Reseasrch Article

Assessment of Essential Newborn Care Practices in the Squatter Settlements of Islamabad Capital Territory in Pakistan

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Abstract

Background: While Pakistan has shown progress in reducing child mortality, significant challenges exist in reducing neonatal mortality rate. WHO recommends a package of "essential newborn care" practices based on effective coverage to improve newborn survival.

Aim: To assess the coverage of Essential Newborn Care (ENC) as defined by WHO guidelines, in the squatter settlements of Islamabad Capital Territory (ICT).

Methods: This cross-sectional survey gathered community-based data on newborn care practices from 416 eligible mothers within randomly selected squatter settlements of ICT. Three composite outcomes (safe cord care, optimal thermal care and good neonatal feeding) were generated by combining individual practices from a list of WHO recommended ENC practices. ENC was considered when all practices within each domain of safe cord care, ideal thermal care and good neonatal feeding were fulfilled.

Results: Only 2.9% of newborns received all components of WHO recommended ENC. Seventeen percent newborns received safe cord care, 40.4% received optimal thermal care and 28.8% followed WHO recommended neonatal feeding practice. Various cultural and societal misconceptions were reported which translate into harmful practices for newborn care.

Conclusion: The study highlighted an extremely low coverage level of effective essential newborn care. Pakistan needs to address issues of quality care for newborns through policy and programs which focus on Maternal, Newborn, and Child Health (MNCH) continuum of care. It needs a concerted effort at the grass root level, especially training front line workers to educate mothers on various cultural and societal misconceptions that translate into harmful practices for newborns.

Keywords: Effective coverage; Essential newborn care; Safe cord care; Optimal thermal care; Good neonatal feeding

Abbreviations

NMR: Neonatal Mortality Rate; NNS: National Nutrition Survey; WHO: World Health Organization; PDHS: Pakistan Demographic and Health Survey; MICS: Multiple Indicator Cluster Survey; SPSS: Statistical Package for Social Sciences; LHS: Lady Health Supervisor; LHW: Lady Health Workers; ICT: Islamabad Capital Territory; RMNCH: Reproductive, Maternal, Newborn and Child Health

Introduction

While the world has seen significant progress in improving child survival in recent decades, nearly 2.5 million neonates died in 2017 alone, showing a 51% reduction in the Neonatal Mortality Rates (NMR) compared with a 58% decline in under-five mortality rate [1,2]. The neonatal period defined as "the initial 28 days in the life of a newborn infant or neonate" is considered as the most critical phase owing to the high vulnerability of infections during this period [3]. It is also regarded as a sensitive marker of the quality of health care for women and newborns within the continuum of care that spans pre-conception, pregnancy, childhood and adolescence [4]. Huge disparities in the rates of neonatal mortality exist across various regions, with South Asia alone accounting for 38% of neonatal deaths worldwide [2]. While Pakistan has shown progress in reducing child mortality, significant challenges exist in reducing the neonatal mortality rate, which shows insignificant improvement compared to infant mortality and under-five mortality [5]. Serial data from demographic health surveys conducted in Pakistan shows an NMR of 55 deaths per 1,000 live births between 1992 to 2012 which improved to 42 deaths per 1,000 live births in the most current 5-year period [6,7]. The mortality patterns also vary across various districts and between urban, semi-urban and rural populations where the neonatal mortality rates are twice more than the national average [8].

For years, the performance of health systems has been evaluated by the fraction of people who are provided a service among those who need it [9]. More recently, the concept of effective coverage was

introduced, which not only focuses on health services utilization but also emphasizes on quality, thus moving beyond the concept of mere provision of health services to a more comprehensive approach towards newborn care [10]. WHO recommends a comprehensive package of "Essential Newborn Care" (ENC) practices for improving newborn survival and reducing illnesses associated in the early days of life [11]. In Pakistan, the highest level of early newborn care is reported from Islamabad Capital Territory (ICT) at 55%. However, this data only reported "contact coverage" and did not assess what "package of services" were included. It also focused on urban populations and did not include the squatter settlements within ICT, which has mostly remains neglected in larger national surveys in Pakistan [12]. We therefore, conducted this study in the squatter settlements of ICT to understand the level of effective coverage of essential newborn care. It is also important to determine if the care received is within the parameters of essential newborn care as defined by WHO guidelines for effective decision making and formulating healthy policies centered on essential newborn care in Pakistan.

Methods

Using a cross-sectional design, this study gathered data on newborn care practices from mothers residing in the squatter settlement of ICT, who delivered a live baby in the past twelve months. A squatter settlement is defined as "a residential area whose inherent non-legal status deprives the households belonging to lower-income group from adequate or minimum level of services and infrastructure". Eligible mothers who gave birth to newborns with congenital abnormalities, who failed to provide informed consent or were not mentally stable to take the interview were excluded from participation in the study.

Sampling procedure and sample size

Of the 37 squatter settlements in ICT, nine most populated squatter settlements were randomly selected in the first stage. A list of households with children up to 1 year of age was developed and eligible households were randomly selected in the next stage of sampling. In households with more than one eligible study participants, one of the child was randomly selected. Assuming the prevalence of postnatal newborn care at 55%, the sample size was calculated to capture the population parameter with a 95% confidence level, and a 5% bound on the error of estimation. It was inflated by 10% to adjust for non-responses and data errors to a final sample size of 416 for this study.

Data collection and field procedures

Information provided by selected mothers in a face to face interview was recorded on a pre-designed, pre-tested structured questionnaire. The questionnaire was developed in English, translated into Urdu and back-translated into English to eliminate translation errors. Urdu version of the questionnaire was administered in the field. Data were collected between April 2019 to July 2019 by a team comprising of 4 public health graduates a field supervisor and lady health workers from the LHW program, who facilitated field work. The entire team was trained in field and data collection procedures in a three days training. A field office was established at the Health Service Academy in Islamabad, where field teams met daily to discuss field schedules and proceeded to the field. Prior to field data collection, pilot testing was carried out to examine the reliability of the data collection tool, the content and procedures. All necessary

modifications in the questionnaire were made accordingly. Field work was facilitated by Lady Health Workers (LHWs) from the federal government run LHW program, who provided assistance to the research team.

Data management and analysis

A data management team supervised by a data manager and two data entry operators worked alongside the field team. All questionnaires received from the field were coded, and entered into a CS pro database specially designed for the study. The final data set was analyzed using Statistical Package for Social Sciences (SPSS v.22). Descriptive analysis was conducted by calculating mean with standard deviation for continuous variables and proportions for categorical variables. To estimate effective essential newborn care three composite variables; safe cord care, optimal thermal care and good neonatal feeding were developed. Each composite variable comprised of three components; i) Safe cord care encompassed use of a hygienic instrument to cut the cord, hygienic tying of the cord and application of nothing or chlorhexidine to the cord; ii) Optimal thermal care included immediate drying the newborn with in ten minutes, immediate skin to skin contact of newborn and mother and delayed bath with warm water for at least 6 hours of birth; iii) Good neonatal feeding comprised of breastfeeding initiation within an hour of birth, giving colostrum and no pre-lacteal feed. Each of these variables were dichotomized into a 'yes' or 'no' response. Coverage of composite variable was calculated based on positive response to all the three variables within each domain. Effective essential newborn care was considered when all practices within each domain of safe cord care, ideal thermal care and good neonatal feeding were fulfilled.

The study followed international ethical guidelines including obtaining informed consent from respondents, privacy and confidentiality of information obtained. The research protocol was approved by the Ethics review committee of Health Service Academy, Islamabad.

Results

Sociodemographic and economic characteristics

Of the 416 mothers interviewed 93.8% (n=390) were currently married and were living with their husbands. The average age of the respondents was 26.7±4.8 years with 31.9% being less than 25 years. A large majority of participants were married at a young age with approximately 46% less than 20 years old at the time of their marriage. One-quarter (24.5%) of the mothers were illiterate with no formal education, while less than 10% had more than 10 years of education. Nearly one third were working women, and 69% lived in a joint/extended family system, with their husbands being the key family income providers (Table 1).

Maternal and obstetric history

Two third (66.6%) of the respondents were multi-parous, 12.3% had a previous history of still birth and 28.6% had an abortion/miscarriage. A high proportion of respondents reported of eight or more antenatal visits for their last pregnancy with 95.7% delivered in a government or private health facility by a skilled health professional. One third reported some form of a complications related to their pregnancy. Among those, 55% had a complication during delivery and another 35% reported of complications during post-natal period.

Table 1: Socio-demographic characteristics of study participants in squatter settlements of ICT (n=416).

Variables	Frequency (n=416)	Percentage (%)
Marital status		
Married	390	93.8
Others (separated, widowed, divorced)	26	6.2
Mother's current age		
Less than 20 years	17	4
20 to 24 years	116	27.9
25 to 29 years	158	38
30 to 34 years	88	21.2
35 years and more	37	8.9
Average ± SD	26.7 ± 4.8	
Mother's age at marriage (Avg ± SD)	21.5 ± 3.5	
Upto 20 years	191	45.9
More than 20 years	225	54.1
Mother's education		
No formal schooling	102	24.5
Primary education (upto 5 years)	107	25.8
Secondary education (6 to 10 years)	172	41.3
Metric and above (more than 10 years)	35	8.4
Mother's employment status		
Employed	136	32.7
Unemployed	280	67.3
Family system		
Joint/extended family	286	68.8
Nuclear family	130	31.2
Husband's age (Avg ± SD)	25.4±7.4	
Husband's education		
No formal schooling	82	19.7
Primary	52	12.5
6-10 Secondary	213	51.2
>11 Higher	69	16.6
Husband's employment status		
Employed	387	93
Unemployed	29	7
Median Family Income (Avg ± SD)	Rs. 21183.5±10180.8	

Nearly 97% of all mothers interviewed, reported having a neonatal post-natal checkup with a large majority (93.3%) of these checkups conducted at a health facility (Table 2).

Essential newborn care practices

Table 3 shows essential newborn care practices segregated into domains of safe cord care, optimal thermal care and good neonatal feeding practices. Among safe cord care practices, 81% of the mothers reported use of a new blade/sterilized scissors to cut the cord whereas 98.3% reported that the cord was tied with umbilical clamp or a sterilized string/thread. A significantly low proportion reported to apply chlorhexidine or nothing (20.2%) on the cut end of the cord.

Table 2: Maternal history and obstetric characteristics among study population in squatter settlements of ICT.

Variables	Frequency (n=416)	Percentage (%)
Parity		
Primiparous	139	33.4
Multiparous	277	66.6
Previous history of still birth	51	12.3
Previous history of abortion/miscarriage	119	28.6
ANC attendance (recent pregnancy)		
None	17	4.1
Less than 8 visits	115	28.8
8 or more visits	284	71.2
Place of Delivery		
Institutional	398	95.7
Home	18	4.3
Delivery conducted by Skilled birth attendant	**398**	**95.7**
Mode of delivery		
Vaginal delivery (normal/assisted)	319	76.7
Caesarean section	97	23.3
Postnatal care received at least once	389	93.5
Complications encountered		
During pregnancy[a]	140	33.7
During delivery[b]	229	55
During post-natal[c]	146	35.1
Neonatal Postnatal check-up received	403	96.9

[a]Includes high blood pressure, blurred vision, vaginal bleeding, loss of consciousness and convulsions (eclampsia),
[b]Includes high blood pressure, premature rupture of membrane, excessive vaginal bleeding, prolonged and obstructed labor,
[c]Includes high blood pressure, blurred vision, heavy vaginal bleeding (PPH), urinary or fecal incontinence (obstetric fistula), convulsions or fits (eclampsia) and high fever.

Within the domain of optimal thermal care, immediate drying and wrapping of the newborn in a clean cloth within first 10 minutes after birth was reported by 68.8%. Initiation of skin to skin contact between mother and newborn within the first 10 min of birth and delaying the first bath for 6 hours was reported by 57% and 65.6% respectively. Almost 89% of the newborns were given colostrum and 61.5% newborns were breast fed within first hour after birth. No pre-lacteals feeding was given to 47.1% of newborns.

The coverage of different essential new born practices for the three domains showed that only 17.1% of the newborns received all three essential safe cord care initiatives, 40.4% received WHO recommended optimal thermal care and 28.8% mothers had followed good neonatal feeding practices. Effective coverage of essential newborn practices showed that only 2.9% of the newborns received all essential practices of safe cord care, thermal care and neonatal feeding as recommended by WHO.

Discussion

Pakistan is regarded by UNICEF as one of the riskiest places to be born, as measured by its newborn mortality rate [13]. The findings

Table 3: Measure of various composite variables of essential newborn care in squatter settlements of ICT.

Variables	Frequency (n=416)	Percentage (%)	Coverage of newborn practices %	Effective Coverage%
Safe Cord Care				
Used sterilized blade/Scissors to cut the cord	337	81	17.1	2.9
Used Clamp/String/Thread to tie cord	409	98.3		
Applied Chlorhexidine or Nothing on the cord	84	20.2		
Optimal thermal care				
Dried and wrapped the newborn within 10 minutes of birth	286	68.8	40.4	
Skin to skin contact of newborn and mother within 10 minutes	237	57		
Newborn's first bath delayed for more than 6 hours after birth	273	65.6		
Good Neonatal feeding practice				
Colostrum given	370	88.9	28.8	
Initiation of breast feeding within 1 hour after birth	256	61.5		
No pre-lacteal feed given	196	47.1		

drawn from this study provide evidence that a large proportion of newborn babies in Pakistan are exposed to primitive community practices and are not taken care of as recommended by WHO [14]. To our knowledge, this is the first study conducted in the squatter settlements of the nation's capital, amidst a well-developed health care system where most RMNCH (Reproductive, maternal, newborn and child health) services are readily available. Despite a very high rate of institutional deliveries (over 95%), it is surprising to see a fairly low uptake of all components of essential newborn care practices encompassing 17.1% safe cord care, 40.4% optimal thermal care and 28.8% good neonatal feeding. Overall only 2.9% of the newborns received all components of the WHO recommended essential newborn care which is fairly low when compared to similar studies [15].

Safe cord care is an important component of ENC to keep newborns healthy and avoid cord infection or sepsis. Community-based data shows a high incidence of omphalitis in Pakistan (217 per 1000 live births), which leads to sepsis among newborns [16]. Within the three sub-components of safe cord care, we found that chlorohexidine or nothing was applied on the cords of only 20.2% newborns; a proven intervention to be effective against neonatal infections [17]. Although included in the list of essential drugs, the use of chlorhexidine in public and private health facilities in Pakistan still remains low. The various challenges include issues of availability, lack of strict protocols and training on recommended guidelines, and poor knowledge of mothers and health care providers to use it effectively [17,18]. In our study, 91.1% of the mothers reported applying various substances such as ghee, vegetable oil, turmeric, surma (local eye makeup) and skin ointments on the cord stump. Several studies from Pakistan and India show, that application of these substance on the cord stump is closely linked to socio-cultural practices in the region [19-22]. A high proportion of women reported use of sterilized blade and scissors to cut the cord (81%) and another 98% of newborns had clean cord tying practices. These higher numbers could be because more than 95% of deliveries occurred in larger hospitals, and the situation might be different in another setting especially home deliveries.

This study reveals that good neonatal feeding is another poor performed practice and half of the respondents reported to have given pre-lacteal feed to their newborn. Pre-lacteal feed is the first food given to the newborn prior to be fed with breast milk or colostrum [23]. Research has shown that giving pre-lacteal feed is a long standing custom due to perceived beliefs on the benefits of certain pre-lacteals, where a pious member of the family lets the newborn suck pre-lacteal from his/her finger as it helps transfer the characters and good qualities of the provider to the newborn [24]. Common pre-lacteals include sugar syrup, honey, rose essence and cow's milk [25]. A positive observation was the high number of newborns fed with colostrum (89%), which is a proven mechanism to reduce neonatal infections [26]. Similar findings from studies in Karachi and Gilgit, showed a high proportion of newborns fed with colostrum i.e., 85% and 96% respectively [27,28]. Early initiation of breastfeeding is a dogma for healthy newborns, and we found 61.5% of the mothers initiating breast feeding within an hour after birth as per WHO recommendation. This is higher than the results of national nutritional survey 2018 (NNS) which shows early initiation of breast feeding in 48.1% newborns [29]. One major hindrance to the early initiation of breastfeeding appears to be pre-lacteal feeding, which remains the first priority due to cultural reasons and delays the purpose of exclusive breast feeding.

Drying and wrapping the newborn instantly after birth and initiation of skin to skin contact of the mother and the newborn are proven interventions to limit hypothermia which is the leading cause of morbidity and mortality of neonates especially in the developing countries [30]. Drying the newborn within ten minutes of birth was reported by 68.8% of the respondents, while 57% of the newborn mother duo had skin to skin contact within ten minutes of birth. Skin to skin contact is an evidence-based intervention for the maintenance and regulation of body temperature of the newborn, which serves as a catalyst for breastfeeding by ensuring release of oxytocin in the first hour [31]. Another worrying finding is the one-third babies who were bathed within the first 6 hours of birth, which is contrary to international guidance. Babies are born with a white, waxy coating "vernix caseosa" which serves as a protective layer to the skin, makes it softer and guards the immune system [32]. Bathing in Pakistani culture is considered essential and is preferred to take place as early as

possible for the religious rituals to be performed quickly [33]. Similar results were reported from comparable studies conducted in squatter settlements of Karachi and Rawalpindi where more than half of the newborns were bathed within less than 6 hours of birth [19,34].

The results of this study indicate that a mere improvement in the access of maternal and newborn health services won't be able to reduce neonatal and child mortality alone. Despite a high proportion of deliveries conducted by skilled birth attendants within secondary and tertiary level health facilities, the coverage of effective essential newborn care practices is extremely low. Pakistan as a country needs to address issues of quality care for newborns through policy and programs which focus on Maternal, Newborn, and Child Health (MNCH) continuum of care and address gaps in care which especially affect newborn babies. It needs a concerted effort at the grass root level, especially training front line workers to educate mothers of the various cultural and societal misconceptions which translate into harmful practices for newborns. We need to ensure that the widespread harmful traditional practices need to be declared hazardous for the health of newborn, and not only the mothers but also the secondary caregivers are educated accordingly. Furthermore, since this study did not determine the knowledge of mothers on essential newborn care, future research can be conducted to understand the relationship between the level of knowledge and newborn care practices from a user perspective as well.

Limitations

The findings of this study need to be considered with care, as our study was limited to the women living in squatter settlements in ICT. The squatter settlements in Pakistan in terms of literacy, health awareness and socio-economic status of its inhabitants closely resemble semi-urban and rural areas of Pakistan although the ease of availability of health facilities is in contrast to the rural landscape in Pakistan. Since most deliveries occurred in health facilities, the results of this study more imply to deliveries and practice of ENC in health facilities rather than to deliveries occurring at homes. Another limitation of the study could be the recall bias especially for those women who delivered almost a year ago. To minimize recall bias, well-formulated, specific questions were used while interviewing the mothers and the interviewer incorporated probing techniques to better elicit the responses.

Conclusion

To conclude, this study was able to identify critical areas of early newborn care which were not researched before and has enlightened our knowledge on how ENC is provided in Pakistan. The issues identified by this study are simple to fix, but require concerted efforts at the level of the community as well as health providers. Community efforts should focus on providing information on various cultural practices which are harmful for newborns. Health care providers must be regularly equipped with up-to-date knowledge based on advances in healthcare practices so that they could update their knowledge and practices in concordance with updated WHO recommendations on essential newborn care.

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the Ethical Review Board of Health Services Academy before carrying out the field work. All study participants were briefed about the study and its objectives prior to receiving informed written consent. As the study was conducted in low literacy settings, the consent was read by interviewers, upon receiving approval to participate by mothers, interviewer signed the consent form. No coerces was used for approval to participate. Measures to ensure confidentiality was taken by not obtaining any personal identifying information like name or address, a unique study ID was assigned to all participants, face to face interview with little or no involvement of other family members etc. All completed questionnaires were kept in locked cabinets and soft data was protected *via* passwords file with limited access only to authorized people.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

RH collected data in the field and conducted parts of analysis. She also wrote the first draft of the paper. TR conducted analysis and monitored field data collection. She also provided inputs in the analysis section. KH did field data collection and provided inputs in the analysis. SH provided inputs in the conceptual design of the study and supervised the research process. JB provided inputs in the conceptual design of the study and also provided inputs in the final draft. FE helped in conceptualizing the study, supervised the overall research process and edited the final draft.

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