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Original Research Article

ASSESSMENT OF OUT-OF-POCKET EXPENDITURE ON ANTENATAL CARE AND ITS DETERMINANTS AMONG RECENTLY DELIVERED WOMEN IN RURAL MAHARASHTRA: A COMMUNITY-BASED CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Maternal health, encompassing the health of women during pregnancy, childbirth, and the postpartum period, is significantly impacted by factors such as education, economic status, and out-of-pocket expenditure (OOPE). OOPE, defined as direct payments made by individuals when receiving healthcare, can create a substantial financial burden, especially for poor households.[1] **Aim & objectives:** To assess the out-of-pocket expenditure in antenatal care & its determinants in recently delivered women in rural Maharashtra.

Materials and Methods: A community-based cross-sectional study was conducted over a period of 6 months in six randomly selected villages under PHC Bhavthana, Ambajogai, Maharashtra. Using multistage stratified random sampling, we selected 425 mothers who had delivered within the previous six months from ASHA/ANM records or identified through house-to-house surveys. We calculated the sample size assuming a 50% prevalence of out-of-pocket expenditure, a 95% confidence level, 5% absolute precision, and a 10% non-response rate.

Results and Conclusion: In the present study, the median total out-of-pocket expenditure (OOPE) for antenatal care was ₹5,800 (IQR: ₹3,750–₹7,400), ranging from ₹1,200 to ₹11,900. Among direct expenses, ultrasound scans accounted for the highest median expenditure (₹2,500), followed by medicines and supplements (₹1,800), laboratory tests (₹600), and consultation fees (₹400). Transportation was the main indirect expense, with a median of ₹500, while informal payments were negligible (median ₹0). High OOPE was significantly associated with maternal education, husband's education, husband's occupation, and BPL card status (p=0.05).

Keywords: Out-of-Pocket expenditure, Antenatal care, Maternal health.

INTRODUCTION

Maternal health, encompassing women's health during pregnancy, childbirth, and the postpartum period, is significantly affected by factors such as education, economic status, and out-of-pocket expenditure (OOPE).[2] OOPE, defined as direct payments made by individuals when receiving healthcare, can create a substantial financial burden, especially for poor households1In India, high OOPE can force families to spend a large portion of their earnings on healthcare, potentially leading to debt and reduced access to essentials like food and education, Such expenditure can also discourage people from seeking timely medical help, which results in worsening health conditions and higher treatment costs later on 3 The Indian government has been increasing investments in public healthcare and expanding health insurance schemes to reduce OOPE

to make healthcare more accessible and affordable While government schemes aim to reduce this burden, many women, particularly in rural areas, remain unaware or unable to access them.[3] OOPE includes expenses during antenatal care, such as registration fees, doctor fees, medicine, tests, sonography, and transportation, as well as expenditures during delivery, like registration, transportation, doctor fees, medicine, tests, bed, and food.[4] Studies show that despite schemes such as Janani Suraksha Yojana (JSY) and Janani Shishu Suraksha Karyakram (JSSK) designed to reduce financial burdens through cash incentives and free services, OOPE for maternal health services remains high,[4] These programs often do not cover all expenses, and non-medical costs like transportation and informal payments continue to contribute to OOPE.[5] In Maharashtra, the cost of maternal healthcare is pushing families into debt, especially among impoverished populations in rural areas. Despite the existing research on OOPE in maternal healthcare, there is a research gap concerning the specific experiences and financial challenges faced by women in rural Maharashtra. Although studies have examined the coverage of maternal care services and variations in OOPE by type of health facility, a deeper understanding is needed regarding the barriers preventing women in rural Maharashtra from accessing and utilising available schemes. Furthermore, the impact of OOPE on maternal health outcomes in this specific population requires further investigation. Therefore, this study is needed to explore OOPE for antenatal care among women in rural Maharashtra, assess their access to government schemes, and identify the factors influencing OOPE for antenatal care. By addressing this research gap, the study can inform policy and interventions to reduce the financial burden on families and improve maternal health outcomes in rural Maharashtra. The study aimed to assess the out-of-pocket expenditure (OOPE) incurred for antenatal care among recently delivered women in rural Maharashtra & factors associated with OOPE, and to assess the awareness of government maternal health schemes among the study participants.

MATERIALS AND METHODS

Study design: A Community-based cross-sectional study

2. Study setting: The study was conducted in selected villages under a Primary Health Centre (PHC) in a rural block of Maharashtra.

3. Ethical considerations: Ethical committee approval was obtained from the Institutional Ethical Committee before the start of the study.

4. Study duration: 6 months after ethical committee permission.

5. Study population: Mothers who delivered in the past 42 days were randomly selected from among the permanent residents of the chosen villages.

6. **Inclusion Criteria:** recently delivered women in the past 42 days residing in the study area for at least 6 months. Willing to give informed consent.

7. **Exclusion Criteria:** recently delivered women with severe illness at the time of data collection.

8. Sampling technique: Sample Size: The sample size was calculated using the single population proportion formula, assuming a 50% prevalence of out-of-pocket expenditure, 95% confidence level (Z=1.96), and 5% absolute precision, yielding a minimum sample size of 385. After adding a 10% allowance for non-response, we rounded the final sample size to 425 postnatal women.

We enumerated all villages in the field practice area and identified eligible postnatal women using MCH registers/RCH portal records, with support from ASHAs, Anganwadi workers, and Multipurpose Health Workers. Participants were then selected by simple random sampling using probability proportional to size (PPS) from each sub-centre until the required sample size of 425 was achieved.

9. Conduct of the study: Data were collected through a pre-designed, pre-tested, semi-structured interview schedule in Marathi covering socio-demographic characteristics, obstetric history, antenatal care utilisation, and itemised out-of-pocket expenditure. The team pilot-tested the tool with 10% of the sample in a non-study area and refined it accordingly. After obtaining written informed consent, we conducted house-to-house visits and face-to-face interviews with support from ASHA workers. MCH cards/RCH portal records were cross-verified wherever available, and all expenditure was recorded in Indian Rupees (₹) based on participants' recall during the antenatal period. We back-translated all data collected in Marathi into the original questionnaire format.

10. Operational definition: a. **Out-of-pocket expenditure[6]:** Out-of-Pocket Expenditures on Healthcare (OOPE) are payments made by an individual at the point of receiving healthcare services or goods. For example, if an individual falls ill and visits a doctor's clinic, she pays the consultation fee and other services (injections, wound dressings, etc.) provided by the doctor. Similarly, she pays separately for medicines at a pharmacy and for diagnostic tests (X-ray, blood tests, etc.) at the laboratory. All these payments made at the point of receiving a health service are considered as OOPE

b. High vs. Low OOPE: High OOPE was defined as an expenditure greater than the sample median (>₹5,800), and Low OOPE as expenditure less than or equal to the median (≤ ₹5,800).

b. Postnatal period.[7]: The postnatal period begins immediately after the birth of the baby and extends up to six weeks (42 days) after birth. For the purposes of describing care provision, the postnatal period consists of immediate, early and late periods.

11. Data compilation: Collected data were entered into Microsoft Excel 2010 worksheets and coded appropriately.

12. Data analysis: Data were analysed using Microsoft Excel 2010 and Open EPI-Info Version 3.01 updated on 2013/04/06.

RESULTS

Table 1: Socio-demographic and household profile of study participants (N=425)

Age group (years)	**n**	**%**
18-20	52	12
21-25	**215**	**51**
26-30	125	29
31+	32	8
Caste	**n**	**%**
Open	**192**	**45**
Other backward caste	146	34
schedule caste	60	14
schedule tribe	27	7
Educational level of Mother	**n**	**%**
No formal education	19	5
Primary education (Class 1-5)	39	9
Secondary education (Class 6-10)	**162**	**38**
Higher secondary (Class 11-12)	132	31
Graduate or above	73	17
Occupation of Mother	**n**	**%**
Housewife	**331**	**79**
Farmer	41	9
Private job	30	7
Government job	13	3
Daily wage labourer	10	2
Husband's education	**n**	**%**
No formal education	6	1
Primary	46	11
Secondary	169	40
Higher Secondary and above	**204**	**48**
Husband's occupation	**n**	**%**
Private job	**136**	**32**
Farmer	132	31
Daily wage labourer	117	28
Government job	35	8
Unemployed	5	1
Monthly family income (INR)	**n**	**%**
< 5000	65	15
5000 - 10,000	142	34
10,000 - 20,000	108	25
> 20,000	110	26
BPL card status	**n**	**%**
Orange	242	57
Yellow	134	32
white	28	7
No	21	4
Type of family	**n**	**%**
Joint	209	49
Nuclear	195	46
Three generation	21	5
Number of children	**n**	**%**
1	266	62
2	122	29
>=3	37	9
Type of health facility		
Public	180	42
Private	170	40
Both	75	18

Table 1 shows the socio-demographic and household characteristics of the 425 study participants. Most women were aged 21–25 years (51%), belonged to the Open caste (45%), had secondary education (38%), and were housewives (78%). Nearly half of their husbands had higher secondary education or above (48%), with private employment (32%) and farming (31%) being the predominant occupations. One-third of families had a monthly income of ₹5,000–10,000 (33%), 57% had an orange ration card, and almost half lived in joint families (49%). In terms of parity, 45% of women had one child, followed by two children (29%), while 18% were primiparous. Public health facilities were utilized by

42% of participants, followed by private facilities (40%) and both public and private facilities (18%). This was observed due to long waiting lines, unavailability of usg at the public facility, and inadequate supply of drugs.

Table 2: Distribution of out-of-pocket expenditure for antenatal care among the study participants

	Expense component	Median (₹)	IQR (₹)	Range (₹)
1. Direct expenses	Consultation fees	400	0-600	0-900
	Medicines & supplements	1800	1000-2500	0-4500
	Laboratory tests	600	500-800	0-1200
	Ultrasound scans	2500	2000-3000	1200-3500
2. Indirect expenses	Transportation	500	250-500	0-800
	Informal payments	0	0-0	0-1000
	TOTAL	5800	3750-7400	1200-11900

In the present study, the median total out-of-pocket expenditure (OOPE) for antenatal care was ₹5,800 (IQR: ₹3,750–₹7,400), ranging from ₹1,200 to ₹11,900. Among direct expenses, ultrasound scans accounted for the highest median expenditure (₹2,500), followed by medicines and supplements (₹1,800), laboratory tests (₹600), and consultation fees (₹400). Transportation was the main indirect expense, with a median of ₹500, while informal payments were negligible (median ₹0). Overall, ultrasound scans, medicines and supplements, and laboratory investigations contributed most to antenatal care OOPE, with considerable variation in participants' expenditure.

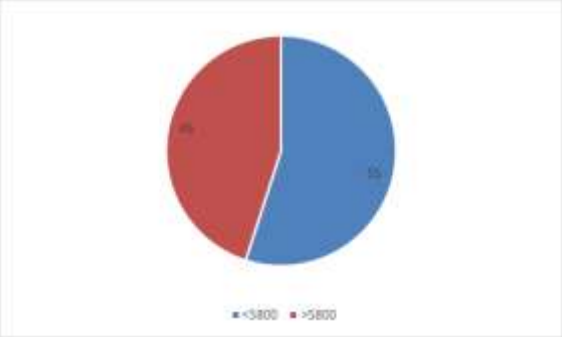


Figure 1: Distribution of total OOPE relative to sample median (₹5800) %

Figure 1: The figure shows that 55% of participants incurred total out-of-pocket expenditure (OOPE) below the sample median of ₹5,800, while 45% incurred expenditure above ₹5,800. This indicates that a slightly higher proportion of participants had below-median expenditure.

Table 3: Association of out-of-pocket expenditure and its various determinants

S. No	Variable & Category	Low OOPE (≤₹5,800)	High OOPE (>₹5,800)	Chi-Square,d.f, (p-value)	Odds Ratio (OR)	95% Confidence Interval
1	**Age of Mother**					
	<25 years	152	116	1.39,1, (p=0.2391)	Reference	—
	>25 years	79	78		1.29	[0.87, 1.92]
2	**Mother's Educational Level**					
	Graduate or above	31	42	23.59, 4,(p=0.0001)	Reference	—
	Higher secondary (Class 11-12)	56	76		1	[0.56, 1.79]
	Secondary education (Class 6-10)	103	59		0.42	[0.24, 0.74]
	Primary education (Class 1-5)	28	11		0.29	[0.13, 0.67]
	No formal education	13	6		0.34	[0.12, 1.00]
3	**Monthly Family Income (INR)**					
	10,000 - 20,000	57	51	6.81, 3,(p=0.0781)	Reference	—
	5000 - 10,000	80	62		0.87	[0.52, 1.43]
	<5000	43	22		0.57	[0.30, 1.08]
	>20,000	51	59		1.29	[0.76, 2.20]
4	**Husband's Education**					
	Higher Secondary & Above	91	113	21.6 ,2,(p=0.00002)	Reference	—
	Secondary	99	70		0.57	[0.38, 0.86]
	Primary education (Class 1-5) & no formal education	41	11		0.2	[0.09, 0.43]
5	**Husband's Occupation**					
	Daily wage laborer	74	43	19.04,3, (p=0.00026)	Reference	—
	Farmer	86	51		1.02	[0.63, 1.76]
	Private job	57	79		2.39	[1.44, 3.96]
	Government job	14	21		2.58	[1.19, 5.60]
6	**BPL Card Status**					
	Orange card	130	112	32.72,2, (p<0.0000001)	Reference	
	Yellow card	91	43		0.54	0.35–0.85
	No card & white card	10	39		4.53	2.16–9.48

7	**Type of Family**					
	Joint	114	95	0.09,2, (p=0.9564)	Reference	—
	Nuclear	105	90		1.03	[0.70, 1.52]
	Three generation	12	9		0.9	[0.36, 2.23]
8	**Type of health facility**					
	Public	150	30	126,2,p<0.0001}	Reference	
	Private	40	130		16.2	9.58,27.56
	Both	41	34		4.14	2.4,7.9

The table presents associations between socio-demographic variables and out-of-pocket expenditure (OOPE) categories. It reports patient counts for Low and High OOPE, along with Chi-Square test statistics and Odds Ratios (ORS) with 95% confidence intervals. We observed significant associations between OOPE and Mother's Educational Level (p=0.0001), Husband's Education (p=0.00002), Husband's Occupation (p=0.00026), and BPL Card Status (p<0.0000001). In contrast, Monthly Family Income, Age of Mother, and Type of Family were not significantly associated with OOPE (p>0.05). The data suggest that maternal education, the husband's education and occupation, and Below Poverty Line (BPL) card status are key factors associated with out-of-pocket expenditures. Mothers with lower educational levels, such as secondary or primary education, had lower odds of high OOPE than the graduate reference group (e.g., secondary education OR = 0.42). Families with private-sector jobs (OR = 2.39) or government jobs (OR = 2.58) had significantly higher odds of high OOPE than those relying on daily wage labour. In addition, having no BPL card substantially increased the odds of high OOPE (OR = 4.53) compared with holding an orange card, highlighting how economic vulnerability and socioeconomic status shape healthcare financial burdens. Patients using private facilities have 16.25 times the odds of incurring high out-of-pocket expenditure compared with those using government facilities (OR=16.25, 95% CI: [9.58,27.56]); this difference is statistically significant. Patients using both government and private facilities have 4.38 times the odds of high out-of-pocket expenditure compared with the government-only reference group (OR=4.38, 95% CI: [2.40,7.97]).

DISCUSSION

The current study's participants are relatively young, with over 51% aged 21–25 years. Most belong to the Open caste (45%) and are primarily housewives (78%) with secondary education (38%). Compared to Issac et al.[8] The mean age was 25 years, and 98.1% of women were housewives from lower socio-economic backgrounds, mostly with husbands as daily-wage labourers (43.9%). The current study shows greater socioeconomic and occupational diversity. Nearly half of the husbands in our study have higher secondary education or above (48%), with common occupations including private employment (32%) and farming (31%). The study also includes a middle-income group (monthly income of ₹5,000–10,000), and 57% have orange ration cards. Obstetric characteristics also show contrasting parity distributions between the two populations. While Issac et al,[8] reported a higher proportion of multigravida (64.8%), our participants had lower overall parity: 45% had one child, 29% had two children, and only 18% were primiparous. Compared with Gupta et al,[9] our study showed a similar age profile (around 25 years) and a high proportion of housewives. However, our participants came from a mixed rural setting with lower family incomes (₹5,000–10,000) than the predominantly urban population reported by Gupta et al,[9] which had a higher median income (₹15,000). Although caste distribution was broadly similar, the open category was slightly higher in our study population (45%). These differences may reflect variations in local socioeconomic and geographic settings.

In the present study, the median expenditure was ₹5,800 (IQR: ₹3,750–₹7,400), ranging from ₹1,200 to ₹11,900. Ultrasound scans were the major contributor, followed by medicines and supplements and laboratory investigations. The reasons for the high cost were explained, as people were forced to use facilities such as scanning and sometimes even blood tests outside the public sector facility. These findings differ from those of Mahajan N. et al,[10] who reported an average antenatal care expenditure of ₹4,338.26 among rural women in Punjab, including delivery and postnatal care. Similarly, Gupta S. et al.9 reported a lower median antenatal OOPE of ₹5,000 (IQR: ₹2,350–₹9,003), with laboratory investigations being the largest contributor. The higher expenditure observed in the present study may reflect differences in healthcare settings, availability of free diagnostic services and medicines, and patterns of service utilisation.

In the present study, OOPE was significantly associated with maternal education, husband's education and occupation, and BPL card status. Similar findings were reported by Mahajan N. et al,[10] who found that 96.7% of respondents incurred childbirth-related expenditure and 25% experienced catastrophic expenditure. Govil D. et al,[11] also identified economic status, educational level, and pregnancy complications as significant predictors of OOPE. These findings highlight how socioeconomic factors influence maternal healthcare expenditure and underscore the need to strengthen public healthcare services and financial protection schemes to reduce the economic burden on vulnerable families.

CONCLUSION

In this community-based study in rural Maharashtra, the median total out-of-pocket expenditure (OOPE) for antenatal care was ₹5,800, with ultrasound scans and medicines accounting for the largest share. High OOPE was significantly associated with the education of women and their husbands, the husband's occupation, and BPL card status. This may reflect a greater likelihood that better-educated women and families with higher earning potential choose private hospitals for faster, more convenient services and shorter waits than those at public health facilities. In contrast, families with limited financial resources may rely more on public healthcare services and government maternity schemes to reduce expenses. The most commonly reported reasons for OOPE included long waits for registration and the convenience of one-stop services at private hospitals, mismatched documents for government schemes, irregular supplies of medicines and supplements, and staff behaviour. These findings underscore that, despite public provisions, structural and administrative gaps continue to push rural households toward costly private alternatives.

Limitations: Expenditure data relied heavily on participants' retrospective recall throughout their antenatal period, which may have led to under- or overreporting of costs. The study was conducted only in villages served by a single PHC (Bhavthana) in Ambajogai, Maharashtra, making it difficult to generalise the findings to the state or the country.

Recommendations: Public health facilities must maintain regular, adequate supplies of essential medicines and supplements, along with functional diagnostic tools such as on-site ultrasound services, to eliminate the need for out-of-pocket outsourcing. Reduce long registration waits and simplify documentation for government health schemes to prevent mismatches and encourage greater use of public facilities.

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