distribute continuous outcomes using an independent-samples median test. P<0.05 was considered statistically significant.

## RESULTS

A total of 264 questionnaires were distributed amongst nursing professionals working in the NICU of 12 major public and private pediatric hospitals of Hyderabad. Out of which 222 completed questionnaires were collected. Total 5 of them were excluded as their responses were incomplete. Out of 12 major hospitals, two were government hospitals, two were trust hospitals and the remaining eight were private hospitals. Among 217 enrolled nurses, the majority (160) were from private hospitals, 33 were from government hospitals and the remaining 24 were from trust hospitals (Figure 1).

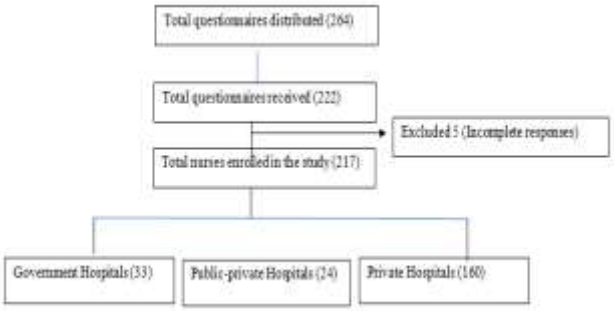


**Figure 1: Flow chart of study.**

**Table 1: Pre-service qualification (n=217).**

| Qualification | N (%) |
|---|---|
| **ANM** | 6 (2.7) |
| **GNM** | 112 (51.6) |
| **B.sc Nursing** | 97 (44.7) |
| **M.sc Nursing** | 1(0.4) |

All the study participants were females. Most of the respondents 76% (n=165) were in the age group of 20-30 years. The median age of the respondent nurses was 25 (23-28) years. The majority of 71% (n=154) of the total IQR nurses were unmarried. Nearly half 52% (n=112) of the nurses were having GNM and 45% (n=97) of the nurses had B.sc Nursing qualification. Two-third 68% (n=148) of the nurses had an experience of <5 years. Only 5% (n=10) out of 217 nurses were working as in-charge/managerial job positions in our study (Table 1).

**Table 2: Distribution of skills among neonatal nurses.**

| Nursing skill | Confident (%) | Somewhat (%) | Not at all (%) |
|---|---|---|---|
| **IV cannulation** | 194 (89.3) | 19 (8.7) | 4 (1.8) |
| **Gavage/Tube feeding** | 193 (88.8) | 24 (11) | 0 (0) |
| **Initiating KMC** | 183(84.2) | 30(13.8) | 4(1.8) |
| **Neonatal resuscitation/Bag & Mask** | 58(26) | 101(46.4) | 58(26.7) |
| **Intubation** | 2(0.9) | 35(16) | 180(82.9) |

### *Nursing skills*

On self-evaluation, most of the neonatal nurses 89% (n=194) reported having good confidence in performing

Intravenous (IV) cannulation, gavage/tube feeding and 83% (n=183) in initiating KMC. Only 26% (n=58) of the nurses were comfortable performing bag and mask ventilation. Only 16 (n=35) % of the nursing respondents were confident in the intubation technique (Table 2).

***Learning preferences***

When asked about their most preferred method to learn, the majority of nurses in the sample reported a strong preference for learning from senior nurses 45% (n=98), followed by medical team/doctors 33% (n=73), workshops 23% (n=23). Least preference was given for the online method of learning by 19% (n=43) (Table 3).

***Stress factors in NICU***

According to the nursing professionals most reported stressors related to working in NICUs (Table 4) were low salaries 45% (n=99), absence of doctor in emergencies 37% (n=81 and paperwork 36% (n=78). Alarm noise of monitors 27% (n=59) and handling attendants 25% (n=55) were other important stress factors in NICU as reported by the study respondents (Table 4).

**Table 3: Learning preferences.**

| Preferences | Strongly disagree (%) | Disagree (%) | Agree (%) | Strongly agree (%) |
|---|---|---|---|---|
| **Senior nurses/ Colleagues** | 22 (10.1) | 14 (6.4) | 83 (38.7) | 98 (45.1) |
| **Medical team/Doctors** | 12 (5.5) | 18 (8.2) | 114 (52.5) | 73 (33.6) |
| **Workshops/ Courses** | 13 (5.9) | 36 (16.5) | 118 (54.3) | 50 (23) |
| **Online** | 23 (10.5) | 33 (15.2) | 118 (54.3) | 43 (19.8) |

**Table 4: Stressful factors in NICU.**

| Stressor | Not stressful at all (%) | Little stressful (%) | Moderately stressful (%) | High stressful (%) |
|---|---|---|---|---|
| **Low salaries** | 34 (15.6) | 32 (14.7) | 52 (23.9) | 99 (45.5) |
| **Absence of doctors in emergencies** | 45 (20.7) | 40 (18.4) | 51 (23.5) | 81 (37.3) |
| **Paperwork** | 57 (26.2) | 39 (17.9) | 43 (19.8) | 78 (35.9) |
| **Alarm noise of monitors** | 34 (15.6) | 68 (31.2) | 56 (25.8) | 59 (27.1) |
| **Handling attendants** | 54 (24.8) | 55 (25.3) | 53 (24.4) | 55 (25.3) |
| **Conflict with the supervisor** | 103 (46.9) | 61 (28.1) | 31 (14.2) | 21 (9.6) |
| **The feeling of being inadequately trained** | 70 (32.2) | 75 (34.4) | 53 (24.4) | 19 (8.7) |
| **Giving care to critically ill neonates** | 88 (40.5) | 59 (27.1) | 60 (27.6) | 10 (4.6) |

## DISCUSSION

This study provides insight into the qualification, preferences to learn and identification of stressors among nurses working in Level 2 and Level 3 NICUs. In our survey half of the study, respondents qualified GNM (General Nursing & Midwifery). Currently, the majority of the nursing staff possess a GNM degree and there are a greater number of colleges offering GNM courses when compared to BSc Nursing.[9,10] GNM training exposure to neonatal nursing is for a very limited duration of two weeks. There is a need to have a redesign of the curriculum and training schedule to improve exposure to neonatal nursing. Recently Indian Nursing Council (INC) launched an in-service post-diploma one-year Neonatal Nursing program for, such programs should be encouraged and hospital establishments should support staff enrolment for in-service learning.[11] In our survey, all study participants were females (100%) and the majority (74%) being in the age group of 20-30 years and unmarried (72%). Nearly two-thirds of the participants had the experience of fewer than 5 years and only 5% of the respondents were in a managerial position. This is an important aspect as it suggests that predominant NICU female nursing staffs are having a short career span and high attrition where a skilled human resource is lost early. This might be due to pertinent socio-cultural situation and negative bias towards female gender to balance work and family responsibilities. Also, it might indicate a lack of career development or progress opportunities. Ways to retain the nursing staff needs to be explored and involves a social change apart from a supportive work environment and skill development opportunities for career development. We could not identify similar studies conducted in India in the past where the composition of the neonatal nursing staff was assessed.

In our survey more than 80% of the neonatal nurses informed that they had good skills in IV cannulation, initiating KMC and gavage/tube feeding. Only 50 % of them were comfortable doing neonatal resuscitation and most of the participants (82%) never intubated in NICU.

The majority of the nurses (approximately 50%) were comfortable in assisting procedures like UVC insertion, starting CPAP and ventilation. There is a need to impart focussed NRP training for the neonatal nurse.

In our country where there is a lack of a sufficient number of doctors, highly skilled specialist neonatal nurses will play an important role in taking newborn care. Presently there is a lack of such 'Specialist nurses caring for the newborn's optimal care. This deficiency has been linked to a lack of expert faculty, standardized training and minimal or no newborn clinical exposure during pre-service education.[12]

To meet this challenge, emphasis must be placed on the identification of knowledge of nurses and how they prefer to learn to ensure that nurses receive standardized education for pre-service, in-service and on-going care. In our study, it was found that nurses felt learning was from senior-nurses and colleagues during the duty hours as the most preferred methodology of learning. (hands-on). Hence those nurses having advance neonatal clinical experience can work in collaboration with nurse practitioners/tutors for pre and in-service education of nurses. Creating standardized education for Pre-service and In-service training of nurses working in the NICU or who desire to work in the NICU. Only the institutions having a well-established level 2/level 3 NICU should be permitted to run post basic diploma in neonatal nursing, M.sc courses in child health, obstetrics and gynecology nursing. There should be separate procedure books for newborn related procedures and a logbook for entering the specified number of resuscitations and sick newborn cares observed/supervised and conducted.

Nurses who provide care for newborns are often faced with numerous stressors in NICU that impede their ability to provide optimal care and result in burnouts affecting their health and interpersonal relationship. In our study majority of the study, participants graded low salaries (45%), the absence of doctors in emergencies (37%) and paperwork (36%) as highly stressful factors in the NICU. These results were comparable with the only study which was done on neonatal nurse's stressors in Iran by Valizadeh et al., where they found that human factors caused significantly higher levels of stress than did environmental factors.[13] To minimize stressors in NICU it is desirable to have an organized salary structure for neonatal nurses based on qualification across the public and private sector. Empowering them in handling neonatal emergencies via training in neonatal resuscitation is highly desired which in turn will mitigate their stress of absence of the doctor. The burden of paperwork related to billing and other administrative work can be transferred to other support staff or by imparting automated systems for monitoring vital parameters.

We did not come across any similar studies from India or other developing countries where nursing workforce qualification, comfort in clinical care and burnout was studied.

## CONCLUSION

The majority of the nursing participants qualified GNM. The current format of the GNM course has limited neonatal nursing exposure. So there is a need to improve neonatal nursing care exposure in GNM. Empowering all nursing cadre in skills of neonatal resuscitation. Mentor based learning can be facilitated by raising a cadre of neonatal nursing tutors in various nursing colleges. Nursing staff should be part of core hospital management as stakeholders to have inputs on salary structures and job profiles. Paperless monitoring systems and other automation methods should be developed to reduce the documentation work of the staff.

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