ORIGINAL ARTICLE

Basic neonatal resuscitation, knowledge assessment at primary health care centers of district Sheikhupura in Pakistan — a cross-sectional study

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Abstract

Objectives: To assess the knowledge of lady health visitors and midwives working at primary healthcare facilities about neonatal resuscitation.

Methods: The cross-sectional survey was conducted in District Sheikhupura of Pakistan's Punjab province from September to November 2013, and comprised lady health visitors and midwives at primary level healthcare facilities. Datas was gathered using a close-ended questionnaire. SPSS 16 was used for statistical analysis.

Results: Of the 103 health workers interviewed, 54(52.4%) were lady health visitors and 49(47.5%) were midwives. Overall, 71(69.90%) health workers had received training on neonatal resuscitation, while 32(30.10%) had no formal training. Basic neonatal resuscitative arrangements were available at all the 54(100%) basic health units and 7(100%) rural health centres. Basic neonatal care knowledge was found adequate but the knowledge of midwives on the subject was poor as only 24(49%) answered correctly.

Conclusion: There is a need for regular in-service trainings of lady health visitors and midwives regarding Basic Neonatal Resuscitation.

Keywords: Neonatal resuscitation, Knowledge, Health workers, Primary healthcare, Pakistan. (JPMA 65: 990; 2015)

Introduction

Birth is a physiological process that represents the start of life as a physically separate being. It signifies a transitional phase that every newborn undergoes, thus leaving the highly protected intrauterine environment to independent existence.[1,2] Successful transition from foetal to neonatal life comprises diverse physiological modifications. Before birth, the baby receives oxygen and removes carbon dioxide through the placenta, while after birth, lungs take over this function. The modulation from placenta to lungs for gas exchange begins when the umbilical cord is cut or tied off and the baby has its first breath.[3] Majority of the neonates adapt to this process smoothly, while 5-10% of them need help for establishing spontaneous respiration and successful cardiopulmonary alterations.[4] Neonatal resuscitation is thus a series of interventions conducted at the time of birth to help the newborn in setting up breathing and circulation. The basic steps in resuscitation process are critical for reducing neonatal morbidity and mortality. Quite often it involves simple manoeuvres like maintenance of body temperature, drying out the body of the neonate and clearing the respiratory passages by suction. However, less than one per cent of neonates require specific medications and certain complex measures such as endotracheal intubation and chest compressions.[5,6] Most of these newborns require intensive care which is not readily available in most low-income and a few middle-income country settings.[7] Worldwide, approximately four million infants die in the neonatal period. In Pakistan, neonatal death rate is around 41 deaths per 1000 live births; and one of the main reasons for this high neonatal mortality rate is lack of proper resuscitative facilities.[8,9] It is now widely accepted that resuscitation provided to neonates immediately after birth by trained birth attendants (TBAs) can significantly reduce mortality rate.[10,11]

Community midwives are an important cadre of workers who are now becoming an important part of Pakistan's healthcare system, but if they lack the required knowledge and skills, then there will be no impact on the overall maternal and newborn mortality and morbidity. The present study was conducted to assess the knowledge of lady health visitors (LHVs) and midwives working at primary healthcare facilities about neonatal resuscitation. Additionally, presence of equipment and arrangements related to neonatal resuscitation were also discussed.

Subjects and Methods

The cross-sectional survey study was carried out at 7 Rural Health Centres (RHCs) and 54 Basic Health Units (BHUs) of District Sheikhupura of Pakistan's Punjab province from September to November 2013, and comprised LHVs and midwives working at the selected primary level healthcare facilities.

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The number of LHVs and midwives attached to a particular health facility varies widely across the district. As such, "universal sampling strategy" was employed; and all LHVs and midwives who were on duty at the time of the survey were included. The ones on leave were excluded.

After getting approval from the ethical committee of the Health Services Academy, Islamabad, permission from the in-charge of particular primary healthcare facility, and written, informed consent from the respondents, data was gathered using a close-ended questionnaire which was designed to assess the knowledge and appropriate training of healthcare providers about neonatal resuscitation.

The self-designed structured questionnaire comprised two parts. The first part had questions about demographic details of the respondents, their basic training on neonatal resuscitation, and availability of basic arrangements and related equipment at the health facility. A question on the availability of standard guidelines at the health facility about neonatal resuscitation was also included in the first part. The second part had 13 questions that aimed at assessing the knowledge of LHVs and midwives about basic neonatal resuscitation.

The questionnaire was developed after extensive literature search and context analysis. Face and content validity was carried out through discussion among the researchers, maternal and child health experts and paediatricians.

The questionnaire was directly administered to the subjects and responses were recorded. Adequate time was given to each respondent for filling up the questionnaire. The questionnaire was translated into Urdu where needed. The data was then digitally encrypted and stored in a safe place. Raw data was also stored in a locked place. Only the researchers had access to the data.

The filled questionnaires were collected and desk editing was done. SPSS 16 was used to carry out statistical analysis.

Results

Of the 103 respondents, 54(52.4%) were LHVs and

Table-1: Responses of lady health visitors to individual statement on newborn resuscitation (n=54).

Statement	Number of respondents answered correctly	%age of respondents answered correctly	Number of respondents answered incorrectly	%age of respondents answered incorrectly	Number of respondents answered don't know	%age of respondent answered don't know
Bulb sucker and infant bag are always required in delivery/ labor room.	48	88.88	4	07.40	2	03.70
Respiratory effort, color and heart rate are used to decide if N.B requires resuscitation.	52	96.29	0	00.00	2	03.70
After delivery, it is important to ascertain that heart rate is above 100/min.	45	83.33	6	11.11	3	05.56
Cyanosis and heart rate less than 100/min are danger signs in N.B.	50	92.59	2	03.70	2	03.70
During stimulation of N.B, slapping back and holding N.B head down is not recommended.	46	85.18	8	14.81	0	00.00
The correct order of initial resuscitation care of N.B includes keeping warm, sucking, head positioning, drying and stimulation.	41	75.92	6	11.11	7	12.96
The first step in initial resuscitation is keeping the baby warm.	50	92.59	2	03.70	2	03.70
Mouth of N.B should be suctioned before nose.	36	66.66	12	22.22	6	11.11
Ambu-bag, mask should cover nose, mouth and chin completely.	37	68.51	10	18.51	7	12.96
When performing N.B resuscitation with Ambu-bag and mask, it is important to verify that seal between N.B mouth, nose and mask is complete.	46	85.18	4	07.40	4	07.40
Best way to assess the success of ventilation with Ambu-bag is to observe rise and fall of chest wall.	47	87.03	3	05.55	4	07.40
During ventilation with Ambu-bag and mask breathing should be delivered at rate of 40 breaths per minute.	24	44.44	20	37.03	10	18.51
Breast feeding should begin in first hour following birth.	54	100.00	0	00.00	0	00.00

NB: New born.

Table-2: Responses of the midwives to individual statements on newborn resuscitation (n=49).

Statement	Number of respondents answered correctly	%age of respondents answered correctly	Number of respondents answered incorrectly	%age of respondents answered incorrectly	Number of respondents answered don't know	%age of respondent answered don't know
Bulb sucker and infant bag are always required in delivery/ labour room.	33	67.34	10	20.40	6	12.24
Respiratory effort, color and heart rate are used to decide if N.B requires resuscitation.	19	38.77	10	20.40	20	40.81
After delivery, it is important to ascertain that heart rate is above 100/min.	14	28.57	20	40.81	15	30.61
Cyanosis and heart rate less than 100/min are danger sign in N.B.	19	38.77	20	40.81	10	20.40
During stimulation of N.B., slapping back and holding N.B head down is not recommended.	10	20.40	30	61.22	9	18.36
The correct order of initial resuscitation care of N.B includes keeping warm, sucking, head positioning, drying and stimulation.	21	42.85	13	26.53	15	30.61
The first step in initial resuscitation is keeping the baby warmth.	40	81.63	6	12.24	3	06.12
Mouth of N.B should be suctioned before nose.	34	69.38	10	20.40	5	10.20
Ambu-bag, mask should cover nose, mouth and chin completely.	21	42.85	20	40.81	8	16.32
When performing N.B resuscitation with Ambu-bag and mask, it is important to verify that seal between N.B mouth, nose and mask is complete.	26	53.06	4	08.16	19	38.77
Best way to assess the success of ventilation with Ambu-bag is to observe rise and fall of chest wall.	19	38.77	8	16.32	22	44.89
During ventilation with Ambu-bag and mask breathing should be delivered at rate of 40 breaths per minute.	13	26.53	26	53.06	10	20.40
Breast feeding should begin in first hour following birth.	46	93.87	3	06.12	0	00.00

Table-3: Respondents answering correctly.

Statement	Number of respondents who answered correctly	%age of respondents who answered correctly
Bulb sucker and infant bag are always required in delivery/ labour room.	81	79%
Respiratory effort, color and heart rate are used to decide if N.B requires resuscitation.	71	69%
After delivery, it is important to ascertain that heart rate is above 100/min.	59	57%
Cyanosis and heart rate less than 100/min are danger signs in N.B.	69	67%
During stimulation of N.B, slapping back and holding N.B head down is not recommended.	56	54%
The correct order of initial resuscitation care of N.B includes keeping warm, sucking, head positioning, drying and stimulation.	62	60%
The first step in initial resuscitation is keeping the baby warmth.	90	87%
Mouth of N.B should be suctioned before nose.	70	68%
Ambu-bag, mask should cover nose, mouth and chin completely.	58	56%
When performing N.B resuscitation with Ambu-bag and mask, it is important to verify that seal between N.B mouth, nose and mask is complete.	72	70%
Best way to assess the success of ventilation with Ambu-bag is to observe rise and fall of chest wall.	66	64%
During ventilation with Ambu-bag and mask breathing should be delivered at rate of 40 breaths per minute.	37	36%
Breast feeding should begin in first hour following birth.	100	97%

49(47.5%) were midwives. Overall, 65(63.11%) respondents had more than 5 years of experience; 72 (69.90%) had training on neonatal resuscitation; and 31(30.10%) did not attain any course or training. Among the workers who had training, 45(62.5%) had pre-service training, 09(12.5%) had in-service training and 18(25%) had both pre-service and in-service training. The duration of training in most of the cases was only one week.

Basic neonatal resuscitative arrangements were available at 54 BHUs and 7 RHCs of district Sheikhupura. All the 7(100%) RHCs were well-equipped for neonatal resuscitation facilities, including newborn resuscitation table, source of warmth, bulb sucker, stethoscope, infant

Ambu-bag and mask. However, none of the BHUs (0%) had proper arrangements and equipment for neonatal resuscitation. Guidelines on newborn resuscitation care were not available at any single health facility (0%).

Proper record and documentation about basic neonatal resuscitation was not present in any of the RHCs and BHUs. However, on probing the staff, it was found that in preceding 6 months, 3067 deliveries had been conducted at 54 BHUs of the district. Of them, 242(7.8%) babies received basic neonatal resuscitation. At the 7 RHCs, 662 deliveries had been conducted and of them 55(8.3%) newborns required neonatal resuscitation. The figures quoted were verbally told by facility staff and could not be verified form any other source as there was no data available at any health facility. Another observation made was that trained birth attendants were available round-the-clock in RHCs, while in BHUs, this facility was only for daytime.

A total of 13 questions were put to each participant and responses were recorded as "Yes", "No" or "Don't know". Among the LHVs, 46(85%) answered the questions correctly. There were some technical questions about suction and advanced resuscitation. The responses of LHVs on these questions were varied: 41(75.92%) knew the correct order of initial resuscitation or care of the newborn; 37(68.51%) answered correctly that Ambu-bag and mask should cover nose, mouth and chin completely; 24(44.44%) knew that rate of breathing by Ambu-bag and mask should be 40 breaths per minute; and all 54(100%) LHVs and midwives answered correctly that breastfeeding should start within an hour of birth (Table-1 and 2).

In contrast, only 24(49%) answered correctly to the questions asked. Only 21(42.85%) midwives knew the correct order of initial resuscitation care of newborn; 21(42.85%) knew that Ambu-bag and mask should cover nose, mouth and chin completely; and 13(26.53%) midwives answered correctly that breathing should be delivered at rate of 40 breaths per minute during ventilation with Ambu-bag and mask.

It was evident that the overall knowledge of LHVs regarding neonatal resuscitation was far superior and updated than the midwives (Table-3).

Discussion

The importance of availability of newborn resuscitation equipment at the health facilities cannot be overlooked. The United Nations Commission on Life-saving Commodities for Women and Children has included a bag-and-mask device for newborn resuscitation on its list of 13 affordable, effective, but underutilised life-saving commodities.[10] In many resource-poor or low-income countries, lack of these essential supplies poses a major barrier to performing effective newborn resuscitation. However, nearly all of the primary healthcare facilities in Sheikhupura, study site, providing maternal and child health services had ample supplies of bag and mask devices for ventilation as well as most basic equipment for neonatal resuscitation.

Maintenance and improvement of neonatal care require active involvement of all the staff working in healthcare system. LHVs and midwives are considered essential members of the healthcare system, providing maternal and child health (MCH) services at BHUs and RHCs in Pakistan. Their training and capacity-building is very much important to reduce the maternal and newborn morbidity and mortality. The content of the pre-service training of LHVs and midwives includes three stages of labour, complications during labour and neonatal resuscitation. Trainings of both cadres are almost the same; practical as well as theoretical part, except that LHV training has more theoretical portion than midwives training. Training of LHV is of 2-year duration while training of midwives takes about 18 months. These pre-service and refresher trainings prepare health workers for real-life situations at rural areas where advanced facilities for neonatal resuscitation are not to be found. Mostly these trainings are context-based and help health workers to address issues in rural set-up of Pakistan. The result of the present study highlighted that LHVs acquire better knowledge about basic neonatal resuscitation than midwives, irrelevant to their experience and training. One of the reasons could be that most of the LHVs complete 14 years of education before enrolling for LHV course of 2 years, while midwives usually have as low as eight years of education before starting the midwifery training. The fact that the knowledge of midwives was found to be insufficient can be linked to their lower education level. The observations of the current study reflect on overall poor performance amongst the midwives sampled on neonatal resuscitation. Similar observations have been made in developing countries where neonatal resuscitation is a big challenge.[12] Despite the fact that the average work experience was more than 5 years and questions were designed to assess basic level of knowledge, only 24(49%) midwives answered them correctly. This indicates a serious deficiency in knowledge of basic neonatal care.

It is also noteworthy that the sampled healthcare personnel working at primary healthcare facilities had mostly pre-service training on neonatal resuscitation and without much practicum exposure. Thus, there is a strong need for regular in-service training programmes and

refresher courses. It is evident from studies that knowledge of healthcare providers improves significantly after having trainings on neonatal resuscitation.[13-15] Another important observation made during this study is the lack of proper documentation and record-keeping practices about neonatal resuscitation services at the primary healthcare level in Pakistan. The healthcare record is paramount to the continuity of care. Inadequate or no documentation has an impact both on patient care and outcomes. Documentation is an essential and useful tool, as it links acute care physicians with primary care physicians and allows transfer of life-saving information.[16] Proper documentation ensures that better quality data will be available for evidence-based decision making for health managers, planners and policy-makers. The accurate data helps in improved management, equitable resource allocation, appropriate funding and improved regional planning.[16] However, similar studies in other districts are needed to evaluate the exact situation about the record-keeping and documentation of data about neonatal resuscitation.

Conclusion

There is a need for regular in-service trainings of LHVs and midwives regarding basic neonatal resuscitation at primary level healthcare facilities in Pakistan; and it should be made a pre-requisite to get a job. Training should emphasise more on the practical component. Evidence-based neonatal resuscitation guidelines should be available at all primary healthcare facilities. Basic neonatal resuscitation provided to any newborn should be properly documented along with its outcome. The curriculum for LHVs and midwives courses should be revised and a significant portion about neonatal resuscitation should be given due importance.

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