

Maternal Experiences during Pregnancy, Delivery, and Breastfeeding Practices: A Community-based Analytical Cross-sectional Study

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Abstract

Background: Evidence on variation in the information provided to mothers during antenatal and postnatal periods, its influence on breastfeeding awareness, and practice in urban and rural settings of India is scarce. The aim of the study was to assess the variation in mothers experience during pregnancy, delivery, and maternity period across settings and its influence on breastfeeding practices in the first six months of infants' life. **Methods:** A community-based analytical cross-sectional study was carried out in urban and rural settings of Coimbatore, Tamil Nadu, among 800 mothers who had delivered between one year and six months before the date of the survey using simple random sampling. **Results:** The proportion of mothers with less than four antenatal visits were significantly higher in urban areas (urban vs rural, 11.4% vs 6.2%). The mean scores for positive experiences during pregnancy (MD -0.99, 95% CI -1.31 to -0.69), experiences during birth and maternity period (MD -0.59, 95% CI -0.83 to -0.35) were significantly lower in the urban areas compared to rural areas. The prevalence of exclusive breastfeeding was 75.8% and 85.0% in urban and rural areas, respectively. Mothers not satisfied with experiences during delivery and maternity period (OR 1.69, 95% CI 1.18 to 2.42) and from urban areas (OR 1.81, 95% CI 1.27 to 2.59) were at significantly increased risk of nonexclusive breastfeeding. **Conclusion:** The present study showed that mothers from urban areas were not provided with appropriate, adequate, and timely information by the healthcare providers. It is the need of the hour to train and motivate healthcare providers regarding maternal awareness of antenatal, intranatal, and postnatal care practices including breastfeeding and infant care.

Keywords: Breastfeeding, India, infant feeding practices, maternal experiences, rural, urban

INTRODUCTION

Breastfeeding, baby's first vaccine, provides adequate immunity and nutrition, especially in the first six months of life.^[1] Infants are, therefore, exclusively breastfed for the first six months; after which infants should receive safe and nutritionally adequate complementary foods while breastfeeding continues for up to two years of age or beyond.^[2] This is essential to achieve optimal growth, development, and health.^[3] It has a significant impact on child survival; of all the available preventive interventions, breastfeeding has the potential to prevent over 800,000 deaths (13% of all deaths) among under-five children from low- and middle-income countries.^[3] Breastfeeding exclusively in the first six months significantly lowers the risk of infant mortality.^[4] Children aged six to twenty-three months who are not breastfed have

nearly double the risk of mortality compared to breastfed children.^[5] Breastfeeding also notably reduces the risk of diarrhea, pneumonia, and respiratory infections, leading to lower mortality rates.^[6] Additionally, breastfeeding provides maternal benefits such as promoting birth spacing and reducing the risk of ovarian and breast cancers. Economic losses due to not breastfeeding or inadequate breastfeeding amount to

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How to cite this article: Shanmugam J, Kumar M, Jayaraj NP, Rajan P. Maternal experiences during pregnancy, delivery, and breastfeeding practices: A community-based analytical cross-sectional study. *Indian J Community Med* 2024;49:532-8.

Received: 25-07-22, **Accepted:** 22-02-24, **Published:** 24-05-24

Access this article online

Quick Response Code:



Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.ijcm_636_22

approximately \$302 billion annually or 0.49% of the world's gross national income.^[7,8]

India accounts for 20% of the 5.9 million global child deaths.^[9] The infant mortality rate stands at 35.2 per 1000 live births. In the National Family Health Survey—5, children under three years of age breastfed within one hour of birth were a mere 41.8% and less than two-thirds children were exclusively breastfed for six months (63.7%).^[10] These indicators fall far below the recommended practice. To achieve the global goal of optimal child health and nutrition, economy, intelligence, and human capital, while reducing inequalities (in accordance with sustainable development goals (SDGs)) all women should be enabled (through improved cognition) to perform (through affective and psychomotor improvement) appropriate breastfeeding practices.^[11]

Breastfeeding is influenced by socioeconomic factors, sociocultural factors, family and psychosocial factors, religious values, literacy, ignorance, factors associated with health system and services (accessibility, affordability, and acceptability), workplace and employment, mother–infant relationship, and levels of knowledge and skills of breastfeeding.^[12] Existing literature has documented that the knowledge and practice of breastfeeding depend on the prior information provided by the healthcare workers.^[13,14] However, evidence on variation in the information provided to mothers during antenatal and postnatal periods, its influence on breastfeeding awareness, and practice in urban and rural settings of India is scarce.^[15] This information will be useful for policymakers and interventional programs.

Against this background, the aim of the study was to assess the variation in mothers experience during pregnancy, delivery, and maternity period across settings and its influence on breastfeeding practices in the first six months of infants' life.

SUBJECTS AND METHODS

This was a community-based analytical cross-sectional study carried out in field practice areas of a tertiary care hospital in Coimbatore between October 2017 and March 2018. The study enrolled mothers with children at least six months of age and consenting to participate. A total of 1300 mothers who delivered babies within one year and six months before the date of the survey were identified from the family folders maintained by the rural ($n = 689$) and urban ($n = 611$) health center in the field practice areas. This constituted the sampling frame.

It was found that the percentage of children under six months of age exclusively breastfed was 54.9% in India—52.1% in urban and 55.9% in rural; 48.3% in Tamil Nadu, ranging between 47.8% in urban and 48.7% in rural.^[16] Taking the prevalence to be 52.1% and 55.9% for urban and rural settings (higher proportions were taken to obtain a higher sample size), with an absolute precision of 5.0%—the minimum required sample size was rounded to 400 each for urban and rural settings ($N = 800$)

with 95% confidence (CI). The familiarity of the study investigators with the population meant that a nonresponse rate was not required in the computation of sample size. A simple random sampling (using random numbers generated in Stata v16) was done to include a sample of 400 participants each in urban and rural settings. In situations where the mother was not available, two additional visits were made on different days, at different times (a total of three visits), and if not available the very next mother in the list was planned to be included.

The study captured the mothers experience during pregnancy, delivery, and maternity period using an adapted version of a prevalidated, pretested, and structured United Nations Children's Fund (UNICEF)/Baby-Friendly Hospital Initiative (BHFI)—Revised Updated and Expanded for Integrated Care questionnaire (the sections on hospital self-appraisal questionnaire, hospital birth statistics, and hospital breastfeeding policy were excluded; only sections relevant to maternal experience were used).^[17] The present study included eight variables to capture experiences during pregnancy and thirteen variables to capture experiences during delivery and maternity period. The mothers were then enquired regarding the infants feeding practices in the first six months of life. It was then categorized as breastfeeding exclusively; both breastfeeding and feeding breastmilk substitutes; and feeding my baby breastmilk substitutes (not breastfeeding at all). The questionnaire was translated into the local vernacular language; face and content validation were done. Trainee doctors posted in the urban and rural health centers were sensitized regarding the objectives of the study, confidentiality of information, participants rights, informed consent, and were trained (using a standardized training module) to administer the questionnaire by an interview method. The data collected was reviewed by the study investigator at the end of each along with the trainee doctors to resolve ambiguity, provide clarifications (if any), and ensure uniformity within and between them.

The data was collected from 800 participants, entered in Microsoft Excel, and analyzed using institutional licensed Stata v16.^[18] Descriptive analysis was presented using numbers and percentages. The Chi-square test of significance (two-sided) was applied to test for association between study settings and independent variables. A positive experience with each independent variable was scored one. The mean (SD) scores of experiences during pregnancy, delivery, and maternity care were compared between urban and rural settings using unpaired or independent *t* test; the mean difference (MD) and 95% CI were reported. The experiences during pregnancy, delivery, and maternity care were considered satisfactory if a mother had scored more than the mean reported in the study; disaggregated for urban and rural subsamples. Significance was taken at $P < 0.05$.

The study was approved by the Institute Ethics Committee, Karpagam Faculty of Medical Sciences and Research, Coimbatore (IHEC/104/Community Medicine/09.2017). The content of the Participant Information Sheet (PIS) in the

local language (Tamil) was provided to the study subjects and contents were read to them in their own language to their satisfaction. The study subjects were enrolled in the study only after obtaining written informed consent.

RESULTS

The study included a total of 800 women of reproductive age group (15 to 45 years) who had delivered between one year and six months before the date of the survey (400 each from urban and rural settings). The response rate in the present study was 100%—none of the selected mothers had an adverse event during delivery or in the postnatal period, including stillbirth, neonatal, infant, or maternal death; and the selected mothers could be interviewed within the prespecified number of visits.

Experience during pregnancy

The results showed that the mothers from urban areas had a significantly ($P < 0.05$) lower number of antenatal care visits (less than a minimum number of four) (urban vs rural, 9.3% vs 4.8%); a significantly lower proportion of mothers from urban areas received advice with respect to the companion of mother's choice (to be with her) during labor (13.5% vs 25.0%), alternatives for dealing with pain during labor (4.8% vs 21.3%), the importance of skin-to-skin contact with baby (20.1% vs 35.5%), the importance of baby with their mother (in room or bed) 24 hours a day (28.0% vs 35.0%), the risk of human immunodeficiency virus (HIV) transmission (7.0% vs 34.0%), and the importance of HIV testing and counseling in pregnant women (11.3% vs 33.3%) [Table 1]. However, we found that a lower proportion of rural mothers were advised about the risk of giving water, formula, or other supplements in the first six months of life (urban vs rural, 48.0% vs 40.8% at $P < 0.05$).

Experiences during birth and maternity period

The results showed that there was no difference between urban and rural settings with respect to birth weight and type of delivery. The involvement of staff in encouraging mothers to look for signs that their baby was ready to feed and offer mother help with breastfeeding during the first contact and since that first contact; helping with positioning and attaching the baby for breastfeeding before discharge; and advising about how long the baby should suckle did not differ between urban and rural settings [Table 2].

A significantly higher proportion of mothers from urban settings were not encouraged to walk and move about during labor (urban vs rural, 41.5% vs 20.8%); not advised about how often the baby should be fed (9.3% vs 2.3%); not given any leaflets or supplies that promote breastmilk substitutes (99.7% vs 94.2%); and not advised about how or where to get help if the mother has problems with feeding (66.7% vs 32.5%) [Table 2].

The study found that a significantly higher proportion of mothers from rural settings held their babies skin to skin (38.0%) during the first contact, in comparison with 18.8% of mothers from urban settings. Also, a higher proportion of mothers from rural settings were shown or given information

on how to express breast milk by hand (urban vs rural, 45.8% vs 53.5%).

The mean scores for positive experiences during pregnancy (MD -0.99 , 95% CI -1.31 to -0.69), experiences during birth and maternity period (MD -0.59 , 95% CI -0.83 to -0.35) were significantly lower in the urban areas (2.16 (1.68) and 9.34 (1.67), respectively) compared to rural areas (3.15 (2.64) and 9.93 (1.73), respectively). However, when experiences during pregnancy, birth, and maternity period were considered as categorical variables, we found no difference between urban and rural settings ($P > 0.05$).

Feeding practices

The prevalence of exclusive breastfeeding was 75.8% and 85.0% in urban and rural areas, respectively; whereas the proportion of infants provided with both breastfeeding and breastmilk substitutes in the first six months of life were 23.2% and 14.5% in urban and rural areas, respectively. The proportion of infants provided with only breastmilk substitutes were 1.0% and 0.5% in urban and rural areas, respectively.

The results showed that the mothers not satisfied with experiences during pregnancy were at 1.4 times increases risk of nonexclusive breastfeeding (OR 1.40, 95% CI 0.95 to 2.06), though not statistically significant ($P > 0.05$). Mothers not satisfied with experiences during delivery and maternity period (OR 1.69, 95% CI 1.18 to 2.42) and from urban areas (OR 1.81, 95% CI 1.27 to 2.59) were at significantly increased risk of nonexclusive breastfeeding [Table 3].

DISCUSSION

The study enrolled 800 mothers with children at least six months of age and found that the experiences of mothers from urban settings were not satisfactory in comparison with that of mothers from rural settings with respect to pregnancy, delivery, and maternity period. More than three-fourths of children were exclusively breastfed during the first six months of life. However, the use of breastmilk substitutes in addition to breastfeeding was prevalent in urban areas. We found that the risk of nonexclusive breastfeeding increases with nonsatisfactory experiences during delivery and maternity period and in mothers from urban areas.

The National Family Health Survey-5 (NFHS-5) reported that 68.1% and 54.2% of mothers from urban and rural areas of India, respectively, had at least four antenatal care visits.^[10] This is in contrast to the finding of this study which showed a higher proportion of rural mothers (95.3%) completing the required minimum number of visits in comparison with urban mothers (90.8%). Importantly, these findings corroborate with the NFHS-5 data for Tamil Nadu which shows a higher proportion (90.8%) of rural mothers with a minimum number of antenatal care visits.^[10] Though literature evidence highlights better healthcare utilization among mothers from urban settings (a significant urban–rural disparity), such evidence in relation to information provided to mothers in urban and

Table 1: Mothers experience during pregnancy and urban—rural differentials

Experiences during pregnancy	Urban (n=400)	Rural (n=400)	Total	P
Number of antenatal visits to a healthcare facility before delivery				
0 to 3	37 (9.3)	19 (4.8)	56 (7.0)	0.013*
4 and above	363 (90.8)	381 (95.3)	744 (93.0)	
During the antenatal visits did the staff discuss any of the following issues related to labor and birth:				
Companion of mother's choice (to be with her) during labor				
No	346 (86.5)	300 (75.0)	646 (80.8)	<0.001*
Yes	54 (13.5)	100 (25.0)	154 (19.2)	
Alternatives for dealing with pain during labor				
No	381 (95.3)	315 (78.8)	696 (87.0)	<0.001*
Yes	19 (4.8)	85 (21.3)	104 (13.0)	
Importance of skin-to-skin contact with baby				
No	320 (80.0)	258 (64.5)	578 (72.3)	<0.001*
Yes	80 (20.1)	142 (35.5)	222 (27.8)	
Importance of baby with their mother (in room or bed) 24 hours a day				
No	288 (72.0)	260 (65.0)	548 (68.5)	0.033*
Yes	112 (28.0)	140 (35.0)	252 (31.5)	
Risk of giving water, formula, or other supplements in the first six months				
No	208 (52.0)	237 (59.3)	445 (55.6)	0.039*
Yes	192 (48.0)	163 (40.8)	355 (44.4)	
Risk of HIV transmission				
No	372 (93.0)	264 (66.0)	636 (79.5)	<0.001*
Yes	28 (7.0)	136 (34.0)	164 (20.5)	
Importance of HIV testing and counseling in pregnant women				
No	355 (88.7)	267 (66.7)	622 (77.8)	<0.001*
Yes	45 (11.3)	133 (33.3)	178 (22.2)	

*Significance was considered at $P < 0.05$. For variables with 20.0% cells or more having expected count less than five, Fisher's exact test was considered

rural areas is severely lacking.^[19,20] The present study showed that a higher proportion of urban mothers were not provided with appropriate, adequate, and timely information by the healthcare providers.^[21,22] Similarly, in a study reported from Chennai, India (urban setting), it was found that the proportion of mothers attending an antenatal clinic with no idea about the nature of labor pain was 25.4%.^[23] The limited information given to urban mothers regarding labor companionship, methods to deal with pain during labor, significance of skin-to-skin contact with baby, rooming in, risk of HIV transmission, and importance of HIV testing and counseling during pregnancy may be attributed to few antenatal care visits among them. However, the number of mothers with zero antenatal care visits was only 5.8% in urban setting compared to 95.3% not receiving information about methods to deal with pain during labor. The other possible explanation would be overburdened human resources of health and time constraints of patients limiting the quality and quantity of interaction.^[24-26] A similar observation was found among urban mothers regarding experiences during delivery and maternity period.

The rates of exclusive breastfeeding among urban and rural mothers in Tamil Nadu are 45.5% and 61.9%, respectively; rates are higher among rural mothers by 16.4 percentage points.^[10] These results corroborate with those found in the present study. Urbanization, maternal education, higher female labor force participation, and higher socioeconomic status may

explain the reasons for the reduced proportion of exclusive breastfeeding among urban mothers.^[27-31]

The study found that the risk of nonexclusive breastfeeding was higher among urban mothers. This is similar to an existing literature that documented the lower prevalence of exclusive breastfeeding, increased use of formula feeding among urban mothers.^[32] The study concluded that provision and reinforcement of information related to breastfeeding by healthcare professionals is an important determinant. The results of the present study show that the experiences during delivery and maternity period are pivotal in ensuring exclusive breastfeeding practices. A comprehensive data analysis that examined the relationship between BFHI programming and rates of exclusive breastfeeding in fourteen developing countries found that BFHI implementation was associated with average annual increases of 1.5% and 1.1% in the rate of exclusive breastfeeding of infants under two months and six months, respectively ($P < 0.001$).^[33] In a similar study reported from Lebanon BFHI intervention significantly improved the exclusive breastfeeding at 2.0 percentage points per month ($P = 0.006$).^[34] Similar results have been presented in studies reported from India as well.^[35]

The present study is not without limitations. The inclusion of mothers with children up to one year of age and enquiring regarding breastfeeding up to six months of age may have

Table 2: Mothers experience during the birth and maternity period and urban–rural differentials

Experiences during birth and maternity period	Urban (n=400)	Rural (n=400)	Total	P
Encouraged to walk and move about during labor				
No	166 (41.5)	83 (20.8)	249 (31.1)	<0.001*
Yes	234 (58.5)	317 (79.3)	551 (68.9)	
Baby's weight at birth				
<2500 grams	68 (17.0)	58 (14.5)	126 (15.8)	0.332
>2500 grams	332 (83.0)	342 (85.5)	674 (84.3)	
Type of delivery				
Normal vaginal	256 (64.0)	269 (67.3)	525 (65.6)	0.333
Others	144 (36.0)	131 (32.8)	275 (34.4)	
How did you hold your baby, for the first time				
Skin to skin	75 (18.8)	152 (38.0)	227 (28.4)	<0.001*
Wrapped without much skin contact	325 (81.3)	248 (62.0)	573 (71.6)	
Did anyone on the staff encourage the mother to look for signs, their baby was ready to feed and offer mother help with breastfeeding				
No	84 (21.0)	63 (15.8)	147 (18.4)	0.055
Yes	316 (79.0)	337 (84.2)	653 (81.6)	
Did the staff offer mother any help with breastfeeding since that first time				
No	35 (8.8)	46 (11.5)	81 (10.1)	0.197
Yes	365 (91.2)	354 (88.5)	719 (89.9)	
Did the staff give mother any help with positioning and attaching your baby for breastfeeding before discharge				
No	59 (14.8)	61 (15.3)	120 (15.0)	0.843
Yes	341 (85.2)	339 (84.8)	680 (85.0)	
Did the staff show mother or give mother information on how you could express your milk by hand?				
No	183 (45.8)	214 (53.5)	397 (49.6)	0.028*
Yes	217 (54.3)	186 (46.5)	403 (50.4)	
Advice about how often the baby should be fed				
Not given	37 (9.3)	9 (2.3)	46 (5.8)	<0.001*
Given	363 (90.2)	391 (97.7)	754 (94.3)	
Advice about how long the baby should suckle				
Not given	13 (3.3)	20 (5.0)	33 (4.1)	0.213
Given	387 (96.7)	380 (95.0)	767 (95.9)	
Baby sucked on a pacifier, while mother was in the maternity unit (n=666)				
No	321 (92.8)	308 (96.3)	629 (94.4)	0.050
Yes	25 (7.2)	12 (3.8)	37 (5.6)	
Mother was given any leaflets or supplies that promote breastmilk substitutes (n=758)				
No	395 (99.7)	341 (94.2)	736 (97.1)	<0.001*
Yes	1 (0.3)	21 (5.8)	22 (2.9)	
Advice about how or where to get help if mother has problems with feeding (n=777)				
Not given	266 (66.7)	123 (32.5)	389 (50.1)	<0.001*
Given	133 (33.3)	255 (67.5)	388 (49.9)	

*Significance was considered at $P < 0.05$. For variables with 20.0% cells or more having expected count less than five, Fisher's exact test was considered

introduced recall bias. Though not totally taken care of, we tried looking at the records available with the mother to note the introduction of any breastmilk substitutes. Recall bias in enquiries related to experiences during pregnancy, delivery, and maternity care was reduced by looking at the mother and child protection card and by asking the mother to brief on a few knowledge variables. Additionally, the present study could not document the variation in mothers experience during pregnancy, delivery, and maternity period by the level (primary or secondary or tertiary) and type (government or private) of health facility from which

the care of obtained. Each positive experience was scored one with an understanding that every variable got equal weightage. However, in assessing overall experience, each variable may weigh differently. Also, the study is limited in bringing out the sociodemographic determinants of maternal experiences (including religion, literacy, and socioeconomic status).

To conclude, a higher proportion of urban mothers were not provided with appropriate, adequate, and timely information by the healthcare providers. Additionally, the risk of

Table 3: Predictors of exclusive breastfeeding

	Exclusively breastfed (n=643)	Not exclusively breastfed (n=157)	Total	OR (95% CI)	P
Experiences during pregnancy					
Not satisfactory	416 (64.7)	113 (72.0)	529 (66.1)	1.40 (0.95 to 2.06)	0.084
Satisfactory	227 (35.3)	44 (28.0)	271 (33.9)	1	
Experiences during birth and maternity period					
Not satisfactory	332 (51.6)	101 (64.3)	433 (54.1)	1.69 (1.18 to 2.42)	0.004*
Satisfactory	311 (48.4)	56 (35.7)	367 (45.9)	1	
Study settings					
Urban	303 (47.1)	97 (61.8)	400 (50.0)	1.81 (1.27 to 2.59)	0.001*
Rural	340 (52.9)	60 (38.2)	400 (50.0)	1	

*Significance was considered at $P < 0.05$. For variables with 20.0% cells or more having expected count less than five, Fisher's exact test was considered OR, odd ratio; 95% CI, 95% confidence interval

nonexclusive breastfeeding increases with non-satisfactory experiences during delivery and maternity period and in mothers from urban areas. It is the need of the hour to train and motivate healthcare providers regarding maternal awareness of antenatal, intranatal, and postnatal care practices including breastfeeding and infant care. The development of handy checklists in accordance with the gestational age of the mother and postnatal age will aid in effective knowledge dissemination.

Acknowledgement

We would like to thank the participating mothers for their time and insights.

Author contribution

SJ and NPJ conceived the study. MK and PR conducted a comprehensive literature search and added to the intellectual content of the study. SJ, NPJ, and PR ensured study implementation with quality data collection and management. MK conducted data analysis with continuous feedback from SJ, NPJ, and PR. MK wrote the first draft of the manuscript. SJ, NPJ, and PR wrote specific sections of the manuscript. All authors provided critical inputs for the revision of the manuscript and approved the final version of the manuscript.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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