

ORIGINAL RESEARCH

Household practices of mothers regarding neonatal care in rural & urban settings of the capital district of Azad Jammu & Kashmir

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ABSTRACT

Introduction: Each day almost 500 newborns die in Pakistan, ranking this country close to Afghanistan and Iraq amongst developing countries in terms of neonatal mortality. This constitutes more than 70% of the infant mortality rate. Among the various determinants of neonatal mortality in Pakistan, most emerge from behaviors and inappropriate practices of mothers, particularly in rural communities. Azad Jammu and Kashmir (AJK) has an urban-rural ratio of 12 : 88 and mainly mountainous topography, so healthcare provision to the scattered rural communities of AJK has been a big challenge. The objective of this research was to study household practices of mothers regarding healthcare seeking for their neonates in rural and urban settings of the capital district of AJK.

Methods: This community-based cross-sectional study was carried out in rural and urban settings of the district Muzaffarabad of AJK. The study was conducted during the 6 months between July and December 2011. Inclusion criterion of participants in the research was mothers who had a neonate with current illness or illness during the previous 2 weeks. One hundred and four eligible mothers, each from rural and urban settings of district Muzaffarabad, were included in the study by utilizing a multistage sampling technique. To assess household practices, recruitment of the mothers was facilitated by lady health workers (LHWs) and interviews were conducted by them at the household level.

Results: After controlling for confounding, significant association was found between rural place of residence and inappropriate household-based practices of mothers. More rural mothers were found to be illiterate compared to urban ones. Tying and cutting the umbilical cord with an unsterilized item, delivery at home attended by unskilled birth attendants, and delay in seeking neonatal



health care were more prevalent in rural settings compared to the urban ones. More urban neonates were found to be immunized, dried and wrapped immediately after birth compared to the rural ones.

Conclusions: Findings of this study conclude that low level of mother's education and rural residence are associated with their inappropriate household-based practices for neonatal care. Behavior change communication and strengthening primary health care are required to address the demand and supply side issues, together with collaboration for action on social determinants of health.

Key words: AJK, Muzaffarabad, neonatal care, primary health care, urban–rural disparity.

Introduction

Pakistan is amongst the five countries that contribute to 49% of global childhood deaths. Each day almost 500 newborns die in Pakistan, ranking its neonatal mortality close to that of Afghanistan and Iraq amongst developing countries. Neonatal mortality constitutes more than 70% of the infant mortality rate. In Pakistan, neonatal mortality has been static for two decades¹. It is not possible to reduce the under-five and infant mortalities without addressing the stagnating neonatal mortality rate.

Given limited funding and the short time to the Millennium Development Goals deadline of 2015, the imperative to invest in the most effective interventions is clear. Cultural beliefs and practices, more common amongst women, often lead to delayed healthcare seeking for neonates in rural communities². Simple and low-cost community and home-based neonatal interventions have the potential to bring about drastic reduction in neonatal morbidity and mortality³. In Bangladesh, the mother's knowledge of essential newborn-care practices, such as drying and wrapping the baby immediately after birth, initiating breast milk within 1 hour of birth and having early postnatal newborn checkups, improved neonatal health outcomes⁴. With Azad Jammu and Kashmir (AJK)'s urban–rural ratio of 12:88 and mainly mountainous topography⁵, health care provision to the scattered rural communities of the Azad Jammu and Kashmir (AJK) has been a big challenge. Moreover, disaggregated data on the patterns of neonatal morbidity and mortality is not available in AJK. Among the various causes and determinants

of neonatal mortality in Pakistan, most emerge from behaviors and inappropriate practices of women and caregivers⁶. Therefore, reasonable gains can be made for newborn health and survival by addressing various myths, fallacies and misconceptions related to health-seeking practices. The objective of this research was to study household-based practices amongst mothers regarding healthcare seeking for their neonates in rural and urban settings of district Muzaffarabad, AJK.

Methods

This community-based cross-sectional study was carried out in rural and urban settings of district Muzaffarabad, AJK. The study was conducted during the 6 months from July to December 2011. Situated in the upper reaches of the Indian subcontinent and the Pakistani side of the Line of Control, AJK is a unique politico-legal territorial entity of unresolved status. Unlike Indian-administered Kashmir, AJK has not been formally annexed by Pakistan. The word *Azad* in AJK derived its inspiration from the political character of freedom movement launched by native Kashmiris for liberation of this state. Although AJK has its own constitution and elected government, the territory has no international legal status⁷.

The population of AJK was 4.059 million in 2011. AJK is divided into three divisions and 10 administrative districts with Muzaffarabad as the capital of the state⁵. Infant mortality rate in AJK is estimated at 62 per 1000 live births while the probability of dying under five years of age is around 96 per



1000 live births. Infant and under-five mortality rates are higher in rural areas than in urban ones⁸.

Inclusion criterion for this study was mothers who had a neonate with current illness or illness within the previous 2 weeks. Mothers who had 'too sick neonates' were excluded from the study. For the purpose of this study, 'too sick neonates' were considered as the ones having non-preventable diseases such as congenital conditions that might present as gross cyanosis, pallor and failure to thrive. 'Too sick neonates' were excluded from the study to avoid the risk of effect modification because there is increased probability of healthcare utilization for them compared to the 'neonates with common illness'. Neonates with preventable and curable illness such as respiratory, gastrointestinal, umbilical cord or eye infections were taken as 'neonates with common illness' in this study. A newborn of less than 28 days of age was considered to be 'neonate'.

For the purpose of this study, socioeconomic status of each household was categorized as low, middle or high. According to the Household Integrated Economic Survey (HIES) of 2007–08⁹, household income is divided into five quintiles. In this study, first and second quintiles of the HIES 2007–08 were categorized as low, third and fourth quintiles as middle, and fifth quintile as high income (Table 1). Average household size in AJK is approximately 6.7 members⁸.

Sample size was calculated by using the formula of two samples to estimate the difference between two population proportions with specified precision¹⁰. Precision required on either side of the true value of the population proportions was taken as 10% (0.1). Disaggregated data on household-based practices of urban and rural mothers for their neonates is not available in AJK. Therefore, proportions for both the rural and urban mothers were taken as 50% (0.5) in order to obtain the largest sample size. Confidence level was set at 95% with significance level at 5% (0.05).

A multi-stage sampling technique was used for selection of 104 mothers each from urban and rural settings of district Muzaffarabad. In Pakistan, administrative boundaries are used to

define urban areas, with designations of municipal corporation, municipal committee or cantonment board¹¹. An urban area having a population exceeding 30 000 is considered to be a municipal committee¹². A cantonment board is responsible for administering the military lands whose functions are synonymous to the municipal committee of the civil setup¹³. The population of a municipal corporation exceeds 5000 000. A rural area is any area that is not an urban area¹².

Basic Health Units (BHUs) were taken as the entry points into household that they cover. BHU is the first-level care facility where a lady health worker (LHW) reports and submits data of the population that she covers by visiting them at their households. In the first stage of sampling, a list of the BHUs of district Muzaffarabad was taken as the sampling frame. In the second stage, two BHUs for the rural population and two for the urban populations were randomly selected. Study was conducted on the mothers at the household level within the catchment populations of these BHUs and LHWs. In the third stage of sampling, the LHWs facilitated identification of the study population in the community.

Recruitment of the mothers having neonates was done, with study objectives explained and informed consent taken. Thereafter, interviews were conducted at the level of household by LHWs for assessing household-based practices and service utilization patterns of mothers regarding early neonatal care. Inclusion criteria were strict; it was not feasible to randomly select from the population. Therefore, all mothers having less than 28-day-old neonates with current or past (within 15 days) illnesses were interviewed. A high response rate was expected because 60 LHWs facilitated recruitment of mothers. LHWs have an established rapport with mothers in their respective areas of urban and rural settings.

A close-ended pre-coded questionnaire was used for data collection. This tool was developed after extensive literature review regarding household-based practices and service utilization patterns of mothers with early neonates in Pakistan, and in neighboring and some developing regional countries^{4,6,14-16}. Questionnaire and consent form were translated into Urdu (the national language of Pakistan) before administering them in the study population. The



questionnaire was pre-tested and necessary changes were made such as a detailed explanation of the categorization of socioeconomic status; inclusion and exclusion criteria were included in the questionnaire.

Data was collected for variables related to sociodemographic characteristics and household-based practices. Quantitative statistical analysis of variables was carried out using the Statistical Package for the Social Sciences v16.0 (SPSS Inc., <http://www.spss.com>). Inferential analysis was carried out using the χ^2 test along with cross-tabulation to assess the level of association. Binary logistic regression was utilized to control the effect of confounders. Selected outcome variables from household-based practices were regressed against a set of predictor variables including mother's age and education, father's education, family system, socioeconomic status and place of residence of the household.

Ethics approval

Research was initiated upon acceptance of the proposal by the Ethical Review Board of the Health Services Academy, Islamabad. Upon written approval from the Ethical Review Board, liaison was established with the administration of district Muzaffarabad and the LHW program of AJK. During processing and analysis of the data, strict confidentiality was maintained.

Results

Response rate was 100% in this study. The predominant proportion of the study population (53%) belonged to the middle socioeconomic group. Thirty five per cent of the mothers in this study were found to be illiterate (Fig1). In cross-tabulation, more rural mothers were found to be illiterate compared to the urban ones ($p=0.004$, χ^2 test).

The majority of the neonates (55%) were delivered at the public health facility. The number of deliveries conducted at homewas 34% (Table 2). Elderly experienced ladies attended 53% of deliveries at home; traditional birth attendants were

called for 27% of home deliveries. Most neonates (77%) in this study had received vaccination. In cross-table analysis, more neonates were found to be delivered at home ($p<0.001$) and left unvaccinated ($p=0.008$) in rural settings compared to urban ones (Table 2).

Statistically significant association was found in cross-table analysis between the rural place of residence and the practices of tying ($p<0.001$) and cutting ($p<0.001$) a newborn's umbilical cord with unsterilized items (Table 3). Similarly, more urban neonates ($p<0.001$) were found to be dried and wrapped immediately after birth compared to the rural ones (Table 4).

In 50% of cases of sick neonates, healthcare seeking was immediate. Out of the remaining cases, there was delay of 1 day for 28% of sick neonates, a delay of 2 days in 16% and delay of 3 days in 6% of the cases. In cross-tabulation, delay in seeking neonatal health care was more common in rural settings compared to urban ones ($p<0.001$) (Table 5). The main reason for delay in seeking health care for the neonates was found to be non-availability of transport followed by 'need of permission from elders'.

The most preferred healthcare provider of mothers in both the urban (29%) and rural (27%) settings of this study was medical doctor (Fig2) either privately or in a public facility. Fifteen per cent of the mothers preferred taking their neonate directly to a district level hospital. There were 12% of the mothers who preferred seeking health care from the traditional birth attendant, while 10% preferred *peer sahib* (faith/spiritual healer), and 7% preferred LHWs.

Findings of the logistic regression analysis showed that residing in rural settings reduced chances of delivery at a health facility. Masters level education of the neonate's father increased chances of childbirth at the health facility (Table 6). Newborns delivered in rural areas had reduced chances of having their umbilical cords tied with commercially available strings (Table 7). Therefore, stratum-specific analyses concluded rural place of residence as a predictor of the inappropriate household-based practices of mothers for their neonates.



Table 1: Socioeconomic status of household

Low SES	Middle SES	High SES
Collective income of the household ranging from 7812 (1st quintile of the HIES) to 9910 (2nd quintile) PKR Non-possession of property, land or any other asset by the household	Collective income of the household ranging from 11,720 (3rd quintile) to 13,227 (4th quintile) PKR Ownership of some property or asset like motorcycle or small car	Collective income of the household more than 24,659 (5th quintile) PKR Ownership of property, land and assets such as car

PKR, Pakistani rupees. SES, socioeconomic status.

Table 2: Place of residence, place of delivery and neonate's vaccination[†]

Residence	Place of delivery			Vaccinated? (yes, no)
	Public health facility	Private health facility	Home	
Rural	19%	6%	25%	35%, 15%
Urban	36%	5%	9%	42%, 8%

[†] More neonates were found to be delivered at home ($p<0.001$) and left unvaccinated ($p=0.008$) in rural settings compared to urban ones.

Table 3: Place of residence, practices of tying and cutting umbilical cord[†]

Residence	Tying umbilical cord			Cutting umbilical cord		
	Commercially available sterilized string	Non-sterilized string (from home)	Did not remember	Sterilized item, boiled item	Unsterilized and unboiled item	Did not remember
Rural	27%	19%	4%	23%, 4%	16%	7%
Urban	44%	2%	4%	31%, 12%	3%	4%

[†]Rural place of residence is associated with the practices of tying ($p<0.001$) and cutting ($p<0.001$) the newborn's umbilical cord with unsterilized items.

Table 4: Place of residence, practice of drying and wrapping newborn immediately after birth[†]

Residence	Dried and wrapped	Not dried and wrapped	Did not remember
Rural	35%	12.0%	3.0%
Urban	47%	0.5%	2.5%

[†] More urban neonates ($p<0.001$) were found to be dried and wrapped immediately after birth compared to rural ones.

Table 5: Place of residence, delay in decision-making and duration of delay[†]

Residence	Delay in decision making		Delay in neonate's healthcare seeking			
	Immediate decision	Had to wait	Sought health care immediately	One day	Two days	Three days
Rural	14%	36%	14%	19%	13%	4%
Urban	36%	14%	36%	9%	3%	2%

[†]Delay in seeking neonatal health care was more common in rural settings compared to urban ones ($p<0.001$).



Table 6: Logistic regression analysis for examining predictors of childbirth at home or in health facility

Outcome predictors	p value	Odds ratio	95% confidence interval for Exp(B)	
		Exp(B)	Lower	Upper
Residence		1.00		
Urban		1.00		
Rural	0.001	0.245	0.110	0.544
Socioeconomic status		1.00		
High		1.00		
Low	0.419	0.630	0.206	1.930
Middle	0.151	2.099	0.762	5.778
Father's education		1.00		
Illiterate		1.00		
< primary	0.345	1.644	0.586	4.615
< matric.	0.060	3.185	0.955	10.629
Professional education	0.863	0.895	0.252	3.173
Can read and write only	0.999	6.386×10^{-8}	0.000	
Masters	0.039	6.275	1.101	35.752
FA/FSc	0.267	2.300	0.528	10.021
Mother's education		1.00		
Illiterate		1.00		
< primary	0.335	1.698	0.579	4.977
< matric.	0.282	1.863	0.599	5.797
Can read and write only	1.000	6.323×10^{-9}	0.000	
Masters	0.325	0.382	0.056	2.589
FA/FSc	0.443	2.693	0.214	33.858
Religious education	0.417	2.024	0.369	11.109
Mother's age (years)		1.00		
<18 or >37		1.00		
18–22	0.381	2.689	0.294	24.643
23–27	0.286	3.120	0.385	25.280
28–32	0.333	2.869	0.339	24.283
33–37	0.375	2.715	0.298	24.707
Family system		1.00		
Nuclear		1.00		
Joint	0.353	1.511	0.633	3.608

'Primary', 'matric', 'FA/FSc' and 'Masters' refer to 5, 10, 12 and 16 years of education respectively in Pakistan.

Discussion

Universal access to basic education is the second Millennium Development Goal. Education is a vital prerequisite for empowering women. Inferential statistics utilized in this study concluded that out of the illiterate mothers (35%),

most were in rural settings. According to the AJK Demographic Health Survey of 2010, 40% of the female population in AJK have no education¹⁷. Only 29% of girls of primary school age are actually in school; the proportion of boys is considerably higher, at 40%⁸.



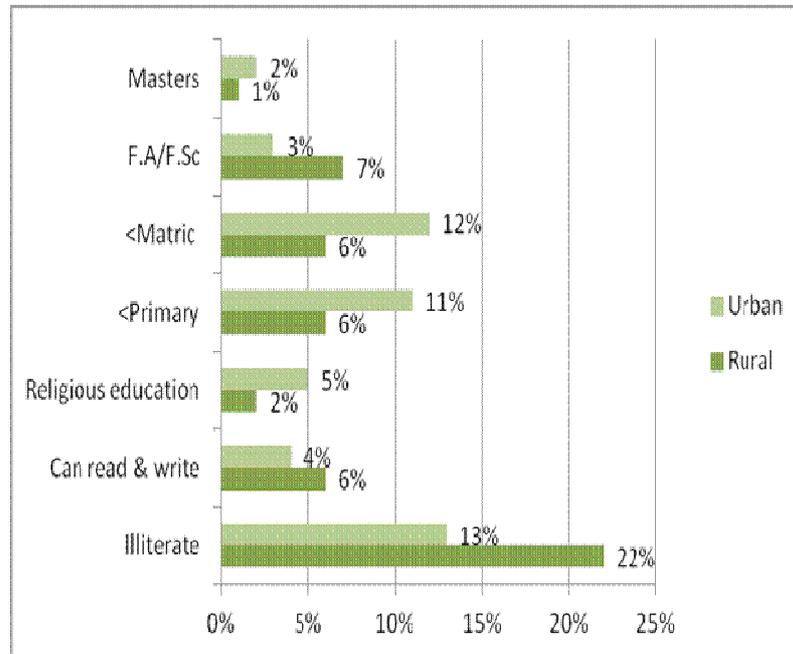
Table 7: Logistic regression analysis for examining predictors of tying the umbilical cord with home-made or commercially available string

Outcome predictors	p value	Odds ratio	95% confidence interval for Exp(B)	
		Exp(B)	Lower	Upper
Residence		1.00		
Urban				
Rural	0.001	0.205	0.081	0.520
Socioeconomic status				
High				
Low	0.250	0.476	0.134	1.685
Middle	0.414	1.616	0.510	5.118
Father's education				
Illiterate		1.00		
< primary	0.114	2.975	0.769	11.512
< matric.	0.100	3.549	0.785	16.042
Professional education	0.244	0.442	0.112	1.747
Can read and write only	0.344	0.237	0.012	4.660
Masters	0.286	2.498	0.465	13.420
FA/FSc	0.478	0.585	0.133	2.570
Mother's education				
Illiterate		1.00		
< primary	0.171	2.273	0.702	7.362
< matric.	0.152	2.552	0.709	9.184
Can read and write only	1.000	6.680×10^{-9}	0.000	
Masters	0.365	0.414	0.061	2.786
FA/FSc	0.137	8.189	0.514	130.510
Religious education	0.633	1.549	0.256	9.364
Mother's age (years)				
<18 or >37		1.00		
18–22	0.075	9.345	0.795	109.856
23–27	0.628	1.714	0.193	15.188
28–32	0.265	3.598	0.378	34.216
33–37	0.593	1.908	0.179	20.352
Family system				
Nuclear		1.00		
Joint	0.147	0.446	0.150	1.329

'Primary', 'matric', 'FA/FSc' and 'Masters' refer to 5, 10, 12 and 16 years of education respectively in Pakistan.

After adjusting for the effect of confounders, findings of the present research showed statistically significant association of the rural place of residence with inappropriate household-based practices of the mothers for neonates. Findings of this research are in concordance with the AJK Multiple Indicator Cluster Survey (MICS 2007–08)⁸, AJK Demographic Health Survey¹⁷ and the research conducted in northern areas of Pakistan and urban and rural areas of other countries in the south Asia region¹⁵ regarding household-based practices of healthcare seeking for children.

In the present study more urban neonates were found to be immunized compared to the rural ones. According to the MICS survey in AJK, children of urban settlements and the wealthiest households are more likely to be fully vaccinated than other children⁸. Findings of the AJK DHS show that 41% of the population in urban areas is in the richest wealth quintile in contrast to 16% of the rural population. On the other hand, almost 20% of the rural population is in the poorest quintile, compared with only 3% of the urban population¹⁷.



'Primary', 'matric', 'FA/FSc' and 'Masters' refer to 5, 10, 12 and 16 years of education respectively in Pakistan.

Figure 1: Education of neonate's mother and place of residence.

Use of health services is known to depend on the physical, economic and social accessibility of the offered services. Traditional community practices and the conservative norms drastically affect neonatal health outcomes⁶. As per the findings of this research, tying the umbilical cord with homemade unsterilized string was more likely with newborns of mothers residing in rural settings compared to the urban ones. Similarly, delivery at home was more likely to occur for mothers residing in rural settings compared to those in urban areas. Evidence suggests that families might view out-of-home care-seeking during the neonatal period as risky because it potentially exposes the newborn to cold winds, malevolent spirits, and the gaze of jealous people, and the treatment itself may be seen as too strong for a young child¹⁶. There is evidence to suggest that participatory health education interventions coupled with community-based

primary health care in rural regions can improve maternal and child health^{18,19}.

In the present research, delay in seeking neonatal health care was more common in rural settings compared to urban ones. The main reason for delay was found to be non-availability of transport followed by 'need of permission from elders'. Results of the AJK Demographic Health Survey showed that half (51%) of the births in AJK are delivered in health facilities, while 47% of births take place at home. The main reasons given for not delivering in a health facility included the facility being too far away or non-availability of transport (41%)¹⁷.

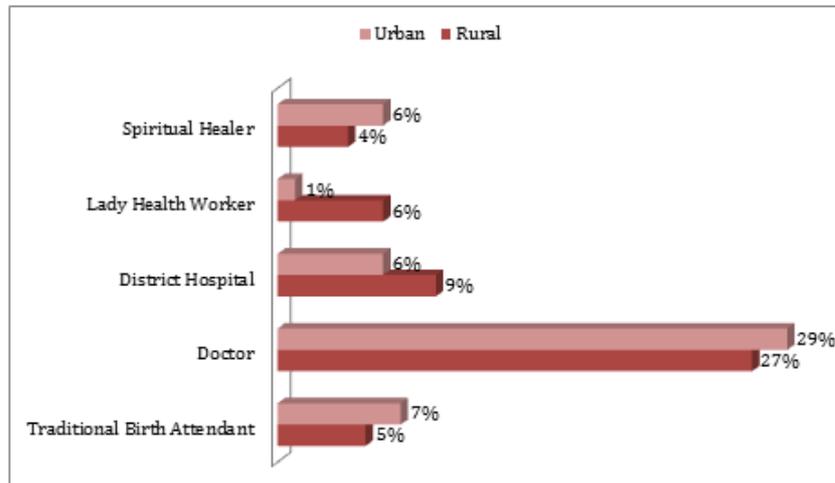
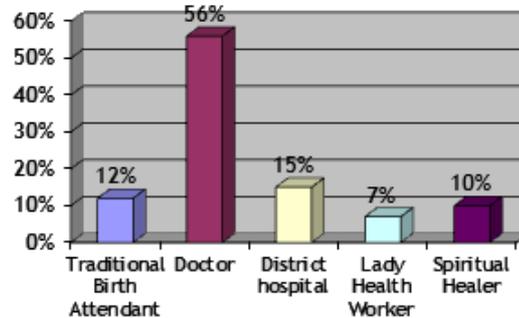


Figure 2: Preferred healthcare provider.

Average distance to a reproductive health facility in rural areas of AJK is almost four times the distance in urban areas, making access to services for rural women without transportation or funds extremely difficult²⁰. Evidence from another study conducted in the northern areas of Pakistan suggests that the effect of long distance on the use of health services becomes stronger when combined with the dearth of transportation, and poor roads, which contribute towards increased costs of visits. As in all other developing countries and restricted cultures, lack of social mobility is a barrier to women seeking health care for themselves and their children, even in matters of utmost importance¹⁴.

The most preferred healthcare provider of the mothers in both the urban and rural settings of this study was a medical doctor. Some mothers preferred seeking health care from traditional birth attendants and *peers sahib*. Factors behind such service utilization preferences include crucial shortages of trained health staff at primary care level. As in other provinces of the country the number of LHVs and nurses is not sufficient for the population health needs of the AJK²⁰. The gender of the healthcare provider is a longstanding issue; there are not enough female healthcare practitioners, particularly in rural areas of Pakistan. Since access to the health care of women is defined by societal norms, most of the time it is constrained because of the non-availability of female healthcare providers⁶.



Achieving the fourth Millennium Development Goal may be delayed unless the prospective range of child survival interventions are scaled up, with a strong focus on the production and deployment of a critical mass of community midwives along with LHWs linked to the health system, and supported by strong partnerships and active community participation. In Pakistan, no more than 20% of people consult a government first-level care facility, and this has been unchanged for the past 10 years¹⁴. There is an urgent need to equip the referral facilities, to scale up integrated management of newborn and child illness and to ensure effective newborn delivery in first-level care facilities²¹.

Conclusions

Findings of this research conclude that inappropriate household-based practices regarding neonatal care are more common in rural settings compared to urban ones. It is imperative to formulate a comprehensive behaviour change and advocacy campaign for promoting appropriate practices for neonatal healthcare seeking. Collaboration for action on social determinants ought to be considered, with particular emphasis on girls' education with the long-term objective to improve decision-making power and health-seeking behaviours of mothers for their neonates.

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