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Can Couple Focused Counselling Improve Outcomes for Newborns and Recently Delivered Women? Evidence from Rural India, 2019-21

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Abstract

India has made significant progress in maternal and newborn health. Still, the country faces challenges in meeting selected health-related SDG goals. This study, the first of its kind in India, investigates whether comprehensive counselling for both women and their husbands (jointly or independently) improves maternal and newborn health outcomes compared to partial or no counselling for either partner. Using the National Family Health Survey-5 (2019-21) couple data, we analyzed 11,613 couples with recent births. Outcomes included low birth weight, postpartum care utilization, and contraceptive use. Comprehensive counselling covered pregnancy complications, institutional delivery, nutrition, and family planning. Variations across states in counselling coverages are evident. Logistic regression suggests that couples receiving comprehensive counselling showed better outcomes than those with partial or no counselling. When both partners were counselled, the odds of low birth weight decreased (AOR: 0.60; 95% CI: 0.52–0.68), postpartum care utilization increased (AOR: 4.23; 95% CI: 3.55–5.03), and contraceptive use improved (AOR: 1.67; 95% CI: 1.45–1.92) compared to couples with partial or no comprehensive counselling. Counselling women alone was more effective than counselling only husbands, and almost as effective as counselling both partners, which yielded the best outcomes. While counselling women is crucial, involving husbands significantly enhances pregnancy related outcomes. Health systems should prioritize couple-focused counselling to optimize maternal and newborn health.

Keywords: counselling, couple, contraceptive use, low birth weight, postpartum care, India

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Introduction

While commendable progress has been made in health and care access parameters in general over the course of this century, India may still not be in a position to meet many of the health-related SDG goals by 2030. For instance, even in 2019-21, around 18 percent of children in India were born with low birth weights, and rates were particularly high in rural areas and less progressive states. The neonatal mortality rate (NNMR) was 29.5 per 1,000 live births with 83 percent of neonatal deaths resulting from complications associated with low birth weight [1]. And just three in five newly delivered women (84%) received their first postpartum checkup in the first two days after delivery [2], Among the social determinants that may be associated with these somewhat sluggish achievements may be the limited engagement of husbands in women's pregnancy and post-partum outcomes.

Including male partners in the process of pregnancy-related care has the potential for reducing negative health outcomes [3–14]. Women themselves have expressed a desire for partners to be more involved in maternal and child health care, and in many cases, men are interested in being involved.[15] Men's engagement in pregnancy-related matters improves maternal health-related outcomes for women, including skilled attendance at delivery and postnatal care [16]. Better knowledge about pregnancy-related care and a positive gender attitude among them enhances maternal health care utilization, the husband's presence during antenatal care visits markedly increases the chances of women's delivery in institutions. [17] Their involvement in providing emotional, practical, and financial assistance reduces maternal stress and enhances the uptake of routine postpartum care [13, 18–20], and their involvement in caregiving was linked to a decrease in postnatal depressive symptoms among mothers [21]. Conversely, inadequate support from husbands has been associated with the worsening of mental health in new mothers. [22]

Although evidence from LMIC, including India, suggests that husbands can play an important role in couple's reproductive health including pregnancy-related care, the role of husbands tend to remain overlooked. In India, policies and programmes have acknowledged the importance of reaching men in order to enhance couple reproductive health (Table S1), yet in practice, programmes have failed to engage men. Health workers neglect men, and fail to provide information or comprehensive information to husbands on contraception or maternal and child health care.[23–28] As a result, many husbands are themselves unaware of contraception and pregnancy-related care, being excluded by both socio-cultural norms and programs [29].

Attitudes remain traditional: many men and families considered maternal care to be unnecessary, and incurring unnecessarily 'high' costs. Gender disparities continue to prevail and are a primary barrier inhibiting women's access to healthcare services [27] and men's reluctance in taking part in maternal health care.

The importance of counselling throughout pregnancy and the postpartum period is well established [30]. It is linked with the likelihood of delivering a healthy infant and reducing the risk of low weight new-borns [31–33], and doubling the likelihood of accessing postnatal care services [30]. Nutritional counselling has been observed to improve compliance with dietary guidelines and improve gestational and birth weight, as well as anaemia levels [34] in high income countries [35], but evidence from developing countries is limited [36]. High-quality and respectful contraceptive counselling is critical for promoting the use of modern contraceptives and addressing couples' post-partum family planning needs and goals effectively [37, 38]. Effective family planning counselling, particularly regarding side effects and misconceptions, is correlated with increased utilization and sustained continuation of contraceptive methods among couples [39, 40]. Unfortunately, counselling has focused almost entirely on women -- efforts to enhance men's knowledge about obstetric danger signs, their involvement in birth spacing, birth preparedness, complication readiness and infant and child care remain compromised in developing countries [27].

Studies relating to couple counselling have adopted different approaches. Some define couple-based counselling as activities reaching couples together, and couple-focused counselling as a flexible model that may initially target the couple together, but later involves individual-based activities and services separately to partners depending on the couples' expressed wishes [41, 42]. A systematic review has observed that common indicators of male involvement have been attendance in antenatal visits, during childbirth and HIV testing, and provision of financial support; it notes, however, that studies rarely collected data from men directly [43].

The objective of this study is to explore the extent to which counselling of women and their husbands, whether separately or independently, affects maternal health outcomes. More specifically, we explore whether engaging women as well as their husbands in counselling sessions is more likely to improve outcomes than engaging only women. Comprehensive counselling is defined here as counselling on maternal danger signs, delivery advice, nutritional care and post-natal contraception; outcomes include birth weight, postpartum care, and contraception use. The study is unique in that it draws on data available in India's NFHS-5 survey that refer to couples rather than individuals, and allows us to explore associations between specific items of counselling and maternal health outcomes.

Data and Methods

Unit-level data were drawn from the fifth round of the National Family Health Survey (NFHS-5) conducted in 2019-21. NFHS-5, the Indian version of the Demographic and Health Survey (DHS), aims to gather information on population, health, and nutrition indicators for each state and union territory. The survey adopted a multistage sampling method to select respondents. In rural areas, villages were selected as Primary Sampling Units (PSUs) in the first stage, and in the second stage, the survey questionnaire was implemented for 22 households, selected randomly from each selected PSU. This nationwide survey collected information from men aged 15-59 and women aged 15-49. A total of 724,115 women and 101,839 men participated in the NFHS 5 survey. This study included a matched sample of 43,581 women and their husbands, referred to as the couple file; information regarding counselling on maternal and child health was available in this file. Counselling-related questions related only to the last birth that took place in the five years preceding the survey, bringing the total number of couples for this study down to 11,613, and further, after excluding missing values, to 10,250 for birth weight, 11,497 for mother's postnatal care, and 8,566 for contraceptive use (after dropping 863 pregnant women and 2,068 women with children aged less than 6 months) (Figure 1).

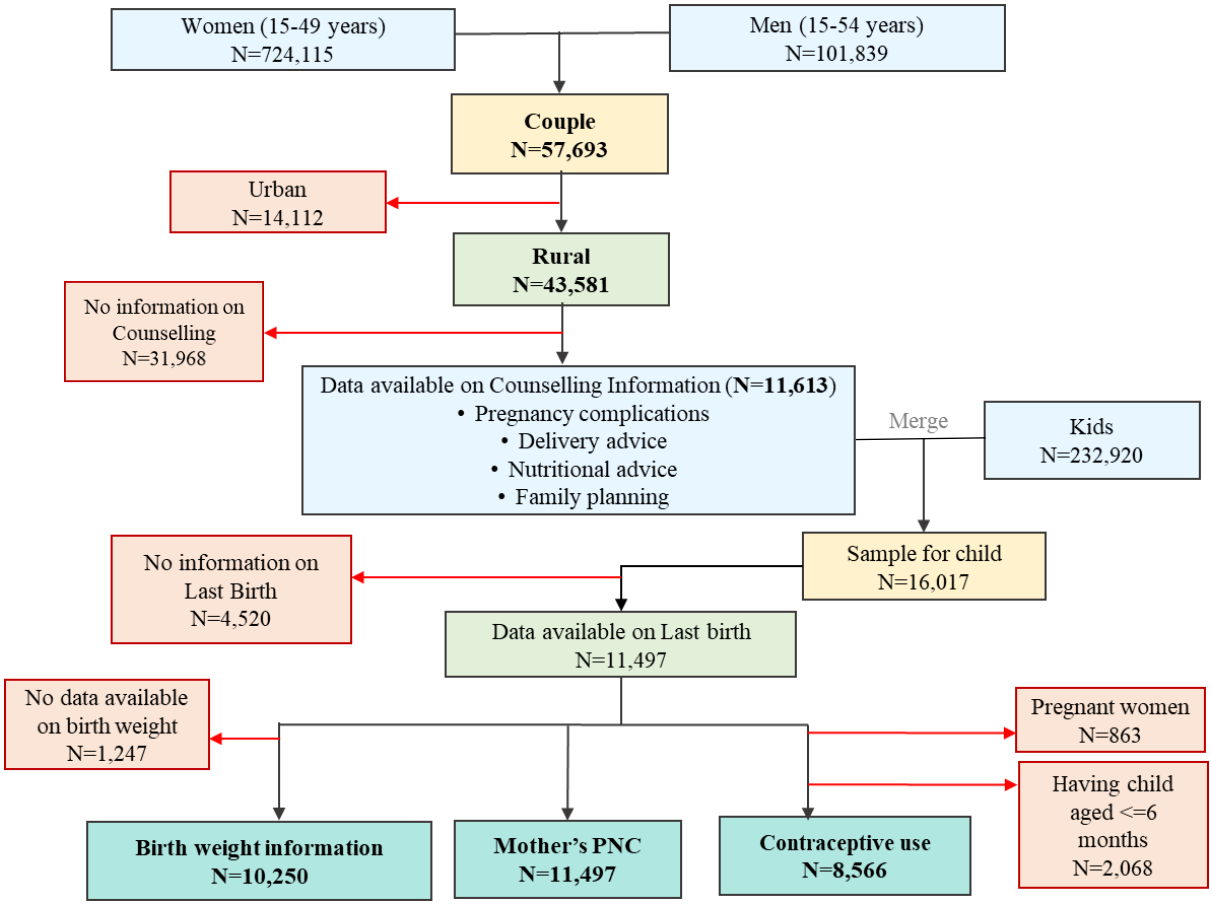

Figure 1. Flow chart showing the sample selection for the study

Outcome indicators

As mentioned above, we explore the association of couple counselling with three outcome indicators. Birth weight was assessed through questions on whether the baby was weighed at birth, his/her weight as assessed by recall as well as through a health card if one was available. Birth weight was coded as 1 if weight was under 2500 grams, and 0 if 2500 grams or more [44]. Postpartum care was coded as 1 if the woman attended a health facility for postpartum care services within 42 days of delivery, and 0 if she had not sought services in this period. Finally, contraceptive use was measured through a calendar providing a monthly history of reproductive events – for this study, we excluded those who were pregnant or whose last child was aged less than six months. Those who had practised contraception were assigned a value of 1, and if not, 0.

Explanatory variables

We explored four components of counselling received by the woman and/or her husband during pregnancy and childbirth, and delivered by any health worker: provision of information regarding danger signals and pregnancy complications, the importance of institutional delivery,

general health and nutrition including about postpartum care, and family planning. Women were asked whether (a) they received counselling any time during their last pregnancy in the course of their ANC check-ups or interaction with any health worker, and whether, in the course of these interactions they were told about signs of pregnancy complications, and specifically, vaginal bleeding, convulsions, prolonged labour, severe abdominal pain and high blood pressure, and the facility they should attend if experiencing these complications; (b) whether, during the last three months of the last pregnancy, they met an ANM, lady health visitor, ASHA, Anganwadi worker or other community health worker and were provided health and nutrition education; (c) whether, in the course of these interactions, the provider has informed the woman about the importance of institutional delivery; and (d) whether she had been advised about family planning for delaying or avoiding another pregnancy. Husbands were asked a similar (but not identical, less detailed) set of questions on the same themes.

Based on the responses to these questions, we created a summary measure of counselling, namely, comprehensive counselling on all four matters (signs of complications during pregnancy, delivery advice, nutritional advice, and family planning advice), categorizing responses into three groups: information on all four themes was received, information on a few themes was received, and information was not provided on any theme. We further generated four sub-groups, namely, couples among whom (a) the woman, the husband or both had received partial information on 1-3 matters or had not received any information on these matters; (b) the husband had received comprehensive information, and the woman received partial or no information; (c) the woman had received comprehensive information, and the husband received partial or no information; and (d) both the woman and the husband had been fully informed on all matters.

Confounding factors

Our analyses controlled for a number of selected variables. These included the woman's age, level of schooling completed (none, primary, secondary or higher) birth order of the last child, employment status, exposure to television, and the age gap between the woman and her husband (less than 3 years, 3 or more years). The husband's education and occupation (agricultural, manual labour, service, business) and exposure to television were also controlled. At household level, household size (less than 5 members, 5 or more), economic status as measured by wealth quintiles, religion (Hindu, Muslim and other), social castes (Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC) and other). Finally, region was also controlled (north, north-east, south, central, west and east).

Statistical Analysis

Descriptive statistics were utilized to summarize socio-demographic characteristics and counselling exposure among couples. Bivariate associations between counselling status and each outcome low birth weight, postpartum care utilization, and contraceptive use were examined using cross-tabulations and chi-square tests to assess statistical significance.

To evaluate the adjusted effect of comprehensive counselling on maternal and newborn outcomes, we employed multivariable logistic regression models. For each outcome, two models were estimated:

Model A: Included all couples, comparing outcomes based on counselling exposure (none/partial vs. comprehensive for either or both partners).

Model B: Restricted to couples where at least one partner received comprehensive counselling, comparing effectiveness between counselling to husbands only, wives only, and both.

The general form of the logistic regression model used is as follows:

$$log\frac{P\ (Y=1)}{1-P\ (Y=1)} = \beta_0 + \beta_1 Counselling_{ij} + \sum_{k=2}^{n} \beta_k X_{ik}$$

Here, Y is the binary outcome variable (low birth weight, postnatal care utilization, contraceptive use). *Counselling $_{ij}$* is the key predictor capturing counselling status of the woman (i) and her husband (j), categorized as: none/partial, husband only, wife only, both received comprehensive counselling. Control variables (X_k) include woman's age, education, employment age at last birth; husband's education, occupation; spousal age gap; birth order and sex of the child; household wealth, caste, religion, size; region; and television exposure. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were estimated using Stata 17, accounting for survey weights and complex sampling design.

Results

Socio-demographic differences between women and their husbands were evident. Overall, husbands were older and better educated than women. While just 21 percent of women were employed, 55 percent of husbands reported non-agricultural occupations. Women's mean age at the time of their last birth was 26 years. For 67 percent of women, the last birth was of second or higher order. About 23 percent households were from rich or richest wealth quintiles (Table 1).

Table 1. Selected characteristics of currently married women aged 15-49 and husbands (%)

Characteristics	Women	Husbands
Individual characteristics		
Mean Age (years)	27	32
Spousal age difference (mean years)	5	
Education		
Secondary or more	63.9	70.5
Employment status		
Working	20.6	89.7
Occupation		
Non-agricultural employment	9.9	55.0
Woman's exposure to TV: exposed	85.2	--
Woman's age at birth of last child (mean)	26 years	--
Infant characteristics		
Birth order of last child: 2 or higher	66.5	
Last birth female	46.8	
Household characteristics		
Household size 5 or more	74.0	
Wealth Index		
Rich or richest (4^{th}-5^{th})	22.7	
Religion		
Hindu	74.8	
Caste		
SC/ST	45.2	
Region		
North	18.3	
Central	26.3	
East	19.2	
North-east	17.0	
West	8.9	
South	10.2	
Number	**11,497**	**11,497**

As seen in Table 2, large proportions of women and husbands had received counselling on all indicators. However, counselling status varied considerably between women and their

husbands, with more women than husbands receiving counselling on every indicator. For example, 57 percent of husbands, compared to 74 percent of women were advised about pregnancy related complications by health workers or providers. Likewise, 74 percent of husbands and 89 percent of women had received guidance concerning the importance of institutional delivery, and 81 percent of husbands and 85 percent of women were counselled about nutrition. Differences were wider with regard to family planning-related counselling, with far fewer husbands than women (67 % vs. 84 %) informed about the importance of family planning or delaying or avoiding another pregnancy. Just 10 percent of husbands and 8 percent of women nationwide received no counselling about pregnancy related complications, delivery, nutrition or family planning. Overall, just over half of all women (52%) and two-fifths of husbands (41%) had been comprehensively counselled. Among almost one-third of all couples (31%), neither women nor husbands had been exposed to comprehensive counselling, and in just one-quarter (24%) both had been exposed.

An overview of key outcome healthcare indicators in India during 2019 to 2021 suggests that 17 percent of infants were of low birth weight. Postpartum care services within 42 days of delivery were received by 84 percent of women, and 73 percent of couples were using any method of contraception (Table 2).

Table 2. Exposure to various components of counselling among married women aged 15-49 and husbands and key outcomes experienced (%)

Components of counselling to which couples exposed	**Women**	**Husbands**
Components of counselling		
Told what to do if mother has pregnancy related complications	73.8	56.9
Discussed the importance of institutional delivery	89.4	73.8
Provided health and nutrition advice	85.2	80.5
Discussed family planning to delay subsequent pregnancy	84.2	66.8
Comprehensive counselling		
Both woman and husband received partial or no information	31.3	
All information received by husband only, women received partial or no information	16.9	
All information received by woman only, husband received partial or no information	27.6	
All information received by both woman and husband	24.2	
Key outcomes		
Low birth weight	17.1	
Sought postpartum services	84.2	
Contraceptive use	73.2	
N	11,497	

Figure 2 illustrates the spatial distribution of the percentage of husbands and/or women who received comprehensive counselling. It is evident that in states such as Odisha, Tamil Nadu, Kerala, Maharashtra and Punjab, husbands received more comprehensive information related to maternal and child health from healthcare workers and providers compared to states like Bihar, Manipur, West Bengal, Chhattisgarh, and Uttarakhand. While women of Odisha, followed by Chhattisgarh, Tamil Nadu, Haryana, Karnataka, Gujarat, and Madhya Pradesh received more information in contrast to states like Manipur, Nagaland, Arunachal, and Bihar. In states such as Odisha, Tamil Nadu, Karnataka, Gujarat, Chhattisgarh, and Haryana, a more significant proportion of women and their husbands gained comprehensive maternal and child health information from healthcare providers (Table S2).

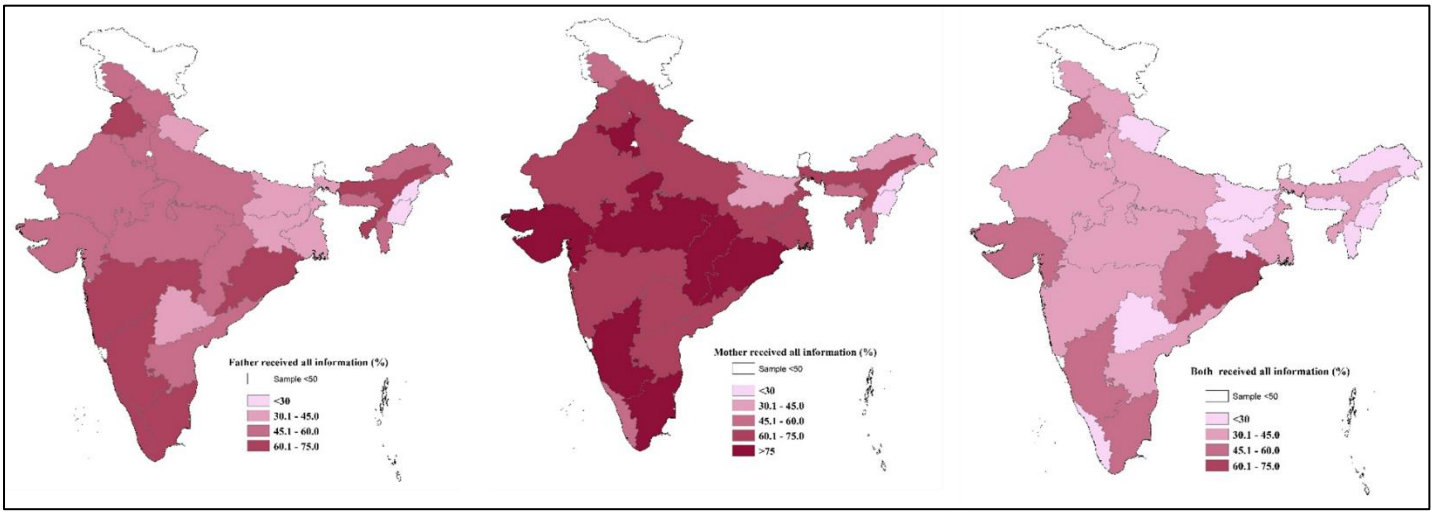

Figure 2. Percentage of husbands (a), women (b), and both (c) who received all information on delivery, nutrition and family planning in rural India, 2019-21

Bivariate findings suggest that counselling to both the woman and her husband is associated with outcomes such as low-birth-weight infants and receipt of postpartum care services. For example, while 18 percent of those couples among whom the woman or husband received no or incomplete information reported a low-birth-weight infant, compared to 16 percent of those among whom both were comprehensively counselled. Likewise, postpartum care was utilised by 75 percent of couples among whom no or partial information was provided to 93 percent when both the woman and her husband were comprehensively counselled. In the case of contraception related advice however, percentages practising contraception were about as high among those couples who were both counselled and those in which only the woman was comprehensively counselled, and somewhat lower among others (Table 3).

Table 3. Receipt of comprehensive counselling and key outcomes: Percentage of married women aged 15-49 and husbands by comprehensive counselling according to key outcomes (%)

Comprehensive counselling	Low birth weight	Postpartum services	Couple practised family planning
No or partial information received by both	18.1	75.0	68.8
All Information received only by husband	17.4	82.2	74.1
All Information received only by woman	17.0	90.6	78.3
All Information received by both	15.7	93.1	77.0

In multivariate analysis, we explored the relationship between counselling status and selected outcome indicators, adjusting for confounding factors, namely age, educational level, woman's employment status and husband's occupation, spousal age gap, birth order and sex of infant, exposure to television, household size, household wealth status, religion, caste and region of residence.

A consistent picture emerges. Outcome indicators were strongly associated with counselling status (Table 4). For example, when all couples are considered (Model A), compared to couples among whom neither partner received comprehensive counselling, those among whom only the husband reported comprehensive counselling (AOR: 0.83; 95% CI: 0.74–0.93), those among whom only the woman reported comprehensive counselling (AOR: 0.65; 95% CI: 0.57–0.74), and in particular, those among whom both had received comprehensive counselling (AOR: 0.60; 95% CI: 0.52–0.68) were far less likely to deliver a low birth weight baby. Similarly, the odds of accessing postpartum care services were significantly greater among couples among whom both the woman and her husband had received comprehensive counselling than those among whom neither or just one had been counselled (AOR: 4.23; 95% CI: 3.55–5.03); however, the probability of women availing PNC was greater when just the woman was comprehensively counselled (AOR: 3.89; 95% CI: 3.22–4.71) than when just the husband was. And finally, in the case of contraceptive practice too, the odds of contraception among couples among whom both partners were comprehensively counselled were significantly greater than those in which neither or just one had received counselling (AOR: 1.67; 95% CI: 1.45–1.92), with those couples in which just one partner had been so exposed falling in between (AOR: 1.34; 95% CI: 1.17–1.52) (husbands only) and AOR: 1.56; 95% CI: 1.34–1.82 (women only).

Model B considers all couples among whom one member or both members have received comprehensive counselling. In this case, we consider those couples among whom (a) only the woman and (b) both members were comprehensively counselled, compared with those among whom only the husband received comprehensive counselling. Odds ratios with regard to all three indicators confirm that counselling only women had a stronger effect on outcomes than counselling only husbands, and that counselling both partners had a somewhat stronger association.

Model C explores outcomes among just two groups, assessing the extent to which counselling both women and husbands had a greater effect than counselling just women. Women in couples among whom both partners had been comprehensively counselled were indeed less likely to

deliver infants with low birth weight than those among whom only the woman had been comprehensively counselled (AOR: 0.89; 95% CI: 0.78–1.01; $p<0.1$). Other differences were mild and insignificant, suggesting that counselling women as well as husbands was marginally more likely to be associated with postpartum services and adoption of contraception than counselling only women.

Several confounding factors were also important in the multivariate analyses (Table S3). Of note, educational attainment levels and household wealth status had a relatively strong and consistent association with all outcomes. Religion and region, as well as women's work status, exposure to television, husband's occupation and birth order, also displayed strong associations, but patterns were inconsistent.

Table 4. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing relationship between counselling status and selected outcome indicators, women aged 15-49 and husbands for all couples and those among whom at least one member received counselling

Counselling status	Low birth weight (N=10,250) aOR (95% CI)	Woman sought postpartum services (N=11,497) aOR (95% CI)	Couple practised family planning (N=8,566) aOR (95% CI)
A. All couples[1]			
Both woman and husband received partial or no information (ref)			
All information received by husband only, women received partial or no information	0.83*** (0.74-0.93)	1.27 *** (1.12-1.43)	1.34*** (1.17-1.52)
All information received by woman only, husband received partial or no information	0.65 ***(0.57-0.74)	3.89 *** (3.22-4.71)	1.56*** (1.34-1.82)
All information received by both woman and husband	0.60*** (0.52-0.68)	4.23*** (3.55-5.03)	1.67*** (1.45-1.92)
B. Couples among whom at least one member received counselling[1,2]			
All information received by husband only, woman received partial or no information (ref)			
All information received by woman only, husband received partial or no information	0.79*** (0.68-0.90)	2.99*** (2.45-3.64)	1.16** (1.01-1.29)

All information received by both woman and husband	0.71*** (0.62-0.81)	3.32*** (2.77-3.98)	1.26*** (1.09-1.46)
C. Couples among whom only women or both women and husbands had received counselling[1,3]			
All information received by woman only, husband received partial or no information (ref)			
All information received by both woman and husband	0.89* (0.78-1.01)	1.14 (0.90-1.45)	1.08 (0.91-1.28)

Note: [1]Controlling for spousal age gap, husband's occupation, woman's employment status, education, woman's age at last birth, birth order, sex of child, exposure to television, household size, wealth quintiles, religion, caste and region; aOR: Adjusted Odds ratio; CI: Confidence interval.

[2]Excludes those couples among whom both women and husbands received no or only partial information

[3]Excludes those couples among whom both women and husbands received no or only partial information and those couples among whom all information received by husband only.

Discussion

Although the role of male involvement in pregnancy-related outcomes is increasingly recognised, associations between the provision of information and counselling to husbands – either together with or independently of women – have not been well-studied in LMIC, including India. Studies exploring the role of husbands have tended to focus on the factors associated with husbands' accompanying women in antenatal care seeking rather than the effect of their involvement in pregnancy related outcomes or challenges faced by husbands in attending pregnancy-related services along with their wives. Few discuss counselling or information provision *per se*. Typically, these studies suggest that it is better educated and economically better off husbands, those who are more knowledgeable about pregnancy related care and those who hold more egalitarian gender role attitudes who are more likely than others to attend pregnancy-related services with their wives. [45–48]. Challenges typically include perceptions of exclusion by the health system, during antenatal checkups and traditional norms suggesting that pregnancy related care is women's domain [28, 49–52].

Our study supplements these findings with reference to rural India. For one, it stresses that comprehensive counselling is limited for both women and especially husband in rural India, and there is considerable spatial variation in the extent of counselling, with states of eastern and northeastern India especially poorly served. Second, it demonstrates that counselling husbands does positively affect pregnancy related outcomes, notably in comparison with instances in which both women and their husbands have been denied comprehensive

counselling. Finally, what is particularly noteworthy is that couple counselling matters but may be particularly relevant with regard to specific pregnancy-related outcomes. This was most obvious in the case of birth weight of infants; when both women and husband were comprehensively counselled birth weight was significantly higher than even when just the woman had so experienced.

In general, other studies corroborate our findings underscoring the importance of male engagement for better pregnancy outcomes. Available studies have observed positive effects on postpartum care along with other positive outcomes; ours observed this effect in comparison to uncounselled couples, but not in comparison with couples among whom just the woman was exposed to counselling. A systematic review of the effectiveness of interventions concluded, for example, that health interventions that included husbands had a significant effect on improving postpartum care, birth preparedness and maternal health education while improving couple communication, partner support and joint decision-making [53]. A study in Nepal also observed that joint couple counselling significantly increased the odds of postpartum care utilisation, as well as birth preparations, but not institutional or skilled birth attendance [54]. A cross-sectional study of couples in rural Bangladesh found that husbands' attendance at ante-natal care visits together with women was positively associated with women receiving ANC from a medically trained provider, an institutional delivery, and access to postnatal services [55]. An intervention among couples in Iran studied the effect of counselling with husbands on stress and social support of women and found that perceived social support increased significantly among the couples among whom the husband received counselling compared to others, but no effect was observed with regard to other factors including stress, preterm delivery and newborn characteristics [56]. And an intervention in Burkina Faso found that men's attendance at two or more counselling sessions was strongly associated with postpartum care, exclusive breastfeeding and postpartum contraception [57].

Mechanisms through which the engagement of male partners can improve pregnancy-related outcomes are poorly studied. We speculate that such engagement improves social support for childbearing women. Providing information to male partners can result in behaviour change, improving understanding of the best practices during pregnancy and the postpartum period, as well as danger signals that may require urgent medical attention, and the important role men can play in supporting their wives to experience safe pregnancy outcomes [58]. It is possible, as other studies have noted, that one spinoff of engaging men may be to empower their wives to make decisions and exercise voice in matters concerning their reproductive lives. Studies have observed that engaging men may help to break down traditional norms about men's and

women's roles, and encourage men to take on tasks considered 'women's roles' (for example, Nasreen et al., 2012, Bangladesh) or support their wives in overriding family and community pressure to conform to traditional norms, and build confidence in men about their significant role in ensuring healthy outcomes for women [59]. Spousal communication may also be enhanced as a result of counselling [57], lead to greater understanding and retention of health information received [54] and enable women to display greater agency in making family planning decisions [60]. Ultimately, counselling to husbands/partners improves marital relationships and relationship satisfaction [61, 62], mutual respect and general well-being [63, 64]. It may encourage husbands to participate actively in raising children, foster a stronger bond with mother and child, and promote a more balanced family dynamic, all contributing to a healthier family unit. Even so, for several outcomes, counselling women remains key.

Limitations of the Study

Our study has some limitations. For one, we recognise the paucity of data in NFHS to perform a more thorough analysis of couple counselling effects. While studies have explored whether counselling couples together is more effective than counselling them separately, even though we employ data from woman-husband dyads, data do not permit us to ascertain the nature of counselling nor its intensity or duration. Data on birth weight are not always obtained by birth records but also by the mother's own perceptions of the weight, acknowledging the possibility of recall bias. Most prominently, data come from a cross-sectional study, and although the timing of events suggests a causal influence on outcome indicators, inferences regarding causation between counselling and pregnancy outcome indicators must be drawn cautiously.

Conclusion

Our findings, first of its kind in India using extensive couple data, establish that counselling to women is paramount in improving pregnancy-related outcomes, yet counselling of husbands/ male partners as well as women has a powerful independent effect with regard to some outcomes, and generally supplements effects on others. While several studies arrive at this conclusion through dedicated interventions, our study notes that this association is evident even in a general situation and at national level in India. Findings call for a relook at India's health promotion strategy in ways that engage husbands, and ensure they are comprehensively counselled, both in matters directly influencing safe birth outcomes, as well as, more indirectly, on providing support to women and enabling closer marital bonds.

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Supporting information

Table S1. Description of programs including reference to male involvement and counselling in Reproductive and Child Health (RCH) and Maternal and Child Health (MCH) programs in India, 2000-2024.

Policy Document	Year	Content with respect to family or couple or male involvement
National Population Policy (Ministry of Health and Family Welfare, Government of India, 2000)	2000	Men are described as an un-served group; policy calls for increased participation of men in planned parenthood, and more specifically, the need for promoting non-scalpel vasectomy and providing family planning educational activities that include men and men's roles
National Health Policy (Ministry of Health and Family Welfare GoI, 2002)	2002	Male participation is identified as crucial for the success of family planning and maternal health initiatives, and acknowledged to lead to better partner support during pregnancy and childbirth, as well as shared responsibility in family planning.
National Rural Health Mission (NRHM) (Ministry of Health and Family Welfare, Government of India, 2005)	2005	While emphasizing the need for behaviour change activities, the National Rural Health Mission also specifically includes the promotion of male participation in family planning.
RCH Phase II Implementation Plan (Ministry of Health and Family Welfare GoI, 2006)	2005	The strategy seeks to create an inclusive environment for both males and females to access reproductive and sexual health services, addressing issues like early marriage, teen pregnancies, and sexually transmitted diseases and calls for friendly services to reach all adolescents, married and unmarried, girls and boys during the clinic sessions, and highlighting the intention to engage males in health-seeking behaviors and reproductive health education.
Janani Suraksha Yojana (JSY) (Ministry of Health & Family Welfare & (MoHFW) Government of India, 2005)	2005	While a conditional cash transfer programme to encourage institutional delivery, the programme recognises the importance of involving men in health-seeking behaviors and decision-making within families, and for gender-sensitive approaches, including male involvement as crucial for effective health outcomes.
National Urban Health Mission (NUHM) (Ministry	2013	While focused on community-based groups for women, such as Mahila Arogya Samitis, for mobilizing local populations for health initiatives, it also highlights the need to mobilize local youth for community led public health action and calls for

of Health & Family Welfare, 2013)		discussions with young men about maternal and reproductive health, fostering a supportive environment for women and family planning methods.
Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) (Maternal Health Division, Ministry of Health and Family Welfare, 2016)	2016	The post-partum family planning includes strategies for IEC campaigns that can target both men and women, emphasizing the role of male partners in supporting maternal health.
National Health Policy (Ministry of Health & Family Welfare, 2017)	2017	Reiterates the need for gender-sensitive approaches in healthcare. Calls for greater male involvement in family planning and reproductive health services. Recognizes the importance of addressing gender inequalities in health outcomes.
Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PM-JAY) (National Health Systems Resource Centre (NHSRC), 2018)	2018	Guidelines suggest that the involvement of men is crucial for promoting gender equity and addressing women's health issues.
National Nutrition Mission (NITI Aayog, 2018)	2018	The document states, cconvergence is to be ensured by active participation of grass root health workers and self-help groups for mobilization of children, adolescent girls, pregnant and lactating mothers, through iinvolving the masses.
National Population Policy Draft	2021	Emphasizes the importance of gender equality and the involvement of men in family planning and reproductive health. Calls for increased awareness and educational campaigns targeting men.

Table S2. Selected major indicators on couple's counselling (received from health provider or health worker), last child's birth weight, women's access to Post Natal Care (PNC) and contraceptive use across regions of rural India, 2019-21.

Selected Indicators	Regions											
	North		Central		East		Northeast		West		South	
	Husband	Women	Husband	Woman	Husband	Woman	Husband	Woman	Husband	Woman	Husband	Woman
Counselling received (%)												
All information	56.55	66.74	49.42	69.34	40.13	59.83	58.39	62.81	58.43	68.10	57.94	75.35
Partial information	33.69	25.29	40.18	25.18	46.60	28.54	34.29	28.77	33.27	26.72	34.42	22.95
No information	9.76	7.97	10.40	5.49	13.28	11.63	7.32	8.42	8.30	5.18	7.64	1.70
N	**2,104**		**3,025**		**2,204**		**1,959**		**1,028**		**1,177**	

Table S3. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing relationship between counselling status and selected outcome indicators controlling other factors for women aged 15-49 and husbands.

Determinants	Low Birth Weight (N=10,250)	Women availed PNC (N=11,497)	Couple using contraceptive (N=8,566)
Programme factors			
Partial or no Information received either by husband or woman or both (ref)			
All Information received by husband	0.83*** (0.74-0.93)	1.27***(1.12-1.43)	1.34***(1.17-1.52)
All Information received by woman	0.65***(0.57 - 0.74)	3.89***(3.22-4.71)	1.56***(1.34-1.82)
All Information received by both	0.60***(0.52-0.68)	4.23***(3.55- 5.03)	1.67***(1.45-1.92)
Couple related factors			
Couple's Age gap			
Less than 3 years (ref).			
3 & more years	1.07 (0.80-1.43)	1.08 (0.84-1.38)	0.79*(0.63-1)
Husband's occupation			
Agriculture (ref).			
Manual	0.99 (0.86 -1.14)	1.10 (0.97- 1.26)	1.36***(1.2-1.55)
Service	1.02 (0.73- 1.42)	0.95 (0.71-1.27)	1.16 (0.89 -1.51)
Business	1.04 (0.74-1.45)	1.13 (0.83- 1.53)	1.41**(1.07-1.87)
Woman's working status			
No (ref).			
Yes	0.92 (0.80 -1.07)	1.26***(1.09-1.45)	0.90*(0.8- 1.01)
Woman's education			
Illiterate (ref).			
Primary	0.91 (0.75-1.09)	1.27***(1.07- 1.52)	1.11 (0.93-1.32)
Secondary	0.73***(0.62 -0.85)	1.47***(1.27-1.7)	1.21**(1.04-1.39)
Higher	0.56***(0.43-0.73)	1.33**(1.04-1.7)	1.31**(1.05-1.63)
Woman's age at birth			
<20 (ref).			
20-24	1.02 (0.82-1.27)	1.09 (0.89-1.34)	1.01 (0.84 -1.22)
25-29	1.08 (0.85-1.37)	1.25**(1- 1.56)	1.10 (0.9 -1.35)
30+	1.10 (0.85 -1.43)	1.20 (0.94 -1.52)	0.89 (0.71 -1.11)
Birth related factors			
Birth order			
1 (ref).			
>=2	0.9 (0.78 -1.03)	0.91 (0.79- 1.04)	2.1***(1.85 -2.37)
Sex of the child			
Boy (Ref).			
Girl	1.15**(1.02 -1.29)	0.9*(0.81-1.01)	0.92 (0.83- 1.02)
Household related factors			

Exposure to television			
No (ref).			
Yes	0.84**(0.73 -0.98)	1.12 (0.97- 1.29)	1.12*(0.98 -1.28)
Household size			
Less than 5 (Ref).			
5 and more	1.06 (0.94 -1.20)	0.92 (0.82- 1.03)	0.95 (0.86 -1.06)
Wealth quintile			
Poorest (ref).			
Poorer	0.93 (0.79 -1.10)	1.28***(1.1 -1.49)	1.16*(1.00- 1.35)
Middle	0.78**(0.63- 0.96)	1.45***(1.19 -1.77)	1.07 (0.89 -1.28)
Richer	0.70***(0.55 -0.90)	1.53***(1.2- 1.95)	1.36***(1.09 -1.69)
Richest	0.52***(0.38 -0.73)	1.93***(1.39- 2.69)	1.42**(1.08- 1.88)
Religion			
Hindu (ref).			
Non-Hindu	1.05 (0.88 -1.24)	0.75***(0.65 -0.86)	0.66***(0.57 -0.76)
Caste			
Schedule caste (ref).			
Schedule tribe	0.87 (0.73 -1.04)	1.12 (0.93 -1.34)	0.88 (0.75 -1.04)
OBC	0.91 (0.78 -1.06)	0.98 (0.84 -1.14)	1.13*(0.98 -1.31)
Others	0.87 (0.70 -1.09)	1.07 (0.87 -1.31)	1.32***(1.09 -1.6)
Region			
North (ref).			
Central	1.10 (0.92 -1.32)	0.69***(0.57 -0.84)	0.72***(0.61 -0.86)
East	0.91 (0.75- 1.12)	0.58***(0.48 -0.71)	0.93 (0.77 -1.13)
North-East	0.67***(0.52 -0.87)	0.36***(0.29- 0.44)	0.83*(0.67- 1.01)
West	0.84 (0.65 -1.08)	1.29*(0.96 -1.72)	0.52***(0.42- 0.65)
South	0.73***(0.57 -0.92)	1.10 (0.83- 1.44)	0.37***(0.31 -0.46)

Note: Reference category; Ref. and significant level; *p < 0.10. **p < 0.05. ***p < 0.01

References

[1] Dandona R, Kumar GA, Henry NJ, et al. Subnational mapping of under-5 and neonatal mortality trends in India: the Global Burden of Disease Study 2000–17. *The Lancet* 2020; 395: 1640–1658.

[2] *National Family Health Survey(NFHS-5), 2019-21: India: Volume1*. Mumbai: IIPS, 2021.

[3] Barua A, Pande R, MacQuarrie K, et al. Caring Men? Husbands' Involvement in Maternal Care of Young Wives. *Economic and Political Weekly* 2004; 39: 5661–5668.

[4] Caleb-Varkey L. Involving Men in their Wives' Antenatal and Postpartum Care in India. *Research Update, Frontiers in Reproductive Health Program*.

[5] Caleb-Varkey L, Mishra A, Das A, et al. Involving men in maternity care in India. *Reproductive Health*. Epub ahead of print 1 January 2004. DOI: 10.31899/rh4.1167.

[6] Naomi Walston. *Challenges and opportunities for male involvement in reproductive health in Cambodia*. Cambodia: Agency for International Development (USAID), http://pdf.usaid.gov/pdf_docs/PNADD199.pdf (2005, accessed 28 June 2024).

[7] Singh A. Men's Involvement during Pregnancy and Childbirth: Evidence from Rural Ahmadnagar, India. *Population Review*; 48. Epub ahead of print 1 January 2009. DOI: 10.1353/prv.0.0016.

[8] Singh KK, Bloom SS, Tsui AO. Husbands' reproductive health knowledge, attitudes, and behavior in Uttar Pradesh, India. *Stud Fam Plann* 1998; 29: 388–399.

[9] Alio AP, Bond MJ, Padilla YC, et al. Addressing policy barriers to paternal involvement during pregnancy. *Matern Child Health J* 2011; 15: 425–430.

[10] Alio AP, Kornosky JL, Mbah AK, et al. The impact of paternal involvement on feto-infant morbidity among Whites, Blacks and Hispanics. *Matern Child Health J* 2010; 14: 735–741.

[11] Alio AP, Mbah AK, Kornosky JL, et al. Assessing the impact of paternal involvement on racial/ethnic disparities in infant mortality rates. *J Community Health* 2011; 36: 63–68.

[12] Feldman PJ, Dunkel-Schetter C, Sandman CA, et al. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosom Med* 2000; 62: 715–725.

[13] Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, et al. Paternal support and preterm birth, and the moderation of effects of chronic stress: a study in Los Angeles county mothers. *Arch Womens Ment Health* 2010; 13: 327–338.

[14] Ngui E, Cortright A, Blair K. An investigation of paternity status and other factors associated with racial and ethnic disparities in birth outcomes in Milwaukee, Wisconsin. *Matern Child Health J* 2009; 13: 467–478.

[15] Population Council. Mixed success involving men in maternal care worldwide. *Population Briefs 11(1)*, http://www.popcouncil.org/pdfs/factsheets/RH_MenInMaternalCare_A4.pdf.Google Scholar (2005).

[16] Yargawa J, Leonardi-Bee J. Male involvement and maternal health outcomes: systematic review and meta-analysis. *J Epidemiol Community Health* 2015; 69: 604–612.

[17] Chattopadhyay A. MEN IN MATERNAL CARE: EVIDENCE FROM INDIA. *Journal of Biosocial Science* 2012; 44: 129–153.

[18] Dibaba Degefa B, Feyisa GT, Dinagde DD, et al. Post-natal care: a vital chance to save mothers and infants! Exploring barriers and factors associated with it: a mixed study. *Frontiers in Global Women's Health*; 4, https://www.frontiersin.org/articles/10.3389/fgwh.2023.1272943 (2023, accessed 9 December 2023).

[19] Padilla YC, Reichman NE. Low birthweight: Do unwed fathers help? *Children and Youth Services Review* 2001; 23: 427–452.

[20] Mullany BC, Becker S, Hindin MJ. The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial. *Health Educ Res* 2007; 22: 166–176.

[21] Fagan J, Lee Y. Perceptions and satisfaction with father involvement and adolescent mothers' postpartum depressive symptoms. *Journal of Youth and Adolescence* 2010; 39: 1109–1121.

[22] Rowe HJ, Fisher JRW. Prevention of postnatal mental health problems in women: knowledge exchange in primary care in Victoria, Australia. *Health Promot J Austr* 2015; 26: 64–69.

[23] Kumar P, Sharma H, Mawkhlieng DR. Do family planning advice and maternal health care utilization changes course in contraception usage? A study based on Bihar, India. *Clinical Epidemiology and Global Health* 2020; 8: 693–697.

[24] Mody SK, Nair S, Dasgupta A, et al. Postpartum contraception utilization among low-income women seeking immunization for infants in Mumbai, India. *Contraception* 2014; 89: 516–520.

[25] Rutaremwa G, Kabagenyi A, Wandera SO, et al. Predictors of modern contraceptive use during the postpartum period among women in Uganda: a population-based cross sectional study. *BMC Public Health* 2015; 15: 262.

[26] Chattopadhyay A, Govil D. Men and maternal health care utilization in India and in selected less-developed states: evidence from a large-scale survey 2015-16. *J Biosoc Sci* 2021; 53: 724–744.

[27] Mersha AG. Male involvement in the maternal health care system: implication towards decreasing the high burden of maternal mortality. *BMC Pregnancy and Childbirth* 2018; 18: 493.

[28] Suryawanshi D, Rajaseharan D, Venugopal R. Involvement of husband in maternal and child health care in rural field practice area of a tertiary medical college in South India—A mixed method study. *J Family Med Prim Care* 2021; 10: 2829–2833.

[29] Santhya KG, Jejeebhoy S. Sexual and reproductive health needs of married adolescent girls. *Reproductive Health*, https://knowledgecommons.popcouncil.org/departments_sbsr-rh/2293 (2003).

[30] Matthews M, Severin von X, Jelka Z. *WHO Technical Consultation on Postpartum and Postnatal Care*. Geneva: World Health Organization, https://iris.who.int/bitstream/handle/10665/70432/WHO_MPS_10.03_eng.pdf?sequence=1 (2010, accessed 30 September 2024).

[31] Gharaibeh M, Al-Ma'aitah R, Al Jada N. Lifestyle practices of Jordanian pregnant women. *International Nursing Review* 2005; 52: 92–100.

[32] Nair MK, Leena ML, Ajithkumar K. Concept of Health Care Counseling for Pediatricians. *Indian Pediatr* 2016; 53: 961–963.

[33] Risica PM, Phipps M g. Educational Preferences in a Prenatal Clinic Population. *International Journal of Childbirth Education* 2006; 21: 4–7.

[34] Girard AW, Olude O. Nutrition Education and Counselling Provided during Pregnancy: Effects on Maternal, Neonatal and Child Health Outcomes. *Paediatric and Perinatal Epidemiology* 2012; 26: 191–204.

[35] Goodarzi-Khoigani M, Baghiani Moghadam MH, Nadjarzadeh A, et al. Impact of Nutrition Education in Improving Dietary Pattern During Pregnancy Based on Pender's Health Promotion Model: A Randomized Clinical Trial. *Iran J Nurs Midwifery Res* 2018; 23: 18–25.

[36] Dewidar O, John J, Baqar A, et al. Effectiveness of nutrition counseling for pregnant women in low- and middle-income countries to improve maternal and infant behavioral, nutritional, and health outcomes: A systematic review. *Campbell Syst Rev* 2023; 19: e1361.

[37] Hardee K, Harris S, Rodriguez M, et al. Achieving the goal of the London Summit on Family Planning by adhering to voluntary, rights-based family planning: what can we learn from past experiences with coercion? *Int Perspect Sex Reprod Health* 2014; 40: 206–214.

[38] Ali MM, Cleland JG, Shah IH, et al. *Causes and consequences of contraceptive discontinuation: evidence from 60 demographic and health surveys*. Geneva: World Health Organization, https://iris.who.int/handle/10665/75429 (2012, accessed 15 December 2023).

[39] Huda FA, Chowdhuri S, Sirajuddin MFR. Importance of appropriate counselling in reducing early discontinuation of Norplant in a northern district of Bangladesh. *J Health Popul Nutr* 2014; 32: 142–148.

[40] Zafar Ullah AN, Humble ME. Determinants of oral contraceptive pill use and its discontinuation among rural women in Bangladesh. *Reprod Med Biol* 2006; 5: 111–121.

[41] Hart J, Ross E, Silva S. *A Collaborative Evaluation of Strategies to Encourage Couples-focused Health Service Delivery in a Sample of Title X-supported Family Planning Clinics*. Washington, DC: U.S. Department of Health and Human Services, https://www.aspe.hhs.gov/sites/default/files/migrated_legacy_files/139791/8278.pdf (2006).

[42] Lasee A, Becker S. Husband-Wife Communication About Family Planning and Contraceptive Use in Kenya. *International Family Planning Perspectives* 1997; 23: 15.

[43] Galle A, Plaieser G, Van Steenstraeten T, et al. Systematic review of the concept 'male involvement in maternal health' by natural language processing and descriptive analysis. *BMJ Glob Health* 2021; 6: e004909.

[44] WHO. *Global Nutrition Targets 2025: Low Birth Weight Policy Brief*. Geneva: World Health Organization.

[45] Abie A, Belay G, Asmare E, et al. Male partner involvement in postnatal care service utilization and associated factors: A community-based cross-sectional study in Motta district, Northwest Ethiopia. *PLoS One* 2023; 18: e0276477.

[46] Degefa N, Dure A, Getahun D, et al. Male partners involvement in their wives' antenatal care and its associated factors in southern Ethiopia. A community-based cross-sectional study. *Heliyon* 2024; 10: e28276.

[47] Paul PL, Pandey S. An examination of the factors associated with male partner attendance in antenatal care in India. *BMC Pregnancy Childbirth* 2023; 23: 532.

[48] Singh R, Kumar A, Kansal S. Involvement of male spouse in care during pregnancy in rural areas of district Varanasi. *J Family Med Prim Care* 2021; 10: 2177–2183.

[49] Angusubalakshmi R, Boratne AV, Venkataraman S. Male Involvement as a Significant Contributor for Enhancing Maternal and Child Health-care Services: A Scoping Review. *Indian Journal of Public Health* 2023; 67: 455.

[50] Boniphace M, Matovelo D, Laisser R, et al. Men perspectives on attending antenatal care visits with their pregnant partners in Misungwi district, rural Tanzania: a qualitative study. *BMC Pregnancy and Childbirth* 2021; 21: 93.

[51] Kaye DK, Kakaire O, Nakimuli A, et al. Male involvement during pregnancy and childbirth: men's perceptions, practices and experiences during the care for women who developed childbirth complications in Mulago Hospital, Uganda. *BMC Pregnancy and Childbirth* 2014; 14: 54.

[52] Kwambai TK, Dellicour S, Desai M, et al. Perspectives of men on antenatal and delivery care service utilisation in rural western Kenya: a qualitative study. *BMC Pregnancy and Childbirth* 2013; 13: 134.

[53] Tokhi M, Comrie-Thomson L, Davis J, et al. Involving men to improve maternal and newborn health: A systematic review of the effectiveness of interventions. *PLoS One* 2018; 13: e0191620.

[54] Mullany BC, Becker S, Hindin MJ. The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial. *Health Educ Res* 2007; 22: 166–176.

[55] Rahman AE, Perkins J, Islam S, et al. Knowledge and involvement of husbands in maternal and newborn health in rural Bangladesh. *BMC Pregnancy and Childbirth* 2018; 18: 247.

[56] Mohammadpour M, Mohammad-Alizadeh S, Malakouti J, et al. Effect of counselling with men on perceived stress and social support of their pregnant wives. *Journal of Reproductive and Infant Psychology* 2020; 40: 1–15.

[57] Daniele MA, Ganaba R, Sarrassat S, et al. Involving male partners in maternity care in Burkina Faso: a randomized controlled trial. *Bull World Health Organ* 2018; 96: 450–461.

[58] Daniele MAS. Male partner participation in maternity care and social support for childbearing women: a discussion paper. *Philos Trans R Soc Lond B Biol Sci* 2021; 376: 20200021.

[59] Nasreen HE, Leppard M, Al Mamun M, et al. Men's knowledge and awareness of maternal, neonatal and child health care in rural Bangladesh: a comparative cross sectional study. *Reproductive Health* 2012; 9: 18.

[60] Hartmann M, Gilles K, Shattuck D, et al. Changes in couples' communication as a result of a male-involvement family planning intervention. *J Health Commun* 2012; 17: 802–819.

[61] Iliyasu Z, Abubakar IS, Galadanci HS, et al. Birth preparedness, complication readiness and fathers' participation in maternity care in a northern Nigerian community. *Afr J Reprod Health* 2010; 14: 21–32.

[62] United Nations. *The sustainable development goals report 2016*. 2016.

[63] Olugbenga-Bello A, Asekun-Olarinmoye E, Adewole A, et al. Perception, attitude and involvement of men in maternal health care in a Nigerian community. *J Public Health Epidemiol* 2013; 5: 262–270.

[64] Schofield MJ, Mumford N, Jurkovic D, et al. Short and long-term effectiveness of couple counselling: a study protocol. *BMC Public Health* 2012; 12: 735.