



Having No Son Impacts Unmet Need for Family Planning: Evidence Based on Demographic Health Survey Data of Bangladesh

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ABSTRACT

Unmet need for family planning, not only lower the satisfied demand of contraceptive use, but also elevate maternal and child death of a country. In order to achieve the targets of sustainable development goal on satisfied demand for family planning (FP), it is essential to reduce the current rate of unmet need for FP in Bangladesh. This study attempted to explore whether son preference increases the rate of unmet for FP after adjusting the effects of other potential confounders. This study used nationally representative data of 2014 Bangladesh Demographic Health Survey (BDHS). A total of 12031 women were selected after removing the missing observations. Bivariate analyses were carried out using chi-square tests to estimate unadjusted effects of several factors on unmet need for FP, while a logistic regression model was used for the estimation of adjusted effects. The odds of unmet need for FP was 22% higher for the couples having no son (CI: 1.05-1.43; p-value = 0.01). Significantly higher unmet need for FP was also found for the couples having more than 7 years of age gap, having 4 or more living children, if none of them were educated, living in rural area, if wives were not working, if wives did not have NGO membership, if they did not receive any contraceptives while visited by FP workers, if wives were not empowered and if they were not living together. Along with the factors that are known to influence unmet need for FP in the developing countries, this study reveals that unmet need for FP is also affected by son preference in Bangladesh.

Keywords: Family planning, logistic regression, odd ratio, unmet need.

1. Introduction

Although Bangladesh is ranked the 12th highly densely populated country in the world (1), the country has

been performing well in maintaining its economy since the last decade. As a result, Bangladesh is now emerging from a 'low-income' to 'lower-middle' income country status.

Reduction in fertility rate (3.44 in 1993 and 2.3 in 2014) is one of the reasons for achieving such economic development (2, 3). Note that the total fertility rate (TFR) is comprised of total wanted and total unwanted fertility rates. Currently, in Bangladesh, the TFR is 2.3, of which the total unwanted fertility rate is 0.7 (3). Therefore, the TFR would have been 30% lower if these unwanted births were avoided. Moreover, these unwanted births are not only inflating the TFR, but also cause life-threatening complications on maternal and child health (4-7). Unwanted pregnancy occurs due to non-use of contraceptives, contraceptive failure, and rape (4). The unwanted pregnancy due to non-use of contraceptives is known as unmet need for family planning (FP), while the use of contraception for birth spacing and limiting is referred to as the met need for FP. Apart from the random factors, contraceptive failure and rape associated with unwanted pregnancy, unmet need can be thought of as missed opportunity for FP and thus can be reduced by taking appropriate policies. This reduction will increase the proportion of satisfying demand for FP, which is comprised of met and unmet needs. In Bangladesh, 12 percent of married women have an unmet need for FP (3). In order to achieve sustainable development goal (SDG) (Target: 100% satisfied demand using a modern contraceptive method by 2030), it is crucial to target the group with an unmet need for FP. Therefore, in order to reduce the fertility rate and improve maternal and child health, a control over unwanted pregnancies can be achieved by identifying factors associated with the unmet need for FP.

Relevant literature shows that several socio-economic and demographic variables have a significant association with the unmet need for FP. Partner's approval of contraception and family planning discussion with wife negatively impacted the unmet need for FP (8-11). Several studies found that higher parity had higher odds of unmet need (9, 12, 13), while few studies found that lower parity had higher odds of unmet need (10, 14). Some studies found that younger women had higher odds of unmet need (10-13), whereas few studies showed that younger women had lower odds of unmet need (9, 15). Women's, as well as their partner's education, have a significant impact on unmet need for FP as educated couples were less likely to have an unmet need for FP (10, 12, 13, 16). Many studies found that women from rural areas were more likely to have an unmet need for

FP than urban areas (12, 13, 17, 18). It was also found that women who were unemployed, who were not counseled by FP workers, and whose partners were not supportive had higher odds of unmet need for FP than their counterparts (17). A higher rate of unmet need was also seen for women who came from a poor household (11-13). Women's media access (9, 13), religion (18), health facility visits, and a number of dead sons (13) were also showed significant association with unmet need in the relevant literature.

Preference for son over a daughter is common in South Asia and in many other developing countries where women are dependent on men (19). It is because sons provide support more than daughters to their parents when they are old (20, 21). It was also found that women who had only one son were more likely to use contraceptives compared to the women who had only a daughter in Bangladesh (20). It implies that son preference has a positive effect on fertility. Many studies have been conducted on son preference and contraceptive use and its impact on fertility (22-26). As evident in this literature review, there have been very few studies that inform our understanding of the unmet need for family planning. The current study contributes to filling some gaps in our understanding of the son preferences and other socio-economic and demographic variables significantly impacting the unmet need for FP.

2. Methods and Materials

2.1. Data & Variables

Bangladesh Demographic and Health Survey (BDHS) 2014 data has been extracted to conduct this study. A two-stage stratified cluster sampling procedure was used in this survey. The first stage of this survey selected 600 clusters with probability proportional to cluster size. Among these 600 clusters, 207 clusters were in urban areas, whereas 393 clusters were in rural areas. In order to create a sampling frame for the second-stage, a listing of the household was carried out in all of the selected clusters. A sample of 30 households was selected from each cluster by using a systematic sampling procedure in the second stage. A total of 18000 residential households were selected for the interview, and BDHS successfully interviewed 17863 ever-married women aged 12-49 years. This study aimed to determine the factors of unmet need for family planning in

Bangladesh. For the purpose of the analysis, the Individual Women's Data- Individual Recode (IR) data of BDHS 2014 was explored, and a total of 12031 women were selected after removing the missing observations (3).

The total unmet need was composed of the unmet need for spacing plus the unmet need for limiting. The absolute number of women with unmet and met needs constitute the total demand for FP. The proportion of satisfied demand equals the percentage of the met need by the demand (3, 13).

In this study, the response was a binary variable coded as 1 for unmet need for FP and 0 for the met need for FP. Several socio-economic and demographic factors have been considered as explanatory variables according to reviews of related literature. Women's age gap with husband (≤ 7 years, > 7 years), wife/husband educated (yes, no), household wealth (poor, middle, rich), place of residence (rural, urban), women's working status (yes, no), media awareness (yes, no), NGO membership (yes, no), FP worker visits (FP methods provided, not provided), wife's empowerment (empowered, not empowered), aware of community clinic (yes, no), no. of sons (at least one, no), and currently reside with husband (staying elsewhere, living with her) etc. were considered in the analysis.

2.2. Statistical Analysis

The Chi-Square test of association is used to determine the unadjusted association between unmet need and explanatory variables. Two logistic regression model has been used, one showed the association of the number of sons and unmet need after adjusting several demographic variables (Model 1), and another model (Model 2) showed the association of the number of sons and unmet need after adjusting all the variables. Explanatory variables that were found significant in the Chi-square test are only included in

Model 2. The binary logistic regression model can be specified as

$$\begin{aligned} \text{logit}(\pi_i) &= \log \left[\frac{\pi_i}{1 - \pi_i} \right] \\ &= \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_p X_{pi} \end{aligned}$$

where π_i is the probability of unmet need of a woman i ; β_0 is the log odds of the intercept; β_1, \dots, β_p are the coefficients of explanatory variables; $X_{1i} \dots X_{pi}$ are the explanatory variables.

For the analysis purpose, STATA 12.1 has been used, and a significance level of 0.05 has been used to determine the statistical significance of estimated parameters.

3. Findings and Results

3.1. Univariate Analysis

It was observed from the sample that 14.3% of our sample observations had an unmet need for FP while the rest of them had a met need for FP. About 23% of women in the study had no sons, while the rest had at least one son. About 54% of the women had an age gap greater than 7 years with their husbands. In the sample, the majority of the women and their husbands were educated (58.8%). It was found that most of the respondents were rich (42.6%, see, Figure 1). A major portion of the women was from rural areas (65.3%, see, Figure 2), and more than two-third (67.7%) of women from the sample were non-working. Almost 79% of women had no awareness of family planning from any media, and 65% had no NGO membership. It was also found that nearly 91% of women were not given any FP method by FP field workers. Most of the women were empowered (86%) in the sample, and most women had no community clinic awareness (70.4%). Moreover, about 23% of women in the study had no sons while the rest had at least one son. In the study period, 89% of the women reported that their husbands lived with them and 55% had 2-3 living children.

Figure 1

Wealth

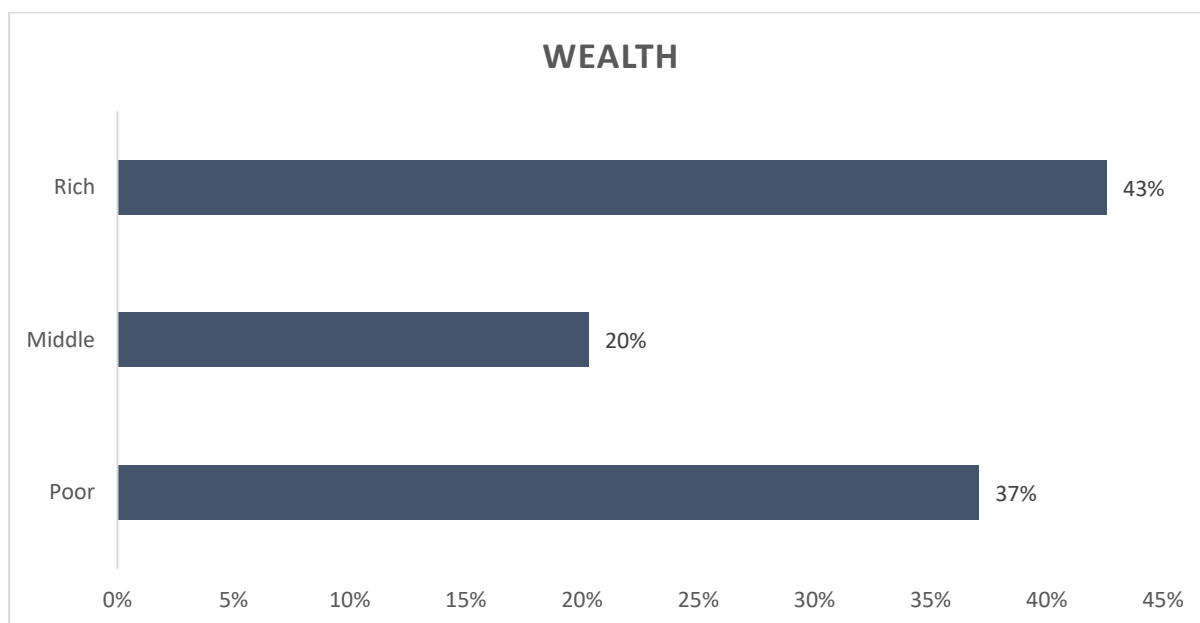
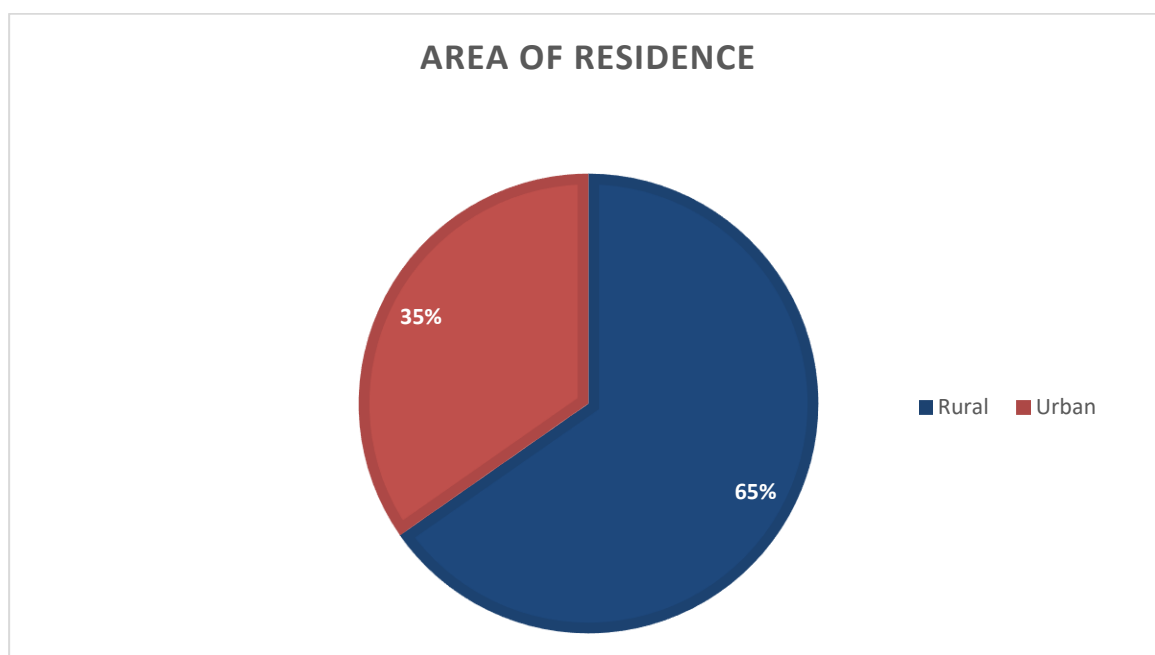


Figure 2

Area of residence



3.2. Bivariate Analysis

Table 1 presents the Chi-square tests of associations with cross percentage distributions to determine whether the explanatory variables exhibited associations with unmet

need in the study sample. It is revealed from Table 1 that unmet need was associated with the number of sons ($p < 0.001$). Women who had no son had a high percentage of unmet need (17.3%), whereas this percentage was 13.4 for women with at least one son. Women who had a lower age gap (≤ 7 years) with their husbands had a significantly lower

percentage of unmet need than their counterparts ($p = 0.01$). Couples where at least one was educated had a higher rate (15%) of unmet need than uneducated couples ($p = 0.01$). It is also observed that women from the rich household had the highest unmet need (15.2%), and women from the poor household had the lowest unmet need (13.1%) ($p < 0.01$). Women from the rural area had a high percentage of unmet needs (15.9%) than the women from the urban area (11.4%). Women who had at most 1 child had a significantly higher rate of unmet need (17.3%) than their counterparts. Women's working status also had a significant ($p < 0.001$) impact on unmet needs. 16.2 % of women who were not working had an unmet need, while this was 10.4% for women who were working. Table 1 also demonstrated that unmet need was significantly higher for women who had no NGO

membership (17.2%) than the women who had NGO membership (9.1%). Unmet need was higher for the women who did not receive FP methods by field workers (15.5%) than the women who received FP methods (2.7%). Women's empowerment had a negative association with the unmet need ($p = 0.001$). Women who were not empowered had a higher percentage of unmet need (17.1%) than the empowered women (13.9%). It was also seen that women who were not aware of community clinics (13.6%) had a lower percentage of unmet need than women who were aware of community clinics (16.1%). If a woman does not reside with her husband, the rate of unmet need was significantly higher (61.6%) than a woman who lives with her husband (8.3%). Women's media awareness did not show any association with unmet needs.

Table 1

Unadjusted effects of socio-economic and demographic factors on unmet need for FP

Characteristics	Unmet Need Status		No. of women	P-value
	Met need	Unmet need		
No. of sons				
0	82.7	17.3	2797	
≥ 1	86.6	13.4	9234	< 0.001
Age gap with husband				
≤ 7 years	86.5	13.5	5591	
> 7 years	84.9	15.1	6440	0.01
Wife/Husband educated				
No	86.7	13.3	4959	
Yes	85	15	7072	0.01
Household wealth				
Poor	86.9	13.1	4463	
Middle	85.2	14.8	2447	0.012
Rich	84.8	15.2	5121	
Place of residence				
Rural	84.1	15.9	7855	< 0.001
Urban	88.6	11.4	4176	
Number of living children				
0-1	82.7	17.3	3267	
2-3	87.6	12.4	6619	<0.001
4 and above	84.2	15.8	2145	
Working status				
No	83.8	16.2	8144	
Yes	89.6	10.4	3887	< 0.001
Media awareness				
No	85.5	14.5	9464	
Yes	86.2	13.8	2567	0.339
NGO membership				
No	82.8	17.2	7817	< 0.001
Yes	90.9	9.1	4214	
FP worker visits				
FP methods provided	97.3	2.7	1132	< 0.001
Not provided	84.5	15.5	10899	
Wife's empowerment				

Not empowered	82.9	17.1	1679	0.001
Empowered	86.1	13.9	10352	
Aware of community clinic				
No	86.4	13.6	8468	0.001
Yes	83.9	16.1	3563	
Currently reside with husband				
Staying elsewhere	38.4	61.6	1361	
Living with her	91.7	8.3	10670	< 0.001

3.3. Multivariate Analysis

The results of logistic regression models are summarized in [Table 2](#). Model 1 showed the evidence that the rate of unmet need varies depending on whether a couple has any son or not after adjusting for demographic variables. To be specific, the odds of unmet need were 37% higher for those who had no son compared to their counterparts (OR = 1.37, 95% CI: 1.21-1.52, $p < 0.001$). The odds of unmet need were 15% higher for couples with an age gap of more than 7 years compared to the couples who had an age gap 7 years or less (OR = 1.15, 95% CI: 1.04-1.28, $p = 0.07$). Wife/husband's education did not show any significant association with unmet need. The odds of unmet need were higher for the women from middle (OR = 1.18, 95% CI: 1.02-1.36, $p = 0.03$) and rich (OR = 1.43, 95% CI: 1.25-1.64, $p < 0.001$) household compared to poor household. Moreover, Women who resided in urban areas were less likely (OR = 0.58, 95% CI: 0.51-0.65, $p < 0.001$) to have an unmet need, compared to women who resided in rural areas.

After controlling for all the covariates, Model 2 showed that a mother's number of sons still had a significant impact on unmet need; the odds of unmet need was 22% higher for those women who had any son as compared to the women who had no son (OR = 1.22, 95% CI: 1.05-1.43, $p = 0.01$). It is found that the odds of unmet need were 14% higher for couples having an age gap of more than 7 years compared to the couples who had an age gap 7 years or less (OR = 1.14, 95% CI: 1.01-1.29, $p = 0.033$). Unlike Model 1, education was found to have a negative association with unmet needs. The odds of unmet need were lower when women or their

husbands or both were educated (OR = 0.82, 95% CI: 0.71-0.94, $p = 0.005$), compared to uneducated women or husbands. Household wealth did not show any association with unmet need in logistic regression, although it was significant in Model 1. [Table 2](#) confirmed the significant association between place of residence and unmet need. Women who resided in urban areas were 0.74 (OR = 0.74, 95% CI: 0.64-0.85, $p < 0.001$) times as likely to have an unmet need, compared to women who resided in rural areas. The number of living children showed a significant adjusted effect on unmet needs. A couple having more than 3 children has higher rate of unmet need than their counterparts. Working women were found to have lower unmet need (OR = 0.70, 95% CI: 0.61-0.80, $p < 0.001$) than the non-working women. Moreover, NGO membership of a woman can reduce unmet need. Women who were a member of an NGO were less likely to have unmet need than the women who were not a member (OR = 0.67, 95% CI: 0.58-0.77, $p < 0.001$). It is also observed that the odds of unmet need were lower among the women who were given FP methods by field workers (OR = 0.18, 95% CI: 0.13-0.27, $p < 0.001$), compared to those who were not given any FP methods. Women's empowerment showed a negative association with unmet needs. Empowered women were less likely (OR = 0.75, 95% CI: 0.64-0.89, $p = 0.01$) to have an unmet need, compared to women who were not empowered. Unlike bivariate analysis, community clinic awareness did not show any association with unmet needs. [Table 2](#) also showed that women who were living with their husbands were 0.06 (OR = 0.06, 95% CI: 0.05-0.07, $p < 0.001$) times as likely to have an unmet need than the women who were not living with their husband.

Table 2

Adjusted effects of the number of sons and other socio-economic and demographic factors on unmet need for FP

Characteristics	Model 1		Model 2	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Number of sons				
0	1.37 (1.22, 1.54)		1.22 (1.05, 1.43)	
≥ 1	1	<0.001	1	0.01
Age gap with husband				
≤ 7 years	1		1	
> 7 years	1.15 (1.04, 1.28)	0.07	1.14 (1.01, 1.29)	0.033
Wife/Husband educated				
No	1		1	
Yes	1.04 (0.93, 1.17)	0.47	0.82 (0.71, 0.94)	0.005
Household wealth				
Poor	1		1	
Middle	1.18 (1.02, 1.36)	0.03	0.92 (0.78, 1.09)	0.370
Rich	1.43 (1.25, 1.64)	<0.001	0.97 (0.83, 1.14)	0.709
Place of Residence				
Rural	1		1	
Urban	0.58 (0.51, 0.65)	<0.001	0.74 (0.64, 0.85)	<0.001
Number of living children				
0-1			0.70 (0.57, 0.85)	<0.001
2-3			0.68 (0.58, 0.80)	<0.001
4 and above			1	
Working status				
No			1	
Yes			0.70 (0.61, 0.80)	<0.001
NGO membership				
No			1	
Yes			0.67 (0.58, 0.77)	<0.001
FP worker visits				
FP methods provided			0.18 (0.13, 0.27)	
Not provided			1	<0.001
Wife's empowerment				
Not empowered			1	
Empowered			0.75 (0.64, 0.89)	0.01
Aware of community clinic				
No			1	
Yes			0.99 (0.87, 1.13)	0.918
Currently reside with husband				
Staying elsewhere			1	
Living with her			0.06 (0.05, 0.07)	<0.001

4. Discussion and Conclusion

The unmet need for FP is regarded as one of the major indicators for monitoring FP programs. To meet the SDG goal 3 of reducing maternal mortality and increasing satisfied demand for FP, the unmet need must be kept as low as possible. Since the rate of unmet need in Bangladesh is 12%, which is high, we made an attempt to investigate the determinants of unmet need for FP in Bangladesh by using BDHS 2014 data. So that necessary actions can be taken to reduce it and hence satisfy the demand for FP.

Several socio-economic and demographic factors were found to have a significant impact on the unmet need for FP. We observe that women with a higher age gap (more than 7 years) with their husbands had significantly more unmet needs than the women who had a lower age gap. It might happen that higher age disparity creates a communication gap within partners over FP and contraceptive use. This positive association of the age gap with unmet needs is also supported by other studies (8, 9).

The number of living children also showed a significant association with the unmet need for FP in both bivariate and

multivariate analysis. In bivariate analysis, unmet need was higher for couples with <2 living children as compared to 2-3 and more than 3 living children. However, the adjusted effect of the number of living children on unmet need tells a different story. The rate of unmet need was highest for the couples having more than 3 children. This evidence was also found in previous studies (9, 12, 13).

Several previous studies found that husbands' or wives' education had a protective impact on unmet needs (8, 10, 12, 13). This study confirmed that if at least any of the partners were educated, their unmet needs were lower than the uneducated husbands or wives.

Two of the critical determining factors of unmet need were household wealth and place of residence. Women from the middle and rich households were more protected against unmet need for FP than poor women. Women from rural areas had an increased risk of unmet need for FP than urban areas. Previous studies in Ethiopia, Nepal, Nigeria, Burundi and Burkina Faso also reported similar findings on these associations (11-13, 17, 18).

Working mothers and mothers who were a member of an NGO were less likely to have an unmet need for FP; these findings are consistent with other studies (12, 17, 27). Moreover, mothers who were given contraceptives by FP workers were less likely to have an unmet need than the women who were not given any method, and literature showed similar findings (12). Another prominent factor of unmet need is women's empowerment. An empowered woman is more aware of contraceptive and family planning, and their empowerment is protectively associated with the unmet need (28). This study also confirmed the negative association of empowerment and the unmet need for FP. In this study, whether women lived with their husbands or not showed a significant negative association with the unmet need for FP.

Son preference is a common phenomenon in South Asia and many other developing countries. This study showed that mothers with no son were at a high risk of unmet need for FP. Both of our logistic regression models (Model 1 and Model 2) confirmed this finding. It happens because having no son acts as a deterrent to contraceptives and, in turn, increases the likelihood of unmet need. Therefore, couples who have no son have a higher rate of unmet need than couples who have at least one son.

This study, one of the few studies on unmet need for family planning in the context of Bangladesh, revealed that couples who have no son had 22% higher odds of unmet need compared to those who had at least one son. The findings of this study would be useful for researchers in family planning, social sciences, psychology, and relevant disciplines. The finding related to unmet needs has some policy implications. In order to reduce the unmet need for FP, the policymakers should revise their existing policies by emphasizing the findings of this research. To be specific, FP program in the rural areas needs to be enhanced; FP visits should be regularized and increased; contraceptives should be made available at the doorsteps. Special attention should be given to families with no son.

Authors' Contributions

S.R., M.M.R., and T.S.M. collaborated on the research design, data analysis, and interpretation of findings for the study on the impact of son preference on unmet need for family planning in Bangladesh. S.R. took the lead in drafting the manuscript and conducting the initial bivariate analyses, while M.M.R. was responsible for running the logistic regression models and interpreting the adjusted effects. T.S.M. contributed to the literature review, data management, and ensured the statistical accuracy of the findings. All authors contributed to the revision of the manuscript and approved the final version for submission. M.M.R. supervised the overall research process, providing guidance on the methodological approach and ensuring the study's alignment with the goals of sustainable development in family planning.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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