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Sexual and Reproductive Health Disparities Among Women: Analysis of Demand and Supply-Side Factors Between Wives of Migrant and Non-Migrant Husbands in India

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Abstract

Migration significantly impacts sexual and reproductive health outcomes, particularly among women whose husbands migrate for employment. Despite the Sustainable Development Goals (SDGs) 2015-2030 emphasizing universal access to sexual and reproductive healthcare as a fundamental human right, empirical evidence examining the relationship between husband migration and reproductive health outcomes in South Asia remains limited. This study investigates how demand and supply factors influence reproductive health outcomes among wives of migrant and non-migrant husbands in India, addressing a critical gap in understanding the intersectionality of migration and reproductive health. This study analysed data from the National Family Health Survey-5 (2019-2021) and applied descriptive statistics, and binary logistic regression analyses. Principal Component Analysis and factor analysis were utilised to create indices of demand and supply side factors. In India 91% women live with their husbands at the time of the survey, and 9% have husbands who are migrants. Lakshadweep, Bihar, and Kerala, accounted highest percentages of husband migrants. A significant prevalence of husbands migrating for better job opportunities and a higher standard of living was reported. The results underscore the significant impact of demand and supply-side factors on use of modern reversible methods (odds ratio 0.55; p<0.001, Confidence interval (CI)=1.15-1.20) and unwanted pregnancy (odds ratio 0.85; p<0.001, CI=0.81-0.90) among women with migrant and non-migrant husbands in India..

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Keywords

NFHS, India

Sexual and Reproductive health (SRH),

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Introduction

Male migration profoundly impacts the sexual and reproductive health (SRH) of women, mainly in developing nations. complex relationship The between migration and sexual and reproductive health (SRH) has gained much attention policymakers and researchers from towards protecting fundamental human rights and achieving many of the related sustainable goals. The Sustainable Development 2030 Goals (SDGs) emphasise ensuring universal access to sexual and reproductive healthcare. However, the local realities showcase a dismal picture of the larger context, especially for women with migrant husband, who fall short of these aspirations. Access to sexual and reproductive healthcare services is the core of fundamental human rights (United Nations 2025). However, developing and underdeveloped regions underline the alarming condition of women's sexual and reproductive health when their husbands have migrated (Lu 2012; Mu and Van de Walle 2011). Although long-term policy implications have been set in place at the global level to deal with the problem of migration and access to reproductive health care, ground reality often presents a blurred picture. This research seeks to address the major concerns of wives of migrated husbands, who were exposed to multiple sexual and reproductive health challenges in utilising and accessing reproductive healthcare services.

Previous studies indicate that male outmigration continues to contribute towards contraceptive non-use, unwanted pregnancy, and poor access to family planning services (Mahapatra et al. 2020; Saggurti et al. 2011; 2012). Husbands' migration can complicate women's lives increases the burden as it of responsibilities and workload while at the same time curbing their reproductive rights. These women often face socioeconomic and structural barriers that hinder their physical and mental wellbeing (Roy and Nangia 2005). The Indian context provides a unique setting to study women's sexual and reproductive health, mainly when over half of its population is in the reproductive age group. Despite improvement in family planning, significant variation persists in the use of modern contraceptive methods across districts in India (IIPS and ICF, 2021). However, more pronounced disparity was recorded among women with migrant husbands, highlighting the need for policies and interventions. targeted Existing empirical studies on migration and SRH primarily focus on demand-side factors such as women's agency, decisionmaking, freedom of movement, and media exposure (Mahapatra et al. 2020; McGrath et al. 2015; Saggurti et al. 2011). A substantial proportion of the migrant population in India consists of individuals who are poor and engaged in low-paid jobs, earning less than the national

average (Babu et al. 2019; Ceulemans et al. 2020). These migrant residents were involved in the informal sector, which makes them more vulnerable to livelihood security. The migrant status of the husband placed greater responsibility on left-behind wives and often assumed decision-making and autonomy within the household. In the absence of their husband, these wives generally make decisions related to cooking, daily expenditures and the health and marriage of their children (Roy and Nangia 2005; Lei and Desai 2021). However, the absence of a husband also complicates the lives of these wives, increasing their workload and responsibilities, such as managing the household, tending to the fields, and caring for children and in-laws. Consequently, women face challenges related to physical health, social wellbeing (including social security within the local community), and mental stress (Roy and Nangia 2005).

Migrants often encounter difficulties in accessing healthcare services, particularly women who reside in new locations with limited access to reproductive health services. In South Asian countries, the absence of husbands is likely to negatively impact women's decisions regarding the accessibility of reproductive healthcare services and their use of family planning Women having migrant methods. husbands also lead to poor spousal communication regarding contraception, health care services, and family planning use, adversely affecting women's sexual and reproductive health. The availability and affordability of reproductive health further compound services the vulnerability of migrant women, as they often lack outreach from FLWs. The current healthcare system appears to be ineffective in catering to the needs of migrant women as well. In addition, the supply-side factors of sexual and reproductive health encompass various components of women's reproductive health. The availability and utilisation of reproductive health services mainly depend upon supply-side factors such as health worker outreach and training, wellequipped facilities, and digital exposure (Sundaram et al. 2012). The non-use of contraception is also one of the reasons for the poor outreach of FLW (Mahapatra et al. 2020). The supply-side barrier increases the non-use of contraception when the need arises in the couple, increasing the risk of unwanted pregnancy manifold. The association between women with migrant husbands and contraception use has shown that the use of contraception is low in the absence of a migrant husband. The inability of women to access contraception is low in terms of women having restricted freedom of mobility to go outside the house (Mukherjee et al. 2021). Studies have shown that the stigma attached to women who access contraception is absent. Social and structural barriers negatively impact women's contraception use behaviour.

Myths and misconceptions regarding contraception and its side effects exacerbate the fear in women with migrant husbands (Chebet et al. 2015). Studies show that negative experiences with contraception impede the intention of using contraception among women with migrant husbands. However, there is a paucity of research examining the relationship between demand-side and supply-side factors in the context of husband migration. This gap in examining the challenges of the development of comprehensive strategies to address the sexual and reproductive health needs of this marginalised section of society.

The complex interplay of factors that influence women's sexual and reproductive health (SRH) in the context of husband migration is categorised into demand and supply-side factors. The demand-side factors include socioeconomic and demographic variables that directly affect women's reproductive health. In the broader context, these socioeconomic variables demonstrated that agency includes women's women's education, age at marriage, mobile and access to banking services, ownership of property and access to different forms of media. On the other hand, supply-side availability factors encompass and accessibility of quality reproductive including health worker services, outreach, exposure to family planning services and coverage by health insurance. This relationship between demand and supply-side factors and the husband's migration is multifaceted. Husbands' engagement in the informal sector and a low-earning job increases the vulnerability wives' of left-behind manifold. The left-behind wives may assume that providing greater decisionmaking power burdens them with greater social responsibility and social stigma. Moreover, the absence of husbands also leads to poor communication between spouses regarding women's reproductive decisions, such as contraception and family planning.

Despite the available literature on migration and the sexual and reproductive health of women, there remains significant lacuna а in understanding the interrelation between demand-side and supply-side factors and reproductive outcomes in the context of husband migration. Furthermore, limited availability of literature on governmental and non-governmental interventions that influence the sexual and reproductive health of women with migrant husbands. This study aimed to fill the lacuna between demand-side and supply-side factors of reproductive health outcomes in India. Reproductive health is considered the outcome where the couple can consciously decide on the number of births, spacing, and timing among the children (Lei and Desai 2021; Willan et al. 2020; Philipov et al. 2009). However, despite improvements in family planning, it did not do well regarding women's

reproductive health (Roy and Nangia 2005). The present study investigates the complex dynamics of husband migration status and women's sexual and reproductive health outcomes.

Existing studies on migration and women's sexual and reproductive health, as cited above, mainly highlight numerous availability poor for reasons of reproductive choices among women across India. However, despite empirical studies on migration and the poor reproductive health of women, very few tried to build the linkage between demand and supply-side factors. The present study focused on the interrelation among demand, supply, and outcome variables regarding husband migration. Apart from the above, a clear gap exists in showcasing how state policies or other non-state actors' interventions must influence the reproductive health services of women having migrant husbands. These research gaps are addressed through active policy implementation at the ground level.

Data and Methodology

Data source

This study used the fifth round of the National Family Health Survey data conducted during 2019-21. We have used the sample of currently married women (both having migrated husbands and staying with husbands) between the ages of 15-49 years. The analytical sample

includes women whose husbands are residing outside the place where women are interviewed and those whose husbands were residing at the same place where the interview was conducted. There is no direct information available in the NFHS on husband migration and nonmigrants. The indirect inferences were used to select eligible women for the study. The first criteria were selected for married women and husbands having no other union. Further questions were asked to record women's responses, such as 'Is your husband living with you now, or is he staying elsewhere? (IIPS, 2019-2021; Sinha, Jha, and Negi 2012). The responses were categorised into two bases, first living with her husband, termed as nonmigrant and second staying elsewhere, termed as a 'left behind woman' (husband migrant). The total sample size is 503,704 women, of which 461,074 women were wives of non-migrants, and 42,630 women's husbands migrated (Table 1). The second criteria were selected variables based on availability of National Family Health Survey (NFHS) complete data that is represented by 503,704 samples and availability of data based on state module that is represented by 75,583 samples. The variables included under demand-side factors, supply-side and reproductive outcome have changed according to research carried out on the full NFHS-5 dataset and on the basis of the state module. About 90.8% of women were residing with their husbands, while 9.2%

lived with migrant husbands. A similar result has been represented in the state

sample, as 9.7% of women lived with migrant husbands.

	Percentage (weighted)	Number (unweighted)
Full sample		
Women with non-migrant		
husbands	90.83	4,61,074
Women with migrant husbands	9.2	42,630
State sample		
Wife with migrant husbands	9.78	6,872
Non-migrant	90.22	68,711

Table 1. Level (%) of husband's	migration in	1 India, 2019-21
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Outcome Variable

The outcome variables in this analysis were associated with different sets of indicators like use of modern reversible methods, unintended pregnancy and voluntary termination of pregnancy in terms of abortion (Table 2). In addition, using a condom at last sex as an outcome factor was measured for the state level reproductive outcome. under The demand-side factors were categorised based on examining the direct effect on women's reproductive health, such as women's agency, decision-making, freedom of mobility, exposure to media, and knowledge of contraception. On the other hand, the supply-side factors were met with FLW in the last three months, exposure to the FP message through media and coverage by any health insurance.

Independent variables

The independent and exogenous variables included women's age, women's education in years, parity, caste, religion, and knowledge of contraception. The status of husbands' migration plays an essential role in accessing and utilising demand and supply-side services. The following exposure variables were used for the analysis.

- 1. Women's age was recorded as 15-24 years, 25-35 years, and 35+ years
- Women's education is categorised into four categories 1. < 5 years; 2. 5-10 years schooling; and 10 years schooling.
- 3. Number of living children 0 children; 1 child; 2 children; and 3 and more children.
- 4. The wealth index is categorised into five quintiles -poorest; poorer; middle; richer; and richest.
- 5. Exposure to media is categorised into three categories: no exposure; any exposure, and all exposure.

- 6. The caste of women was categorised into three categories: schedule caste and schedule tribe SC; ST; OBC, and other caste.
- 7. The religion of women was recorded as Hindu; Muslim, and Other
- Knowledge of contraception is recoded as knowing all modern reversible methods (IUCD/pills/injectables/condoms)

and knowing any modern reversible method

(IUCD/pills/injectables/condoms).

- 9. The indicators of women's agency (WA) were created based on factor analysis of women's age; women's education; caste; household wealth; and exposure to media and knowledge of contraceptives.
- 10. The women's decision-making latent factors were created based on the indicators of decisions on women's health, large purchases, visits to farms, and decisions on respondent earnings. The coding was based on the respondent's response if she made the decision "respondent alone" coded 1; if the decision taken by her husband "husband alone" coded 2; and if the decision done by other than 1 or 2 "others" coded marked 3(Rahman, Mostofa, and Hoque 2014; Vaz, Pratley, and Alkire 2016; Acharya et al. 2010). Freedom of mobility was recorded

based on permission to go to the market, access the facility, and go outside the village. Coding 0 if the respondent does not have at all freedom of mobility, 1 if the respondent alone made the mobility-related decisions, and 2 when someone else made the decisions on behalf of the respondent.

- 11. Exposure to FP message through media: variables included here: heard family planning on the radio in the last few months; heard family planning on TV in the last few months; heard family planning in a newspaper/magazine in the last few months; and heard family planning on the internet.
- 12. Incentives/schemes which provided financial assistance, like coverage by life insurance
- 13. The outcome indicator depended upon four major factors: first, use of modern reversible method; second, the variables like unintended pregnancy, and later and no more children were categorised combined child to unwantedness; third, controlling the outcome of a pregnancy/terminating a pregnancy (abortion); and fourth, condom use during last sex.

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Demand-side factors	Supply-side factors	Reproductive health outcome
Women education	Met with healthcare providers	Use of modern reversible method
	Exposure to family planning	
Women age	message through media	Last birth unwanted
Number of living children	Covered by a health insurance	Experience of abortion
Caste		Used condom at last sex
Religion		
Household wealth		
Exposure to media		
Knowledge of contraceptives		
Mobility [@]		
Decision making@		
Access to mobile [@]		
Access to internet@		
Ownership of bank account [@]		

Table 2. Variables specification of the study

Note: @ based on the state level samples

Statistical Methods

Descriptive statistics, including crosstabulations and chi-square, were used to analyse the primary result. Common sample distribution statistics are used to test whether the distribution in the variables statistically categorical is different in two or more groups. The statistical test used to measure the level of significance between the migration status husbands background of and characteristics. The significance level was measured through a p-value of 0.05 or less. In addition, the Principal Component Analysis (PCA) and factor analysis were done to make different composite indexes with the help of Promax oblique factors and Cronbach's alpha. The above 0.50 Cronbach's alpha value was used for the selection of high-weighted factors in the study. Different composite indexes were used to measure women's agency, women's decision-making, and freedom of mobility. However, the final composite index score was divided into three

categories (low, medium and high) based on the tercile. Furthermore, multivariate logistic regression was used with the binary dependent variable (migrant status of husbands) and independent variables (Age, Education, Wealth Index, parity, Caste, Religion, Region, etc).

This model was employed for the binarycoded dependent variable, husband migrant status. The logistic regression model is commonly estimated using the maximum likelihood function for dependent variables. The logistic model follows the general form:

logit
$$p = \ln\left(\frac{p}{1-p}\right) = b_0 + b_1 x_1 + b_2 x_2 + \dots + b_i x_i + e_i$$

Where b1, b2, ... and bi represent the coefficients of each of the independent variables included in the model, while ei is the error term. Ln [p/(1-p)] represents the natural logarithms of the odds of the outcomes.

Results

State-wise husband migration pattern in India

The highest male outmigration was recorded in Lakshadweep (43%), followed by Bihar (27%), Kerala (18%), and Jharkhand (16%) (Figure 1). The reasons for gender disparity in terms of husbands' migration depended on marriage and searching for job opportunities. The regional disparity is recorded in husband migration data. Developed states like Karnataka, Maharashtra, and Tamil Nadu showed a lower percentage of migrant husbands compared to Bihar and Uttar Pradesh. The poor socio-economic conditions, lower wages, and high unemployment rate in rural areas are among the major driving forces of husband migration in India.

Distribution of women by husband migration status across selected background characteristics

Distribution of women by their husband migration status across selected background characteristics is presented in Table 3. The age of women revealed a association significant with their husbands' migration status. The proportion of women with non-migrant husbands increased as age increased -15.8% among women aged 15-24 years, 46.9% among women aged 35 and above. Migration status of husbands also varied by women's educational attainment. For instance, proportion of women with

migrant husbands was higher among those with less than five years of education (34.9%) compared to those with ten or years of education more (25.8%). Additionally, women with non-migrant husbands had a higher proportion of living children compared to women with migrant husbands. Furthermore, husbands' migration status is also significantly associated with household wealth quintiles. The proportion of women with migrant husbands decreased substantially from the poorest (27.3%) to the richest (12.7%) wealth quintile, suggesting a potential link between economic status and spousal migration. Exposure to media a was higher among both - women with migrant and nonmigrant husbands. Knowledge of modern reversible methods was higher among women irrespective of their husbands' migration status. However, front-line workers (FLW) outreach in the past three among months was low women irrespective of husbands' migration status.

Table 3 also presents descriptive statistics of women aged 15-49 years based on their husbands' migration status using state sample. In state sample also, women's age is associated with husband migration status. For instance, proportion of women with migrant husbands increased as age of women increased – 26.3% among those aged 15-24 years, 40.6% among those aged 25-35 years, and 33.1% among women aged 35 and above. Husbands' migration status is also associated with women's educational attainment. The proportion of women with migrant husbands was slightly higher among those with 5-10



Figure 1. State-wise distribution of women with migrant husbands

years of education (38.9%) compared to women with 10 and above years of education (26.2%). However, more than one-third of women had less than 5 years education, irrespective of of their husbands' migration status. Women with more than three children had the highest proportion of migrant husbands (33.3%) while the proportion decreased with decreasing parity. This indicates a potential network among fertility behaviour, reproductive preferences, and spousal migration dynamics. Husband migration status is significantly associated with household wealth quintiles. For instance, proportion of women with migrant husbands decreased substantially from the poorest (26.3%) to the richest (12.2%) wealth quintile. The proportion of women with non-migrant husbands was

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17.8% among poorest quintile and 20.8% among richest quintiles. No exposure to media was higher among wives of migrant husbands (34.3%) compared to those with non-migrant husbands (23.5%).

Key reproductive health outcomes among with husband's migration status

The data presented in Table 4 shows the differences reproductive in health outcomes among women with migrant husbands and non-migrant husbands in India. The results showed comparatively low prevalence of modern reversible methods among wives with migrant husbands (10.89%), while recorded higher prevalence of child unwantedness (p <= 52.71), and voluntary 0.001, χ2 terminated their pregnancy (p < 0.001, χ^2

= 34.49), (9.9%) and (1.8%) respectively. The differences in key reproductive health outcomes between women with nonmigrant husbands and migrant husbands from the state level sample showed significant differences in reproductive outcomes by husband's migration status. For instance, 11.4% of women with migrant husbands compared to 18.7% with non-migrant husbands used modern reversible methods. Moreover, prevalence of condom use during the last sex was reported by women with migrant husbands (14.1%) than non-migrant husbands (13.8%).

Differences in reproductive health outcomes by demand and supply-side factors among with migrant and nonmigrant husbands

Table 5a and Table 5b presents differences in reproductive health outcome between women analyse the women aged 15-49 years based on their husbands' migration status and reproductive outcomes. Data represents the demand and supply-side factors of programme variables of family planning based on the full sample and state sample. For both the demand and supply side-factors, a tercile was created.

Table 5a highlights the association between contraceptive use and husbands' migration status. The proportion of women with migrant husbands who used the modern reversible method was lower in the low-demand-side factor group (8.5%) compared to the medium (10.6%) and high (14.2%) groups. Similarly, this proportion was higher in the high supplyside factor group (16.2%) compared to the low (6.9%) and medium (11.8%) groups. On the other hand, the proportion of women with non-migrant husbands showed a similar pattern of use of modern reversible methods among low, medium, and high categories. Use of modern reversible method was higher among demand-side factors compared to supplyside factor group. The analysis also revealed a significant association between unwantedness and husbands' child migration status. Proportion women who reported last child unwanted was 11.6% among low group, 10.1% among medium group, and 7.6% among high groups. Experience of abortion was higher women with migrant husbands than those with non-migrant husbands. Such proportion increased from low demand-side (1.3%) factors to high demand-side factors (2.2%). Similarly, women with non-migrant husbands had a higher percentage of abortion in the high-demand-side factor group and a lower percentage in the lowdemand-side factor group. The supplyside factor also highlighted a similar pattern of women's reproductive health outcomes.

Analysis based on the state sample reproductive showed that health outcomes such as use of modern reversible methods, unwanted births, abortions, and condom use at last sex, had significant association with both demand-side and supply-side factors. Use of modern reversible method among women with migrant husbands was higher in high demand-side category (13.8%) compared to the medium (11.9%) and low (8.1%) groups. Similarly, the lower prevalence of modern reversible methods recorded among wives of migrant husbands in the

low category of supply-side factors and higher prevalence in the high supply-side factor category (7.7%) and (14.6%), respectively.

Proportion of unwanted birth was higher in the medium demand-side factor group (12.2%) compared to the low (11.2%) and high (8.5%) groups. The supply-side factors showed a similar association as well, women with non-migrant husbands slightly lower prevalence have of unwanted children compared to wives with migrant husbands. The data also indicated a slightly higher percent of abortion among wives with migrant husbands in both demand-side and supply-side factor groups. In addition, the study examined condom use during the last sexual intercourse in the state sample, indicated significant which also а association with husbands' migration status.

Results of multivariate analysis

Results of multivariate analysis showing the effect of husbands' migration status as well as demand and supply side-factors on reproductive health outcomes are presented in Table 6a. The odds ratio estimates highlighted that women with migrant husbands were 45% less likely to use modern reversible methods than their counterparts (Adjusted Odds Ratio (AOR) 0.55; p<0.001). Similarly, wives of migrant husbands have 15% lower odds of last unwanted birth (AOR 0.85; p<0.001) than wives of non-migrant husbands. The odds ratio estimates indicated that demandside factors positively affect family planning practice and attitude towards childbearing. Women with medium demand-side factors were 18% more likely to use modern reversible methods (AOR 1.18; p<0.001). Indeed, 15% of women reported higher child unwantedness compared to those with low demand-side factors. The amplified effect has been reported by women in high-demand-side factors, with 73% higher odds of modern reversible methods. Similarly, 44% of women were more likely to have child unwantedness. Indeed, supply-side factors also demonstrate the strong association reproductive between outcome variables of FP and medium supply-side factors, with 50% more likely to use modern reversible methods than low supply-side factors. Indeed, nine percent higher odds of child unwantedness than their counterparts. Furthermore, high supply-side factors increase the odds 69% of modern 23% reversible methods and unwantedness of children in the study population.

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Demand-side factors	Husbands' migration status: National sample			Husbands' migration status: State sample			
	Women with non-migrant husbands	Women with migrant husbands	Number	Women with non- migrant husbands	Women with migrant husbands	Number	
Women age in years				0			
15-24 years	15.8	26.7	80,688	15.9	26.3	12,086	
25-35 years	37.3	40.9	190,900	37.6	40.6	28,776	
35+ years	46.9	32.4	232,116	46.5	33.1	34,721	
Women education							
<5 years	33.3	34.9	174,762	33.5	34.9	26,246	
5-10 years	43.1	39.4	218 <i>,</i> 510	43.0	38.9	32,761	
10+ years	23.6	25.6	110,432	23.5	26.2	16,576	
Number of living children							
0 child	9.2	13.5	47,486	9.1	12.1	6,920	
1 child	19.5	23.1	97 <i>,</i> 371	19.6	23.6	14,718	
2 children	38.1	30.5	181 <i>,</i> 592	38.1	31.1	27,174	
3 and more children	33.2	32.9	177,255	33.2	33.2	26,771	
Household wealth							
Poorest	17.7	27.4	105,212	17.7	26.3	15,551	
Poorer	19.5	24.8	110,806	19.7	26.0	16,806	
Middle	20.6	18.9	104,634	20.7	19.4	15,833	
Richer	21.3	16.2	96 <i>,</i> 957	21.0	16.1	14,561	
Richest	20.9	12.7	86,095	20.8	12.2	12,832	
Exposure to media		· · · · · · · · · · · · · · · · · · ·					
No exposure	23.2	34.4	129,931	23.5	34.3	19,430	
Any exposure	75.1	64.5	366,729	74.8	64.4	55,116	
All exposure	1.7	1.1	7,044	1.7	1.3	1,037	
Caste		· · · · ·					
Scheduled castes	21.5	21.8	96,942	21.4	21.3	14,323	
Scheduled tribes	9.5	5.7	89,666	9.4	5.9	13,645	
Othe backward castes	42.4	50.2	196,258	43.2	50.3	29,720	
Other	26.6	22.3	120,838	26.0	22.5	17,895	
Religion							
Hindu	82.2	80.0	386,934	81.4	79.2	57,694	
Muslims	12.8	16.7	60,898	13.3	17.4	9,279	

Table 3. Distribution of women by husbands' migration status across selected characteristics, 2019-21

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Others	5.0	3.3	55,872	5.2	3.4	8,610
Knowledge of contraceptive						
Knows any modern reversible method	26.9	23.4	139,783	26.3	23.6	20,218
Knows all modern reversible method	73.1	76.6	363,921	73.7	76.4	55,365
FLW outreach for FP in last 3 months						
No	93.6	92.7	471,319	93.6	92.8	70,829
Yes	6.4	7.3	32,385	6.4	7.2	4,754
Exposure to FP message through media						
No exposure	33.4	38.3	180,383	33.7	40.0	26,865
Any exposure	66.6	61.7	323,321	66.3	60.0	48,718
Covered by a health insurance						
No	68.9	77.8	339,144	68.2	77.3	50,503
Yes	31.1	22.2	164,560	31.8	22.7	25,080
Mobility§						
Not at all				4.4	4.1	2,975
Alone				64.4	65.1	49,026
With someone else				31.2	30.8	23,582
Decision making§						
Respondent alone				16.9	26.5	12,768
Husband alone				1.6	0.3	1,248
Other				81.5	73.2	61,567
Access to mobile§						
No				45.2	23.1	32,767
Yes				54.8	76.9	42,816
Access to internet§						
No				71.9	64.6	54,503
Yes				28.1	35.4	21,080
Ownership of bank account [§]						
No				20.5	15.9	14,908
Yes				79.5	84.1	60,675

§Based on the state sample

National sample								
Reproductive health outcome	Women with non- migrant husbands	Women with migrant husbands	All women	p-value				
Use of modern reversible method	17.9	10.8	17.3	0.000				
Last child unwanted	8.4	9.8	8.6	0.000				
Experience of abortion	1.5	1.8	1.5	0.000				
State sample								
Use of modern reversible method	18.7	11.4	18.0	0.000				
Last child unwantedness	8.7	10.4	8.9	0.005				
Experience of abortion	1.5	1.9	1.6	0.012				
Used condom at last sex	13.8	14.1	13.8	0.036				

Table 4. Differences in reproductive outcomes (%) between women with non-migrant and migrant husbands in India, 2019-21

Table 5a. Differences (%) in reproductive health outcomes among women with migrant and non-migrant husbands by demand and supply-side factors, 2019-21 (full sample)

Reproductive	Husbands' migration status	Low	Mediu	High	Numbe	p-		
health outcome			m	-	r	value		
Demand-side factors								
Use of modern	Women with non-migrant	12.9	16.1	23.6	461,074	0.000		
reversible method	husbands							
	Women with migrant husbands	8.5	10.6	14.2	42,630			
Last child unwanted	Women with non-migrant	10.9	8.8	6.6	165,078	0.000		
	husbands							
	Women with migrant husbands	11.6	10.2	7.7	20,674			
Experience of abortion	Women with non-migrant	0.9	1.5	2.1	461,074	0.000		
_	husbands							
	Women with migrant husbands	1.3	2.3	2.2	42,630			
	Supply-side facto	ors						
Use of modern	Women with non-migrant	11.3	20.6	21.9	461,074	0.000		
reversible method	husbands							
	Women with migrant husbands	6.9	11.8	16.2	42,630			
Last child	Women with non-migrant	10.2	7.8	7.7	165,078	0.000		
Unwanted	husbands							
	Women with migrant husbands	11.3	9.2	8.7	20,674			
Experience of abortion	Women with non-migrant	1.2	1.7	1.6	461,074	0.000		
_	husbands							
	Women with migrant husbands	1.5	1.9	2.3	42,630			

Analysis based on the state sample reveals that women with migrant husbands have substantially lower odds of using modern reversible methods (AOR 0.52; p<0.001) 16% lower odds of and child unwantedness (Table 6b). Demand and factors showed supply а strong relationship with of modern use contraceptive. The medium demand-side factors were 35% more likely to use modern reversible methods than nine higher odds of child percent unwantedness. The high demand-side factors were 2.17 times more likely to affect modern reversible methods than their counterparts. High demand-side factor was 36% more likely to have unwantedness of their last child (AOR 1.36; p<0.001). However, the supply-side demonstrated a significant association with indicators of reproductive outcome. The medium supply-side factor, 38%, was more likely to influence the use of modern reversible methods and 16% higher child unwantedness. While high supply further increases the odds ratio value by 58% and 32%, the child's unwantedness increases. Analysis based on the state sample reveals that women with migrant husbands have substantially lower odds of using modern reversible methods (AOR 0.52; p<0.001) and 16% lower odds of child unwantedness (Table 6b). Demand and factors showed supply а strong relationship with of use modern contraceptive. The medium demand-side factors were 35% more likely to use modern reversible methods than nine odds percent higher of child unwantedness. The high-demand-side factors were 2.17 times more likely to affect modern reversible methods than their counterparts. High demand-side factor was 36% more likely to have unwantedness of their last child (AOR 1.36; p<0.001). However, the supply-side demonstrated a significant association with indicators of reproductive outcome. The medium supply-side factor, 38%, was more likely to influence the use of modern reversible methods and 16% higher child unwantedness. While high supply further increases the odds ratio value by 58% and 32%, the child's unwantedness increases.

Discussion

The present paper examined relationship between husbands' migration status and selected reproductive health outcomes among married women aged 15-49 years in India using the National Family Health Survey data conducted during 2019-21. The findings unveiled significant connections between husbands' migration status and selected reproductive health indicators, including the use of modern reversible contraceptive methods, the of unwanted incidence births, and experience of abortion.

Table	5b.	Differences	(%)	in	reproductive	health	outcomes	among	women	with
migrai	nt an	n <mark>d non-migr</mark> a	nt hu	sba	ands by demai	nd and s	supply-side	factors,	2019-21	(state
sample	e)									

Reproductive health outcome	Husbands' migration status	Low	Medium	High	Number	p-value
Use of modern	Women with non-migrant	12.4	16.5	26.4	68,711	0.000
	Women with migrant husbands	8.1	11.9	13.8	6,872	
Last child unwanted	Women with non-migrant husbands	10.9	8.6	7.4	24,853	0.005
	Women with migrant husbands	11.2	12.2	8.5	3,325	
Experience of abortion	Women with non-migrant husbands	0.8	1.5	2.2	68,711	0.012
	Women with migrant husbands	0.9	2.5	2.1	6,872	
Used condom at last sex	Women with non-migrant husbands	7.7	11.8	21.2	61,578	0.036
	Women with migrant husbands	8.7	13.6	19.4	5,398	
Use of modern reversible method	Women with non-migrant husbands	11.9	21.2	23.2	68,711	0.000
	Women with migrant husbands	7.7	13.2	14.6	6,872	
Last child unwanted	Women with non-migrant husbands	10.3	8.2	7.8	24,853	0.005
	Women with migrant husbands	11.6	9.8	9.5	3,325	
Experience of abortion	Women with non-migrant husbands	1.1	1.9	1.7	68,711	0.012
	Women with migrant husbands	1.7	1.8	2.5	6,872	
Used condom at last sex	Women with non-migrant husbands	7.4	16.7	17.1	61,578	0.036
	Women with migrant husbands	8.2	18.4	16.4	5,398	

Table 6a. Adjusted Odds ratio (OR) and its 95% confidence intervals (CI), for observing the effect of demand and supply factors on women's reproductive health outcome in India, 2019–21 (full sample)

Independent Variables	Use of modern	Last child						
	reversible method	unwanted						
Husband migration status								
Women with non-migrant husband	ls®							
Women with migrant husbands	0.55***[0.54-0.57]	0.85***[0.81-0.90]						
Demand-side factors								
Low®								
Medium	1.18***[1.15-1.20]	1.15***[1.10-1.20]						
High	1.73***[1.7–1.76]	1.44***[1.38-1.51]						
Supply-side factors								
Low®								
Medium	1.50***[1.47-1.53]	1.09***[1.05-1.14]						
High	1.69***[1.66-1.72]	1.23***[1.18-1.29]						
0.001/1/1/1 0.01/1								

®Reference category ;<0.001***, <0.01**, <0.05*.

Table 6b. Adjusted odds ratio (OR) and its 95% confidence intervals (CI), for observing the effect of demand and supply factors women's reproductive health outcome in India, 2019–21 (State level)

Independent Variables	Use of modern reversible method	Last child unwanted
Husband migration status		
Women with non-migrant husbands®		
Migrant Husband	0.52***[0.48-0.56]	0.84***[0.74-0.95]
Demand-side factors		
Low®		
Medium	1.35***[1.28-1.42]	1.09 [0.98-1.21]
High	2.17***[2.06-2.28]	1.36***[1.22-1.52]
Supply-side factors		
Low®		
Medium	1.38***[1.32-1.45]	1.16**[1.04-1.29]
High	1.58***[1.5–1.66]	1.32***[1.17-1.48]

®Reference category ;<0.001***, <0.01**, <0.05*

Disparity emerged in the use of modern reversible contraceptive methods between women with migrant husbands and those with non-migrant husbands. Specifically, women with migrant husbands exhibited a lower prevalence of contraceptive use when compared to women whose husbands did not migrate (Mahapatra et al. 2020).

Several factors can be attributed to the lower contraceptive use among women with migrant husbands. One compelling reason is that separation of couples due to migration hinder effective communication and decision-making regarding

contraceptive (Lindstrom use and Hernández 2006). Additionally, concerns about side effects, a perceived lack of necessity for contraception, insufficient time for preparation before sexual activity, limited knowledge about contraception, and lack of preparedness to have contraception readily available during a husband's visit can all discourage use of reversible modern methods. These findings indicate that factors related to the availability of demand and supply-side factors substantially impact accessibility and utilisation of reproductive health services. This findings are consistent with highlighting previous research the challenges faced by migrant families in accessing and using reproductive health services, including family planning (UNESCO, New Delhi et al. 2011; Desai and Banerji 2008).

Furthermore, the study unveiled а noteworthy association between the utilisation of contraceptives and an array of demand and supply-side variables, including education, age, parity, household wealth, exposure to media, and knowledge of contraceptive methods. These findings support the current body of literature, which underscores the impact of socio-economic and cultural contraceptive factors on utilisation (Cleland and Ali 2006; Westoff and Bankole 1997).

This paper also posits an important implication and recommends specific actions to address the reproductive health challenges faced by women with migrant husbands. These findings align with previous research that has established a connection between migration and an increased risk of unintended pregnancies and ended with induced abortions (Lindstrom and Hernández 2006). The higher rates of unwanted births among women with migrant husbands may be attributed to difficulties in accessing and utilising the family planning services, as well as the disruption in spousal communication resulting from the caused separation by migration (Mukherjee, Mahapatra, and Saggurti 2021). It is crucial to enhance the accessibility and utilisation of family planning services for this population. Efforts must be made to ensure that these services are accessible, affordable, and customised to the unique needs and circumstances of women who have spouses who are migrants. Furthermore, these findings may also suggest that women with migrant husbands are more likely to resort to abortion as a means of pregnancies, addressing unintended potentially due to limited access to or utilisation of contraceptive methods. A high number of unintended pregnancies increases the likelihood of abortion and intimate partner violence (IPV) by 4-5 compared to times women not experiencing reproductive coercion (Silverman et al. 2019; Uthman, Lawoko, and Moradi 2009; Grace and Anderson 2018).

The study also shed lights on the influence of various socio-economic and empowerment factors on reproductive health outcomes. The study yielded significant associations between husbands' migration status and factors such as age, education, parity, household wealth, exposure to media, caste, religion, knowledge of contraceptives, access to healthcare providers, and family planning messages. Husbands' migration leads to transformative change in the social and economic aspects of women's lives, often resulting in their subordination (Sinha, Jha, and Negi 2012). Structural barriers within families and society hinder with women's progress migrant husbands. In the absence of their husbands, women with migrant husbands often assume their responsibilities and manage outside work, such as tending to the farm (Colfer, n.d.). Findings highlighted that some sole indicators cannot represent the actual result. Previous studies have suggested that women may excel in one indicator of empowerment but not others (Hashemi, Schuler, and Riley 1996; Mukherjee, Mahapatra, and Saggurti 2021). The agency and autonomy of women depend on multi-dimensional indicators, and the wives may perceive their husbands' work as their duty, not always aligning with their own desires.

The findings of this study have significant implications for policymakers, program implementers, and healthcare providers. Firstly, it is imperative to augment access to and delivery of family planning services, with a particular focus on regions with elevated migration rates. This may entail the deployment of mobile health clinics, community-based information dissemination about modern reversible contraceptive methods, and targeted outreach initiatives aimed at reaching populations. Secondly, migrant interventions targeted at enhancing spousal communication and decisionmaking about family planning should be accorded with priority. This might encompass a couple counselling sessions, community-based educational campaigns, and the involvement of male partners in family planning endeavours. Thirdly, addressing socio-economic disparities and promoting women's empowerment are crucial to enhancing reproductive health outcomes. This could be achieved through initiatives such as improving educational fostering accessibility, economic opportunities for women, and creating an enabling environment women's for involvement in decision-making processes. Lastly, further research is indispensable for comprehending the intricacies and complexities of the link among husbands' migration, demand and supply-side factors, and reproductive health outcomes. Qualitative studies could offer valuable insights into the experiences, perspectives, and decisionmaking processes of migrant families, thereby facilitating the development of

effective more and context-specific attending to these interventions. By implementing implications and the recommended measures, policymakers, healthcare providers, and organisations can endeavour to ameliorate reproductive health outcomes for women with migrant spouses and alleviate the inequalities they encounter in the context of migration.

Conclusion

This study has helped us better understand how migration husbands' status affects reproductive health outcomes among married women in India. The findings highlight the implementing importance of focused interventions that tackle the specific challenges encountered by migrant families in accessing and utilising reproductive health services. Additionally, it highlights the importance of addressing socio-economic inequalities and promoting women's empowerment. By taking action on these factors, policymakers and healthcare providers can contribute to improving maternal and reproductive health outcomes, ultimately benefiting families and communities affected by migration.

Declarations

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Ethical declarations

The present study utilizes a secondary dataset available in the public domain for legitimate research purposes with no identifiable information on the survey participants. Hence, there is no requirement for any additional ethical approval.

Consent for publication

Not applicable. No details, images or videos related to individual participants were obtained. In addition, data are available in the public domain.

Competing interests

The authors declare no competing interests.

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Supplementary material

Independent variables	Use of modern reversible method	Last child unwanted
Age of women in years		
15-24 years®		
25-34 years	1.03*[1.01-1.05]	1.68***[1.61-1.75]
35 and more years	0.57***[0.56-0.59]	1.46***[1.37-1.55]
Education of women in years		
<5 years®		
5-10 years	1.35***[1.32–1.37]	0.95*[0.91-1.10]
10+ years	1.70***[1.66-1.74]	0.84***[.79-0.89]
Parity		
0 child®		
1 child	3.32***[3.21-3.43]	0.88**[0.80-0.96]
2 children	2.65***[2.57-2.75]	0.49***[0.44-0.53]
3 or more children	2.36***[2.27-2.45]	0.24***[0.22-0.26]
Household wealth		
Poor®		
Poorer	1.00 [0.98-1.02]	1.06*[1.01-1.11]
Middle	0.88***[0.86-0.90]	1.16***[1.1-1.23]
Richer	0.91***[0.88-0.93]	1.22***[1.14-1.29]
Richest	1.22***[1.19-1.26]	1.31***[1.22-1.41]
Exposure to media		
Not at all®		
Less frequently	0.96***[0.94-0.98]	0.98 [0.93-1.02]
More frequently	0.96 [0.91-1.02]	1.31**[1.09-1.58]
Caste		
Scheduled castes®		
Scheduled tribes	1.06***[1.03-1.09]	1.58***[1.49-1.68]
Other background castes	0.84***[0.82-0.85]	1.16***[1.1-1.21]
Other	1.29***[1.26-1.32]	0.96 [0.91-1.02]
Religion		
Hindu®		
Muslim	1.72***[1.68-1.75]	1.18***[1.12-1.24]
Other	1.50***[1.47-1.54]	1.07 [1.10-1.14]
Knowledge of contraceptive		
Knows no modern reversible method®		
Knows all modern reversible method	1.70***[1.67-1.73]	0.98 [0.95-1.03]
FLW outreach for FP in last 3 months		
No®		
Yes	1.05***[1.03-1.07]	1.2***[1.16-1.24]
Exposure to FP message through media		
No Exposure®		
Any exposure	1.36***[1.34-1.39]	1.12***[1.08-1.16]
Covered by a health insurance		
No®		
Yes	0.90***[0.89-0.92]	1.23***[1.19-1.28]

Appendix 1: Adjusted odds ratio from binary logistic regression model predicting likelihood of women's reproductive outcome indicators and background characteristics, 2019-21

Note: ®Reference category. <0.001***, <0.01**, <0.05*.

Appendix 2: Adjusted odds ratio from binary logistic regression model predicting likelihood of women's reproductive outcome indicators and background characteristics (State level dataset)

_

Independent Variables	Use of modern reversible method	Last child unwanted
Age in years		
15-24 years®		
25-34 years	1.05 [0.99-1.11]	1.59***[1.42-1.78]
35 and more years	0.58***[0.54-0.62]	1.31**[1.11-1.54]
Education in years		
<5 years®		
5-10 years	1.30***[1.23-1.37]	0.91 [0.81-1.02]
10+ years	1.48***[1.39-1.59]	0.82**[0.7-0.95]
Parity		
0 child®		
1 child	3.30***[3.03-3.60]	0.89 [0.7-1.13]
2 children	2.59***[2.38-2.83]	0.50***[0.4-0.64]
3 or more children	2.36***[2.15-2.6]	0.25***[0.2-0.32]
Household wealth		
Poor®		
Poorer	0.99 [0.93-1.05]	1.06 [0.93-1.20]
Middle	0.80***[0.74-0.85]	1.2*[1.04-1.38]
Richer	0.85***[0.79-0.92]	1.25**[1.07-1.47]
Richest	1.13**[1.04-1.22]	1.38**[1.14-1.66]
Exposure to media		
Not at all®		
Less frequently	0.92**[0.87-0.97]	0.97 [0.86-1.08]
More frequently	0.88 [0.75-1.03]	1.33 [0.83-2.12]
Caste		
Scheduled castes		
Scheduled tribes	1.08*[1.01-1.15]	1.54***[1.32-1.80]
Other backward castes	0.85***[0.80-0.90]	1.13*[1.10-1.27]
Other	1.36***[1.28-1.44]	0.92 [0.8–1.06]
Religion		
Hindu®		
Muslim	1.69***[1.59–1.78]	1.15*[1.01-1.31]
Other	1.48***[1.38-1.57]	1.10 [0.94-1.30]
Knowledge of contraceptive		
Knows no modern reversible methods®		
Knows all modern reversible methods	1.67***[1.59–1.76]	0.98 [0.89–1.09]
FLW outreach for FP in last 3 months		
No®		
Yes	1.02 [0.97–1.07]	1.17**[1.07-1.28]
Exposure to FP message through media		
No exposure®		
Any exposure	$1.34^{***}[1.27-1.40]$	1.17**[1.06-1.3]
Covered by a health insurance		
NO®		
Yes	0.93**[0.89-0.97]	1.31***[1.19–1.46]
Freedom of mobility		
Not at all®	1 10*[1 00 1 05]	1 0/+[1 0/ 1 50]
Alone	1.13^[1.02-1.25]	1.26^[1.04-1.52]
With someone else	1.05 [0.95–1.17]	1.31**[1.08-1.58]
Decision-making		
Respondent Alone	0.80 [0.75, 1.04]	
nuspanu Alone	U.07 [U./J-1.U0]	1.11 [U./O-1.03]
Others	1.15 [1.07-1.19]	1.18""[1.05-1.34]
Access to mobile		

No®			
Yes	1.13***[1.08-1.19]	1.08 [0.98-1.2]	
Access to internet			
No®			
Yes	1.30***[1.24-1.37]	0.90 [0.80-1.01]	
Access to bank account			
No®			
Yes	0.93**[0.88-0.98]	1.04 [0.94-1.16]	

Note: ®Reference category. <0.001***, <0.01**, <0.05*