Effects of Gender Role Beliefs on Social Connectivity and Marital Safety: Findings From a Cross-Sectional Study Among Married Adolescent Girls in India

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ABSTRACT

Purpose: The purpose of the study was to examine associations of gender role beliefs with marital safety as well as social and digital connectivity among married adolescent girls in India.

Methods: We analyzed cross-sectional survey data from married adolescent girls from rural Bihar and Uttar Pradesh, India in 2015–2016 (N = 4,893). Gender role belief items assessed participants’ beliefs regarding appropriateness of female marital choice and economic decision-making, male childcare responsibility, and marital violence. The outcomes were time with friends (social connection), freedom of movement, mobile phone ownership and internet access (digital connection), and safety from marital violence (marital safety). Adjusted regression models examined associations between gender role beliefs and outcomes, caste/religion beliefs related to segregation, and demographics.

Results: Beliefs supportive of female marital choice (adjusted odds ratio [AOR] 1.38, 95% confidence interval [CI] 1.00–1.88, p = .048) and female economic decision-making (AOR 1.43, 95% CI 1.03–1.99, p = .03) were associated with social connection. Beliefs supportive of female marital choice (AOR 1.88, 95% CI 1.31–2.71, p = .001), female economic decision-making (AOR 1.67, 95% CI 1.03–2.72, p = .04), and male childcare responsibilities (AOR 1.42, 95% CI 1.05–1.94, p = .03) were associated with freedom of movement. Belief supporting female marital choice was associated with mobile phone ownership (AOR 1.23, 95% CI 1.01–1.50, p = .04), and belief supporting male childcare responsibility was associated with internet access (AOR 1.76, 95% CI 1.11–2.77, p = .02). Beliefs supportive of female marital choice (AOR .73, 95% CI .59–.89, p = .003), male childcare responsibility (AOR 1.26, 95% CI 1.03–1.54, p = .02), and unacceptability of marital violence (AOR 1.72, 95% CI 1.38–2.15, p = .001) were associated with safety from marital violence.

Conclusions: Progressive gender role beliefs regarding female choice, control, and safety in marriage are associated with greater connectivity and safety for married adolescent girls in India. Future studies that can longitudinally assess these associations are warranted.

IMPLICATIONS AND CONTRIBUTION

This study with married adolescent girls from rural India finds progressive gender role beliefs regarding female choice, control, and safety in marriage associated with married girls’ safety from marital violence and higher social and digital connection, highlighting the need for attitudinal and social norm changes regarding female agency in marriage.

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Child marriage—i.e., marriage before 18 years—affects one in five girls globally, disproportionately affecting poor, less educated, and rural girls, particularly in South Asia and sub-Saharan Africa [1,2]. Child marriage compromises the health, safety, and rights of young wives [3–7], as well as their children [8–13]. Although some reduction in the practice has occurred in the past decade, the annual rate of reduction in child marriage is less than 2% [14]. Accordingly, the United Nations General Assembly in November 2020 renewed their commitment to eliminate child marriage by 2030 and called for greater emphasis on addressing the ongoing gender norms enabling the practice, including a specific resolution calling on member states to work with communities to “combat negative social norms and gender stereotypes” related to child marriage [15]. Little research has examined whether these norms are associated with girls’ agency and safety once they are married.

India has the largest number of women and girls married as minors of any nation [16], with 27.9% of females aged 20–24 years married by age 18 [17]. Despite progress in female education and literacy, and substantial development overall over the past 20 years, the reduction in the global prevalence of child marriage has been inadequate, likely due to persistent gender inequalities [18]. Although there is evidence of improvement on this issue in India [17], more work is needed, particularly with regard to the social inequalities in the prevalence of child marriage in the country. There is much evidence that girls who marry as minors in India largely come from isolated rural and impoverished circumstances where development has lagged and more traditional beliefs and norms persist [17].

Norms that support child marriage may impede development of more equitable gender role beliefs among girls who marry as minors. Equitable beliefs may broaden their options and strengthen their agency to engage in protective social and health practices. Hence, conventional gender role ideologies (e.g., beliefs restricting female mobility and marital choice, supporting husbands’ dominance over wives, and defining female value based on domestic contribution and motherhood) often exclude women from decision-making, limit male engagement in domestic and caregiving responsibilities, and justify marital violence against women. Girls who marry during adolescence often drop out of school and may be less connected to social support and services, making them all the more vulnerable within their marital households [19,20]. If so, these beliefs, and the broader norms that maintain them, may be important targets for social support and communication interventions and policies to prevent girl child marriage and to provide social protections for women and girls married as children.

In this study, we assess the prevalence of more progressive rather than conventional gender role beliefs among adolescent married girls in Bihar and Uttar Pradesh, India, states lagging behind on progress for women and girls and with the highest number of married girls, 22 million and 32 million, respectively [17]. We examine the association between progressive beliefs and married girls’ social connection, freedom of movement, digital connectivity, and their safety in marriage (i.e., freedom from marital violence). We also consider beliefs related to caste and religion, specifically social segregation based on these characteristics, to help elucidate whether conventional beliefs broadly may affect married girls’ agency and safety or whether it is specifically conventional gender role beliefs that are associated with these outcomes. We hypothesize gendered beliefs specifically are important.

We use Zimmerman’s theories of resiliency and psychological empowerment to guide our analysis of these issues. Resiliency theory takes a strength-based approach to understanding adolescent development, positing that those in high stress or barrier-affected circumstances are able to overcome obstacles such as traditional gender norms and caste norms that can restrict behavior, to achieve their self-directed goals [21]. Psychological empowerment refers to an individual’s perceptions of personal control and their proactive approach to achieving their goals via use of their assets and resources [22] or, in other words, their agency [23]. The interconnection of norms and married girls’ agency are our focus of this analysis. This is, to our knowledge, the first study that considers the role of both gendered and nongendered conventional beliefs to provide insight into the role of such beliefs on the connectivity and safety of married girls. Secondarily, we also assess whether any observed associations are moderated by age at marriage, as girls married at younger ages (<15 years) may be particularly vulnerable to both restrictive gender roles beliefs and their impacts.

Methods

Study design and sampling

This study utilizes cross-sectional data from married adolescent girls participating in the Understanding the Lives of Adolescents and Young Adults (UDAYA) study conducted in Bihar and Uttar Pradesh, India, in 2015–2016. The UDAYA study was conducted with 10- to 19-year-olds, inclusive of a subsample of married girls aged 15–19 years, and was designed to yield state-representative samples. This analysis was limited to girls who were currently married and for whom gauna (a ceremony associated with the consummation of marriage, before which the bride continues to live in her natal home) has been performed (n = 3,182 adolescents in Bihar and n = 1,711 adolescents in Uttar Pradesh). For more details on sampling strategy, sample, and data collection, please see original UDAYA study reports [24,25].

All study procedures for the UDAYA study were approved by the Population Council Institutional Review Board. The authors of this study, not involved in original data collection, only had access to deidentified data available via public data portal. This study received approval for ethical exemption from University of California, San Diego’s Institutional Review Board for secondary data analysis.

Survey measures assessed

Outcomes. Our outcomes of interest included social connection, freedom of movement, digital connectivity, and safety from marital violence.

Social connection was captured via a single item asking about time with friends; response categories were combined to yield a dichotomous analysis variable of spends time with friends or not.

Freedom of movement was assessed via three items asking whether the girl can travel to a location alone, can go with someone else, or cannot go at all. Responses were dichotomized to full freedom of movement (can go alone to all locations) or
restricted movement (cannot go alone to at least one of three locations).

Digital connectivity was captured via two dichotomized items, mobile phone ownership (yes/no) and internet use (any/none). Mobile phone ownership and internet access were each kept as their own variables for analyses.

Safety from marital violence was assessed via eight questions asking whether the girl’s husband had ever perpetrated seven forms of physical violence or one form of sexual violence (see Appendix Table 1 for full survey items and outcome definitions). Responses were dichotomized to having ever experienced any form of marital violence or not.

**Independent variables.** Our independent variables assessed participants’ beliefs related to gender roles. These items were included in the UDAYA study with support from the Global Early Adolescent Study [26], a multinational survey research study with 10- to 19-year-olds in low- and middle-income countries. While this measure has not been published, the selected items built on formative research, expert input, and sound theoretical foundation, with consideration of the Indian context [24–26]. Beliefs about gender roles were assessed via four items, asking participants whether or not they agreed that a given behavior was acceptable: 1. ‘Should girls be allowed to decide when they want to marry?’ (female marital choice). 2. ‘Should husband alone/mainly decide how household money is to be spent?’ (female economic decision-making). 3. ‘Is giving the kids a bath and feeding the kids women’s responsibility only?’ (male childcare responsibility). 4. ‘Is it all right for a husband to beat his wife if she does not listen to him or obey him?’ (unacceptability of marital violence). While these items were designed in the survey to compile a single measure on gender role beliefs, they showed poor internal reliability and relatively low correlation (Cronbach alpha = .46, pairwise correlation between individual items ranging .09–.26). Hence, each item was utilized as a single variable for analyses. Multicollinearity was assessed; variance inflation factors for the four gender items were low (ranging from 1.05 to 1.15), and thus simultaneous inclusion of all items was deemed acceptable.

**Covariates.** The sociodemographic covariates included age, age at marriage, marital choice, education, parity, wealth quintile, caste, religion, urbanicity, and state. We also included beliefs regarding caste/religion which focused on segregation versus social mixing based on these characteristics. As with the gender role belief measure, these items were developed for use with this study. Caste/religion beliefs were assessed via three items:

| Table 1 |
| --- |
| Regression models to assess the associations between gender role beliefs and social time with peers (the participant “often or sometimes” spends time with friends), among married adolescent girls in Bihar and Uttar Pradesh, India |
| Belief | A | B | C | D |
| --- | --- | --- | --- | --- |
| **OR** | **95% CI** | **OR** | **95% CI** | **OR** | **95% CI** | **OR** | **95% CI** |
| Caste/religion beliefs | 1.37*** | [1.20, 1.56] | - | - | 1.32*** | [1.15, 1.50] | - | - | 1.27*** | [1.12, 1.45] |
| Female marital choice | 1.76*** | [1.31, 2.37] | 1.66*** | [1.24, 2.23] | 1.54** | [1.14, 2.08] | 1.38* | [1.00, 1.88] |
| Female economic decision-making | 1.78*** | [1.29, 2.45] | 1.62** | [1.14, 2.30] | 1.47* | [1.07, 2.02] | 1.43* | [1.03, 1.99] |
| Male childcare | 1.35* | [1.04, 1.74] | 1.13 | [0.87, 1.47] | 1.1 | [0.83, 1.44] | .95 | [.72, 1.25] |
| Marital violence acceptability | 1.08 | [.79, 1.46] | .95 | [.69, 1.30] | 0.9 | [.65, 1.24] | .84 | [.61, 1.16] |
| Current age | - | - | - | - | - | - | - | - | .98 | [.83, 1.17] |
| Age at marriage | - | - | - | - | - | - | - | - | .96 | [.86, 1.08] |
| Spouse selection | - | - | - | - | - | - | - | - | - | - |
| Self | 1 | [1.00, 1.00] | .86 | [.51, 1.45] | .84 | [.51, 1.39] | 1.06* | [.101, 1.11] |
| Parents, with respondent input | .86 | [.51, 1.45] | .84 | [.51, 1.39] | 1.06* | [.101, 1.11] | 1 | [1.00, 1.00] |
| Parents, without respondent input | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| Education | - | - | - | - | - | - | - | - | 1.06* | [.101, 1.11] |
| Parity | 0 | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| 1 | - | - | - | - | - | - | - | - | .56*** | [.40, 0.77] |
| 2*** | - | - | - | - | - | - | - | - | .31*** | [.18, 0.52] |
| Wealth index | 1 (poorest) | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| 2 | - | - | - | - | - | - | - | - | 1.59** | [.12, 2.27] |
| 3 | - | - | - | - | - | - | - | - | 1.48* | [.101, 2.16] |
| 4 | - | - | - | - | - | - | - | - | 1.70** | [.12, 2.39] |
| 5 (wealthiest) | - | - | - | - | - | - | - | - | 1.69* | [.105, 2.71] |
| Caste | General | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| SC/ST/OBC | - | - | - | - | - | - | - | - | 1.54 | [.97, 2.43] |
| SC/ST/OBC | - | - | - | - | - | - | - | - | 1 | [.100, 1.00] |
| Hindu | - | - | - | - | - | - | - | - | 1 | [.100, 1.00] |
| Non-Hindu | - | - | - | - | - | - | - | - | .89 | [.60, 1.31] |
| Urban/rural | - | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| Urban | - | - | - | - | - | - | - | - | 1.22 | [.83, 1.78] |
| Rural | - | - | - | - | - | - | - | - | - | 1 | [.100, 1.00] |
| State | - | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| UP | - | - | - | - | - | - | - | - | 1 | [1.00, 1.00] |
| Bihar | - | - | - | - | - | - | - | - | 1.49** | [.112, 2.00] |

* Each belief is separate regression; *p <.05, **p <.01, ***p <.001.
Do you mix freely with people of different castes (from yourself)? Do you mix freely with people of different religions (from yourself)? and Would you eat together with a person of a different caste/religion (from yourself)?

These items demonstrated good internal reliability (Cronbach alpha = .80) and thus comprised a single scale. Each ‘yes’ response was one point, and the three items were summed for a final scale score, where a higher score indicated higher equity.

Descriptive statistics regarding nature of marriage and spousal characteristics are reported; these are not included in adjusted models because of collinearity with marital choice variable (nature of marriage) and large missingness (spousal characteristics).

Analyses

First, descriptive statistics regarding covariates, outcomes, and gender role beliefs were examined for the total sample. A series of logistic regression analyses were utilized to assess the associations between beliefs and each outcome (models A–D). First, unadjusted models were separately conducted for each of the belief measures for each of the five outcomes (models A). Next, an unadjusted model including all four gender role beliefs was conducted for each outcome (model B) and additionally including the caste/religion belief scale for each outcome (model C). Finally, a series of fully adjusted models accounting for sociodemographic covariates were conducted, including all four gender role beliefs and the caste/religion belief scale for each outcome (model D). For clarity, only fully adjusted model findings (model D) are presented in the results in the following. As a sensitivity analysis, stratified fully adjusted models (model D) were conducted to assess whether age at marriage changed the relationships between beliefs and the examined outcomes.

All analyses, including calculation of proportions and regressions, accounted for provided survey weights. Significance was set at $p < .05$ for all comparisons; adjusted odds ratios (AORs) and 95% confidence intervals (CIs) are reported for regression results. All analyses were conducted using STATA 15.1.

Results

Descriptive statistics

In our sample of married adolescent girls, most girls (88.6%) were able to often or sometimes spend time with friends, but only one in 10 (9.5%) reported having full mobility to go to all noted locations alone (see Appendix Table 2). One third of girls (34.2%) had their own mobile phone; only 4.5% of girls reported

Table 2
Regression models to assess the associations between gender role beliefs and freedom of movement (the participant able to go alone to multiple locations), among married adolescent girls in Bihar and Uttar Pradesh, India

| Belief                              | A OR (95% CI) | B OR (95% CI) | C OR (95% CI) | D OR (95% CI) |
|-------------------------------------|---------------|---------------|---------------|---------------|
| Caste/religion                      | 1.51*** [1.27, 1.81] | -             | 1.43*** [1.21, 1.70] | 1.37*** [1.15, 1.64] |
| Female marital choice              | 2.00*** [1.39, 2.87] | 1.83*** [1.28, 2.61] | 1.68** [1.19, 2.37] | 1.88*** [1.31, 2.71] |
| Female economic decision-making    | 2.08** [1.28, 1.39] | 1.81* [1.14, 1.27] | 1.63* [1.02, 2.61] | 1.67* [1.03, 2.72] |
| Male childcare                     | 1.57* [1.10, 2.23] | 1.35 [0.98, 1.86] | 1.28 [0.93, 1.76] | 1.42* [1.05, 1.94] |
| Marital violence acceptability     | 1.01 [0.70, 1.45] | .84 [0.60, 1.18] | .79 [.56, 1.12] | .79 [.55, 1.13] |
| Current age                         | -             | -             | -             | -             |
| Age at marriage                     | -             | -             | -             | -             |
| Spouse selection                    | 1.28 [0.99, 1.66] | .73*** [.60, .87] | -             | -             |
| Self                                | -             | -             | -             | -             |
| Parents, with respondent input      | -             | -             | -             | -             |
| Parents, without respondent input   | -             | -             | -             | -             |
| Education                           | -             | -             | -             | -             |
| Parity                              | -             | -             | -             | -             |
| 0                                   | -             | -             | -             | -             |
| 1                                   | -             | -             | -             | -             |
| 2+                                  | -             | -             | -             | -             |
| Wealth index                        | -             | -             | -             | -             |
| 1 (poorest)                         | -             | -             | -             | -             |
| 2                                   | -             | -             | -             | -             |
| 3                                   | -             | -             | -             | -             |
| 4                                   | -             | -             | -             | -             |
| 5 (wealthiest)                      | -             | -             | -             | -             |
| Caste                               | -             | -             | -             | -             |
| General                             | -             | -             | -             | -             |
| SC/ST/OBC                           | -             | -             | -             | -             |
| Religion                            | -             | -             | -             | -             |
| Hindu                               | -             | -             | -             | -             |
| Non-Hindu                           | -             | -             | -             | -             |
| Urban/rural                         | -             | -             | -             | -             |
| Urban                               | -             | -             | -             | -             |
| Rural                               | -             | -             | -             | -             |
| State                               | -             | -             | -             | -             |
| UP                                  | -             | -             | -             | -             |
| Bihar                               | -             | -             | -             | -             |

* Each belief is separate regression; *$p < .05$, **$p < .01$, ***$p < .001$. 

"Do you mix freely with people of different castes (from yourself)?", "Do you mix freely with people of different religions (from yourself)?", and "Would you eat together with a person of a different caste/religion (from yourself)?" These items demonstrated good internal reliability (Cronbach alpha = .80) and thus comprised a single scale. Each 'yes' response was one point, and the three items were summed for a final scale score, where a higher score indicated higher equity. Descriptive statistics regarding nature of marriage and spousal characteristics are reported; these are not included in adjusted models because of collinearity with marital choice variable (nature of marriage) and large missingness (spousal characteristics).
internet access. Two in five girls (42.8%) had experienced marital violence (i.e., were unsafe in their marriage). The majority of participants (92.6%) reported that their parents selected their husband, and of these, 51.5% reported that they were not asked their opinion about this mate. Almost two thirds of the sample (64.2%) did not know their husband before their wedding day, and only 11.4% reported that they knew him very well before marriage. The majority (85.8%) indicated that a dowry was provided.

**Regression analyses**

In adjusted models, endorsement of beliefs supporting female marital choice (AOR 1.38, 95% CI 1.00–1.93), female economic decision-making (AOR 1.43, 95% CI 1.03–1.93), marital choice (AOR 1.38, 95% CI 1.00–1.88), marital violence (AOR 1.72, 95% CI 1.38–2.15) and male childcare responsibilities (AOR 1.26, 95% CI 1.03–1.54) were all positively and significantly associated with full freedom of movement (AOR 1.37, 95% CI 1.15–1.64).

In adjusted models, endorsement of the belief supporting female marital choice was positively and significantly associated with marital safety (AOR 1.72, 95% CI 1.38–2.15). In adjusted models, endorsement of the belief supporting male childcare responsibilities was significantly and positively associated with mobile phone ownership (AOR 1.18, 95% CI 1.08–1.29).

In adjusted models, endorsement of the belief supporting male childcare responsibilities was significantly and positively associated with internet access (AOR 1.18, 95% CI 1.08–1.29) (Table 3, models D.). More equitable caste/religion beliefs were also positively and significantly associated with mobile phone ownership (AOR 1.18, 95% CI 1.08–1.29).

In adjusted models, endorsement of beliefs supporting male childcare responsibility (AOR 1.26, 95% CI 1.03–1.54) and unacceptability of marital violence (AOR 1.72, 95% CI 1.38–2.15) was associated with marital safety (i.e., freedom from marital violence) (Table 5, model D.). Contrary to our hypothesis, endorsement of the belief supporting female marital choice was negatively associated with marital safety in our final fully adjusted model (AOR .73, 95% CI .59–.89). Caste/religion beliefs were not associated with marital safety.

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**Table 3**

Regression models to assess the associations between gender role beliefs and mobile phone ownership, among married adolescent girls in Bihar and Uttar Pradesh, India.

| Belief                        | A | OR 95% CI | B | OR 95% CI | C | OR 95% CI | D | OR 95% CI |
|------------------------------|---|-----------|---|-----------|---|-----------|---|-----------|
| Caste/religion               | 1.27*** [1.17, 1.39] | - | - | - | 1.22*** [1.11, 1.33] | 1.18*** [1.08, 1.29] |
| Female marital choice       | 1.50*** [1.32, 1.92] | 1.50*** [1.24, 1.81] | 1.42*** [1.18, 1.72] | 1.21* [1.01, 1.50] |
| Female economic decision-making | 1.43** [1.14, 1.79] | 1.50*** [1.24, 1.81] | 1.42*** [1.18, 1.72] | 1.21* [1.01, 1.50] |
| Male childcare              | 1.41** [1.13, 1.75] | 1.19 [0.95, 1.49] | 1.16 [0.93, 1.44] | 1.05 [0.84, 1.31] |
| Marital violence attitudes  | 1.48*** [1.18, 1.86] | 1.35** [1.08, 1.70] | 1.31* [1.04, 1.64] | 1.24 [0.98, 1.57] |
| Current age                 | - | - | - | - | - | - | - | - |
| Age at marriage             | - | - | - | - | - | - | - | - |
| Spouse selection            | - | - | - | - | - | - | - | - |
| Self                        | 1 | [1.00, 1.00] | - | - | - | - | - | - |
| Parents, with respondent input | - | - | - | - | - | - | - | - |
| Parents, without respondent input | .74 | [.53, 1.04] | - | - | - | - | - | - |
| Education                   | - | - | - | - | - | - | - | - |
| Parity                      | - | - | - | - | - | - | - | - |
| 0                           | - | - | - | - | - | - | - | - |
| 1                           | - | - | - | - | - | - | - | - |
| 2+                          | - | - | - | - | - | - | - | - |
| Wealth index                | - | - | - | - | - | - | - | - |
| 1 (poorest)                 | - | - | - | - | - | - | - | - |
| 2                           | - | - | - | - | - | - | - | - |
| 3                           | - | - | - | - | - | - | - | - |
| 4                           | - | - | - | - | - | - | - | - |
| 5 (wealthiest)              | - | - | - | - | - | - | - | - |
| Caste                       | - | - | - | - | - | - | - | - |
| General                     | - | - | - | - | - | - | - | - |
| SC/ST/OBC                   | - | - | - | - | - | - | - | - |
| Religion                    | - | - | - | - | - | - | - | - |
| Hindu                       | - | - | - | - | - | - | - | - |
| Non-Hindu                   | - | - | - | - | - | - | - | - |
| Urban/rural                 | - | - | - | - | - | - | - | - |
| Urban                       | - | - | - | - | - | - | - | - |
| Rural                       | - | - | - | - | - | - | - | - |
| State                       | - | - | - | - | - | - | - | - |
| UP                          | - | - | - | - | - | - | - | - |
| Bihar                       | - | - | - | - | - | - | - | - |

* Each belief is separate regression; *p < .05, **p < .01, ***p < .001.
### Table 4
Regression models to assess the associations between gender role beliefs and internet access, among married adolescent girls in Bihar and Uttar Pradesh, India

| Belief                                | A | B | C | D |
|---------------------------------------|---|---|---|---|
| Caste/religion                        | 1.42** |    | .94 | 1.23 |
| Female marital choice                 | 2.65*** |    | .87 | 1.23 |
| Female economic decision-making       | 2.03   |    | 1.15 | 1.33 |
| Male childcare                        | 2.83*** |    | 1.40** | 1.76* |
| Marital violence attitudes            | 1.36   |    | 1.78*** | .83 |
| Current age                           | -     |    | -    | .86 |
| Age at marriage                       | -     |    | -    | .94 |
| Spouse selection                      | -     |    | -    | 1   |
| Parents, with respondent input        | -     |    | -    | 1.36 |
| Parents, without respondent input     | -     |    | -    | .83 |
| Education                             | -     |    | -    | 1.20*** |
| Wealth index                          |      |    |      |      |
| 1 (poorest)                           | -     |    | -    | 1 |
| 2                                    | -     |    | -    | 1.47 |
| 3                                    | -     |    | -    | 1.21 |
| 4                                    | -     |    | -    | 5.53** |
| 5 (wealthiest)                        | -     |    | -    | 8.83*** |
| Caste                                |      |    |      |      |
| General                               | -     |    | -    | 1 |
| SC/ST/OBC                             | -     |    | -    | .82 |
| Religion                              |      |    |      |      |
| Hindu                                 | -     |    | -    | 1 |
| Non-Hindu                             | -     |    | -    | 1.37 |
| Urban/rural                           | -     |    | -    | 1 |
| Rural                                 | -     |    | -    | .87 |
| State                                 |      |    |      |      |
| UP                                    | -     |    | -    | 1 |
| Bihar                                 | -     |    | -    | .68 |

* OR 95% CI OR 95% CI OR 95% CI OR 95% CI

* Each belief is separate regression; *p < .05, **p < .01, ***p < .001.

### Age at marriage stratified analyses

In stratified adjusted models, we observed no significant differences by age at marriage in the relationship between any outcome and any of the four gender role beliefs or the caste/religion belief scale (i.e. CIs in effect size overlapped for all beliefs and all outcomes) (See Appendix Figures 1–5).

### Discussion

This study examined the relationships between beliefs related to gender roles with indicators of female agency among married adolescents aged 15–19 years living in rural areas in Bihar and Uttar Pradesh, India. Study results indicated a relationship between equitable gender role beliefs and positive agency-related outcomes. This is true even after accounting for beliefs related to caste/religion, which were notably associated with all outcomes except for safety from marital violence. The gender role beliefs explored included female marital choice, female economic decision-making, male childcare responsibility, and unacceptability of marital violence. More equitable beliefs regarding gender roles were associated with social connection, freedom of movement, digital connectivity, and safety from marital violence. Attitudes of acceptability toward marital violence were not significantly associated with experiences of marital violence. These findings correspond with prior research documenting associations between gender role beliefs and female agency in the area of livelihoods [27–29] and extend these findings by demonstrating the association between these beliefs and social connectivity and safety, additional key areas of agency, including marital safety or freedom from marital violence. Identification of the beliefs associated with poor outcomes in this population can inform interventions to support married girls, as strategies to affect gender role beliefs and norms have already been shown to be instrumental in interventions for prevention of child marriage [30–32] but not applied to support married girls. Findings support the potential value of addressing norms and agency toward building girls’ resiliency and psychological empowerment in marriage, as per our theoretical framework [21,22].

As noted previously, associations between more equitable gender role beliefs and connectivity, inclusive of digital connectivity, were significant, but importantly, digital connectivity as indicated by mobile phone ownership and internet access was quite low among these rural, married girls in Bihar and Uttar Pradesh. These findings related to social and digital support and connectivity are a particular concern in light of the current COVID-19 pandemic, which is increasing social isolation. Absence of social and digital connectivity not only increases that isolation but also impedes these married adolescent girls’ capacities to link
adolescent girls in Bihar and Uttar Pradesh, India. At the same time, conventional beliefs related to caste and religion were significantly associated with marital violence, with more progressive beliefs related to caste and religion associated with greater connectivity and safety.

Our more exploratory analysis assessing whether observed associations for the total sample differed based on age at marriage surprisingly yielded no meaningful or significant findings. In other words, associations of gender role beliefs with women’s connectivity and safety did not vary by how young these adolescent wives were at marriage. Prior research suggests greater social and health vulnerabilities for girls married in early adolescence, i.e., before the age of 15 years [34–36]. Although these findings were not significant in our study, we did find that older age at marriage was associated with both greater freedom of movement and safety from marital violence, findings seen in previous research [5,37].

**Limitations**

Findings from this study should be considered in light of certain limitations. First, available research on measuring gendered beliefs among married adolescent girls is limited. There is no gold standard for this measure, and items were not sufficiently intercorrelated to allow for development of a scale. Furthermore, all measures rely on self-report, which are subject to recall bias.

**Table 5**

Regression models to assess associations between gender role beliefs and safety from marital violence (never experienced violence from spouse), among married adolescent girls in Bihar and Uttar Pradesh, India.

| Belief                      | A*   | B   | C   | D   |
|----------------------------|------|-----|-----|-----|
|                            | OR   | 95% CI | OR  | 95% CI | OR  | 95% CI | OR  | 95% CI |
| Caste/religion              | .98  | [.90, 1.07] | -   | -     | .94  | [.86, 1.03] | .95  | [.86, 1.04] |
| Female marital choice       | .95  | [.77, 1.16] | .85  | [.70, 1.04] | .87  | [.71, 1.06] | .73** | [.59, 0.89] |
| Female economic decision-making | 1.32  | [.99, 1.76] | 1.12  | [.84, 1.51] | 1.15  | [.85, 1.54] | 1.17  | [.86, 1.58] |
| Male childcare              | 1.54*** | [.127, 1.86] | 1.38** | [.113, 1.69] | 1.40** | [.114, 1.71] | 1.26* | [.103, 1.54] |
| Marital violence attitudes  | 1.92*** | [.55, 2.37] | 1.76*** | [.141, 2.20] | 1.78*** | [.142, 2.23] | 1.72*** | [.138, 2.15] |
| Current age                 | -    | -     | -   | -     | -    | -     | -    | -     |
| Age at marriage             | -    | -     | -   | -     | -    | -     | -    | -     |
| Spouse selection            | -    | -     | -   | -     | -    | -     | -    | -     |
| Self                        | -    | -     | -   | -     | -    | -     | -    | -     |
| Parents, with respondent input | -    | -     | -   | -     | -    | -     | -    | -     |
| Parents, without respondent input | -    | -     | -   | -     | -    | -     | -    | -     |
| Education                   | -    | -     | -   | -     | -    | -     | -    | -     |
| Parity                      | -    | -     | -   | -     | -    | -     | -    | -     |
| 0                           | -    | -     | -   | -     | -    | -     | -    | -     |
| 1                           | -    | -     | -   | -     | -    | -     | -    | -     |
| 2+                          | -    | -     | -   | -     | -    | -     | -    | -     |
| Wealth index                | 1 (poorest) | -     | -   | -     | -    | -     | -    | -     |
| 2                           | -    | -     | -   | -     | -    | -     | -    | -     |
| 3                           | -    | -     | -   | -     | -    | -     | -    | -     |
| 4                           | -    | -     | -   | -     | -    | -     | -    | -     |
| 5 (wealthiest)              | -    | -     | -   | -     | -    | -     | -    | -     |
| Caste                       | -    | -     | -   | -     | -    | -     | -    | -     |
| General                     | -    | -     | -   | -     | -    | -     | -    | -     |
| SC/ST/OBC                   | -    | -     | -   | -     | -    | -     | -    | -     |
| Religion                    | -    | -     | -   | -     | -    | -     | -    | -     |
| Hindu                       | -    | -     | -   | -     | -    | -     | -    | -     |
| Non-Hindu                   | -    | -     | -   | -     | -    | -     | -    | -     |
| Urban/Rural                 | -    | -     | -   | -     | -    | -     | -    | -     |
| Urban                       | -    | -     | -   | -     | -    | -     | -    | -     |
| Rural                       | -    | -     | -   | -     | -    | -     | -    | -     |
| State                       | -    | -     | -   | -     | -    | -     | -    | -     |
| UP                          | -    | -     | -   | -     | -    | -     | -    | -     |
| Bihar                       | -    | -     | -   | -     | -    | -     | -    | -     |

* Each belief is separate regression; *p < .05, **p < .01, ***p < .001.
to social desirability biases. In addition, the outcomes considered here are not comprehensive and may not fully capture the constructs of interest (connectivity, freedom). This was partly a limitation of available data and partly a choice of outcomes with reasonable distribution across the sample. For example, involvement in self-help groups would be a good measure of social connectivity, but was reported by 3.9% of respondents. While internet access was also a very rare outcome in this population (4.5% reporting any access), a lack of alternate indicators and the unique connectivity offered by the internet (including social media, etc.) led to its retention for these analyses. Because of the rarity of this outcome, findings related to internet access (particularly null findings) should be viewed with caution. Future related studies would be well served to include a range of physical and digital connectivity items, as well as items reflecting freedom of movement and decision-making. There is also the possibility of endogeneity in these findings. Factors unavailable to us in the data may explain the observed relationships. For example, factors related to the natal family, such as better connection to and protection of daughters subsequent to marriage, may be associated with less traditional social norms, and the norm variable may simply be a marker for this family factor in terms of its association with our outcomes. Research with more comprehensive and multilevel factors is needed to provide further understanding on these issues. Finally, and perhaps most importantly, the cross-sectional nature of these data allows us only to understand associations, not causality. It is possible, for example, that these gender beliefs are created, shaped, or reinforced by social connections or by access to digital connectivity. It is also possible, for example, that family norms or other unobserved factors confound the associations seen here, shaping both a married adolescent girl’s beliefs of gender roles as well as her behaviors. The girl with digital connectivity may be more likely to have been exposed to messaging which broadens their gender norms, rather than norms affecting their digital access. We must also note that internet access is less prevalent in the sample, resulting in large standard errors and affecting our capacity to detect significant associations. Nonetheless, given the importance of the variable, we retain the variable in our analyses, although findings should be viewed with this consideration. Investigating these issues from a longitudinal developmental lens and a larger and more diverse sample will offer more insight into understanding these beliefs.

Findings from this work offer evidence of interconnection between adolescent girls’ gender role beliefs as correlates of married girls’ connectivity and marital safety and at the same time show caste/religion beliefs associated with these outcomes as well. These findings lend support to use of resiliency and empowerment theories [21, 22] in guiding our understanding of norms and agency among married adolescent girls and extend our understanding by highlighting the interconnection of other potentially restrictive social norms such as caste norms with indicators of agency, as well. More specifically, traditional beliefs held by girls are linked both to lesser agency inclusive of safety from husbands and to lesser access and use of assets that facilitate agency, such as social support. Hence, supporting girls’ resiliency and empowerment in the context of child marriage likely may benefit from program that builds less restrictive norms and improved agency for girls. Future research should include longitudinal and qualitative studies to help elucidate the nature and directionality of these associations for future intervention guidance and should further expand analysis of factors affecting agency of adolescent wives. In addition, the finding that the influence of belief related to acceptability of violence is limited to marital violence offers a cautionary note reminding us that it is important to carefully identify which gender role belief or norm is linked to particular behavior in a given context. This suggests the need for more work to assess different social norms that may affect women and girls’ agency. Overall, these findings reinforce the importance of understanding social norms inclusive of gender norms and the potential value of norm-focused interventions for married girls as well as for child marriage prevention.

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**Supplementary Data**

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2021.07.030.

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