

## Improving nursing care in a children's hospital in rural India

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### ABSTRACT

**Background:** Nursing care quality in developing countries is an ongoing challenge leading to poor patient outcomes. The objective of this study is to evaluate changes in nursing performance providing routine cares following a training program in children's hospital in Mota Fofalia, Gujarat, India. **Methods:** The main outcome measure was the proportion of newborns with vital signs and weights obtained by nursing staff before and after a training program. The training program consisted of an in-service reinforced by hands-on management of patient care for 2 weeks. Following the training, the nurses were observed for 2 months. **Results:** Observation of 138 newborn encounters demonstrated a 29.7% improvement in vital sign monitoring and 88.4% in weight monitoring from the 0% baseline. **Conclusion:** We observed a moderate improvement in measuring vital signs and a substantial improvement in measuring weights in newborns with the training intervention. For further improvement, continued training, and follow-up is indicated.

**Key words:** Hospitals, India, Infant, Newborn, Nurses, Patient care, Pediatric, Rural populations

Nurses play a critical role in patient outcomes in the clinical setting. Large studies reveal a link between higher nurse staffing and education with decreased patient morbidity and mortality [1]. India faces an acute shortage of nurses, especially in rural areas with economic hardship and low literacy [2,3]. Over 88% of the countries' nursing schools are in urban areas, which contribute to the shortage of adequately trained nursing personnel available to address the healthcare needs of rural areas [4]. Not only is there a paucity of nursing education opportunities, but also analyses of nurse training programs demonstrate a lack adequate educational materials and clinical skills teaching [2,5,6]. In addition, many hospital institutions lack ongoing professional development opportunities for nurses and have little administrative support to encourage quality patient outcomes and accountability [2]. Together these factors contribute to poorer quality patient care, which leads to poor patient outcomes and increased deaths [7].

Death rates of children in India exceed the U.S. numbers by up to 20-fold [8]. Lack of access to healthcare contributes to the country's notably high infant mortality rate [9]. Children in rural areas in India are particularly vulnerable due to limited access to healthcare. To help sustainably improve access and delivery of healthcare to children in rural India, the University of Utah created a partnership program with the administrators of Shakti Krupa Charitable Trust. A new charitable pediatric center opened in October 2013 to serve a population of up to 300,000 children in the rural village of Mota Fofalia, Taluka Sinor, Vadodara District,

Gujarat [10]. Many of the local nurses working at the charitable facility were observed to be new to the field with very little exposure to pediatric care, especially newborn care. As part of the partnership program, a short-term nurse training program was developed to help the nurses in Mota Fofalia master basic clinical skills to care for pediatric patients. The purpose of this study is to evaluate the effectiveness of this short-term training program for nurses and its impact on newborn patient care.

### METHODS

This study was conducted at Shakti Krupa Charitable Pediatric Center in Mota Fofalia, Gujarat. Specifically, this study focused on evaluating the skills of measuring and documenting newborn vital signs and weights. These skills were selected because infection and low birth weight are major contributors to the high infant mortality rate [9]. Vital signs in newborn patients are an important way to detect infection and weights of newborns help identify low birth weight children who are at high risk for complications. When properly identified, steps can be taken to provide appropriate care for these patients.

The main outcome measure of this study was the proportion of newborn patients with vital signs and weights properly measured and documented following two waves of a short-term nurse training program at the Shakti Krupa Charitable Pediatric Center in Mota Fofalia. The patients included in the study were infants admitted to the Neonatal Intensive Care Unit (NICU)

and neonatal care unit. Baseline observation of nurses caring for newborns in this facility following its opening in 2013 revealed 0% of newborns had vital signs and weights taken daily. In response, a nurse training curriculum was developed to focus on measuring and documenting newborn vital signs and weights. The curriculum was based on standard practice guidelines obtained from the Chief Nurse Educator at Primary Children's Hospital in Salt Lake City, Utah. It was further adapted to utilize the equipment available to nurses in the hospital in Mota Fofalia.

Following Institutional Review Board approval as well as hospital administration and nursing staff agreement, the first wave of training was completed in October 2013. A second training session was also completed in January 2014. Two, 30-min in-service training sessions were held during each wave of training to train all 10 nursing staff (Table 1). Other hospital staff with sufficient English speaking capabilities translated the in-service training into Gujarati for the nurses. In the training sessions, the nurse educator from Primary Children's Hospital demonstrated and explained the steps of measuring and documenting newborn vital signs and weights. For the vital signs portion of the training, the nurse educator demonstrated how to obtain a temperature using a tympanic thermometer with disposable tips. For the heart rate and respiratory rate, the nurses were taught to listen to the baby's chest with a stethoscope and watch the chest for 1 min using a wrist watch with seconds to keep track of time. To measure weights, a portable digital baby scale was provided so the nurses could take the scale to the various rooms of the hospital. They were taught to place the scale on an even surface, zero the scale, and place the baby on the scale until the scale beeped, indicating the scale had finished measuring.

Following the in-service, the nurse educator managed patient care with the nursing staff for 1-2 weeks to reinforce the training. In addition, a bulletin board with pictures of the basic steps taught in the in-service was placed next to the nursing station. In May through July 2014, the nursing staff was observed by medical students from the University of Utah School of Medicine to determine whether or not vital signs were measured and charted twice a day and weights were measured and charted daily for neonatal and NICU patients. A convenience sample of newborn encounters on weekdays during this period was used for analysis. Results were transferred to a secure database for analysis.

## RESULTS

We observed routine cares of 138 newborn encounters from May 22 to July 26, 2014. Six of the ten trained nurses were working on the days the routine cares were observed during this period. Two of the ten nurses who received training were no longer working at the hospital. All of the observed nurses were women, and the average age was 20 years. We noted vital signs were performed and charted twice a day for 41 of 138 encounters (29.7%), and daily weights were measured and charted for 128 of the 138 encounters (88.4%). This demonstrates a 29.7% improvement in vital sign measurement and charting and an 88.4% improvement in daily

weight measurement and charting from the 0% baseline observed in October 2013 (Table 2). Daily weight measurements required less time and equipment for the nursing staff to complete, whereas vital sign measurements required more time and technical skills with more equipment.

## DISCUSSION

We observed a moderate improvement in vital sign measurement and a substantial improvement in weight measurement in newborn patients with the nurse training intervention. Although these initial results show a benefit of basic nursing skills training program in improving routine newborn cares, we observed routine cares were not being performed and documented for all newborn encounters. It is also difficult to determine if cares are carried out more consistently when an evaluator is present versus when there is no evaluator present. Some barriers to the consistent application of acquired skills in the clinical setting may include lack of administrative support, poor hospital infrastructure, and high staff turnover rates [11].

We noted the hospital administrators in Mota Fofalia lacked accountability as there were no defined standards of nursing care. There was also no staff oversight or tools to measure competency. As such, nursing staff had little incentive to regularly perform routine cares and seek on-going professional development. Day-to-day nursing practice thus continues to be "circumstance driven," which is associated with poor patient outcomes, infant morbidity, and mortality [12]. Another barrier to the consistent application of skills is the high turnover rate at the hospital.

**Table 1: Mota Fofalia charitable hospital nursing demographics<sup>a</sup>**

Parameters	Total nurses (n=10)		
	Number	Range	Percentage
Females	10	NA	100
Males	0	NA	0
Mean age (years)	20	17-24	NA
Mean duration of training (years)	1.8	1-2	NA
Registered general nurse and midwife <sup>b</sup>	0	NA	0
Registered auxiliary nurse and midwife <sup>c</sup>	4	NA	40

<sup>a</sup>Data obtained in January 2014 by visiting nurse educator via personal interview, <sup>b</sup>3.5 years of training with National Board Exam certification (Indian Nursing Council), <sup>c</sup>2 years of training with National Board Exam certifications (Indian Nursing Council). NA: Not available

**Table 2: Neonatal routine cares following nurse training program**

Parameters	Patient encounters (n=138)	
	Number	Percentage
Vital signs (T, HR, RR) <sup>a</sup>		
Performed and charted twice daily	41	29.7
Weight		
Measured and charted daily	128	88.4

<sup>a</sup>T: Temperature, HR: Heart rate, RR: Respiratory rate

Due to better financial prospects in larger cities and the cultural expectation to move to a husband's village after marriage, many of the nurses leave rural hospitals [13]. This leads to an ongoing need of new nurses and training programs. An intact training program would be beneficial in supporting a competent, evolving nursing staff.

Moving forward, we hope to continue the training and supervision of the local nurses to improve newborn care. Beginning in January 2016, the nurse educator from Primary Children's Hospital started implementing a 2-week training course with 1.5-h morning and afternoon in-services for the nurses in Mota Fofalia. Our goal is to consistently provide these training sessions every several months in an effort to establish an ongoing education program supported by the local nursing staff. In addition, we are considering creating educational materials in Gujarati and implementing regular staff skill assessments with re-training. Enhancing administrative support of these measures will be an essential element in the process of improving patient care in Mota Fofalia.

## CONCLUSION

Newborns in rural Indian areas are especially vulnerable and directly benefit from appropriate routine cares by appropriately trained nursing staff. Simple training programs focusing on basic routine cares, such as accurate measurement and documentation of newborn weights and vital signs, have the potential to greatly affect nursing staff performance.

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