



Out-Of-Pocket Expenditure and its Associated Factors among Antenatal and Postnatal Women Attending a Tertiary Care Hospital in Chhattisgarh, India: A Cross-Sectional Study

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Abstract

Introduction: Out-of-pocket expenditure (OOPE) imposes substantial financial burden on households, and despite various maternal and child health (MCH) schemes, OOPE for maternal care remains high in Chhattisgarh. This study aimed to determine the extent of OOPE during the antenatal and postnatal periods among women attending a tertiary care hospital and to identify the socio-demographic and economic factors associated with OOPE. **Methods:** A hospital-based cross-sectional study was conducted among 220 women (110 antenatal and 110 postnatal) attending a tertiary care hospital between May and October 2025, using convenience sampling. OOPE over the preceding 30 days, and its source of financing was recorded and analysed using appropriate statistical tests. **Results:** Almost all participants (217 of 220) incurred some OOPE, irrespective of MCH scheme utilization. Savings were the predominant source of financing among utilizers, while borrowing was more common among non-utilizers. Direct costs, particularly transportation and food, formed a major share of postnatal expenditure. Catastrophic OOPE was significantly higher among non-utilizers (OR= 12.67, 95%CI: 5.08, 31.58) and was significantly associated with maternal age above 30 years, nuclear family type and unskilled occupation. **Conclusions:** Socio-demographic factors are associated with OOPE during maternal care. MCH scheme utilization was associated with lower catastrophic expenditure, but financial protection remains incomplete, particularly during Postnatal period, and gaps in awareness and access persist. Strengthening entitlement-based schemes may help progress towards universal health coverage.

Key Words: Catastrophic Health Expenditure, Health Expenditures, Maternal Health Services, Postnatal Care, Prenatal Care

Introduction

Universal health coverage means that all people have access to the full range of quality health services they need, when and where they need them, without financial hardship.^[1]

Out-of-pocket payments for health push a substantial proportion of the global population into extreme poverty each year, and preventable maternal deaths continue to occur at unacceptably high rates worldwide.^[2]

According to the National Family Health Survey-5 (NFHS-5), the average out-of-pocket expenditure per delivery in a public health facility decreased nationally as compared with the previous survey round; however, in Chhattisgarh the average OOPE increased over the same period, indicating a divergent local trend. The subsequently released NFHS-6 (2023–24) reports further national gains in institutional deliveries (90.6%), antenatal care coverage (95.9%) and health insurance coverage (60.2%);^[3] however, a Chhattisgarh-specific,

cost-disaggregated OOPE estimate comparable to the NFHS-4/NFHS-5 comparison has not yet been published, so the state-level financial-burden trend described above remains the most recent available specific evidence.

MCH schemes includes Pradhan Mantri Matru Vandana Yojana, Pradhan Mantri Surakshit Matritva Abhiyan, Integrated Child Development Services, Janani Suraksha Yojana and Janani Shishu Suraksha Karyakram- These five schemes address different but complementary components of maternity-related financial hardship. PMMVY and JSY primarily provide financial transfers, whereas PMSMA focuses on free antenatal care, ICDS addresses nutritional and preventive needs, and JSSK seeks to eliminate user charges and other specified expenses associated with maternity and new-born healthcare. Collectively, these programmes can reduce OOPE through three principal pathways: Direct financial support, Subsidisation or free provision of services,

Prevention and early management of complications.^[4]

OOPE for maternal healthcare comprises direct medical expenditure and indirect medical expenditure.^[5] Most published Indian studies, including national surveys, have quantified OOPE largely for the institutional delivery event alone;^[6] this may underestimate the total financial burden of maternal care, since substantial direct and indirect medical costs are also incurred during antenatal follow-up visits and postnatal care. Under-utilization of MCH services remains an important contributor to maternal mortality, with cost cited as a key deterrent.^[7]

No locally generated data from Chhattisgarh have jointly examined OOPE across both the antenatal and postnatal periods, its distribution across direct medical and non-medical cost components, and its association with utilization of government MCH schemes; this represents the specific knowledge gap addressed by the present study, which sought to generate locally relevant evidence to inform recommendations for strengthening financial protection. The specific objectives were to determine the OOPE incurred by beneficiaries during the antenatal and postnatal periods, and to find out the association of catastrophic out-of-pocket expenditure with selected socio-demographic characteristics and utilization of maternal-health schemes.

Methods

Study design and setting:

This Cross-sectional, hospital-based study was conducted among women receiving antenatal and postnatal care at the Department of Obstetrics and

Gynaecology of a tertiary care hospital over Six months from May to October 2025.

Study population:

The study included antenatal women in the third trimester of a Primigravida pregnancy and postnatal women between 6 and 14 weeks postpartum who provided informed consent. Mothers below 18 years of age and those who had delivered in private hospitals were excluded.

Sample size and sampling technique:

Taking the prevalence of out-of-pocket spending on health as 49.8%^[5], the sample size was calculated using the formula $n = Z^2pq/d^2$ at 95% confidence interval and an allowable error of 7%, the calculated sample size was approximately 195; after adjusting for a 10% non-response rate, a final sample of 220 women (110 antenatal and 110 postnatal) was recruited using convenience (non-probability) sampling.

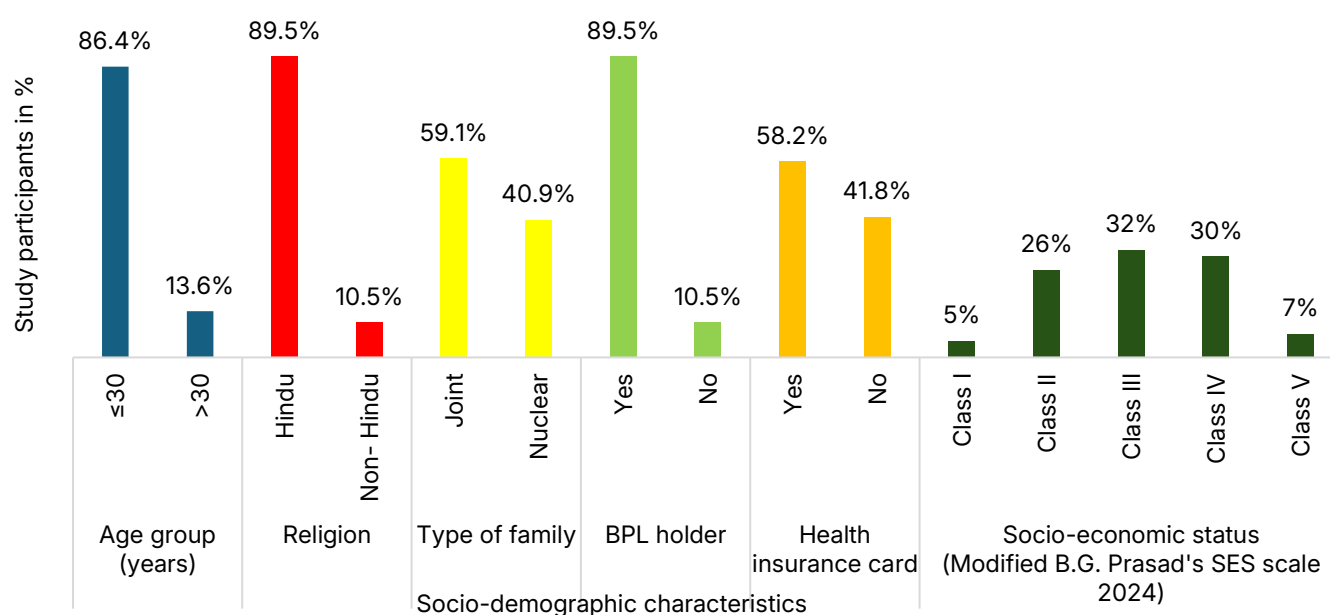
Study tools and technique:

Data were collected through a semi-structured, pre-designed and pre-tested questionnaire containing open- and closed-ended questions, available in English and Hindi, supplemented by review of medical records and available bills. Interview was conducted by the investigator.

Operational definitions:

Out-of-pocket expenditure (OOPE) was defined as any direct outlay by households, including gratuities and in-kind payments, made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances and other goods and services, assessed over the

Figure 1:
Distribution of various Socio-demographic characteristics (N=220)



preceding 30 days.^[6] Direct costs comprised registration, medicines, consumables, bed charges, laboratory investigations, anaesthesia and surgery charges, food, gifts to attendants and transportation. Indirect costs comprised the loss of daily wages of the mother and caretakers.^[7] Catastrophic expenditure was defined as healthcare costs exceeding 10% of a family's total monthly consumption expenditure.^[8]

Utilizers of MCH Schemes: Women who accessed at least one of the schemes such as PMMVY, PMSMA, ICDS, Mahtari Express, JSY, JSSK.

Non-Utilizers: Women who did not utilize any of these schemes

Ethical considerations:

Institutional Ethics Committee approval was obtained prior to commencement of the study (Approval Letter No. 69/IECGMCRJN/2025, dated 19/04/2025). Written informed consent was obtained from all participants after explaining the purpose of the study.

Statistical analysis:

Data were entered into a spreadsheet and analysed using IBM SPSS Statistics, version 25.0 (IBM Corp., Armonk, New York, United States of America). Quantitative data were summarized as frequencies, percentages, means and standard deviations. Associations between categorical variables were tested using the chi-square test or Fisher's exact test, as appropriate, and unadjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated for each factor to quantify the strength of association; a p value of less than .05 was considered statistically significant. Multivariable logistic regression to derive adjusted odds ratios could not be performed for this analysis, as noted in the Limitations.

Results

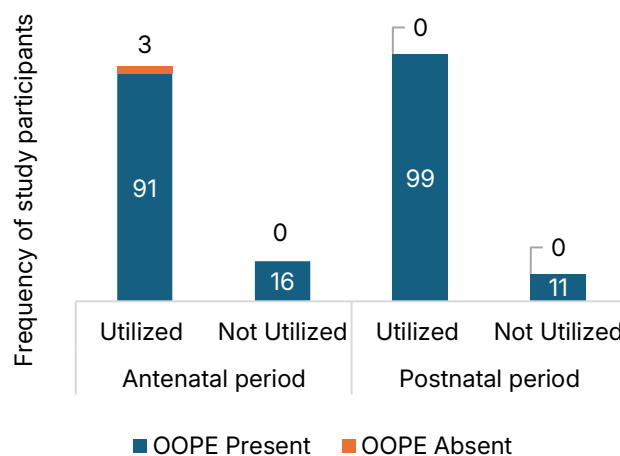
Of 220 participants recruited, 110 were antenatal and 110 were postnatal women. Most participants belonged to joint families (59.1%), and a substantial proportion held Below Poverty Line (BPL) cards (89.5%); more than half had health insurance coverage, and participants were predominantly from the middle socio-economic class (32.0%). (Figure 1)

Utilization of MCH schemes was high: 94 of 110 antenatal women (85.5%) and 99 of 110 postnatal women (90.0%) had utilized at least one scheme. Only three participants (1.4%) reported zero out-of-pocket expenditure. (Figure 2)

During the antenatal period, among utilizers (n= 91), the majority (56.0%) financed expenses through a combination of monthly income and savings, 25.3%

Figure 2:

Distribution of study participants as per frequency of Utilization of MCH Schemes and Out of Pocket Expenditure (OOPE) incurred during Antenatal and Postnatal period (N=220)



relied solely on income, and 18.7% additionally borrowed. Among non-utilizers (n= 16), the largest proportion (37.5%) borrowed in addition to income. During the postnatal period, 58.6% of utilizers and 36.3% of non-utilizers relied solely on savings, while 45.5% of non-utilizers combined savings with borrowing. (Table 1)

Among antenatal utilizers, direct medical expenses constituted 63.7% of total OOPE (Mean ₹808 ± 557), while indirect expenses accounted for 36.3% (Mean ₹301 ± 181); 31.9% incurred both direct and indirect medical expenses; 19.8% experienced catastrophic expenditure. Among antenatal non-utilizers, direct costs formed 75% of expenses (Mean ₹1910 ± 319.1), 12.5% incurred both expenses and 68.8% experienced catastrophic expenditure. During the postnatal period, indirect costs predominated among utilizers (76.8%; Mean ₹283 ± 110), with 20.2% incurred both medical expenses and 12.1% experiencing catastrophic expenditure, whereas among non-utilizers, indirect costs constituted 54.5% (Mean ₹695 ± 91), 45.5% did spent both expenses and 72.7% experienced catastrophic expenditure. (Table 2)

Factors significantly associated with catastrophic OOPE included maternal age above 30 years (40.0% versus 19.8% in women aged 30 years or younger; OR= 2.70, 95%CI: 1.20, 6.10; p= .014), nuclear family type (32.2% versus 15.7% in joint families; OR= 2.54, 95%CI: 1.33, 4.88; p= .004), and unskilled occupation of the head of family (53.8%; OR= 5.56, 95%CI: 2.25, 13.71; p= .002) (Table 3). A gradient of increasing catastrophic expenditure with declining socio-economic class was observed (16.7% in Class I and II, 20.8% in Class III, and 25.5% in Class IV and V); however, this association did

not reach statistical significance ($p = .532$). Non-utilization of MCH schemes was the factor most strongly associated with catastrophic OOPE (70.4% versus 15.8%

among utilizers; unadjusted OR= 12.67, 95%CI: 5.08, 31.58; $p < .001$).

Table 1:

Distribution of source of income used to cover Out Of Pocket Expenditure during the antenatal and postnatal period, categorized by service utilization. (N=217)

Source of income	During Antenatal Period (N=107)		During Postnatal Period (N=110)	
	Utilizers (n=91)	Non-Utilizers(n=16)	Utilizers (n=99)	Non-Utilizers (n=11)
Monthly income (Wage/ salary/ Pension)	23 (25.3%)	5 (31.25%)	58 (58.6%)	4 (36.3%)
Monthly income+ Borrowing	17 (18.7%)	6 (37.5%)	19 (19.2%)	5 (45.5%)
Monthly income+ Savings	51 (56.0%)	5 (31.25%)	22 (22.2%)	2 (18.2%)

Note. Three participants (Utilizer during antenatal period) haven't paid any of the expenses from their pocket

Table 2:

Distribution of medical expenses and categorization of OOPE into Catastrophic and Non-catastrophic during Antenatal and Postnatal period. (N=217)

OOPE	During Antenatal period (n=107)		During Postnatal period (n=110)	
	Utilizers (n=91)	Non-Utilizers (n=16)	Utilizers (n=99)	Non-Utilizers (n=11)
Direct medical expenses [Freq (%)]	58 (63.7%)	12 (75.0%)	23 (23.2%)	5 (45.5%)
Mean±SD (INR)	808±557	1910±319.1	206±140	210±102.8
Indirect medical expenses [Freq (%)]	33 (36.3%)	4 (25.0%)	76 (76.8%)	6 (54.5%)
Mean±SD (INR)	301±181	614±83.7	283±110	695±91
Incurred both Direct and Indirect [Freq (%)]	29 (31.9%)	2 (12.5%)	20 (20.2%)	5 (45.4%)
Catastrophic OOPE [Freq (%)]	18 (19.8%)	11 (68.8%)	12 (12.1%)	8 (72.7%)
Non- Catastrophic OOPE [Freq (%)]	73 (80.2%)	5 (31.2%)	87 (87.9%)	3 (27.3%)

Note. OOPE= Out of Pocket Expenditure; INR= Indian Rupees; Direct medical expenses: Lab investigations, Medicines, Doctor's fees, Blood transfusion/ Bed charges; Indirect medical expenses: Lodging attendants, Wage loss of mother and attendants

Table 3:

Factors associated with Out-Of-Pocket Expenditure (N=217)

Variable	Catastrophic, n (%)	Non-catastrophic, n (%)	Unadjusted OR (95%CI)	p value
Age (years)				
≤30	37 (19.8%)	150 (80.2%)	Reference	.014
>30	12 (40.0%)	18 (60.0%)	2.70 (1.20, 6.10)	
Family type				
Joint	20 (15.7%)	107 (84.3%)	Reference	.004
Nuclear	29 (32.2%)	61 (67.8%)	2.54 (1.33, 4.88)	
Occupation of head of family				
Skilled	21 (17.4%)	100 (82.6%)	Reference	.002 [#]
Semi-skilled	12 (21.4%)	44 (78.6%)	1.30 (0.59, 2.87)	
Unskilled	14 (53.8%)	12 (46.2%)	5.56 (2.25, 13.71)	
Unemployed	2 (14.3%)	12 (85.7%)	0.79 (0.17, 3.81)	
Socio-economic status (Modified B.G. Prasad scale 2024)				
Class I & II	5 (16.7%)	25 (83.3%)	Reference	.532 [#]
Class III	16 (20.8%)	61 (79.2%)	1.31 (0.43, 3.97)	
Class IV & V	28 (25.5%)	82 (74.5%)	1.71 (0.60, 4.89)	
Utilization of MCH schemes				
Yes	30 (15.8%)	160 (84.2%)	Reference	< .001
No	19 (70.4%)	8 (29.6%)	12.67 (5.08, 31.58)	

Note. MCH= Maternal and Child Health; Chi-square test applied for test of significance; [#]Fisher's exact test applied. Odds ratios are unadjusted (bivariate)

Discussion

This study assessed OOPE for MCH services at a tertiary care hospital, contributing evidence from a region where national data indicate a rising trend in OOPE. The persistence of OOPE in public facilities observed in the present study is consistent with national data reporting a median OOPE of ₹2,067 for institutional deliveries in the public sector, although the present study examined the wider antenatal and postnatal periods rather than delivery costs alone.^[7]

Only three participants in the present study reported zero OOPE despite MCH scheme utilization, in contrast to another study from northern India in which the majority of scheme beneficiaries continued to incur some expenditure.^[9] Indirect costs emerged as a major component of expenditure, a finding supported by other studies conducted in similar settings.^[6,10]

Catastrophic expenditure was reported by 15.8% of scheme utilizers and 70.4% of non-utilizers in the present study. Comparable studies have reported catastrophic health expenditure among 75.6% of households seeking inpatient care in an urban village in Delhi,^[11] 34% of families delivering in government hospitals in urban slums of Gujarat,^[5] and up to 81% in rural Lucknow using a higher expenditure threshold.^[12] These findings collectively reinforce those of the present study, that maternal healthcare continues to impose a substantial financial burden capable of pushing households into poverty in this region.

The strong association between catastrophic OOPE and unskilled occupation of the head of the family reflects a well-documented poverty trap, in which the poorest households are least able to afford care yet most vulnerable to its financial consequences, consistent with earlier work.^[13] A similar gradient of higher catastrophic expenditure with declining socio-economic class was observed in the present study but did not reach statistical significance, possibly reflecting the relatively small number of participants in the lowest socio-economic strata; this association warrants confirmation in larger, adequately powered samples. The overall pattern is reinforced by the financing mechanisms observed: scheme utilizers predominantly relied on savings, whereas non-utilizers, who faced greater catastrophic risk, relied more on borrowing, a pattern of distress financing also documented among the poorest quintiles in Mumbai slums.^[14] The association with older maternal age may reflect a higher prevalence of high-risk pregnancies, which have been shown to incur greater costs.^[15]

A protective effect of MCH scheme utilization was evident, with catastrophic OOPE reduced from 70.4%

among non-utilizers to 15.8% among utilizers, consistent with evaluations of government cash-transfer programmes; one such evaluation found that Janani Suraksha Yojana incentives offset more than half of the total out-of-pocket expenditure for institutional delivery,^[16] while another reported that a combination of entitlement schemes and a state-level maternity benefit resulted in zero or net-negative OOPE for the majority of households in urban slums of Odisha.^[17]

However, protection in the present study was incomplete: the persistence of OOPE among utilizers, particularly for transport and food, suggests gaps in implementation of Janani Shishu Suraksha Karyakram, which explicitly mandates these services free of cost. Similar gaps in transport-related entitlements have been reported elsewhere.^[9,18]

Recommendations

These findings suggest a need for strengthened monitoring of entitlement-based free transport and diet provisions, targeted awareness generation among non-utilizers, particularly those from nuclear families and unskilled occupational backgrounds, and enhanced outreach during the postnatal period, when service utilization and scheme uptake appear to decline.

Limitations

Expenditure was estimated using a recall-based method, which may have introduced recall bias, a limitation also noted in earlier work. As this was a hospital-based, cross-sectional study, it did not capture the experience of women delivering at home or exclusively in private facilities. The use of convenience sampling may also limit the generalizability of the findings. The non-significant association between socio-economic status and catastrophic expenditure may reflect limited statistical power within individual socio-economic strata rather than a true absence of effect, and associations across the five bivariate comparisons were not adjusted for multiple testing or for potential confounding between variables; multivariable analysis was beyond the scope of this descriptive study.

Conclusion

Socio-demographic and economic factors significantly influence out-of-pocket expenditure during maternal care. Utilization of maternal and child health schemes was associated with a reduction in catastrophic expenditure; however, gaps in awareness, implementation and access persist, particularly during the postnatal period. Strengthening financial protection

mechanisms and entitlement-based service delivery is essential to progress towards universal health coverage.

Declarations

Conflicts of Interest: None declared.

Funding: No external funding received.

AI usage declaration: Artificial Intelligence (AI)-based tools were used only for language refinement and formatting assistance during manuscript preparation; no AI tool was used for study design, data collection, analysis or interpretation, and the authors take full responsibility for the accuracy and integrity of the content.

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