



Is parental engagement associated with subsequent delayed marriage and marital choices of adolescent girls? Evidence from the Understanding the Lives of Adolescents and Young Adults (UDAYA) survey in Uttar Pradesh and Bihar, India

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ABSTRACT

Objective: This study examines the association between parental engagement and subsequent delayed marriage of adolescent girls and, secondarily, to assess whether parental engagement is positively associated with girls' involvement in marital decision-making regarding husband selection.

Methods: The study used longitudinal survey data from the Understanding the Lives of Adolescents and Young Adults (UDAYA) in Uttar Pradesh and Bihar, India. We analysed 6168 unmarried adolescent girls aged 15–19 years at wave 1 (2015–16) who were interviewed in wave 2 (2018–19). Our outcomes were delayed marriage of girls (unmarried vs. married at 20–22 vs. married at 18–19 vs. married at <18) and, among those married at <18 years, girls' involvement in husband selection (alone vs. with parents vs. not involved). Parental discussion around school performance, friendships, menstruation, pregnancy, free time, and personal issues were the exposure variables. We applied unadjusted and adjusted multinomial regression models to assess associations between our exposure variables and each outcome variable.

Results: From wave 1 to wave 2, 1551 girls (31.2%) married; 567 girls (12.5%) married as minors (<18 years). We found that parental discussion around school performance (relative risk ratio [RRR]: 1.33), friendship (RRR: 1.37) and personal matters (RRR: 1.29) were positively associated with remaining unmarried relative to early marriage of girls. However, discussion with parents about menstruation was negatively associated with marriage at 20–22 (RRR: 0.67) and remaining unmarried (RRR: 0.80), compared to early marriage. Discussing school performance was negatively associated with marriage at 18–19 (RRR: 0.62) and at 20–22 (RRR: 0.50), relative to early marriage. Discussing personal issues with parents was positively associated with joint parent-girl decision-making regarding husband selection, relative to parents alone selecting the husband (RRR: 1.43).

Conclusions: Parental engagement on school performance, friendship, and personal issues in early adolescence may help delay marriage and support marital choice for girls in India.

1. Introduction

Early/child marriage, defined as marriage before 18 years of age, is a grave violation of human rights. India has the highest number of child brides (223 million) globally, with 1.5 million being married as children each year (UNFPA-UNICEF, 2021). Despite substantial reduction over

the recent decades, India continues to grapple with this issue, with nearly one in every four girls (23.3%) being married off before they reach the age of 18 in 2019–21 (International Institute for Population Sciences and ICF, 2021). The consequences of early marriage are far-reaching and well-documented in the existing literature (Fan & Koski, 2022; Prakash et al., 2011; Santhya, 2011; Vikram, 2021). Early

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marriage poses serious threats to girls' freedom and dignity, curbing educational and economic opportunities and leading to social isolation, lower self-esteem, and loss of autonomy (Paul, 2020a, 2020b; Raj, 2010). Moreover, early marriage has significant negative health impacts. It increases the risk of early and poor pregnancy. Studies have suggested that marriage during childhood is significantly associated with inadequate maternity care utilization, lower use of family planning services, poor reproductive health outcomes (e.g., stillbirth, miscarriage), malnutrition (low body mass index), poor mental health, chronic diseases and maternal mortality (Aggarwal et al., 2023; Godha et al., 2016; Goli et al., 2015; Paul, 2018; Paul & Chouhan, 2019; Raj, 2010; Raj et al., 2009; Vikram et al., 2023). It also has intergenerational health effects on children, including developmental delays and childhood morbidity and mortality (Paul, 2020a, 2020b; Paul et al., 2019; Raj, Saggurti, Winter, et al., 2010).

Studies also highlight that girls who marry early are more likely to experience domestic violence in their marital relationships, relative to those who marry as adults (Erulkar, 2013; Raj, Saggurti, Lawrence, et al., 2010). This harmful practice is prevalent among rural, low-educated, and impoverished areas (Paul, 2020a, 2020b; Raj, 2010), and disproportionately affects women and girls contending with household poverty, lack of formal education or low levels of education, and systematic gender bias (Desai & Andrist, 2010; Jejeebhoy, 2019; Paul, 2019; UNICEF, 2018). Emerging research has also recognized the influence of social and community norms, as well as parental influences, in shaping the timing of marriage for girls and increasingly gained considerable attention in programmatic interventions to address the practice of early marriage (EP and Poonia, 2015; Jejeebhoy, 2019; Jha et al., 2016; Psaki et al., 2021). At the same time, qualitative evidence documents that parent-child connection and communication can support girls' marital choices and delayed marriage (Raj et al., 2019). Quantitative evidence on this topic is sorely lacking.

Parental engagement may play a crucial role in delaying the marriage of girls. When parents are involved in their children's lives and have positive relationships with them, they may be more likely to prioritize their children's education and well-being and less likely to consider early marriage as an option (Raj et al., 2021). In culturally conservative parts of India, socio-cultural norms often create pressure on parents to marry off their daughters early (EP and Poonia, 2015). Such norms may reinforce traditional gender roles, devalue girls' education, limit their autonomy and agency, and condone unequal power dynamics perpetuating child marriage by normalizing the idea that girls should be married off at a young age (Psaki et al., 2021). Parents often believe that early marriage can reduce potential dowry demands because dowry amounts tend to increase with age at marriage (Ghosh, 2011a). They also believe that early marriage can protect their daughters from pre-marital sexual activity and marital violence (Verma et al., 2013). Therefore, parents view early marriage as a way to ensure a secure and sustainable life for their daughters in the marital household. In these contexts, the virginity and chastity of daughters are highly valued to uphold honour and prestige in society (Chowdhury, 2004). Economic constraints coupled with exorbitant dowry demands can exacerbate early marriage in poverty-stricken families, as parents view marriage as a means to secure their daughter's future, especially when there is a lack of viable economic opportunities for girls (Ghosh, 2011b). However, a multi-country study inclusive of India found that parent-child communication serves as a protective factor against early marriage (Bhan et al., 2019). Studies from elsewhere also demonstrate that parental engagement more broadly, such as positive/validating engagement, educational support, and sexual and reproductive health education, can delay early sexual activity and teen pregnancy (Deptula et al., 2010; Silk & Romero, 2014; Skosana et al., 2020). There is a lack of research from India examining the associations between parent-child engagement and the timing of marriage.

Against the backdrop of limited research on the role of parental engagement with girls in early adolescence as a means of supporting

older adolescent girls' voice and choice in marriage, our study aims to explore whether such parental engagement is associated with subsequent delayed marriage of adolescent girls. We utilized data collected at two time periods in India's Uttar Pradesh and Bihar states with notable levels of early marriage (International Institute for Population Sciences and ICF, 2021), to test our hypothesis that positive parental engagement among non-married girls at wave 1 will be associated with later marriage for girls at wave 2. Secondly, we investigated with the sub-sample of married girls (i.e., girls married prior to age 18 between wave 1 and wave 2), whether parental engagement is positively associated with girls' involvement in husband decision-making. Findings from this study can inform development of interventions to prevent the practice of early marriage and promote female involvement in mate selection for marriage.

2. Methods

2.1. Study setting

This study, known as Understanding the Lives of Adolescents and Young Adults (UDAYA), involved survey data collection with adolescents aged 10–19 years in the states of Uttar Pradesh and Bihar in India, geographically located in the northern region of India. Uttar Pradesh is the most populous state in the country, with a population of 199.8 million (24.4 million adolescents), accounting for 17% of India's population. Bihar is the third-largest state in terms of population, with a population of 104.1 million (22.5 million adolescents), accounting for 9% of the country's population (Office of the Registrar General & Census Commissioner India, 2013). Bihar and Uttar Pradesh are the poorest among all Indian states, where a substantial proportion of the population (34% in Bihar and 29% in Uttar Pradesh) lived below the poverty line in 2011–12 (Planning Commission, 2013). The majority of the population resides in rural areas, with just 22% and 11% living in urban areas of Uttar Pradesh and Bihar, respectively (Office of the Registrar General & Census Commissioner India, 2013). Female literacy in both states is lower (57% in Uttar Pradesh and 52% in Bihar) than the nation's average (65%) (Office of the Registrar General & Census Commissioner India, 2013). The prevalence of early marriage is widespread, with 41% and 16% of women aged 20–24 years in Bihar and Uttar Pradesh, respectively, married before 18 years in 2019–21 (International Institute for Population Sciences and ICF, 2021).

2.2. Data source

The UDAYA study involved a longitudinal survey with state-representative samples of adolescent boys and girls aged 10–19 years conducted in the Indian states of Uttar Pradesh and Bihar in 2015–16 and then followed up again three years later in 2018–19. Created and conducted by the Population Council, the UDAYA survey covers a wide range of topics, including education, work, sexual and reproductive health, social and digital connectivity, life aspirations, agency, gender role attitudes, romantic and sexual relationships, transition to marriage and parenthood, and healthcare-seeking (Santhya et al., 2017a; Santhya et al., 2017b).

2.3. Sampling design

UDAYA employed a multi-stage systematic sampling design based on 2011 Census data, wherein researchers randomly selected 150 primary sampling units (PSUs), comprised of villages in rural areas and census wards in urban areas. They mapped each selected PSU and then conducted household listing for all selected PSUs. Systematic sampling allowed for the selection of households with equal probability from the list of households in each PSU. To ensure gender balance, each PSU was divided into two segments, with one segment designated for male interviews and the other for female interviews. Within each segment, only

one respondent from each category was interviewed per household, with a maximum of three interviews per household: one younger girl, one unmarried older girl, and one married older girl in the female segment, and one younger boy, one older boy, and one married older girl in the male segment. They randomly selected a respondent from a household with multiple eligible candidates from the same category using a Kish table, without replacement (Santhya et al., 2017a; Santhya et al., 2017b).

2.4. Data collection and sample selection

In the baseline survey (wave-1), researchers completed 20,594 interviews (5969 boys and 14,625 girls) across both states. In wave-2, 4567 boys and 12,251 girls were re-interviewed, resulting in an effective follow-up rate of 76.5% for boys and 84% for girls. Participants were lost to follow-up for various reasons - migration, refusal, or researchers' inability to track the household. After excluding participants who provided inconsistent responses to age and education during the re-interview phase, the final sample in wave-2 was comprised of 16,292 adolescents (4428 boys and 11,864 girls), with an effective follow-up rate of 74% for boys and 81% for girls. For the primary outcome, we utilized 6168 adolescent girls aged 15–19 years who were unmarried at baseline and had interviews from both waves. Among them, we limited our sample to 567 girls who married as minors (<18 years) at wave 2 for our secondary outcome.

2.5. Outcome variables

Delayed marriage (marriage during adulthood) of girls was the primary outcome of interest in this study. We defined delayed marriage using the item on age at which respondents got their first marital alliance. We categorized respondents into four groups: married before 18 years, married between 18 and 19 years, married between 20 and 22 years, and unmarried girls. We used early marriage (married before 18) as the reference group in the analysis.

Our secondary outcome was female involvement in marital decision-making, specifically mate selection. To create our female involvement in marital decision-making process variable, we used data on the involvement of respondents in selecting their husbands. We categorized the variable into three groups: involvement of respondents only, parents and respondents, and parents only. Involvement of parents only served as our reference group.

2.6. Exposure variable

Our exposure of interest was parental engagement. We used a six-item measure to ask respondents about parental engagement in the past one year. We assessed if they and their parents had any discussion about: (a) school performance; (b) youth friendships; (c) physical changes of puberty/menstruation; (d) how pregnancy occurs; (e) what respondents do in their free time; and (f) youth's personal issues (whether respondents feel that they can talk about personal things with parents and they will listen).

We constructed each item into a separate binary variable due to poor internal reliability (Cronbach's alpha = 0.53) and low correlation (pairwise correlation ranging from 0.01 to 0.39) between items, which allowed for concurrent inclusion of all items in the regression analysis.

2.7. Baseline covariates

Our socio-demographic covariates include place of residence (urban

and rural), caste¹ (Scheduled Caste [SC]/ Scheduled Tribe [ST], Other Backward Classes [OBC], and General), religion (Hindu and other religions), completed years of schooling (none, 1–5 years, 6–9 years, and 10+ years of schooling), household wealth quintile (poorest [Q1], poorer, middle, richer, and richest [Q5]), and state (Uttar Pradesh and Bihar).

We also included social/digital connectivity as a covariate in the analysis. We assessed social connectivity via two binary items- 1) asked respondents whether they meet and spend time with friends (yes/no) and 2) asked whether they are members of any social group (yes/no). Digital connectivity was captured via two dichotomous variables, mobile phone ownership (yes/no) and internet use (any/none). We kept each of the items for social/digital connectivity as a single dichotomous variable separately in the analysis. We present a brief description of the outcome (wave 2), exposure (wave 1), and covariates (wave 1) in Appendix A.

2.8. Statistical analysis

We carried out unadjusted and covariate adjusted longitudinal analyses examining whether parental engagement (our key exposure variable collected in wave-1 [2015–16]) was associated with delayed marriage (our outcome collected in wave-2 [2018–19]), and secondarily to assess among those married as minors whether parental engagement in wave-1 was associated with female involvement in marital decision-making in wave-2. Prior to constructing multivariate models for both analyses, we tested for multicollinearity using variance inflation factor (VIF) and found no evidence of collinearity (VIF ranging from 1.14 to 2.01).

Descriptive statistics were carried out to show the distribution of the outcome, exposure, and covariates for the study sample. We applied multinomial regression models, both crude and adjusting for covariates, to assess the associations between our parental engagement exposure variable and each of our outcome variables (delayed marriage and girls' involvement in husband selection). Since our delayed marriage categorization includes those who are not married but may marry in the future, we have opted for multinomial logistic regression because it can be used with either ordered or unordered categories (Sainani, 2021). Adjusted models were controlled for baseline confounders selected *a priori*. We present multinomial regression results as relative risk ratios (RRRs) with a 95% confidence interval (CI).

In addition, we conducted a sensitivity analysis to test whether the association between parental engagement and delayed marriage remained consistent when our outcome was a dichotomous variable (married before 18 years vs. married at 18 years or later or unmarried). A sensitivity analysis was also performed to test of association between parental engagement and girls' involvement in mate selection by constructing a binary outcome variable (respondents alone or with parents vs. parents only). We employed unadjusted and adjusted logistic regression models to assess the associations. An odds ratio (OR) with a 95% CI was used for logistic regression models.

All statistical analyses were performed using Stata 16.0. We used *svyset* command in Stata to identify the complex design of the survey and used an appropriate sample weight that combined both states for conducting analyses.

¹ Caste is an entrenched, hereditary, and hierarchical social system deeply embedded in the Hindu social structure where general caste is considered as privileged group, OBCs are socially and educationally disadvantaged, and SCs and STs are socially and economically marginalized groups, occupying the lowest rungs of the caste hierarchy.

3. Results

3.1. Descriptive statistics

Of 6168 total unmarried adolescent girls aged 15–19 years at wave 1 (2015–16) who were successfully interviewed in wave 2 (2018–19), 1551 girls (31.2%) got married between both waves. Of them, 567 girls (12.5%) were married before 18 years of age. Over two-thirds of girls (68.8%) remained unmarried in wave 2. Among girls who married as minor, only 6.9% of girls alone were involved in mate selection, while over half (54.7%) of girls' marriage was decided by parents only. Parental engagement substantially varied across items, ranging from 3.2% discussing how pregnancy occurs to 80.2% interacting with parents about personal matters.

Among baseline characteristics collected at wave 1, the majority of respondents lived in rural areas (82.7%), belonged to OBC (58.1%) and believed in Hinduism (78.6%). Two in five (40.2%) girls attained ten or more years of schooling. The share of participants was almost equal in both states (52.2% in Uttar Pradesh vs. 49.8% in Bihar). Most girls reported that they spent time with friends (95.0%). Only a smaller proportion of girls (4.5%) had a membership in an adolescent group. Fewer girls owned a mobile phone (8.0%) and had internet access (8.2%) (Table 1).

3.2. Association between parental engagement and delayed marriage of girls

Unadjusted multinomial regression results indicate that, except for discussion regarding menstruation, all other five variables of parental engagement had a significant positive association with girls remaining unmarried. We also found that girls who report parental engagement on how girls spend their free time, who their friends are, and discussion of personal issues were more likely to report delayed compared to early marriage. Girls reporting parental engagement in discussion of school performance and physical changes of puberty/menstruation were less likely to report delayed compared to early marriage.

Similar findings held after controlling for covariates in the adjusted model. We again found that parental discussion around school performance (RRR: 1.33; CI: 1.11, 1.60), friendship (RRR: 1.37; 95% CI: 1.15, 1.64), and personal matters (RRR: 1.29, 95% CI: 1.09, 1.54) were positively associated with unmarried relative to early marriage status of girls. We also found that parental engagement on friendship (RRR: 1.62, 95% CI: 1.22, 2.15) was more likely for those married at 20–22 relative to those married early, and parental engagement on personal matters (RRR: 1.39; 95% CI: 1.12, 1.73) was more likely for those who married at 18–19 relative to those reporting early marriage. We also found a trend in the latter association for those who married at 20–22 (RRR: 1.31; 95% CI: 0.98, 1.76); lack of significant findings may be attributable to smaller cell sizes. We found that discussion with parents about physical changes/menstruation was negatively associated with marriage between 20 and 22 years (RRR: 0.67; 95% CI: 0.51, 0.88) and unmarried status (RRR: 0.80; 95% CI: 0.67, 0.95) of girls, relative to marriage at <18. Finally, we again found a negative association between discussing school performance with parents and marriage at both 18–19 (RRR: 0.62; 95% CI: 0.50, 0.77) and 20–22 (RRR: 0.50; 95% CI: 0.38, 0.66), relative to early marriage (Table 2).

Our sensitivity analyses also reveal similar associations between parental engagement and delayed marriage (married before 18 years vs. married at 18 or later + unmarried). The odds of parental engagement in discussing friendship (OR: 1.32; 95% CI: 1.11, 1.56) and personal matters of girls (OR: 1.32; 95% CI: 1.11, 1.56) were significantly higher for those who married at ≥18 years or unmarried as compared to their early married counterparts (Appendix B).

Table 1

Descriptive statistics for the variables included in this study (n = 6168).

Variables	Number (n)	Percent (%)
Outcome variables (wave 2)		
<i>Age at marriage</i>		
Married before 18 years	567	12.5
Married 18–19 years	659	12.8
Married 20–22 years	325	5.9
Unmarried girls	4617	68.8
<i>Girls' involvement in husband selection, among early married girls (n = 567)</i>		
Respondents only	47	6.9
Parents and respondents	254	38.4
Parents only	266	54.7
Exposure variables (wave 1)		
<i>Parental engagement</i>		
Discussed school performance		
No/Not attending	2718	44.6
Yes	3450	55.4
Discussed friendship		
No	1745	31.5
Yes	4222	68.5
Discussed physical changes/menstruation		
No	1694	29.6
Yes	4273	70.4
Discussed how pregnancy occurs		
No	5783	96.8
Yes	184	3.2
Parents know how respondent spends leisure time		
No	622	11.0
Yes	5345	89.0
Respondent can talk about personal matters		
No	1163	19.8
Yes	4804	80.2
Baseline Covariates (Wave 1)		
<i>Residence</i>		
Urban	2785	17.3
Rural	3383	82.7
<i>Caste of the HH head</i>		
SC/ST	1235	21.9
OBC	3571	58.1
General	1362	20.0
<i>Religion of the HH head</i>		
Hindu	4560	78.6
Other religions	1608	21.4
<i>Respondent's completed years of schooling</i>		
None	393	7.1
1–5 years	521	8.9
6–9 years	2503	43.8
10 and above	2751	40.2
<i>Household wealth quintile</i>		
Q1 (Poorest)	567	12.2
Q2	822	17.5
Q3	1201	22.5
Q4	1727	25.0
Q5 (Wealthiest)	1851	22.9
<i>State</i>		
Uttar Pradesh	3365	50.2
Bihar	2803	49.8
<i>Social/digital connectivity</i>		
Spending time with friends		
Never/no friends	312	5.0
Sometimes/often	5856	95.0
Member of any social group		
No	5877	95.5
Yes	291	4.5
Own mobile phone		
No	5,487	92.0
Yes	681	8.0
Access to internet		
No	5371	91.8
Yes	797	8.2

Note: Numbers are un-weighted and percentages are weighted.

Table 2

Unadjusted and adjusted multinomial logistic regression results (relative risk ratio with 95% confidence intervals) showing the association between parental engagement at wave 1 and subsequent delayed marriage of girls at wave 2 in Uttar Pradesh and Bihar, UDAYA (n = 5967).

Parental engagement	Model I: Age at marriage (compared with early married girls)			Model II: Age at marriage (compared with early married girls) ^a		
	Married 18-19 years	Married 20-22 years	Unmarried girls	Married 18-19 years	Married 20-22 years	Unmarried girls
Discussed school performance	0.82* (0.67, 0.99)	0.60** (0.47, 0.76)	1.59** (1.38, 1.85)	0.62** (0.50, 0.77)	0.50** (0.38, 0.66)	1.33** (1.11, 1.60)
Discussed friendship	1.10 (0.90, 1.36)	1.72** (1.32, 2.25)	1.37** (1.17, 1.62)	1.03 (0.83, 1.28)	1.62** (1.22, 2.15)	1.37** (1.15, 1.64)
Discussed physical changes/menstruation	0.84 (0.68, 1.03)	0.61** (0.47, 0.79)	0.74** (0.62, 0.87)	0.88 (0.71, 1.09)	0.67** (0.51, 0.88)	0.80* (0.67, 0.95)
Discussed how pregnancy occurs	0.83 (0.43, 1.58)	1.66 (0.84, 3.26)	1.63* (1.02, 2.60)	0.76 (0.39, 1.47)	1.49 (0.74, 2.99)	1.50 (0.92, 2.46)
Parents know about free time spending	1.37* (1.04, 1.79)	1.58* (1.09, 2.29)	1.34** (1.10, 1.65)	1.18 (0.90, 1.56)	1.24 (0.84, 1.82)	1.08 (0.87, 1.34)
Can talk about personal things with parents	1.66** (1.34, 2.06)	1.89** (1.42, 2.51)	1.60** (1.36, 1.88)	1.39** (1.12, 1.73)	1.31 (0.98, 1.76)	1.29** (1.09, 1.54)

*p < 0.05.

**p < 0.01.

^a Model adjusted for residence, caste, religion, years of schooling, household wealth, state, and social/digital connectivity.

3.3. Association between parental engagement and girls' decision-making on husband selection, among girls married as minors

Our unadjusted multinomial analysis demonstrated no significant associations between parental engagement variables and respondent alone control over decision-making on husband selection for the daughter versus parent alone decision-making on daughter's husband selection. However, girls who report that they can talk to parents about personal issues were significantly and positively associated with daughter + parents decision-making on husband selection versus parent alone decision-making. Similar findings held after controlling for covariates in the adjusted model. Our adjusted multinomial models document that girls who report that they can talk to parents about personal issues were significantly and positively associated with parents + girls selecting their husband, relative to parents alone selecting the husband (RRR: 1.43; 95% CI: 1.02, 2.00) (Table 3).

Our sensitivity analysis further shows that parental engagement variables (except for discussing menstruation) were positively associated with girls alone or with parents selecting husband, relative to parents alone selecting husband. However, the associations were statistically insignificant, which have been due to smaller cell sizes (Appendix C).

4. Discussion

In this study, we used unique longitudinal data to assess whether parental engagement is associated with subsequent delayed marriage of girls in Uttar Pradesh and Bihar, India. Findings from this study suggest that parental discussion around school performance, friendship, and personal issues had a significant and positive association with remaining unmarried in this sample. However, discussion of school performance was negatively associated with delayed marriage (18–22) compared to

early marriage. This finding may be because, for most girls, engagement in school is only protective against marriage until the girl reaches 18. Therefore, it may be helping to support a reduction in marriage before 18, but it results in marriage just after completion of education. While girls that remain in school after 18, may be more likely to stay unmarried (Sekine & Hodgkin, 2017). In a similar tune, a prior multi-country cohort study found that while higher parent-child relationship quality was protective against very early marriage (<16 years), higher parent-child communication was associated with an increased likelihood of marriage after legally permissible age (Bhan et al., 2019).

Menstruation and puberty discussion with parents was negatively associated with marriage between 20 and 22 years and unmarried status of girls, relative to early marriage, and this may be attributable to a) menstruation discussion with parents occurring at the time of menstruation and younger age at marriage in India, a finding seen in prior research (Raj et al., 2015). These findings demonstrate that supporting parental engagement with girls to ensure they are abreast of their lives, friends, sensitive issues, and education can support delayed marriage, possibly by facilitating dialogue with girls about opportunities beyond marriage. It is also possible that parents who are more engaged are less invested in seeing the marriage, and in particular early marriage of girls in Bihar and Uttar Pradesh.

Our findings suggest significant associations between various items of parental engagement and delayed marriage of girls, indicating parental engagement is a key factor in deterring the early marriage of girls. Parental support may improve self-efficacy among girls and empower them, which could help to exercise their agency and raise their voices against marriage proposals at an early age. Women's agency and decision-making power can lead to better utilization of maternal healthcare and optimal health outcomes (Vijayaraghavan et al., 2022; Vizheh et al., 2023). Although self-resistance is important for preventing

Table 3

Unadjusted and adjusted multinomial logistic regression results (relative risk ratio with 95% confidence intervals) showing the association between parental engagement and girls' involvement in husband selection among early married girls in Uttar Pradesh and Bihar, UDAYA (n = 548).

Parental engagement	Model I: Girls' involvement in husband selection (compared with involvement of parents only)		Model II: Girls' involvement in husband selection (compared with involvement of parents only) ^a	
	Involvement of respondents only	Involvement of respondents and parents	Involvement of respondents only	Involvement of respondents and parents
Discussed school performance	1.33 (0.77, 2.27)	1.11 (0.84, 1.48)	1.65 (0.78, 3.49)	1.12 (0.77, 1.63)
Discussed friendship	0.88 (0.50, 1.56)	1.17 (0.86, 1.58)	0.90 (0.47, 1.72)	1.16 (0.83, 1.62)
Discussed physical changes/menstruation	1.07 (0.59, 1.96)	1.05 (0.76, 1.45)	0.85 (0.44, 1.66)	1.16 (0.82, 1.64)
Discussed how pregnancy occurs	0.16 (0.00, 6.93)	0.51 (0.19, 1.36)	0.32 (0.01, 14.85)	0.60 (0.21, 1.68)
Parents know about free time spending	1.25 (0.60, 2.58)	1.33 (0.90, 1.96)	1.36 (0.62, 2.95)	1.13 (0.74, 1.72)
Can talk about personal things with parents	0.78 (0.45, 1.34)	1.48* (1.08, 2.01)	0.72 (0.40, 1.30)	1.43* (1.02, 2.00)

*p < 0.05.

^a Model adjusted for residence, caste, religion, years of schooling, household wealth, state, and social/digital connectivity.

early marriage, social support, particularly from fathers, is instrumental in stalling the forthcoming marriage proposals (McDougal et al., 2018). A Young Lives Study in India further reiterates that parental education and aspirations for daughters' education acted as protective factors against the marriage of girls at younger ages (Singh & Vennam, 2016). A recent study based on UDAYA data in rural areas of Uttar Pradesh and Bihar found that equitable gender role beliefs are associated with improving agency-related outcomes among girls and are instrumental in building resiliency against social norms that perpetuate the child marriage practice (Raj et al., 2021).

Our study also suggests an association between parental engagement and marital decision-making of girls, though the observed effects were weak and inconsistent across parental engagement variables. Only parental engagement on personal matters significantly increased the likelihood of girls' involvement in husband selection. However, a previous study noted that girls' participation in marital decision-making typically involved elopements in the contexts of India and Ethiopia (McDougal et al., 2018). In India, the marriage of daughters is typically decided by parents, particularly fathers and extended family members (Jejeebhoy & Halli, 2005). Daughters are rarely asked to give their consent for marriage, especially when prospective grooms and their families have higher status and prestige in society (Desai & Andrist, 2010). This is concerning as parent-arranged and semi-arranged marriages generally result in young brides having compromised agency in their marital household (Banerji & Deshpande, 2021; Jejeebhoy & Raushan, 2022; Mehra et al., 2018). Social norms – perhaps reflect in parents' normative beliefs and social pressure create an environment that encourages parents to marry off daughters early in Indian settings (EP and Poonia, 2015; Jejeebhoy, 2019; Jha et al., 2016). Marital agency of women has significant health implications. For instance, a previous study in rural India suggests that women's decision-making power in choosing a partner is positively associated with the use of modern contraceptive methods (Dixit et al., 2023).

4.1. Strengths and limitations

This study offers a valuable contribution to the understanding of the relationship between parental engagement and delayed marriage among adolescent girls in India. By using longitudinal data from a state-representative sample in Uttar Pradesh and Bihar, where early marriage is prevalent, the study provides some important insights into potential causality that was previously lacking. The study's findings are robust and consistent and have the potential to inform evidence-based policy-making to prevent early marriage practices in resource-poor settings in India. Our findings have significant health implications. The successful transition of adolescent girls into adulthood and the postponement of marriage can result in improved sexual and reproductive health outcomes, as well as enhanced overall well-being in later stages of life.

The study has some limitations that should be taken into account. The study relies on self-reporting, making it vulnerable to recall bias and social desirability. The information available on parental engagement is not comprehensive and may not fully capture the nuances of this complex relationship. Moreover, the lack of internal reliability in the available items for parental engagement makes it difficult to construct a composite measure of it. There could be a possibility of endogeneity bias in the analysis due to unobservable factors, which may explain observed relationships in the model. For instance, early initiation of menarche among adolescent girls may increase the likelihood of child marriage (Raj et al., 2015). Therefore, non-inclusion of such important factors due to unavailability of information in the dataset may lead to less consistent results. Although the survey was conducted by trained interviewers and strictly followed the privacy of respondents, we could not completely rule out the possibility of reporting and social desirability biases. Further, we cannot assess the potential pathways that explain the association between parental engagement and early marriage of girls

partly due to limited data information. Future studies could explain the pathways through which parental engagement shapes the timing of marriage for girls. More in-depth, qualitative and quantitative research is warranted for a nuanced understanding of the relationship between parental engagement and early/delayed marriage in the Indian context. Improving measures of parental interaction/engagement is needed to provide robust evidence on the relationship between parental engagement and marriage timing among girls that could guide us for more focused, targeted interventions.

5. Conclusion

Our study highlights the crucial role of parental engagement in reducing the risk of early marriage among adolescent girls. The findings emphasize the need for focused and targeted interventions, particularly among socio-economically vulnerable groups, by raising awareness among parents about the risks associated with early marriage. Promoting gender equality and girls' empowerment within the household, along with parent-child engagement and communication, can be effective in preventing early marriage. Achieving this, particularly in rural and remote areas, requires collective efforts by engaging stakeholders at various levels (Mehra et al., 2018). Most importantly, efforts should be made to improve girls' access to education and create an enabling environment for them to exercise their rights and agency in the marital decision-making process. Since child/early marriage is not solely a legal issue, the legal framework alone may not be successful in eliminating the practice in a patriarchal context like India. Changing socio-cultural norms and beliefs that encourage early marriage requires a multi-sectoral approach and mobilizing community-based networks. Parents' engagement and support for children may be highly effective means of reducing early marriage and improving marital choice for girls in India.

Author contributions

Pintu Paul: Conceptualization, Data Curation, Software, Methodology, Writing - original draft, Writing - review & editing; Kalysha Closson: Formal Analysis, Methodology, Writing - review & editing; Anita Raj: Conceptualization, Formal Analysis, Validation, Writing - review & editing, Visualization, Supervision. All authors read and approved the final manuscript.

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Ethical statement

The UDAYA survey protocol was approved by the ethical review board of the Population Council. Privacy and confidentiality of respondents were strictly maintained while conducting the interviews. Consent was obtained from each participant, with parent or guardian's consent sought for unmarried minors.

Declaration of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The UDAYA data can be accessible upon request from the Population Council through the data repository at Harvard dataverse (<https://www.>

projectudaya.in/).

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ssmph.2023.101523>.

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