

RESEARCH ARTICLE

# Association between school dropouts, early marriages, childbearing, and mental health in early adulthood of women: Evidence from a cohort study in Bihar, India

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**Abstract:** School dropouts, early marriages, and low age at childbearing are issues still prevalent in Indian states like Bihar, which may be responsible for poor mental health among young adults. The present study examined the effect of life-course events such as school dropouts, early marriages, and early childbearing on mental health status at later ages (23–28 years). Using data from the Understanding the Lives of Adolescents and Young Adults consisting of a 2360 adolescent (ages 15 – 19) girl cohort interviewed in 2007 and re-interviewed at ages 23 – 28 in 2016 from the state of Bihar, India, we applied ordinal logistic regression models in analyzing factors associated with mental health status. Women who never attended school, or dropped out from school, and who got married before age 19 showed a poorer mental health status in their young adulthood (22 – 28 years) compared to their respective counterparts who attended a school and who got married at age 19 or older. As compared to women who had a child before age 19, those who did not have any child, or who had children after 20 years of age were more likely to have poor mental health. Working women, high self-efficacy of women, and women who have decision-making power showed better mental health outcomes as compared to their respective counterparts. To enhance psychological well-being of young women, the study recommends continue education and delaying marriage as the programmatic keys with attention to improving young women's autonomy and gender role attitudes and reducing societal pressure for bearing first child soon after marriage.

**Keywords:** Mental health; Depression; School dropout; Early marriage; Early childbearing; Adolescents; Women empowerment; India

## 1. Introduction

According to the World Health Organization, globally, 14% of adolescents (10 – 19) suffer from mental health conditions (WHO, 2021) and nearly 9.8 million young Indians aged between 13 and 17 years need active interventions (Gururaj, Varghese, Benegal, *et al.*, 2016). The burden of mental health problems in India is 2443 disability-adjusted life years (DALYs) per 10,000 population and the age-adjusted suicide rate is 21.1 per 10,000 population (Prakash, 2021). According to the National Mental Health Survey 2015 – 2016,

conducted by the National Institute of Mental Health and Neurosciences, 9.8 million teenagers in the age-group 13 – 17 years suffer depression and other mental health issues (Roy, Bharati, and Chakravarty, 2019). Adolescence is a time of change and transition: Changes to hormones and to the body, changes in the social environment, and changes to the brain and the mind, all occur in this transition phase of life (Blakemore, 2019). Post-traumatic disorder, exposure to violence, and a combination of genetic and environmental influences at an early age lead to higher rates of adult mental health problems, including personality disorders, major depression, substance use, and suicidal behavior (Chauhan, Srivastava, Kumar, *et al.*, 2021; Kumar, Srivastava, Mishra, *et al.*, 2020; Patel, Saggurti, Pachauri, *et al.*, 2015). Many mental health problems emerge in mid-to-late-adolescence. According to a large-scale meta-analysis, worldwide, the onset of the first mental problem occurs before age 14 in one-third of individuals; and by age 18 half of them get affected, and before age 25, it is seen in nearly 63% population (Solmi, Radua, Olivola, *et al.*, 2021).

School is a place where a child spends most of their time and it is a known fact that during this time, cognitive, social, and emotional skill development takes place. According to the chief-executive officer of child rights and you, the dropout rate of girls rises significantly after secondary education. One in every five girls enrolled drops out after class eighth (Deb, Chatterjee, and Walsh, 2020). Stress to perform well in academics, household factors, early marriages and pregnancies, cultural factors, substance use, low self-esteem, and feeling of isolation from the school environment are some of the core reasons for early dropouts (Dangal, 2006; Kishore and Shaji, 2012; Shahidul and Karim, 2015). Young women cannot enjoy their day-to-day life normally because they have high discipline levels and more remarkable persistence to achieve their goals and find success (Hjorth, Bilgrav, Frandsen, *et al.*, 2016). A study in India shows that for women, merely participating in secondary education may lead to life-long autonomy and participation in decision-making (Marphatia, Reid, and Yajnik, 2019). Among the member countries of Organization for Economic Co-operation and Development, around 20% of young people end their education before reaching the upper secondary level, which means one in five students have a higher risk of facing unemployment, morbidity, mortality, and poverty compared with their cohorts who complete their education. The State of Bihar of India, which had a literacy rate of 61.8% (overall), 71.2% for men, and 51.5% for women, according to the 2011 census, was one among the four states which performed poorly in school dropouts. The other three states are Jharkhand, Uttar Pradesh, and Arunachal Pradesh.

Another vital life event is a marriage that plays a key role in the transition to adulthood that affects the lives of young people. Marriage is widely recognized as a benefit for mental health due to good social support. However, the apparent benefit may vary across the lifetime of an individual. The timing of an event may be more consequential than its occurrence (Elder, 1995); this may be especially true for marriage where it is culturally agreed that there is an appropriate time to do it. Early or child marriage is a strong social custom particularly for girls in South Asian countries, including India where the mean age of marriage for girls married below age 18 was 16.5 years in 2011 (ORG and CCI, 2015). However, there has been an improvement in recent years in child marriage where the percentage of women married before age 18 has reduced from 27% in 2015–2016 to 23% in 2019–2021 (IIPS and ICF, 2020). However, still with early marriage, the transition from childhood into adulthood is lost for many young women, particularly in states like Bihar. Although early marriage affects both boys and girls, this transition in India, where mostly women leave their parental house, comes with the change in status and position within the household, and an onset of early childbearing. Therefore, early school dropouts, early marriage, early childbearing affect psychological well-being; however, these associations over the early life course have not been examined in an Indian setting. Family characteristics such as early divorce, parental education, and occupation also predict early dropouts and also predict childhood psychiatric disorders (Gilman, Kawachi, Fitzmaurice, *et al.*, 2002; Le Strat, Dubertret, and Le Foll, 2011; Lorant, Delière, Eaton, *et al.*, 2003; Muntaner, Eaton, Diala, *et al.*, 1998; Muntaner, Eaton, Miech, *et al.*, 2004).

Mental health remains a neglected issue in India. The data constraint and limited understanding of the causal effects of mental illness and life cycle events such as school dropouts, marriage, and childbearing do not allow for interventions to tackle this problem. This study attempts to understand the various life-course events such as educational attainment or dropout, marriage, and childbearing at early ages on reported mental health status of women in early adulthood.

## 2. Data and Methods

### 2.1. Data sources

We used data from the Understanding the Lives of Adolescents and Young Adults (UDAYA), a state-level longitudinal survey for Uttar Pradesh and Bihar, India, conducted by the Population Council. UDAYA was designed to provide estimates for the state as a whole as well as for the urban and rural areas of the state instead of district or sub-district levels. This paper is based on data drawn from a survey of Bihar participants in Youth in India: Situation and Needs Study

(IIPS and Population Council, 2010) conducted in six states (Andhra Pradesh, Bihar, Jharkhand, Maharashtra, Rajasthan, and Tamil Nadu) in 2006–2007 (Youth stand adolescents who aged 15 – 19 at that time were followed up after almost 8–9 years later in 2015–2016 by Population Council). The follow-up study was done to assess factors that determine accumulation or losses of assets and adolescents' quality of transitions to adulthood. The corresponding data set provides longitudinal information for adolescents who were 15–19 years old in 2007 and were young adults aged 23–28 years in 2015–2016. Three categories of adolescents were tracked – unmarried adolescent girls and boys aged 15–19 in 2007, and married girls aged 15–19 in 2007 (Santhya, Acharya, Pandey, *et al.*, 2017). In total, 601 married girls, 1759 unmarried girls, and 563 unmarried boys were followed up successfully in 2015–2016. To fulfill the targeted objectives, the study has extracted 2360 sample sizes (only girls), out of total female sample of 3188 at baseline. The newly generated datasets included all girls who belonged to the 15–19 age-group in the baseline (2007) and the same girl cohort who were in the age group 23 – 28 years, in the follow-up (2015 – 2016).

## 2.2. Measures

### 2.2.1. Outcome variables

**Mental health status:** The outcome variable was constructed from the measure of psychological well-being that was obtained from the 12-item General Health Questionnaire (GHQ-12), a popular and widely used and validated scale to measure the mental health status of the population (Montazeri, Harirchi, Shariati, *et al.*, 2003). The questionnaire consists of 12 items, each one assessing the severity of a mental problem over the past 1 month using a dichotomous (0–1) scoring style. The positive items were scaled as 0 for “Yes” and 1 for “No,” and the negative ones as 1 for “Yes” and 0 for “No.” The 12-items are: (a) Being able to concentrate; (b) lost sleep over worry; (c) feeling that you are playing a useful role; (d) feeling that you are capable of making a decision; (e) feeling constantly under strains; (f) feeling that you can't overcome difficulties; (g) being able to enjoy your normal day-to-day activities; (h) being able to face up to your problems; (i) feeling unhappy and distressed; (j) losing confidence in yourself; (k) thinking of yourself as a worthless person; and (l) feeling reasonably happy, all things considered. The score was used to generate a total score ranging from 0 to 12. Using the generated scores, a mental health status index was constructed, which was divided into three categories (Goldberg and Williams, 1988). The first category with score “0” is considered “normal mental health,” the second category with scores “1–6” is considered “moderate mental health,” and the third category “7–12” is considered “poor mental health.” The internal consistency of the items was assessed using Cronbach's alpha, and alpha equal to or > 0.75 was considered satisfactory (Taber, 2018). Therefore, these mental health questions were suitable for constructing mental health index.

### 2.2.2. Explanatory variable

#### 2.2.2.1. Educational attainment

The variable defined as current status of schooling was computed at both baseline and follow-up surveys. The education variable considers the status of female schooling at the time of the survey and is classified into three categories. The first category is women who never attended school (never attended). The second category is dropouts-women who dropped out of school before completing 12 standards (dropout before completing 12 class), and the third category consists of women who completed or were continuing their schooling at the time of the survey (completed or continuing).

#### 2.2.2.2. Marriage and childbearing-related variables

Marital status (never married, currently married), the age at first marriage (below 19 years, 19 years or above), age at first birth (below 20 years, 20 years and above, no child, unmarried), parity, and age of last child (no child, 2 years and below, above 2 years, and unmarried) were measured at follow-up data. Age at first birth was not readily available in the data; therefore, this variable was constructed by subtracting the age of the first child from the age of the woman and then categorized as – women who gave birth to their first child before age 20; and after 20 years. Parity is defined as the total number of times a woman gives birth to a child, alive, or dead. In the case of parity, unmarried women were categorized with the women having zero parity to find out the mental health status of women having zero parity as compared to women having parity one or two or three plus.

The age of the last child was computed using the birth order and age of every child. This variable was useful to compare the mental condition of women with no child, with children < 2 years of age and children older than 2 years of age. This variable is used to compare the impact of raising younger children and children older than 2 years on the women's mental health since younger children require more attention and care from their mothers.

### 2.2.3. Control variables from baseline

Background characteristics variables of the females taken from the baseline survey are as follows; Religion (Hindu and Non-Hindu), caste (scheduled caste/scheduled tribes, other backward class [OBC], and General), family type (Nuclear family and Non-nuclear family), parents' education (educated and not educated) parents' working status (No and Yes), and parents' life (One of the parents or both died and both are alive). Data provided a household's wealth index variable and constructed from the household's conditions and amenities (IIPS and Population Council, 2010).

### 2.2.4. Control variables from follow-up

Variables at the follow-up survey are also the key characteristics of the respondents that could be closely linked with their mental health. The following variables are included respondent's age (23–24, 25–26, and 26–27), place of residence (rural and urban), household wealth index (Poor, Middle Rich), working status (Yes vs. No), self-efficacy (High vs. low), and decision-making power (Yes vs. No). The self-efficacy is a variable that is determined by combining two variables, expressing an opinion to older adults in the family, confronting if something went wrong, that is, (1) whether the respondent is able to express an opinion (1-never, 2-sometimes, and 3-often) to older persons in the family and (2) whether she confronts (1-stay quiet, 2-sometimes confront, and 3-always confront) if someone says or does something wrong to her. We constructed self-efficacy score by summing the responses to these questions and then dichotomized it as high versus low. This question was asked by both unmarried and married women. We considered four items relevant to decisions about matters related to their own lives, all are measured at follow-up – ‘decision in spending money, about making major household purchases, about health care for herself and whether she should work or stay at home. The score was assigned as follows: (1) Others only, (2) jointly with others, (3) alone, and an additive score for decision-making was constructed by summing the three responses from the above-mentioned items. The higher the score, the higher the decision-making in adolescence.

Husband's education (no education, primary, secondary, higher secondary and above, DK) and spousal age gap were also modeled. Spousal age gap (at the follow-up survey) is calculated by subtracting the wife's age from the husband's age and was categorized in four groups “wife older than husband or wife 2 years younger than husband,” “wife three to 6 years younger to husband,” “wife more than 6 years younger than husband,” and “do not know” (DK) (husband's age was not reported). The categorization of spousal age gap is done based on the distribution of data. Further, being younger than husband (more than 6 years) is also a proxy indicator of low level of empowerment of young girls. Aforesaid variables – such as education, self-efficacy, decision-making power, working status, and spousal age gap are proxy indicators of empowerment of young women.

## 2.3. Statistical Analysis

We used bivariate analyses (cross-tabulations and Chi-square tests) and ordered logistic regression (OLR) models to examine school dropouts, early marriages, and early childbearing on mental health status at follow-up. OLR is being used when the dependent variable is ordinal (i.e., the variable has a meaningful order with more than two categories or levels). Here, the dependent variable (Mental Health status) has three ordinal categories in nature, that is, normal, moderate, and poor mental health status. The poor mental health status is coded as the highest rank, whereas the normal is coded as the lowest rank. Three multivariate models were fitted to understand the effects of sociodemographic variables measured in adolescence (Model-1), marriage and childbearing in adolescence (Model-2), and variables measured in young adulthood (Model-3) on mental health outcomes in young adulthood at follow-up. All analysis was carried out using STATA 15.0.

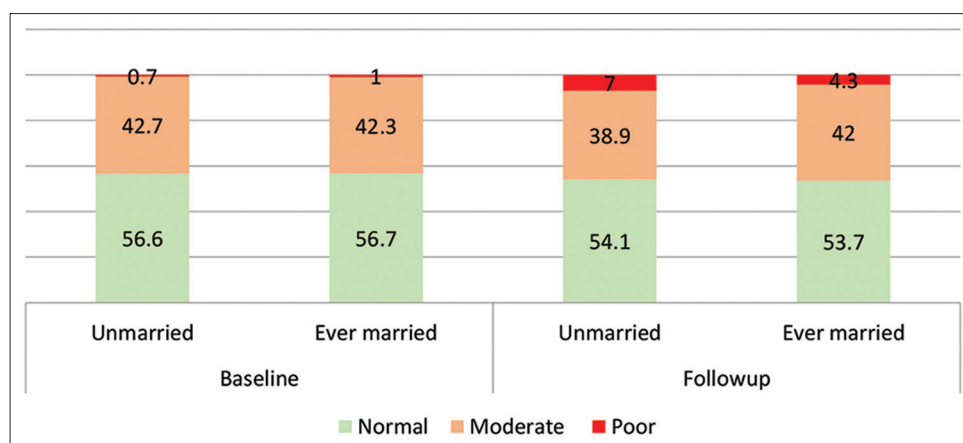
## 3. Results

The prevalence of women's mental health status by GHQ-12 at baseline and follow-up surveys were shown in Table 1. Cronbach alpha values suggested a higher consistency in reporting depressive symptoms in both rounds. The pattern of reported symptoms changed considerably over the period. During adolescence, the statement “Not felt capable of making decisions” was reported by almost 21% of adolescent girls, although such a proportion reduced to merely 13% at follow-up. Similarly, the percentage of girls who felt cannot overcome difficulties reduced from 15% to 12% over the cohort. On the other hand, to all other statements reporting of depressive symptoms increased over the period. For instance, girls who felt under strain increased from 6% in adolescence to 19% in follow-up, and those who were unhappy and depressed increased from 5% to 18%. Consistently, almost 10% of girls reported that they were not able to face up problems at both rounds of the survey. Overall, mental health status of adolescents worsened from adolescence (15–19) to young adulthood (23–28), while worsening was more visible in unmarried girls (Figure 1).

**Table 1.** Response to statements of GHQ-12 by adolescent girl's cohort at baseline and follow-up surveys in Bihar, India.

GHQ-12	Adolescence (Baseline)	Young adulthood (Follow-up)
	N=2360	N=2360
Not able to concentrate	1.5	8.3
Lost sleep over worry	4.2	13.8
Not felt playing a useful role	4.1	7.3
Not felt capable of making decisions	21.1	13.2
Felt constantly under strain	5.6	18.8
Felt cannot overcome difficulties	14.5	11.5
Not able to enjoy a normal day to day activities	1.9	10.5
Not able to face up problems	10.4	9.8
Unhappy and depressed	4.5	17.6
Losing self-confidence	4.3	9.1
Thinking of self as worthless	5.0	9.1
Reasonably not happy	2.5	13.7
Cronbach alpha	0.64	0.85

Marital status was taken from the baseline survey.

**Figure 1.** Changes in the mental health status of unmarried and ever married girls from adolescence to early adulthood (from baseline to follow-up).

Findings of the frequency distributions and the associations between variables measured at adolescence and the mental health outcomes at young adulthood are presented in Table 2. The results revealed that school attendance at adolescence showed a positive association with later mental health status, which was indicated by the likelihood of poor mental health. As compared to girls who never attended school, those who dropped out from school in adolescence had lower adjusted odds ratio (AOR) (0.80, 95% CI: 0.64, 0.99) and those who continued their schooling had lower AOR (0.73, 95%CI: 0.59, 0.91).

The effect of early marriage and childbearing on mental health status in early adulthood (at age 23–28 years in follow-up) after controlling for the effect of socioeconomic variables is shown in Table 3 which contains results from bivariate and multivariate OLR. Age at the first marriage equal to or greater than 19 was associated with 29% (AOR: 0.71, 95% CI: 0.56, 0.90) lower odds as compared to ages at the first marriage younger than 19. In comparison with girls who had the first childbirth before age 20 years, those who experienced childbearing after age 20 had nearly 24% higher risk (AOR: 1.24, 95%CI 1.00, 1.54) and those who did not have any child had 64% higher risk (AOR: 1.64, 95%CI: 1.15, 2.35) of having poor mental health status at age 23–28 years. In addition, it reduced with the increase in number of children a women have.

Table 4 presents the results from the analysis to assess the effect of current schooling status and other women empowerment-related variables measured at young adulthood after controlling socioeconomic variables measured in



**Table 2.** Effects of factors measured in adolescence on mental health status in later young adulthood (aged 23–28 years) of women in Bihar

Background characteristics measured at baseline (at age 15–19 years)	Mental health status at follow-up (%)				N	Results from ordered logistic regression <sup>#</sup> AOR (95% CI)
	Normal	Moderate	Poor	Level of significance <sup>##</sup>		
School attendance						
Never attended <sup>®</sup>	55.4	38.7	5.9	***	576	1.00
Dropped out	49.9	43.3	6.8		988	0.80 (0.64,0.99)**
Completed or continuing	58.1	36.2	5.8		796	0.73 (0.59,0.91)**
Religion						
Hindu <sup>®</sup>	52.5	41.1	6.4	*	1,971	1.00
Muslim	61.2	33.3	5.6		389	0.75 (0.59,0.92)***
Caste						
SC/ST <sup>®</sup>	50.5	42.0	7.5	**	488	1.00
OBC	54.6	39.4	6.1		1,549	0.92 (0.71,1.16)
General	56.5	38.3	5.2		323	0.97 (0.61,1.28)
Family type						
Nuclear <sup>®</sup>	55.2	38.3	6.5		1,074	1.00
Non-nuclear Family	53.0	41.0	6.1		1,286	1.00 (0.88,1.23)
Mother's education						
Not educated <sup>®</sup>	52.7	40.8	6.5	***	1,954	1.00
Educated	60.1	34.7	5.3		406	0.76 (0.58,0.95)**
Father's education						
Not educated <sup>®</sup>	53.0	40.9	6.1		1,213	1.00
Educated	55.0	38.6	6.5		1,147	1.11 (0.94,1.37)
Mother's working status						
No	54.4	39.6	6.0		1,129	-
Yes	53.6	39.9	6.5		1,231	
Father's working status						
No <sup>®</sup>	46.8	44.7	8.6	***	271	1.00
Yes	54.9	39.1	6.0		2,089	0.65 (0.53,1.10)**
Parent's survival status						
One of the parents or both died <sup>®</sup>	51.5	42.3	6.2		259	1.00
Both alive	54.3	39.4	6.3		2,101	1.16 (0.93,2.17)
Total	54.0	39.7	6.3		2,360	

<sup>#</sup>Based on multivariate ordinal logistic regression models. AOR, adjusted odds ratios are based on controlling all variables in the table; <sup>®</sup>: reference category; CI: confidence interval; <sup>##</sup>based on Chi-square test; \*\*\* $P < 0.01$ ; \*\* $P < 0.05$ ; \* $P < 0.10$ .

adolescence. In comparison to the girls who never attended school, dropped out girls from school had 23% (AOR: 0.77, 95% CI: 0.62, 0.94), and who were continuing schooling till follow-up had 45% (AOR: 0.55, 95% CI: 0.39, 0.79) lower risk of being in poor mental health status.

The socioeconomic control variables also show the effect on mental health outcomes in early adulthood of women (Table 2). The young adult women from Muslim religion had a 28% (AOR = 0.72, 95% CI: 0.56, 0.92) lower risk of having poor mental health than the Hindus. A higher risk of being in poor mental health status was observed in early adulthood of women from SCs/STs and OBCs as compared to general category. The education and occupation of parents also affect the mental health status of children. The risk of being in poor mental health status was 26% (AOR = 0.74, 95% CI: 0.58, 0.95) lower in young adulthood of women whose mothers were educated as compared to women whose mothers were uneducated (Table 2). Husbands' education was positively related to the good mental health status of women. Young

**Table 3.** Effects of marriage and childbearing in adolescence on mental health status in later young adulthood (aged 23–28 years) of women in Bihar, India

Background characteristics measured at follow up	Mental health status (%)				N	Results from ordered logistic regression <sup>#</sup>
	Good	Moderate	Poor	Level of significance <sup>##</sup>		AOR (95% CI)
Age						
23–24 <sup>®</sup>	53.0	40.0	7.0	***	1,311	1.00
25–26	56.0	38.3	5.7		727	0.98 (0.82,1.18)
27–28	53.3	42.2	4.4		322	0.82 (0.63,1.04)
Marital Status						
Never married <sup>®</sup>	54.0	39.2	6.8	***	155	1.00
Ever married	54.0	39.8	6.2		2,204	0.82 (0.44,1.52)
Age at first marriage						
<19 years <sup>®</sup>	52.4	41.5	6.1	***	1,603	1.00
≥19 years	58.2	35.2	6.6		602	0.71 (0.56,0.90)***
Unmarried	54.0	39.2	6.8		155	1.00
Husband's education						
No education <sup>®</sup>	55.2	38.2	6.6	***	547	1.00
Primary	56.8	37.7	5.5		597	1.10 (0.85,1.42)
Secondary and above	54.5	40.1	5.4		938	1.33 (1.03,1.72)**
DK	30.7	55	14.2		122	2.61 (1.75,3.91)***
Unmarried	54.0	39.2	6.8		155	1.00
Spousal age gap						
Below 2 years <sup>®</sup>	52.4	41.3	6.3	***	593	1.00
3–6 years	60.2	35.9	3.9		937	0.79 (0.64,0.99)**
7+years	56.2	37.4	6.4		307	1.04 (0.78,1.39)
DK	38.8	49.2	12		368	1.62 (1.22,2.15)***
Unmarried	54.0	39.2	6.8		155	1.00
Age at first birth						
<20 years <sup>®</sup>	55.9	39.9	4.3		910	1.00
≥20 years	55.2	38.6	6.2		963	1.24 (1.00,1.54)**
No child	49.1	40.3	10.6		333	1.64 (1.15,2.35)***
Unmarried	54.0	39.2	6.8		155	1.00
Parity						
0	49.1	40.3	10.6	**	333	
1	52.7	39.6	7.7		409	-
2	56.6	38.2	5.2		721	-
3+	54.2	40.9	4.9		897	-
Age of last child						
No child <sup>®</sup>	49.1	40.3	10.6		333	1.00
≤2 years	54.9	39.7	5.4		1,222	0.83 (0.52,1.30)
>2 years	52.2	40.8	6.9		650	0.91 (0.57,1.46)
Unmarried	54.0	39.2	6.8		155	0.64 (0.38,1.10)
Total	54.0	39.8	6.3		2,360	N = 2360

<sup>®</sup>Based on multivariate ordinal logistic regression models by controlling background characteristics such as school attendance, religion, caste, father's working status from baseline; Parity was not taken in model as it was correlated with age, age at first birth. <sup>®</sup>: reference category; CI: confidence interval; DK: don't know; <sup>##</sup>based on Chi-square test; \*\*\* $P < 0.01$ ; \*\* $P < 0.05$ ; \* $P < 0.10$ .

**Table 4.** Factors at follow-up associated with mental health among adolescent girls (aged 23–28 years) in Bihar, India, 2016

Background characteristics measured at follow up (at age 23–28 years)	Mental health status (%)				N	Results from ordered logistic regression <sup>#</sup> AOR (95% CI)
	Good	Moderate	Poor	Level of significance <sup>##</sup>		
School attendance						
Never attended <sup>®</sup>	50.1	43.2	6.7	***	1,170	1.00
Dropout before completing 12 class	56.5	37.5	6.0		1,023	0.77 (0.62,0.94)**
Completed or continuing	60.1	34.6	5.3		167	0.55 (0.39,0.79)***
Age						
23–24 <sup>®</sup>	53.0	40.0	7.0		1,311	1.00
25–26	56.0	38.3	5.7		727	0.96 (0.80,1.15)
27–28	53.3	42.2	4.4		322	0.83 (0.65,1.07)
Place of residence						
Urban <sup>®</sup>	56.2	39.6	4.2		333	1.00
Rural	53.6	39.8	6.6		2,027	0.95 (0.78,1.15)
Wealth status						
Poor Quin <sup>®</sup>	54.0	40.4	5.6		780	1.00
Middle Quin	54.6	38.7	6.7		1,061	1.06 (0.85,1.30)
Rich Quin	52.5	41.1	6.4		519	1.10 (0.84,1.43)
Spousal education						
No education <sup>®</sup>	55.2	38.2	6.6	***	547	1.00
Primary	56.8	37.7	5.5		597	1.06 (0.82,1.36)
Secondary and above	54.5	40.1	5.4		938	1.18 (0.91,1.53)
DK	30.7	55	14.2		122	3.05 (2.05,4.53)***
Unmarried	54.0	39.2	6.8		155	1.44 (0.99,2.08)*
Working status						
Yes <sup>®</sup>	53.1	39.5	7.4	**	954	1.00
No	54.6	39.9	5.5		1,406	0.92 (0.77,1.11)
Self-efficacy						
High <sup>®</sup>	56.3	38.3	5.5	***	2,010	1.00
Low	40.6	48.5	10.9		350	1.79 (1.42,2.26)***
Decision making						
Others <sup>®</sup>	51.2	41.6	7.2	*	1,045	1.00
Alone	56.2	38.3	5.6		1,315	0.86 (0.73,1.02)
Total	54.0	39.8	6.3		2,360	

<sup>#</sup>Based on multivariate ordinal logistic regression models by controlling background characteristics such religion, caste, father's working status and parents survival status from baseline; <sup>®</sup>: reference category; CI: confidence interval; DK: don't know; <sup>##</sup>based on Chi-square test; \*\*\* $P < 0.01$ ; \*\* $P < 0.05$ ; \* $P < 0.10$ .

women who were more than 6 years younger to husband had poor mental health as compared to those who had almost 3–6 years of spousal age gap (Table 3). However, self-efficacy of young women is an important factor that improves their mental health status. As compared to high self-efficacy girls, others had a high risk (AOR: 1.79, 95% CI: 1.42, 2.26) to face poor mental health in early adulthood (Table 4).

## 4. Discussion

Using data from the UDAYA study consisting of a 2360 adolescent (ages 15 – 19) girl cohort interviewed in 2007 and reinterviewed at ages 23–28 in 2016 from the state of Bihar, India, this study examined the effect of life-course events such as school dropouts, early marriages, and early childbearing on mental health status at later ages (23–28 years). Our findings on the effect of educational attainment in adolescence (baseline at age 15–19) and in early adulthood (follow-up at age 23–28)



on mental health status in early adulthood (23–28 years) are consistent with prior research that found significant association between dropout rate and mental health problems in China (Wang, Yang, He, *et al.*, 2015). School attendance in adolescence and also in early adulthood affects mental health status in early adulthood. From these findings, it is visible that continued schooling in adolescence and getting higher education until young adulthood is positively associated with good mental health status in early adulthood. Issues such as poverty, low academic achievement, lack of motivation, high rates of early marriage and pregnancy, unsupportive family, and domestic violence have also been found to be the main causes of school dropouts (Jensen and Thornton, 2003; Velez and Saenz, 2001), and these factors may also have negative consequences on mental health even for longer period as evident in the present study. Dropping out of school affects a person's life in different ways. Inability to complete high school education can lead to negative outcomes such as unemployment, underemployment, and poverty which results in poor mental health in early adulthood as also seen in this study.

Life-course events such as marriage and childbearing have a huge impact on the life of an individual especially psychologically both positively and negatively. The present findings show that women who are ever married have better mental health as compared to their unmarried counterparts at their young adulthood. Studies have shown that marriage enhances psychological well-being (Strohschein, McDonough, Monette, *et al.*, 2005; Waite, 1995) and improves social support, and it also connects people to other individuals, social groups, and social institutions which are themselves a source of benefits (Stolzenberg, Blair-Loy, and Waite, 1995). Another study by Haarasilta *et al.* (2004) found that unmarried or not-cohabiting young adults showed higher odds of having major depressive episodes. The present results did not find any significant effect of marital status on mental health status in young adulthood. The proportion of women who experienced separation, divorce, or widowhood was lower in Bihar, India; hence, mental health was status that was not analyzed separately for these groups. Mental illness among the widows is generally associated with the financial condition whereas the separated or divorced women can have stress or strain due to financial difficulties as well as childcare commitments and diminished social support (Wade and Pevalin, 2004).

There are many studies in developing countries showing a high incidence of early marriage. In addition, parents and other family members arranged the marriage of teen girls makes them vulnerable to mental health problems as they do not have the freedom to speak or share in the broader aspect which results in a psychotic disorder such as immobility, lack of confidence, and nervousness (Ahmed, Khan, Alia, *et al.*, 2013). It is found in this study that women who marry in their teenage have poor mental health as they are hit by early termination of education, due to low level of education, they may not be able to find work in the formal sector, face social and physical vulnerability, early childbearing which affect the life of a female in various dimensions (Jacubowski, 2008), that is, directly responsible for the poor mental health status of women at her later ages (Roest, 2016). People who get married at older ages have a higher level of maturity and emotional behavioral skills, use more effective strategies to cope and conflicts and problems, and, therefore, are expected to have greater marital satisfaction means better mental health status (Ghosh, Lahiri, and Datta, 2017; Hajihassani and Sim, 2019). Therefore, the present finding on the negative effect of late marriage on their poor mental health status in early adulthood is well supported by prior studies. This finding is also supporting the recent ongoing discussion on increase of legal age at marriage from 18 to 21 years in India. In this direction, Government of India has introduced the Prohibition of Child Marriage (Amendment), Act, 2021 to increase the legal age at marriage from 18 to 21 years (Government of India, 2021).

In the present research, it is found that young married women who have children after the age of 20 or who did not have any child had a poorer mental health status. The pressure to have children among young married women who do not have children and the pressure to cope up with the rearing and caring of a child are both situations in India that can have a lot of mental pressure on women (Marphatia, Ambale, and Reid, 2017). Fertility pressures from the family particularly from in-laws' are common especially among adolescent girls and in the states such as like Uttar Pradesh and Bihar (Dixit, Bhan, Benmarhnia, *et al.*, 2021). Women who had child after age 20 may have younger children at the current age (22 – 29) when mental health status being assessed, and, therefore, having young kids have the feeling of responsibility and caregiving due to which they have some kind of mental pressure (Hank, 2010; Aitken, Hewitt, Keogh, *et al.*, 2016).

A higher proportion of young women from SCs/STs experiencing poor mental health was found in the present study, which is similar to the finding in most of the studies (Das, Do, Friedman, *et al.*, 2009; Gaur, Vohra, Subash, *et al.*, 2003; Kohrt, 2009; Mohindra, Haddad, and Narayana, 2006). Findings on the effect of a husband's education suggest that highly educated husband's wives are more likely to have poor mental health. This may be due to male dominance through education (Pai, Godboldo-Brooks and Edington, 2010). However, on the contrary, wives 3–5 years younger than their husbands have better mental health than their peers who are either older than or 2 years younger than their husbands. However, a significant proportion of women did not know about their husbands' age and education. It is noteworthy that women who do not know their husband's age and their husband's education are more vulnerable to poor mental health. It is expected in a rural Indian society where marriages are performed at an early age, mostly arranged by the family with no

consent of girls, where gender roles are also very critical (Patel, Santhya and Haberland, 2021). In such cases, women are less likely to know about their husband's characteristics. Further, the present findings that women's empowerment (work status, self-efficacy, decision making) improves mental health outcomes suggest a need to focus on girl's empowerment at younger ages. In this way, events such as drop-out from school, early marriage, and early childbirth may be delayed, which will improve their mental health outcomes in young adulthood.

The present study is based on two state samples and, therefore, results may not be generalized for other states of India. Variables, including outcome variables of mental health status and husband characteristics, are based on the reporting from individuals and, therefore, may have some response biasedness. Nevertheless, the study findings are crucial and have programmatic relevance.

## 5. Conclusions

The present study identified the effect of life course events such as school drop-out, marriage, childbearing, and parental characteristics on the mental health outcomes at young adulthood. We also assessed the association of empowerment of young women with their mental health outcomes. Young women who never attended school or dropped out from school have a poorer mental health status in their young adulthood (22–28 years). Young women who completed their higher education showed a better mental health status. Young women having educated mothers and fathers with the job were less likely to have poor mental health. Women whose marriage was dissolved due to the death of their spouse, separation, or divorce were most likely to have poor mental health. Delaying age at marriage positively affects mental health in early adulthood as girls who got married after age 19 showed better mental health outcomes. On the contrary, compared to women who had their first child before age 19, women who did not have a child, or who had their first child after 20 years of age, were more likely to have poorer mental health. This suggests that the societal pressure of bearing a child just after marriage is a norm that might affect the mental health of women who could not bear it soon after marriage. Further, young mothers who gave birth after age 20 years are likely to report more mental health issues in that new childcare is found to be more associated with postpartum depression than those who already had older children. The current findings indicate that not bearing a child, bearing a child late, and postpartum depression affect mental health negatively and require a programmatic attention on young motherhood.

Another emerging finding of the study is the association of empowerment-related variables with mental health. Young women who did not know their husband's age or education had poor mental health outcomes. Surprisingly, women with highly educated husbands are more likely to have poor mental health. Working women, women who have better self-efficacy and have a decision-making power show better mental health outcomes. Therefore, the study recommends continued attention to improving young women's autonomy and gender role attitudes as it directly affects their psychological well-being.

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## Conflict of Interest

The authors declare that they do not have any competing interest.

## Author Contribution

Conception and design of the study: RY and PD; analysis and/or interpretation of data: RY; drafting the manuscript: RY and AK; revising the manuscript critically for important intellectual content: PD and SKP; reading and approving the manuscript: all authors.

## Availability of Supporting Data

The use is secondary in nature and is freely available to everyone on request at <https://www.popcouncil.org/>. UDAYA follow-up data and survey tools can be obtained from the Harvard Dataverse.

## Ethics Statement

Not applicable.

## Consent to Publish

Not applicable.

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