Effectiveness of Helping Babies Breathe Training on Knowledge and Skills for Health Professional and Medical Doctors at Nepalgunj Medical College

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ABSTRACT

Introduction: Neonatal death is an emerging challenge and a basic neonatal resuscitation within the first few minutes of life can substantially prevent neonatal mortality. **Aims**: To reduce neonatal mortality from birth asphyxia and development of the low cost neonatal neonatal resuscitation tool. **Methods:** The educational effectiveness of helping baby breathe training on newborn simulator, knowledge of trainees from Doctors, Nurses and Medical Students was evaluated before and after training on 19th & 20th November 2021, 10th & 11th December 2021 and 6th & 7th January 2022 respectively. A post course practical skills evaluation was performed on a Neonatalie Newborn Simulator. Participants underwent a two days training course of five hours each day. **Results**: Seventy eight participants had completed the course. The percentage of correct answers on a written test significantly increased from 82% to 99% after training. 100% of the trainees achieved passing scores. **Conclusion**: The trainees who participate in helping baby breathe training can significantly improve their knowledge and skills on simulators.

Keywords: Asphyxia, Helping Babies Breathe, Neonatal mortality, Resuscitation, Still Birth

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INTRODUCTION

Neonatal death is an emerging challenge in low and middle income countries and birth asphyxia is one of the major cause for the death, to reduce deaths from birth asphyxia, the development of the low cost interventions and their effective delivery are needed. The Millennium Development Goals 4 and 5, aimed respectively at reducing child mortality and improving maternal health[1] nearly all (99%) intrapartum-related deaths occur in low and middle income countries.[2, 3] So a basic neonatal resuscitation within the first few minutes of life can substantially prevent neonatal mortality.[2] Approximately three to six percentage of all newborns require basic resuscitation at the time of birth.[5] Helping Babies Breathe at Birth is a program to reduce the burden of intrapartum mortality and facilitate health workers implements effective resuscitation practices. It was developed by the American Academy of Pediatrics which is a simplified neonatal resuscitation protocol. Helping baby breathe is designed as educational program for resource limited settings.[6,7] Ideally, at every birth there should be a skilled person who can provide essential services to both mother and infant, including HBB. Helping Babies Breathe is focused on the first sixty seconds, i.e. first minute of birth, also called Golden Minute, when either stimulating or ventilating with bag and mask can save a life.[7,8]

METHODS

This study was conducted at Nepalgunj Medical College, Nepalgunj Nepal. It included 8 Doctors, 34 Nurses and 36 Medical Students (Convenience Sampling).

Instructors and participants The HBB course was facilitated by a Master Trainer HBB and 4 senior Nurses who had been trained HBB course for 2 days. A total of 78 (Doctors, Nurses and Medical Students) were invited to participate on 19th & 20th November 2021, 10th & 11th December 2021 and 6th & 7th January 2022 respectively. On 19th & 20th November 2021, training was held for Group A (8 doctors and 4 Senior Nurses). On 10th & 11th December, Group B, 30 Nurses were trained and on 6th& 7th January 2022, Group C, 36 Medical Students were trained. There were altogether 5 Facilitators for the training program. The trainees learned in pair as required by HBB protocol. Helping Babies Breathe Curriculum consists of four main lessons:

1. Preparation for Birth

2. Routine Care

3. The Golden Minute

4. Ventilation with normal or slow heart rate

5. Training/Teaching lesson was introduced by the main facilitator. After a demonstration, participants completed a number of self-directed and self-assessment exercises using a learner workbook and a flip chart. The training comprised 10 classroom hours and was given in two days.

6. A series of procedures surrounding a birth were reviewed through practical exercises under the supervision of the trainers. Scenarios reproducing routine care and neonatal resuscitation at birth were performed on a Neonatalie New born Simulator (Laerdal Medical Foundation, Stavanger, Norway). One Simulator, a stethoscope, an HBB resuscitator and suction device were available for every two trainees. Helping baby breathe emphasized Hands on training rather than theoretical Knowledge.[9,10]

The course was conducted in both Nepali and English languages since most of the participants were adaptable to both the languages and its curriculum is also available.

Evaluation of knowledge and practical skills

A 15 minutes written test with 17 multiple-choice questions based on the HBB flip chart was given to participants before and after the training to evaluate their knowledge. It was available both in Nepali as well as English Languages.

The practical evaluation performed after training consisted clinical simulations using the Neonatalie Newborn Simulator. An instructor directed the participants and noted their abilities as they demonstrated their skills on a mannequin. An Objective Structured Clinical Evaluation B (OSCE B) contained in the HBB flip chart was the basis of this performance test. The OSCE B includes 18 items reflecting the key components of the course. Each item was scored a 1 if carried out correctly. Any partially correct or incorrect action was scored as 0. A –passing score required 14 items to be successfully completed (78%) of a total of 18 tasks. The 14 items correctly performed must include the following main procedures:

1. Assert whether the baby is breathing or not.

2. Ventilates at 40 breaths per minute

3. Looks for chest movement and improves ventilation.

At the end of the training session, participants were asked for feedback on the quality of the HBB course by using a 5- point likert scale of satisfaction ("strongly disagree" to "strongly agree"). A discussion session about the results of the pretest and post-test was held with participants at the end of the course.

Data management and analysis

Data from answer sheets and evaluation checklists were collated and entered into Excel and then converted to SPSS version 20, where pretest and posttest were computed. All files containing data for knowledge and performance evaluation at the above two points in time were merged before analysis. Measures of paired t- test were repeatedly used to ascertain

differences in mean scores between the written pretest and posttest. Results were expressed and reported a mean of right answers ± standard deviation and p- value < 0.05 was considered statistically significant.

RESULTS

Among total 78 participants, all completed the resuscitation and assessment course. The professional characteristics of the participants were Pediatricians, Gynecologist, Medical Officer, Nurses and Medical Students from the teaching Hospital. Among the trainees 10% were doctors, 44% were nurses and 46% were medical students. Written test scores improved significantly P (<0.005) after the course for group B and group C. It was not statistically significant for group A and group C. It was not statistically significant for group A, (P=0.05). All scores substantially improved after training.

On feedback submitted by the participants immediately after course, all agreed that they had learned how to help babies breathe.

Variable	Sample Size	Pretest mean±SD	Posttest mean±SD	t value	P value
Group A*	12	15.17±1.722	17.00±0.00	-2.61	0.05
Group B**	30	14.20±2.305	16.80±0.414	-5.52	<0.001
Group C***	36	13.39±1.420	16.83±0.383	-9.72	<0.001
Total	78	13.97±1.91	16.85±0.366	-9.47	<0.001

*Group A- Doctors and Senior Nurses
** Group B- Nurses
***Group C- Medical Students

Table I: Effectiveness of Training Programme

The P value for Group A was found to be 0.05 which shows that there was no statistical significance for effectiveness of the training programme. Since the P value for Group B, Nurses and Group C, medical students was less than 0.001, was found to be significant.

DISCUSSION

Knowledge of participants has been improved after the two days of training programme. Although the P value for the Doctors and Senior Nurses (Group A) was not found to be significant (0.05). One of the reasons might be that the senior professionals already had expertise in their relevant field.

The training has certain limitations. In our study OSCE B was not used for the pretest and similar study done in Rwanda they also considered OSCE B vast as a Pretest. So it was considered too difficult and was used after the course. Although our findings revealed a potential benefit of HBB as an educational training on new born simulator we could not evaluate the impact of this training on newborn outcomes.[9] One of the studies done among birth attendants in a rural hospital in Tanzania found that the participants performed significantly better in simulated neonatal care and resuscitation seven months after one day of HBB training but this improvement did not transfer into clinical practice.[7]

Major strengths of the study was the instruments used to evaluate knowledge and skills which were previously validated and standardized by the American Academy of Pediatrics. The HBB programme was taught in Nepali and English which was easy to understand and the HBB curriculum was in Nepali and English languages. The participants could easily understand both the languages.[11, 12–17]

Several studies in high-income and low-income countries have shown that resuscitation knowledge and skills improve immediately following training, however, these resuscitation skills tend to deteriorate over a period of time.[11, 12–17] Therefore, neonatal resuscitation training in itself is not an effective implementation strategy to retain resuscitation skills. Similar to our findings from this study, a study done in Canada has shown that the review of schematic posters on neonatal resuscitation before or after resuscitation of babies is not an effective strategy for retention of neonatal resuscitation skills.[17]

LIMITATIONS

This study or Helping baby breath program have its own limitation, like

1. It should be conducted in large group for more better result.
2. HBB program provides very basic knowledge on Neonatal resuscitation.
3. Repeated training are needed to retain the knowledge.

CONCLUSION

The present study demonstrates that HBB training on Neonatalie newborn simulator significantly improved the knowledge of the participants. Together with the refresher course on timely manner will ensure that the participants are better prepared to meet neonatal emergencies in low-income countries like Nepal where most deliveries occur at homes by traditional birth attendants.

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