

Original Research Article

Socio-demographic and cultural determinants of high fertility among women residing in an urban metropolitan slum: a comparative cross-sectional study

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ABSTRACT

Background: High fertility (three or more children) remains a public health concern in socioeconomically vulnerable urban populations. This study compared socio-demographic, reproductive, and cultural factors associated with low and high fertility among women residing in an urban metropolitan slum.

Methods: A community-based comparative cross-sectional study was conducted from January 2021 to April 2022 among 322 women in an urban slum of a metropolitan city in India. Women were equally categorized into low-fertility (1-2 children) and high-fertility (≥ 3 children) groups. Participants were selected by systematic random sampling. Data were collected using a pre-tested structured interview schedule and analysed using Chi-square tests and multivariable logistic regression.

Results: Women with high fertility were more likely to have lower maternal and paternal education, lower socioeconomic status, earlier marriage and first pregnancy, more conceptions, lower mass-media exposure, and greater desire for additional children. Contraceptive use was lower among women with high fertility than those with low fertility (87.5% versus 96.3%). In adjusted analysis, higher paternal education was associated with lower odds of high fertility (AOR 0.52), while an unplanned last pregnancy was associated with higher odds (AOR 3.56). Having a male first child and the husband's desire for another child were also independently associated with fertility status (AOR 0.27 and 0.22, respectively).

Conclusions: High fertility in this urban slum was associated with gender preference, spousal fertility intentions, pregnancy planning, and lower paternal education. Couple-centred family-planning counselling, male involvement, delayed marriage, improved education, and access to effective modern contraception should be prioritised.

Keywords: Family planning, High fertility, Maternal education, Socioeconomic determinants, Son preference, Urban slum

INTRODUCTION

India has undergone a substantial fertility transition over recent decades, yet high fertility persists in several socioeconomically vulnerable populations, particularly in urban slums.¹⁻³ These settlements are increasingly important in the country's demographic profile, as a large share of urban population growth occurs through natural increase rather than migration.^{4,5} Despite an overall

decline in the total fertility rate, heterogeneity in reproductive behaviour remains pronounced across disadvantaged communities.⁵

High fertility, often considered as birth order three or more, is a matter of public health importance because it is associated with greater risk of maternal depletion, pregnancy complications, maternal mortality, adverse neonatal outcomes, and child morbidity.^{2,6} In low-

resource settings, these risks may be combined by malnutrition, anemia, poor access to health services, and unmet need for contraception.^{5,7}

Fertility behavior is shaped by a complex interaction of demographic, socioeconomic, and cultural factors. Previous studies have shown that female education, age at marriage, family planning access, and household decision-making strongly affect parity.⁸⁻¹⁰ Son preference, which remains deeply rooted in parts of South Asia, also affects fertility decisions by encouraging continued childbearing until the desired number of sons is achieved.¹¹⁻¹³ Similarly, male partners' fertility intentions and family-level authority structures have an important effect on reproductive outcomes and contraceptive use.¹⁴⁻¹⁶

Although several studies have observed fertility determinants in rural settings or at the national and state level, fewer studies have specifically compared women with low and high fertility within metropolitan slum communities.¹⁻¹⁶ Such localized evidence is important because averages derived from broader populations may obscure the unique social norms, reproductive pressures, and access barriers faced by slum residents.

The current study was conducted to compare the socio-demographic and cultural factors associated with low fertility (1-2 children) and high fertility (3+ children) among women residing in an urban metropolitan slum. This comparative approach is justified to isolate specific, modifiable risk factors and "unmet needs" within these underserved communities, which is essential for developing evidence-based public health strategies.

METHODS

A community-based comparative cross-sectional study was conducted between January 2021 and April 2022 in an urban slum area of a metropolitan city in India, comprising 11 sectors (A to K) with a total population of 92,596 based on the 2011 census. The study population included women aged 19-49 years who had at least one live child. Women were categorized into group A (low fertility: 1-2 children) and group B (high fertility: ≥ 3 children). Women with 1-2 children who had decided not to conceive in the future were included in the low-fertility group. Women who had only adopted children or did not provide written informed consent were excluded. A total sample size of 322 participants (161 per group) was calculated based on the 12% third-order birth rate reported for Maharashtra in NFHS-4, using a 95% confidence level and 5% precision.⁷

Systematic random sampling was employed using Health Post records of 13,975 households to establish a sampling interval of 44; after a random start determined by the lottery method, every 44th household was visited. If more than one eligible woman was present in a household, the woman with the highest number of children was selected.

Data were collected through face-to-face interviews using a pre-tested structured interview schedule that obtained information on socio-demographic profiles, reproductive history, contraceptive use, and cultural determinants of fertility. Socioeconomic status was classified according to the 2019 Modified B. G. Prasad Scale based on per capita monthly income.¹⁷ Data were entered into Microsoft Excel and analyzed using PSPP version 1.6.2.¹⁸ Quantitative data were presented as mean $\pm$ SD (standard deviation), while categorical variables were summarized using frequencies and percentages. Associations between fertility groups and explanatory variables were assessed using Chi-square tests, with continuity correction applied for 2x2 tables and Fisher's exact test used for expected cell counts below five. Variables that showed statistical significance in the bivariate analysis ($p < 0.05$) were included in a multivariable logistic regression model to identify independent predictors of high fertility.

The study protocol received approval from the ethics committee for Academic Research Projects of the parent institute (Letter No. ECARP/2021/79, dated 10/08/2021). Written informed consent was obtained from all participants in their vernacular language following a detailed explanation of the study objectives.

RESULTS

A total of 322 women were included in the study, with 161 women each in the low-fertility (group A) and high-fertility groups (group B).

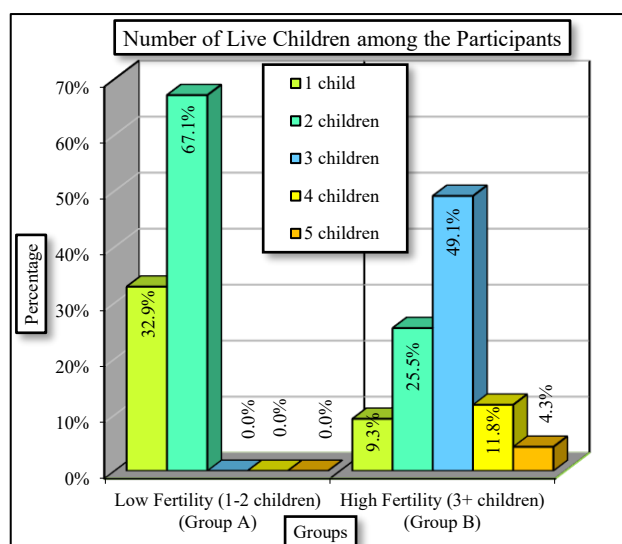


Figure 1: Number of live children among participants.

The mean age of participants in group A was 30.09 $\pm$ 4.73 years, compared with 28.85 $\pm$ 4.22 years in group B. In group A the mean number of living children was 1.60 $\pm$ 0.47 and a median of 2 with a minimum of 1 and maximum of 2 living children compared to group B with mean number of living children of 2.70 $\pm$ 0.93, median of 3 with a minimum of 1 and maximum 5 living children.

(non tabulated data). In group A, 108 women (67.1%) had two children and 53 (32.9%) had only one child. In contrast, in group B, 79 women (49.1%) had three children, and 19 (11.8%) and 7 (4.3%) women had four

and five children respectively, with this difference in family size distribution between the groups being statistically significant ($p < 0.001$) (Figure 1).

Table 1: Socio-demographic characteristics among groups using chi square test.

Variables		Low fertility (group A) n=161	High fertility (group B) n=161	Total n=322	Chi- square value	P value
		N (%)	N (%)	N (%)		
Age (years)	19-23	12 (7.5)	15 (9.3)	27 (8.4)	11.96	0.00074 Significant
	24- 28	66 (41.0)	48 (29.8)	114 (35.4)		
	29-33	64 (39.8)	53 (32.9)	117 (36.3)		
	34 -38	13 (8.1)	41 (25.5)	54 (16.8)		
	≥39	6 (3.6)	4 (2.5)	10 (3.1)		
Religion	Hindu	76 (47.2)	20 (12.4)	96 (29.8)	46.4	8.96×10^{-12} Significant
	Muslim	76 (47.2)	141 (87.6)	217 (67.4)		
	Christian	7 (4.4)	0	7 (2.2)		
	Buddhist	2 (1.2)	0	2 (0.6)		
Family type	Nuclear	111 (68.9)	110 (68.3)	221 (68.6)	0	1 (Non- significant)
	Joint	50 (31.1)	51 (31.7)	101 (31.4)		
Mother's education	Illiterate	4 (2.5)	22 (13.7)	26 (8.1)	82.6	2.40×10^{-16} Significant
	Primary	0	18 (11.2)	18 (5.6)		
	Upper Primary	25 (15.5)	62 (38.5)	87 (27.0)		
	SSC	64 (39.7)	43 (26.7)	107 (33.3)		
	HSC	50 (31.1)	11 (6.8)	61 (18.9)		
	Graduate	18 (11.2)	5 (3.1)	23 (7.1)		
Father's Education	Illiterate	2 (1.2)	23 (14.3)	25 (7.8)	70.22	5.30×10^{-17} Significant
	Primary	5 (3.1)	27 (16.8)	32 (9.9)		
	Upper Primary	26 (16.1)	49 (30.4)	75 (23.3)		
	SSC	60 (37.3)	43 (26.7)	103 (32.0)		
	HSC	36 (22.4)	10 (6.2)	46 (14.3)		
	Graduate	32 (19.9)	9 (5.6)	41 (12.7)		
Socio- Economic Status	Class I	50 (31.1)	2 (1.2)	52 (16.1)	99.07	1.55×10^{-20} Significant
	Class II	56 (34.7)	26 (16.1)	82 (25.5)		
	Class III	37 (23.0)	54 (33.6)	91 (28.3)		
	Class IV	18 (11.2)	65 (40.4)	83 (25.8)		
	Class V	0	14 (8.7)	14 (4.3)		
Mass media exposure	One	25 (15.5)	75 (46.6)	100 (31.1)	34.82	3.61×10^{-9} Significant
	More than two	136 (84.5)	86 (53.4)	222 (68.9)		

Socio-demographic characteristics

Age, religion, education, socioeconomic status, and mass media exposure showed statistically significant associations with fertility status. Women in group A were predominantly 24-28 years old (41.0%), whereas those in group B were mainly 29-33 years old (32.9%) ($p < 0.001$). Hindus and Muslims were almost equally represented in group A (47.2% each), while group B comprised mostly Muslims (87.6%), with 12.4% Hindus ($p < 0.001$). Family type did not differ between groups, with approximately two-thirds of women in both groups living in nuclear families ($p = 1.000$). Maternal education differed significantly, with illiteracy being lower in group A (2.5%) than in group B (13.7%), and secondary or higher

secondary education more common among women with one or two children, whereas upper primary education predominated in the high-fertility group ($p < 0.001$). A comparable pattern was noted for paternal education, with husbands' illiteracy higher in group B (14.3%) than in group A (1.2%), and secondary or above education more frequent in group A ($p < 0.001$).

Socioeconomic status was strongly associated with fertility. Most women in group A belonged to class II (34.7%) and class I (31.1%), while the majority in group B were in class IV (40.4%) and class III (33.6%); very few high-fertility women were in the upper class, and 8.7% belonged to class V ($p < 0.001$). Mass media exposure related to family welfare was also significantly

higher among women with lower fertility, with 84.5% of women in group A reporting exposure to more than one form of mass media compared with 53.4% in group B ($p<0.001$) (Table 1).

Reproductive characteristics

Age at marriage, age at first pregnancy, and number of conceptions differed significantly between the fertility

groups. Women in the high-fertility group married earlier, with a mean age at marriage of 19.149 ± 3.099 years in group B compared with 20.615 ± 2.416 years in group A ($p<0.001$). The mean age at first pregnancy was also lower in group B (20.354 ± 3.013 years) than in group A (21.845 ± 2.461 years) ($p<0.001$). Consistently, the mean number of conceptions was higher in group B (3.10 ± 1.17) than in group A (2.30 ± 1.08) ($p<0.001$) (non tabulated data).

Table 2: Reproductive and other variables among groups using chi square test.

Variables		Low fertility (group A) n=161 N (%)	High fertility (group B) n=161 N (%)	Total n=322 N (%)	Chi- square value	P value
Planned last pregnancy	Yes	119 (73.9)	70 (43.5)	189 (58.7)	29.51	5.55E-08 Significant
	No	42 (26.1)	91 (56.5)	133 (41.3)		
Gender of first child	Male	118 (73.3)	60 (37.3)	178 (55.3)	34.82	3.61E-09 Significant
	Female	43 (26.7)	101 (62.7)	144 (44.7)		
Gender of second child	Male	61 (56.5)	65 (44.5)	126 (49.6)	3.09	0.079 Non- significant
	Female	47 (43.5)	81 (55.5)	128 (50.4)		
History of miscarriage	Yes	51 (31.7)	38 (23.6)	89 (27.6)	2.23	0.13 Non- significant
	No	110 (68.3)	123 (76.4)	233 (72.4)		
History of death of any child	Yes	12 (7.5)	15 (9.3)	27 (8.4)	0.16	0.68 Non- significant
	No	149 (92.5)	146 (90.7)	295 (91.6)		
Husband's desire to have another child	Yes	31 (19.3)	71 (44.1)	102 (31.7)	22.95	1.66E-06 Significant
	No	130 (80.7)	90 (55.9)	220 (68.3)		
Mother's desire to have another child	Yes	35 (21.7)	53 (32.9)	88 (27.3)	4.51	0.034 Significant
	No	126 (78.3)	108 (67.1)	234 (72.7)		
Financial stability to raise another child	Yes	85 (52.8)	55 (34.2)	140 (43.5)	10.62	0.001 Significant
	No	76 (47.2)	106 (65.8)	182 (56.5)		
Physical capability to raise another child	Yes	118 (73.3)	75 (46.6)	193 (59.9)	22.81	1.79E-06 Significant
	No	43 (26.7)	86 (53.4)	129 (40.1)		
Use of any method of contraceptive measures	Yes	155 (96.3)	141 (87.5)	296 (91.9)	7.924	0.0049 Significant
	No	6 (3.7)	20 (12.5)	26 (8.1)		
Type contraceptive use (n=155 and n=141)	Traditional	10 (6.5)	36 (25.5)	46 (15.5)	27.337	0.000006 Significant
	Barrier	81 (52.2)	71 (50.4)	152 (51.4)		
	Hormonal	16 (10.3)	15 (10.6)	31 (10.5)		
	Permanent	48 (31.0)	19 (13.5)	67 (22.6)		
Purpose of contraceptive use (n=155 and n=141)	Birth control	112 (72.3)	84 (59.6)	196 (66.2)	4.75	0.029 Significant
	Birth interval	43 (27.7)	57 (40.4)	100 (33.8)		

Table 3: Multivariable logistic regression.

Variables	Referance category	AOR	95% CI	P value
Age at marriage (years)	-	0.90	0.81-1.01	0.076
Father's education	-	0.52	0.40-0.68	<0.001
Exposure to mass media sources	More than two	1.89	0.95-3.74	0.068
Planned last pregnancy	Yes	3.56	1.99-6.37	<0.001
Gender of first child	Female	0.27	0.15-0.48	<0.001
Husband's desire to have another child	Yes	0.22	0.12-0.44	<0.001
Use of contraceptive measures	Yes	0.95	0.29-3.09	0.935

A planned last pregnancy was significantly more frequent in group A (73.9%) than in group B (43.5%) ($p<0.001$). The sex of the first child showed a strong association with fertility status: 73.3% of women in group A had a male first child, whereas 62.7% of women in group B had a female first child ($p<0.001$), while the sex of the second child was not significantly related to family size ($p=0.079$). History of miscarriage and history of death of any child were not significantly associated with fertility group (Table 2).

Fertility intentions and perceived capability

Fertility intentions and perceived capability also differed between groups. The husband's desire for another child was more common in the high-fertility group (44.1%) than in the low-fertility group (19.3%) ($p<0.001$), and mothers' own desire for another child was higher in group B (32.9%) than in group A (21.7%) ($p=0.034$). Perceived financial stability to raise another child was reported more often in group A (52.8%) than in group B (34.2%) ($p=0.001$), and perceived physical capability was likewise higher in group A (73.3%) than in group B (46.6%) ($p<0.001$) (Table 2).

Although most women in both groups considered two children to be ideal, this preference was far more prevalent in group A (93.2%) than in group B (57.8%) ($p<0.001$), with the mean ideal number of children being 1.9 ± 0.25 in group A and 2.6 ± 0.95 in group B (non tabulated data).

Contraceptive behaviour

Contraceptive behaviour showed similar gradients: overall contraceptive use was higher in group A (96.3%) than in group B (87.5%) ($p=0.0049$), and among users, method mix differed significantly ($p<0.001$), with group A more frequently using barrier methods (52.2%) and permanent methods (31.0%), while women in group B more often relied on barrier (50.4%) and traditional methods (25.5% versus 6.5% in group A). The primary purpose of use also differed ($p=0.029$), with contraception more often used for birth limitation in group A (72.3%) and relatively more for spacing in group B (40.4%). In total, 26 women (8.1%) were not using any contraception and 46 (15.5%) relied on traditional methods; together, these 72 women (22.4%) represented a considerable unmet need for modern contraceptives, particularly among those who had completed their desired family size or wished to space births (Table 2).

Multivariable logistic regression analysis

The multivariable logistic regression model examining determinants of high fertility was statistically robust, with a model chi-square of 152.90 ($p<0.001$), explaining 50.4% of the variance in fertility status (Nagelkerke $R^2=0.504$), and correctly classifying 78.3% of participants (Table 3). The gender of the first child, planned last

pregnancy, husband's desire for additional children, and paternal educational status remained significant independent predictors of high fertility in the adjusted model. Women whose first child was male had substantially lower odds of being in the high-fertility group compared with those whose first child was female (AOR=0.27, 95% CI: 0.15-0.48, $p<0.001$). Reporting the last pregnancy as unplanned was associated with markedly higher odds of high fertility (AOR=3.56, 95% CI: 1.99-6.37, $p<0.001$). Husband's desire for another child was independently associated with fertility status (AOR=0.22, 95% CI: 0.12-0.44, $p<0.001$), and higher paternal education was associated with reduced odds of high fertility (AOR=0.52, 95% CI: 0.40-0.68, $p<0.001$) (Table 3).

DISCUSSION

The present study identified several socio-demographic, reproductive, and fertility intentions of high fertility among women residing in an urban metropolitan slum. The findings indicate that high fertility is not merely a function of biological reproduction, but rather reflects the combined effect of early marriage, lower education, socioeconomic disadvantage, son preference, spousal fertility intentions, and gaps in effective contraceptive use.

Age was associated with higher fertility, for each one-year increase in age at marriage, the odds of high fertility were approximately 10% lower (AOR 0.90, 95% CI 0.81-1.01), which is expected because parity accumulates over time. This is expected because cumulative fertility increases with duration of marital and reproductive exposure. Similar patterns have been reported in demographic studies from India and neighbouring countries, where parity rises with advancing maternal age until fertility begins to decline at later ages.^{1,3,19}

Age at marriage remained important. Women in the high-fertility group married earlier, and increasing age at marriage reduced the odds of high fertility. This is consistent with demographic transition theory and earlier Indian studies showing that early marriage extends reproductive exposure and increases the likelihood of larger family size.^{3,20-22} Although age at marriage and mass media exposure did not reach conventional levels of statistical significance in the adjusted model, both variables demonstrated trends consistent with established demographic theory. Earlier marriage increases reproductive lifespan and may contribute to higher fertility, while greater exposure to mass media may influence reproductive attitudes and family planning behaviors. Delaying marriage therefore remains a key strategy for fertility reduction in vulnerable communities.

Paternal education remained independently associated with high fertility. For each one-category increase in father's educational level, the odds of having more than two children decreased by approximately 48% (AOR

0.52, 95% CI: 0.40-0.68). Although maternal education showed a strong association in the bivariate analysis, it did not remain independently significant after adjustment. The persistence of paternal education in the adjusted model may reflect the role of husbands in household decision-making, fertility preferences, and contraceptive decisions. Previous studies have reported associations between parental education and fertility, while studies of couples in developing countries have emphasized the influence of men on reproductive decision-making.^{9,14,15,23-26} This finding supports a couple-centred approach to family planning rather than interventions directed exclusively at women.

Socioeconomic disadvantage was strongly linked to high fertility in the descriptive analysis. Women with high fertility were concentrated in the lower socioeconomic classes. This supports the inverse association between socioeconomic advancement and fertility, mediated through education, aspirations, child-rearing costs, and access to services, child-rearing costs, and access to health services.^{3,27,28}

Mass media exposure was strongly associated with lower fertility in the unadjusted analysis, but the association was attenuated after adjustment. Women with lower mass-media exposure had higher odds of high fertility than those with greater exposure (AOR 1.89, 95% CI: 0.95-3.74), although the confidence interval was compatible with no independent association. This may reflect the influence of related factors such as education, socioeconomic position, and access to health information. Nevertheless, mass media can support dissemination of information on contraception, birth spacing, and small-family norms, complementing interpersonal counselling and community-based services in underserved populations.²⁹⁻³¹

The sex of the first child showed one of the strongest associations. Women whose first child was male had substantially lower odds of high fertility than those whose first child was female (AOR 0.27, 95% CI: 0.15-0.48). Thus, women with a female first child had approximately 3.7 times the odds of high fertility compared with those whose first child was male. This finding is consistent with earlier Indian and South Asian studies reporting that couples may continue childbearing when the desired sex composition of children has not been achieved.^{2,11-13,32,33} In an urban slum setting, persistent son preference may therefore contribute to additional pregnancies despite increasing awareness of smaller family norms. This has important public health implications because family-planning services need to address gender-related fertility preferences alongside contraceptive availability.

Husband's desire for another child was the strongest social predictor in the adjusted model. Women whose husbands did not desire another child had substantially lower odds of high fertility compared with those whose husbands desired another child (AOR 0.22, 95% CI: 0.12-

0.44), indicating approximately 4.5-fold higher odds of high fertility among women whose husbands desired another child. This finding emphasizes the important role of men in reproductive decision-making. A husband's desire for another child may be associated with continued childbearing, potentially reflecting larger-family preferences, son preference, cultural expectations, or a perceived need for additional children. Evidence from developing countries has shown that family-size preferences and contraceptive decisions are frequently influenced by male partners.^{14,15,34} Programs focused solely on women may therefore be insufficient in settings where husbands play a decisive role in continuing childbearing.

Women's own desire for another child was also associated with high fertility (Table 2), indicating that reproductive intentions remain active even among women who already have large families. This may be linked to son preference, incomplete family composition, social expectations, or normalization of larger family size within the community.^{35,36}

Women in the low-fertility group were more likely to report being physically and financially capable of raising another child, yet fewer of them had high fertility. This suggests that fertility decisions are not determined by capability alone, but rather by intention, negotiation within marriage, and social norms.

Pregnancy planning was also independently associated with fertility. Women reporting an unplanned last pregnancy had higher odds of high fertility (AOR 3.56, 95% CI: 1.99-6.37) compared with those reporting a planned last pregnancy. The relatively wide but clearly elevated confidence interval indicates a meaningful association rather than a finding based only on statistical significance. This may reflect gaps in effective contraceptive use, inconsistent use of methods, or difficulties in translating fertility intentions into reproductive behaviour. Previous evidence from India has similarly highlighted persistent gaps in family-planning use despite improvements in contraceptive coverage.³⁷⁻³⁹ Strengthening counselling on method choice, continuation, switching, and management of contraceptive concerns may therefore be particularly relevant in underserved urban communities.

Several factors that were strongly associated with fertility in the bivariate analysis, including socioeconomic status, maternal education, age at marriage, and mass-media exposure, did not remain independently significant in the final model. These findings suggest that their apparent associations with high fertility may partly operate through interrelated social and reproductive pathways. For example, lower socioeconomic status may coexist with lower educational attainment and reduced exposure to health information, while early marriage increases the duration of reproductive exposure. Previous Indian and international studies have consistently linked education,

age at marriage, socioeconomic conditions, and media exposure with fertility behaviour.^{1,3,20-31} Therefore, the absence of independent statistical significance in the adjusted model should not be interpreted as an absence of public health relevance; rather, these factors may act through or overlap with other determinants included in the model.

An important finding highlights a substantial gap between women's reproductive intentions and their actual contraceptive behaviour. A total of 26 women (8.1%) were not using any contraceptive method, and another 46 depended on traditional methods among users, which are generally less effective and more failure-prone than modern methods. Taken together, these 72 women (22.4%) can be considered as having an unmet need for modern contraception, especially in the context of a population where many had already achieved or exceeded their desired family size, or expressed a wish to space further pregnancies. This proportion is important from a public health perspective, as it suggests ongoing risk of unintended pregnancies despite expressed intentions to limit or space births, and points to gaps in access, counselling quality, method mix, or autonomy in contraceptive decision-making. Contraceptive behaviour also differed between the two fertility groups, particularly in the greater reliance on traditional methods among women with high fertility. However, contraceptive use itself was not independently associated with high fertility in the adjusted analysis. This should be interpreted cautiously because of the cross-sectional design and the possibility of reverse causality: women may initiate contraception after achieving their desired family size. The finding therefore does not imply that contraception is unimportant, but rather that current contraceptive use cannot be interpreted as a temporal determinant of fertility from these data alone. The presence of women using no method or relying on traditional methods also indicates an opportunity to strengthen access to and counselling regarding effective modern contraceptive options.

Overall, the findings indicate that high fertility in this urban slum is shaped by interconnected gender, family, and socioeconomic factors rather than by contraceptive use alone. The strongest adjusted associations point particularly towards son preference, pregnancy planning, paternal education, and couple-level fertility preferences. Public health interventions should therefore combine accessible and reliable modern contraception with couple-centred counselling, greater male involvement, promotion of girls' and women's education, delayed marriage, and interventions addressing son preference and gender norms. Such a multifaceted approach is more likely to address the social and reproductive pathways underlying high fertility in underserved urban populations.

A key strength of this study is its direct comparison between low- and high-fertility women within the same urban slum setting, allowing identification of specific

contextual determinants. The use of systematic sampling and multivariable analysis also strengthens the validity of the findings.

However, the study has some limitations. Its cross-sectional design precludes causal inference. Responses on fertility preferences and contraceptive use were self-reported and may be subject to recall or social desirability bias. Since the study was conducted in a single metropolitan slum, the findings may not be generalizable to all urban poor populations.

CONCLUSION

High fertility among women residing in urban metropolitan slums was found to be significantly associated with early age at marriage, lower levels of parental education, lower socioeconomic status, a preference for sons, the spouse's desire for additional children, and less effective contraceptive practices. The husband's desire for another child and the sex of the first-born child emerged as particularly strong determinants of high fertility. These findings suggest that interventions aiming to reduce high fertility in slum populations should prioritize delaying the age at marriage, improving both female and male education, promoting couple-centred family planning counselling, addressing son preference and underlying gender norms, expanding access to reliable modern contraceptive methods, and strengthening women's participation in reproductive decision-making. Collectively, such measures may play an important role in improving maternal and child health and in promoting small family norms in underserved urban communities.

Declaration

We used ChatGPT (OpenAI, free version) and Perplexity AI (free version) only to improve the language, grammar, and readability of the manuscript. These tools were not used for study design, data collection, data analysis. All content was reviewed and verified.

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