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Exploring the impact of perceived early marriage on women's education and employment in Bangladesh through a mixed-methods study

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Child marriage negatively affects women's socio-economic empowerment, particularly in education and employment. This study aimed to explore women' perspectives on the timing of their marriages, considering their educational and employment status at the time. It also sought to identify factors influencing early married women's perception of their marriages as timely. We analyzed both quantitative and qualitative data. The quantitative data included a sample of 5,596 women aged 15–24 from the 2017/18 Bangladesh Demographic and Health Survey. Additionally, we collected qualitative data through six in-depth interviews, two focus group discussions, and 13 key informant interviews. We used a multilevel mixed-effects Poisson regression model to examine the relationship between women's formal employment, education, and child marriage. Thematic analysis was employed for the qualitative data. Around 62% of the total women analysed reported their married occurred early with the mean age at marriage was 15.2 years. Approximately 55% of the total early married women believed their marriages occurred at the right time, especially among those who were employed at the time of their marriage. Among this subset, we also noticed a higher likelihood of discontinuing work and education following marriage. Qualitative findings revealed reasons behind this perception, such as escaping poverty, safety concerns, limited job prospects, and the impact of non-marital relationship and societal norms. While many early-married women perceived their marriage as timely, particularly those initially employed, this decision often coincides with a subsequent withdrawal from work and education. This underscores the pressing need for policies and programs aimed at educating women about the legal age for marriage and the negative consequences associated with early marriage while also equipping them with knowledge and resources for informed decision-making.

Keywords Child marriage, Women, Working status, Educational status, Bangladesh

Abbreviations

LMICs	Low- and middle-income countries
DHS	Demographic Health Survey
BDHS	Bangladesh Demographic Health Survey
aOR	adjusted odds ratio
CI	Confidence interval
SDG	Sustainable development goal

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NIPORT	National Institute of Population Research and Training
PSU	Primary sampling unit

Child marriage is a pervasive issue in low- and middle-income countries (LMICs), especially in South Asia and sub-Saharan Africa[1]. The 2022 UNICEF report on child marriage revealed that approximately 12 million girls in LMICs are married before the age of 18 each year, which translates to one in every five girls in those settings[2]. In Bangladesh, the situation is even more alarming, with recent estimates indicating that about 59% of women aged 20–24 years were married before turning 18[3], and 22% were married before the age of 15[4]. The rate is further higher in rural areas, particularly those with widespread poverty, low education enrolment and significant concerns about family's reputation[4–6].

Child marriage can have devastating consequences for girls and their families, as it often leads to a cycle of poverty and disempowerment[7]. Girls who are forced into early marriage are often forced to drop out of school, which reduces and restricts their opportunities for education and limits their economic prospects[8]. Additionally, child marriage has been associated with higher rates of domestic violence and divorce, which can have significant negative impacts on girls' physical and mental health, hampering the development and wellbeing of girls[9,10]. Moreover, child marriage has serious implications for maternal health. Child brides are more likely to experience complications during pregnancy and childbirth, such as obstetric fistula and maternal mortality[11,12]. Children born to child brides are also at a higher risk of mortality and malnutrition[13]. This leads to an intergenerational effect because malnourished children are often more likely to drop out of school and subsequently become child brides themselves[14]. These adverse consequences associated with child marriage, coupled with the high number of girls affected, highlight a significant burden in LMICs[1]. Therefore, it poses challenges to achieving Sustainable Development Goals (SDGs) related to health and well-being (SDG 3), gender equality (SDG 5), education (SDG 4), and poverty reduction (SDG 1)[15].

Socio-demographic factors associated with child marriage have been extensively studied in LMICs, including Bangladesh[16–19]. Although such observational studies played a crucial role in developing relevant policies and programs to reduce the occurrence of child marriage, they fall short comprehensively addressing the issue. Girls' views over their marriage along with marriage age can carry a significant weight and override all socio-demographic factors by mediating their roles[20]. It is commonly assumed that every child marriage occurs on parental wishes and is not desired by the girls. However, this is not always the case in reality. The underlying reasons for girls choosing to marry at an early age instead of continuing education and work has remained understudied[21]. Therefore, it is crucial to explore the percentage of girls who perceive their marital age as appropriate or not, as this can inform the development of more effective policies and programs. However, undertaking this requires comprehensive research, integrating determinant factors of early marriage and perceptions of those who marry early. Unfortunately, such information is largely absent in existing literature due to the nature of available data in LMICs, including Bangladesh, where DHS surveys serve as primary data sources[16–19,22]. The survey provides important information on prevalence of early marriage and its socio-demographic predictors, however, lacking content related to girls' views over early marriage as it typically requires qualitative study. This indicates a need for mixed-methods studies, which are mostly lacking in LMICs, with none conducted in Bangladesh[23–26]. To address these limitations, we aimed to investigate women's perceptions of getting married at an earlier age, taking into account their education and employment status at the time of marriage. We also sought to identify the factors that influenced earlier-aged women to perceive their marriages as occurring at the right age.

Methods

Study design

The study applied a sequential explanatory mixed-methods design where analysis of secondary quantitative data were followed by the collection and analysis of qualitative data[27]. The qualitative findings, therefore, aimed to explain and interpret the findings of the quantitative study.

Quantitative study

Data source and sampling

This study analysed data of most recent 2017/18 Bangladesh Demography and Health Survey (BDHS). The survey employed a two-stage stratified random sampling method to select the respondents. In the first stage, 672 Primary Sampling Units (PSUs) were selected from a list of 293,579 PSUs generated during the 2011 National Population Census of Bangladesh, excluding three PSUs due to extreme floods. In the second stage, 30 households were randomly selected from each of the PSUs, using probability proportional to PSU size. This generated a list of 20,160 households, and 19,457 of these households were interviewed. There were 20,376 respondents eligible in the selected households with the eligibility criteria: (i) being a married woman of reproductive age and (ii) spent the previous night of the survey day in the selected households. Of them data were collected from 20,127 women. Details of the BDHS survey procedure were published elsewhere[3]. A sub-sample, 5,596 women aged 15–24, of them was analysed in this study selected based on the following two inclusion criteria: (i) aged 15–24 years (to ensure inclusion of only recently married women following the recommendation of global literature[2,6,7,9,24,28]) and (ii) married at the time of survey.

Outcome variable

The focus of our quantitative study was child marriage, which we defined as a binary outcome variable (yes or no). To collect this data, the BDHS asked women to report the age at which they first began living with their spouse or first spouse in case of more than one marriage. We categorized responses as either child marriage (1, if the marriage occurred before the woman turned 18) or normal-aged marriage (0, if the marriage occurred at age 18 or later) according to the universal recommendation which is also followed in Bangladesh[2].

Exposure variables

Working status and educational status of respondents at the time of their marriage as well as following marriage were our primary exposure variables. The BDHS collected this data by asking whether the respondents were working or studying in school just before they got married. If the response was affirmative, the respondents were then asked two follow-up questions to determine their work or education continuity and the number of years of continuity. These follow-up questions were: (i) Did you continue working/studying after marriage? and (ii) If yes, for how long? Based on the responses, we created four variables: (i) study before marriage (yes, no), (ii) work before marriage (yes, no), (iii) after marriage study (no, continue less than a year, continue less than five years), and (iv) after marriage work (no, continue less than a year, less than five years). We also considered additional exposure variables by reviewing the available literature for Bangladesh and other LMICs[16–19]. These variables included respondents' age, education level, partner's education level, partner's occupation, wealth quintile, place of residence, and region of residence.

Statistical analysis

Descriptive statistics, including frequency and percentage, were used to describe the characteristics of the respondents. Multilevel mixed-effect Poisson regression model was utilized to explore the association between early marriage and the working and studying status of the respondents, as well as the continuity of their working and studying status following child marriage. The reason for using a multilevel Poisson regression model was higher prevalence of child marriage (> 10%) and the clustering structure of the BDHS data. Previous studies have found that simple logistic regression analysis produces less precise findings when the prevalence of the outcome variable is high and the data come from a clustered structure[29]. Both adjusted and unadjusted models were run, where one particular exposure variable was considered with the child marriage variable in the unadjusted model, and other factors were adjusted in the adjusted model. Multicollinearity was checked before running each model. Results were reported as unadjusted or adjusted Prevalence Ratios (PRs) and corresponding 95% confidence intervals. Stata version 18.0 was used for data analysis.

Qualitative exploration

In our quantitative study, we identified a higher prevalence of child marriage among working women. To explore why working women get married at an early age, we conducted a qualitative study during January 2023 and January 2024 as this information was not available in the BDHS survey data. The Gazipur district of Dhaka division was purposively selected as the study area. This area has a higher concentration of ready-made garments and small-scale industries where the majority of workers are women and married[30]. Two focus group discussions (FGDs) involving 16 participants (8 in each FGD), six in-depth interviews (IDIs), and 13 key informant interviews (KIIs) were conducted using two pre-developed interview topic guides. The topic guides covered several areas, including marriage experience, perceptions at the time of marriage, education and employment after marriage, respondents' perspectives on marriage over time, and community and religious norms related to early marriage. The length of these interviews ranged from 75 to 90 min.

The participants included in the FGD and IDI were selected purposively selected based on the following criteria: (i) currently aged between 15 and 24 years, (ii) married before their 18th birthday, (iii) involved in either work or education just before marriage, and (iv) currently either continuing education or work or have left them to become housewives. These criteria aimed to ensure that the qualitative study participants were similar to those in the quantitative study. To recruit the participants, data collectors first approached them by sharing the details of the study plan and collected data on their preferred date. To protect privacy of the participants and ensure limited interruption during interview process, the participant and interviewer choose a private location. Prior to the qualitative data collection, participants were again briefed about its objectives and assured of the confidentiality of their responses. Informed consent was obtained from participants above 18 years old, while for participants under 18, informed consent was obtained from their legal guardians (father or husband).

Additionally, 13 key informant interviews (KIIs, male = 9; female = 4) were conducted with managers of ready-made garment factories ($n = 2$), small-scale industries ($n = 1$), local leaders (members of the Pourosova, $n = 3$ [male = 2, female = 1]), the Upazila Nirbahi officer ($n = 1$, female), and parents of girls who married at an early age ($n = 6$ [male = 4, female = 2]). Their perspectives on early marriage were sought due to their significant involvement in the issue, including shaping cultural norms and exerting social pressures that perpetuate early marriage practices.

Participation was completely voluntary, and no participants were provided with any gifts or incentives to participate in this study. Experienced social researchers were involved in the qualitative data collection. The FGDs and IDIs were conducted by a female interviewer (second author). The KIIs were conducted by two male interviewers (first and third author). All conversations during FDGs, IDIs and KIIs were audio recorded with consent. The recorded audio files were subsequently reviewed and translated into English by the respective research team members. Relevant sections on the reasons behind early marriage and its impact on work and educational pursuits were extracted and discussed among the team to ensure accurate interpretation and presentation of the data. Qualitative data were thematically analysed[31], using Nvivo version 12.10[32]. Key themes identified in the analyses were synthesized and presented as study findings. Ethical approval for the qualitative study was obtained from the Institutional Review Board of the University of Rajshahi.

Results

Background characteristics of the respondents

Table 1 presents the background characteristics of the respondents included in the quantitative exploration. The mean age at marriage was 15.2 years (SD, ± 1.41) and the mean years of education were 6.9 years (SD, ± 2.95). About 32.8% of the respondents reported being engaged in a formal job. Of the respondents analyzed, 61.7%

Characteristics	Crude estimate
Age at marriage, mean years (±SD)	15.2 (1.41)
Education, mean years (±SD)	6.9 (2.95)
Engagement in formal job (prevalence (95% CI))	32.8 (30.8–34.5)
Classification of marital status as per age	
Early marriage	61.7 (61.0-62.5)
Not early marriage	38.3 (37.5–39.0)
Preference of earlier aged married women about their marriage age (n = 3,453)	
Earlier aged married women think their marriage occurred at right age	55.1 (52.0-58.1)
Earlier aged married women think their marriage occurred earlier and they should delay	44.9 (41.9–48.0)

Table 1. Background characteristics of respondents aged 15–24 in Bangladesh, BDHS 2017/18 (N = 5596).

reported their marriage occurred before reaching their age 18 years. Over half of the (55.1%) total 61.7% who reported being married before 18 years reported that their marriage occurred at the right time, while 44.9% of them felt that they should have delayed their marriage.

Respondents' perception about their marriage timing

Table 2 illustrates the distribution of respondents' perception about their marriage timing as per their socio-demographic characteristics. Among the respondents who believed that their marriage occurred earlier, and they should delay, 49.8% were aged between 15 and 19 years, and 41.2% were aged between 20 and 24 years. Earlier-aged married women who believe their marriage occurred earlier and should be delayed, 36.6% were illiterate. This number was half to 63.4% of illiterate women who thought their marriage occurred at right age.

How women's education and employment status before marriage influences their perception of marriage age

The unadjusted associations suggest that earlier-married women who thought their marriage occurred at the right time were more likely to have worked before marriage (PR = 1.88, 95% CI = 1.34–2.64) and less likely to have studied before marriage (PR = 0.55, 95% CI = 0.47–0.66) compared to women who thought they should delay their marriage (Table 3). After adjusting for confounding variables, the associations remain significant, but the effect sizes are attenuated. Earlier aged women who thought their marriage occurred at the right time were still more likely to have worked before marriage (aPR = 1.47, 95% CI = 1.01–2.18), but the association was no longer significant. However, adjusted likelihood of early marriage was found lower among studying girls (aPR = 0.43, 95% CI = 0.35–0.53).

Impact of early marriage on the continuation of education and employment

Table 4 presents the results of the analysis of the association between the women's perception of their marriage timing and their continuation of education and work after marriage. In the unadjusted analysis, earlier aged women who think that their marriage occurred at right time were more likely to report continuation of their education up to five years (PR = 1.73, 95% CI 1.31–2.28) as compared to the women who did not continue their education. However, this association was not significant for those who continued their education for less than one year. In the adjusted analysis, the association between continuing education and women's perception of their marriage timing was attenuated, with women who continued their education for less than five years having a non-significant lower likelihood of perceiving their marriage as occurring at the right time (aPR = 0.92, 95% CI 0.65–1.28). The association between continuing work and women's perception of their marriage timing remained non-significant in the adjusted analysis.

Qualitative exploration

Through qualitative investigation, we conducted an extensive exploration into the reasons why working women who married at an earlier age believed that their marriage took place at the right time, and also examined why studying women who married at an earlier age perceived their marriage as occurring earlier, as revealed in our quantitative analysis. The characteristics of the participants participated in qualitative interviews are presented in supplementary Tables 1, 2 and 3. Our comprehensive findings have uncovered a multitude of factors that can be categorized into distinct thematic patterns (supplementary Table 4). These include: (i) getting married is a way to recover from poverty, (ii) marriage was perceived as a means to ensure the safety and security of young unmarried girls, (iii) less hope for job prospects, and (iv) intimate relationships and social norms.

Getting married way to recover from poverty

Participants reported that a common influencing factor behind early marriage among young girls was their perception that it would help them escape poverty.

> "I had dreams of studying and becoming a government service holder, but poverty choked those dreams before they could bloom. Marriage was the only path open to me, even if it means leaving those dreams behind." (IDI participant 3, age 20).

Characteristics	Earlier-aged married women who believe their marriage occurred earlier and should be delayed ($n = 1550$)	Earlier-aged married women who believe their marriage occurred at the right age ($n = 1903$)
Respondents' age in years		
15–19	49.8 (45.9–53.6)	50.2 (46.4–54.1)
20–24	41.2 (38.1–44.4)	58.8 (55.6–61.9)
Respondents' education		
Illiterate	44.6 (37.2–46.2)	55.4 (45.7–64.8)
Primary	41.6 (37.2–46.2)	58.4 (53.8–62.8)
Secondary	48.8 (45.3–52.3)	51.2 (47.7–54.7)
Higher	33.0 (28.4–38.0)	67.0 (62.0-71.6)
Respondents' partner education		
Illiterate	36.6 (30.9–42.7)	63.4 (57.3–69.1)
Primary	46.4 (42.2–50.7)	53.6 (49.3–57.8)
Secondary	46.2 (42.6–49.9)	53.8 (50.1–57.4)
Higher	42.2 (37.1–47.5)	57.8 (52.5–63.0)
Respondents' partner occupation		
Agricultural worker^{+}	51.1 (45.4–56.7)	48.9 (43.3–54.6)
Blue color worker^{++}	42.9 (39.5–46.3)	57.2 (53.7–60.5)
White color worker^{+++}	41.5 (32.5–51.1)	58.5 (48.9–67.5)
Pink color worker^{+++}	44.9 (39.9–50.0)	55.1 (50.0-60.2)
Others	41.6 (25.9–59.2)	58.4 (40.8–74.1)
Wealth index		
Poorest	49.1 (43.3–54.9)	50.9 (45.1–56.7)
Poorer	43.4 (38.8–48.0)	56.6 (52.0-61.2)
Middle	47.7 (43.0-52.4)	52.3 (47.6–57.0)
Richer	44.6 (39.6–49.7)	55.4 (50.3–60.4)
Richest	38.6 (33.4–44.0)	61.4 (56.0-66.1)
Place of residence		
Urban	39.2 (33.5–45.1)	60.8 (54.9–66.5)
Rural	47.0 (43.4–50.6)	53.0 (49.4–56.6)
Region of residence		
Barishal	58.8 (51.7–65.5)	41.2 (34.5–48.3)
Chattogram	61.5 (57.0-65.7)	38.5 (34.2–42.9)
Dhaka	26.8 (19.8–35.3)	73.2 (64.7–80.0)
Khulna	64.2 (55.9–71.8)	35.8 (28.2–44.1)
Mymensingh	13.2 (6.81-24.0)	86.8 (75.9–93.2)
Rajshahi	49.1 (40.2–57.9)	50.9 (42.1–59.8)
Rangpur	57.8 (48.4–66.7)	42.2 (33.3–51.5)
Sylhet	29.6 (21.3–39.5)	70.4 (60.5–78.7)

Table 2. Respondents' perception (aged 15–24) of their marriage timing by socio-demographic characteristics in Bangladesh, BDHS 2017/18 ($N = 3,453$). $^{+}$Farmer, agricultural worker, fisherman, poultry rising, home-based manufacturing. $^{++}$Rickshaw driver, brick driver, domestic servant, non-agricultural work, carpenter, mason. $^{+++}$Doctor, lawyer, dentist. $^{++++}$Small business, trader.

> "My parents couldn't afford to keep me in school anymore, and marriage seemed like the only way to have a roof over my head and food on the table." (IDI participant 2, age 19).

Most female participants reported that they entered the labour market before reaching their 18th birthday. Since their families were from lower socio-economic backgrounds, they started looking for a job to support their families. They often engaged in low-wage occupations, such as house cleaning or garment factories.

> "I worked in house cleaning before my marriage and received a very low wage, which was not enough for my living. As a result, I could not send money to my parents, even though they expected me to do so." (FGD 1 participant, age 19).

According to them, like many young girls, they also moved to the city from rural areas leaving their families behind in search of jobs and started living in rental accommodations. The income derived from these jobs proved insufficient to meet their daily expenses, including paying for food, rent and utilities while providing

	Studying before marriage, PR (95% CI)	Working before marriage, PR (95% CI)
Unadjusted association		
Women's think their marriage occurred earlier and they should delay (ref)	1.00	1.00
Women's think their marriage occurred at right time	0.55 (0.47–0.66)*	1.88 (1.34–2.64)**
Adjusted association[§]		
Women's think their marriage occurred earlier and they should delay (ref)	1.00	1.00
Women's think their marriage occurred at right time	0.43 (0.35–0.53)**	1.47 (1.01–2.18)*

Table 3. Effect of women's Education and Employment Status before early marriage on their perception of marriage age among Bangladeshi women aged 15–24 years, BDHS 2017/18 ($N = 3,453$). [§]Model is adjusted with respondents' age, respondents' education, respondents' partner education, respondents' partner occupation, place of residence, and region of residence.* *$p < 0.01$, *$p < 0.05$.

	Women who were married before the age of 18 years perceived that they were married at the right age, prevalence ratio (PR, 95% CI)
Unadjusted association	
After marriage study	
No (ref)	1.00
Yes, less than a year	0.98 (0.77–1.25)
Yes, less than 5 years	1.73 (1.31–2.28)**
After marriage work	
No (ref)	1.00
Yes, less than a year	0.96 (0.39–2.35)
Yes, less than 5 years	0.93 (0.44–1.94)
Adjusted association[§]	
After marriage study	
No (ref)	1.00
Yes, less than a year	0.79 (0.59–1.05)
Yes, less than 5 years	0.92 (0.65–1.28)
After marriage work	
No (ref)	1.00
Yes, less than a year	0.61 (0.21–1.72)
Yes, less than 5 years	0.56 (0.24–1.32)

Table 4. Association between earlier aged married women's perceptions of the timing of their early marriage and their continuation of education and work after marriage among women aged 15–24, Bangladesh ($N = 3453$), BDHS 2017/18. [§]Models are adjusted with respondents' age, respondents' education, respondents' partner education, respondents' partner occupation, wealth quintile, place of residence, and region of residence. **$p < 0.05$.

financial assistance to their families. This issue was also highlighted in the KIIs. One ready-made garment manager reported that young female ready-made garment factory workers' wages are not enough to support themselves and their parents. Therefore, they usually decide or agree to get married at an early age to overcome their financial struggles.

> "Girls who started working here usually work on a daily basis and earn only 150–200 BDT (1.5-2 USD) per day, which is not enough to maintain their daily expenses. What's even worse is that many of these girls migrated from rural areas to work here, meaning they have to pay for their rent and other associated costs. It's no surprise that many of them end up choosing to get married, as it seems like the only way out of this financial struggle". (Ready-garment manager, male, age 45).

Marriage was perceived as a means to ensure the safety and security of young unmarried girls

In the context of working girls who opt for early marriage, safety and security emerge as crucial factors. Participants reported that young girls working in different industries (such as ready-made garments factories) usually work alongside male workers. Due to the demands of their jobs, they usually spend prolonged hours working together at workplace. The nature of their joint work and spending prolonged hours at workplace often create tensions and a sense of insecurity among themselves and within their families. They fear being exposed to physical and sexual abuse and/or violence at workplace, thereby reinforcing the inclination towards early marriage.

> "My parents were concerned about the potential risks of sexual and physical abuse when working outside the home, especially during evening hours and interacting with male colleagues. I would hold the same belief and take similar precautions if I had a young daughter engaged in employment, as there are multiple reasons to support this perspective". (FGD 1 participant, age 18).

> "Living alone as a young woman in this city felt dangerous. Marriage, even if it's not ideal, meant having someone to protect me and a family to belong to." (IDI participant 2, age 20).

This fear also reflected in the KIIs with fathers. Families of young girls working in ready-made garment factories tend to marry off their young girls to protect their daughters or girls from any future risks of abuse.

> "Soon after starting working at age 15, I arranged her marriage. Although it was not my intention, we did not feel secure leaving my young daughter outside the house, as she could be at risk of rape or harassment from strangers. My neighbours also suggested that I do so". (Father of a married and working young girl, age 55).

One key informant, a supervisor of a ready-made garments industry, also confirmed that young girls working in the industries often become victims of physical and sexual harassments. He also added that the prevalence of sexual violence and harassment had been underreported like in other sectors in Bangladesh and remained a concerning reality. However, the families of the young girls are aware of these risks, even if based on limited evidence, which significantly influenced marry off their girls at a young age against the law.

> "A significant number of girls who start working at a young age face violence from their male counterparts, including sexual violence. We are aware of this, and our organization has very strict laws against it. However, these incidents often go unreported, similar to other sectors in Bangladesh". (A supervisor of a garment factory, male, age 38).

Even parents of young school or college-going girls also voiced their concern regarding their daughters' safety while traveling to school or college. Sometimes local boys or men harassed these young girls on the way to home or college, and parents of these young girls usually perceived that marrying the young girls off was the only solution.

> "I wanted my daughter to continue her education. However, a mischievous boy started following her to school. I contacted his parents and asked them to discipline their son and prevent him from following my daughter, but it did not work. Eventually, I had to marry off my daughter when she was only 16 years old". (Father of earlier aged girls who marry off while studying, age 38).

However, during the FGDs, female participants expressed their viewpoints that the claims regarding safety concerns and incidents of violence were not always accurate. They argued that this phenomenon might stem from parents' genuine apprehensions regarding the safety and their desire to uphold societal prestige, their parents mostly forced them to get married at an early age against their will. This highlights the need to delve deeper into the complexities surrounding early marriage and the factors that shape this decision.

> "I started working as a house cleaner when I was 15 and got married at age 16. I wasn't intending to get married at that time, but my parents pressured me to do so. They had heard that young girls working as house cleaners often face sexual and physical violence from homeowners. Though my homeowners treated me like their daughter. Therefore, they were strict in their decision to marry me off". (FGD 2 participant, age 20).

Less hope for job prospects

Several female participants highlighted the interconnectedness between school dropout, limited employment opportunities for people with lower educational attainment, early entry into workforce, and early marriage. According to them, education could not guarantee job prospects in Bangladesh. Securing a job could be more challenging for individuals with low academic achievements. Therefore, they perceived that entering the job market early would be more worthwhile for them and their families than continuing their education, as it required financial resources.

> "Studying seemed pointless when I knew there were barely any jobs at the end. Marriage offered a chance at some stability, even if it wasn't the kind I hoped for." (IDI participant 5, age 21).

One FGD participant reported that she perceived that she did not have the necessary qualities to compete in the increasingly competitive job market. She felt early employment would give her practical work experience, opening opportunities for better job prospects. Hence, she decided to dropout from school. Other FGD participants agreed with her, indicating they shared similar perceptions.

> "Obtaining a job after completing education is only possible for highly meritorious students. I did not fall into that category. Hence, I decided to start working with the hope that by the time I finished my education, I would have accumulated several years of work experience, which would undoubtedly enhance my chances of securing a comparatively better job". (FGD 2 participant, age 19).

Some guardians of young school or college-going girls also perceived that education would not guarantee any employment for their daughters and married them off at an earlier age.

> "Why would I continue my daughter's education? What hope was there? Even many educated and meritorious students are now unemployed. Therefore, I married off my daughter when she was only 15, and she is now leading her own life. I have no concern now". (Father of earlier aged girls who marry off while studying, age 40).

Intimate relationships and social norms

Several female participants revealed that working girls were found to be more susceptible to developing relationships with their colleagues. These close bonds often evolve into sexual relationships, contributing to early marriage among working girls.

> "Shortly after I began working, I entered into a relationship with one of my colleagues, which later turned into a sexual relationship. We then decided to marry, although our parents were unhappy with our decision. However, we did it without their approval because we knew what we did was not right according to our religion". (FGD 1 participant, age 18).

The issue of having a relationship at the workplace without parents' permission was identified as a growing concern for early marriage, even in the absence of an intimate relationship.

> "Parents of the earlier-aged working girls are mostly uneducated and strongly influenced by the social norms and misconceptions. They believe female and male could not be co-worker. Therefore, they prefer to marry off their daughters earlier". (Upazila Nirbahi officer, age 38).

Importantly, this perception was found to be common among parents of both working and studying girls. However, it does not pose a significant concern for the parents of studying girls. This is because their awareness of the negative effects of child marriage motivates them to prioritize the education of their daughters and prioritize their daughters' safety above all else.

> "I had concerns about the possibility of my school-going daughters engaging in intimate relationships, which have become more common due to modernization. However, my intention was not to abruptly end her education and arrange her marriage solely based on this risk. I believed she was young and had a promising future ahead. Eventually, I did make the decision to marry her, but it was primarily motivated by the opportunity to find a comparatively better groom within my family lineage". (Father of earlier aged girls who marry off while studying, age 38).

Social norms were highlighted as significant reasons for early marriage among the women who married at a younger age.

> "Marriage is a way to uphold our traditions, to show respect to our families and ancestors. Even if I had doubts, I knew I had to follow the path laid out for me." (IDI participant 4, age 22).

One participant mentioned that she felt she did not belong in her society and remained a minor in society's eyes when she found many of peers were getting married at an earlier age than her.

> "Everyone around me was getting married young, building families. It felt like I was the only one left behind, stuck in a childhood that was no longer fitting. Marriage was a way to belong, to be seen as a responsible adult." (IDI participant 5, age 21).

Another participant explicitly mentioned why marriage was important for them to become important in the society.

> "Marriage is a social currency here. It defines your status, your worth. Choosing a career over marriage felt like choosing shame over acceptance, a path less traveled and less understood." (IDI participant 3, age 19).

Discussion

The primary objective of this study was to explore the perspectives of girls regarding the timing of their own marriages, taking into consideration their educational and employment backgrounds at the time of marriage. Furthermore, we aimed to investigate the factors that influenced earlier-aged women to perceive their marriages as occurring at the appropriate time. Our findings indicate that among the total population of earlier-aged women, 55% believe that their marriages took place at the right time, with a higher percentage observed among women who were employed at the time of marriage. Among those who held this perception, there was a notable trend of discontinuing work and education after getting married. Through qualitative analysis, we gained insights into the underlying reasons why these women considered their marriages to be timely, including the desire to escape poverty, concerns regarding safety and security, and the influence of intimate relationships and societal norms.

The study findings convey three significant messages concerning early marriage in the country. Firstly, a substantial portion of early marriages are a result of girls' choice. Secondly, the engagement of girls in formal employment contributes to an increase in early marriage rates, unless measures are implemented to ensure economic security and safety. Lastly, early-married girls who believe that their marriages occurred at the right time are more likely to discontinue their education and withdraw from the workforce.

The perception of working girls who marry early that their marriage occurred at the right time can be understood from two distinct directions. Firstly, these girls may lack awareness regarding the appropriate age for marriage and the potential negative consequences associated with marrying at a young age. Secondly, their working environment and the challenges they face may have influenced their decision to marry early, despite being aware of the adverse outcomes of early marriage. This may include parental pressure for marriage once

girls start working, especially if they work alongside male colleagues or develop intimate relationships with them, which can conflict with societal norms[33]. Traditional patriarchal values in Bangladesh further reinforce these pressures[33]. Regardless of the direction, these perceptions indicate a failure of policies and programs, which can result in long-term burdens for the country.

If the first direction holds true, it suggests that a portion of women have not received the message regarding the correct age for marriage at early ages and consequences of early marriage. Factors such as early dropout from education to enter the workforce and limited exposure to mass media due to work obligations may contribute to this lower level of awareness[28,29,34]. These directions are influenced by various socio-demographic and socio-cultural factors. While leaving the parental home to enter the workforce can indicate a degree of freedom for girls, this is not always the case in many LMICs, including Nepal and India[8,18]. In these contexts, girls who start working early, often without continuing their education, typically come from low-income families where they are expected to support their families. Early marriage remains a long-standing norm in these communities, perpetuated by the fact that their mothers and grandmothers also married at a young age. Furthermore, these girls often move from their parental homes to their workplace, which is often seen as opposite of social norms in Bangladesh as well as other LMICs[35].

On the other hand, if the second directions is true, it indicates a failure of long-standing governmental priorities to ensure continuing girls' education and prevent child labour, as well as a failure to ensure the safety of working girls[18]. Though Bangladesh has made remarkable progress in reducing violence against women, incidents still occur frequently with one in three women faces it[36]. Importantly, any such incidents are usually spread widely with additional rumours, causing concern for the girls' security and motivating their parents to marry them off early. However, the above explanations may not be true for the girls who continue education. They are usually better aware off about the right age of marriage and risk of early marriage as well as usually stay at home with less security issue. They are also from a comparatively better family status.

In this study, we have also found that there is a lower likelihood of continuing work after marriage. This change is mainly due to the presence of family pressure or intention to have a child, as well as the desire to give more time to the family[37,38]. Moreover, we found that while women are employed, their wages in the factories are very low. This financial constraint limits their opportunities, often pushing them towards early marriage or leading them to leave work altogether to assume traditional roles as wives, mothers, and homemakers[39]. However, this practice can have several adverse consequences on women's economic flexibility, empowerment and decision making abilities in the family[40,41]. For instance, stopping work can lead to face earlier aged pregnancy, which is associated with various adverse maternal and child health outcomes, including lower utilization of maternal healthcare services, pregnancy complications, and maternal and child mortality[40,42]. Furthermore, this trend indicates a significant dropout rate of girls from continuing their education and working status, which negatively affects women's empowerment and decision-making abilities[40,41]. These consequences can lead to higher household poverty, greater sensitivity to economic shocks, and less income diversification[41]. These factors, in turn, can have significant intergenerational impacts, resulting in poorer health among children and lower investment in education and other forms of human capital accumulation[43,44]. All of these factors increase the likelihood of early marriage in subsequent generations[43].

Regardless of the explanation provided, these findings indicate challenges for the country to achieve relevant SDG's targets related to the improvement of sexual and reproductive health rights as well as equity. This highlights the need for policies and programs to educate and raise awareness among studying and working girls about the correct age of marriage and the adverse effects of early marriage. Increasing the wages of working girls at the initial level is also important. Nevertheless, the existing initiatives remain ineffective unless appropriate engagement of multiple stakeholders including girl's parents and local leaders for implementation of target-oriented policies and programs to reduce early marriage. Reducing gender-based violence and improving their safety in the workplace are also crucial to reducing early marriage.

This study exhibits several notable strengths as well as a few limitations. It stands as the first investigation in Bangladesh and other LMICs that delves into women's perceptions of their marriage age, accounting for their educational and employment statuses, and utilizing nationally representative quantitative survey data. Additionally, the qualitative survey findings offer insight into the motivating factors behind the marriage decisions of working and educated girls. The qualitative interviews were conducted by the authors of this study, who have extensive experience in academia and public health research. They hold postgraduate degrees in population science, public health, and anthropology, and possess substantial expertise in conducting research in LMICs, including Bangladesh. All authors agreed on and approved the interpretation presented in the manuscript. The study employed appropriate statistical modelling techniques to analyze the data, incorporating a diverse range of confounding variables. As a result, the reported findings possess sufficient robustness to inform national-level policies and programs. However, one key limitation of this study is that the quantitative data analyzed in this study were derived from a cross-sectional survey, which restricts the ability to establish causal relationships. While the study explored cultural factors associated with early marriage through qualitative analysis, these factors were not adjusted for in the quantitative analysis due to their unavailability within the survey. We were also unable to account for other important factors, such as spousal age differences and the extent of early marriage within the women's families, due to a lack of data, despite their relevance to the occurrence of early marriage. Furthermore, the women's age of marriage was self-reported, introducing the potential for recall bias. Nevertheless, any such bias is expected to be random in nature and should not significantly skew the reported results in any particular direction. Conducting qualitative study was another strength of this study, where representation of women (in IDIs and FGDs) and men (in the KIIs) allowed us to capture diverse perspectives on this complex issue. We conducted the qualitative study in a purposively selected district and utilized data to explain and interpret findings from the nationally representative quantitative data. However, this comparison may introduce errors due to different social norms and cultural issues regarding early marriage in various parts of the country. Moreover,

the perception of early marriage among this group of women might differ slightly from that of women in other regions and rural areas due to factors such as their relocation, economic stability, community engagement, and relatively higher decision-making autonomy. This indicates a need for qualitative interviews to be conducted in different regions of the country. However, we were unable to do so due to a lack of funding. It is worth noting that although participants included in our qualitative survey were from only one district, a significant portion of them reported their origins as being from different parts of the country, including rural areas, rather than their present location. They had moved to this district for employment, given that ready-made garment and small-scale industries are predominantly located in this area. Moreover, we conducted qualitative interviews in 2023–2024, while the quantitative data we analysed was collected in 2017–2018. Comparing data from different time points may introduce some distortion in the reported associations and conclusions. However, we could not address this issue further as the quantitative survey data we analysed is the most recent available in Bangladesh.

Conclusion

Our findings revealed that approximately 55% of women who married at an early age believed that their marriage took place at the right time. Among early-married women, those who were employed at the time of their marriage were more likely to perceive their marriage as timely, whereas those who were pursuing studies at the time of their marriage were more inclined to view their marriage as occurring too early and should have been delayed. Multiple factors emerged as influential in shaping the perception of earlier-aged married women regarding the timing of their marriage, including the desire to escape poverty, concerns related to safety and security, and the influence of intimate relationships and societal norms. These findings highlight that a significant proportion of early-married women believe their marriage occurred at the right time, indicating a gap in policies and programs designed to raise awareness about the risks of early marriage and early childbearing. It is crucial for policies and programs to prioritize comprehensive education for all girls and those around them, including parents, to ensure they are informed about the appropriate age for marriage and the potential consequences of early marriage. Additionally, those involved in decision-making and upholding social norms around early marriage should receive extensive counselling on its adverse effects. This focus should particularly target working girls, who may be more vulnerable to early marriage.

Data availability

"The data that support the findings of this study are available from The DHS Program, but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are, however, available from the corresponding author upon reasonable request and with permission of The DHS Program. To proceed, researchers are required to submit a research proposal via the website (https://dhsprogram.com/data/available-datasets.cfm). Subsequently, the designated individual will review the proposal and approve access for data download. We are unable to share the qualitative interview data due to restrictions imposed by the ethical review committee".

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Author contributions

"Khan MN designed the study. Khan MN, Khanam SJ and Khan MMA collected qualitative data. Khan MN and Billah MA analysed quantitative data while all authors analysed qualitative data. Khan MN, Khan MMA, Billah MA and Khanam SJ wrote the first draft of this manuscript. Akter S critically reviewed and edited the previous versions of this manuscript. All authors approved this final version of the manuscript".

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Declarations

Competing interests

The authors declare no competing interests.

Ethical approval

The quantitative data analysed in this study was extracted from the survey which was approved by the institutional review board of ICF macro (Inner City Fund) and the National Research Ethics Committee of the Bangladesh Medical Research Council. Informed consent was obtained from all participants. All necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived. No separate ethical approval was required to conduct this study. We obtained permission to access this survey and conduct this research. All methods were performed in accordance with the relevant guidelines and regulations. Ethical approval for conducting the qualitative survey was obtained from the Institutional Review Board of the University of Rajshahi (123/430/IAMEBBC/IBSc), ensuring compliance with ethical guidelines and protocols. Informed consent was obtained from all participants who were 18 years of age or older. For participants who were under 18 years of age, their legal guardian, such as their husband or father, provided informed

consent on their behalf. This process ensured that all participants had a clear understanding of the survey's purpose, procedures, and potential risks, and voluntarily agreed to participate. So that this applies to illiterate respondents as well.

Additional information

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