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Urban-Rural Disparities in the Continuation of Education after Marriage among Bangladeshi Women

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Abstract

Background: Despite significant progress in female education in Bangladesh, many young women discontinue their studies after marriage, with notable disparities observed between urban and rural areas. This study examines the factors associated with the continuation of education after marriage among young Bangladeshi women, with a focus on urban-rural differences.

Methods: Data were extracted from the Bangladesh Demographic and Health Survey (BDHS) 2022, which used a two-stage stratified sampling design to ensure national representation across urban and rural areas and all eight administrative divisions of Bangladesh. Multilevel mixed-effects logistic regression model was used to identify the factors associated with the continuation of education after marriage among young women in urban and rural settings.

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Results: The results revealed that only 19.16% of Bangladeshi women continue their education after marriage, with a higher rate in urban areas (25.51%) than in rural areas (16.80%). Key factors associated with continued education include age at first marriage, household income, and region. Women who married at or after age 18 had significantly higher odds of pursuing education post-marriage. Wealthier women, particularly those from the richest households, were 4 to 5 times more likely to continue education than the poorest. In rural areas, media access and improved household conditions also supported educational continuation. Marked regional disparities were found, especially in Rangpur, Barishal, and Rajshahi. The decline in intraclass correlation from about 17% to 8% in the final models indicates that much of the variation was explained by individual, household, and community-level factors.

Conclusions: A small proportion of women in Bangladesh continue their education after marriage, highlighting a critical area of concern. Several key factors- such as socioeconomic status, age at marriage, household conditions, and geographical location- were found to significantly influence the likelihood of postnuptial educational continuation. These findings underscore the need for targeted policy interventions that address early marriage, poverty, and regional disparities. By tackling these issues, policymakers can better support married women in pursuing education, thereby promoting gender equality and contributing to broader socio-economic development in Bangladesh.

Keywords: Women's education, Women's empowerment, Postnuptial education, Multilevel mixed effects logistic regression model

Introduction

Education is essential in transforming people and communities, preparing them with the knowledge, abilities, and values necessary to achieve personal development and improvement in society (Dr.R.K.Doharey et al., 2023). It is one of the most studied aspects, while social scientists focusing specifically on women's education. Even during the ages when women commonly married and had children, education was still pursued (Howlader et al., 2023). Marriage is an essential life event that often affects an individual's goals, duties, and responsibilities; consequently, they must make critical decisions involving their education and family responsibilities (Ebaugh, 1988). In Bangladesh, the median age at first marriage for women aged 20-49 was just 16.9 years in 2022 (BDHS, 2022a), and at least 41.6% of young women are married before the age of 18 (Jahan, 2024). Marriage is frequently viewed as a challenge to education, because women are usually expected to leave their studies to prioritize domestic responsibilities like pregnancy and childcare (Jensen & Thornton, 2003). Globally, around 600 million girls who live in the developing world do not have the opportunity to become fully functioning members of society, due to limited access to education, high rates of early marriage and childbearing, and exposure to violence and harmful practices (Chaaban & Cunningham, 2011). Despite these challenges, girls' education offers numerous benefits, including improved self-efficacy, enhanced life skills, greater economic opportunities, and increased empowerment (Bhowmik et al., 2021).

Women's empowerment and economic development are closely linked. Economic growth can help reduce gender inequality, and at the same time, empowering women can improve overall development results (Duflo, 2012). Women's education is an essential indicator of health and economic advancement, contributing to improved child health (Amin et al., 2013), delayed childbirth (Güneş, 2015), reduced total fertility rates (Amin et al., 2013), lower body mass index

(BMI) among women (Keats, 2018), enhanced educational outcomes of children (Duflo, 2012), and decreased prevalence of intimate partner violence (Ahmed, 2005; Marium, 2014). Promoting women's education is therefore vital for achieving a country's sustainable development.

A complex interaction of economic, cultural, and geographical variables influences the continuance of education after marriage. A girl's ability and willingness to continue education, along with support from parents, in-laws, husband, and teachers, affect her chances of staying in school after marriage. Early marriage, childbirth, and social attitudes against girls' education also play a role (Raj et al., 2019). A research conducted in Bangladesh revealed that women who married prior to the age of 18 and adolescent mothers were less likely to pursue postnuptial education (Bhowmik et al., 2021). Two other studies identified individual, household, and community-level variables (Ghose et al., 2023; Howlader et al., 2023); however, none examined the factors associated with urban-rural differences in continuing education after marriage. In Bangladesh, urban and rural areas differ significantly in terms of educational access and gender norms, with urban areas offering better infrastructure and support for continued education after marriage, while rural regions face structural barriers and stronger societal pressures on women (Rahman, 2019). Therefore, a study is necessary to identify other individual, household, and community-level factors for urban and rural areas that can influence the postnuptial education of women in Bangladesh. This study aims to identify the factors influencing the continuation of postnuptial education among Bangladeshi women within the context of urban and rural residency, focusing on individual, household, and community-level factors.

Methods

Data Source

This study analyzed publicly available secondary data derived from Bangladesh Demographic and Health Survey (BDHS) 2022 conducted from June to December 2022 as a collaborative effort between the National Institute of Population Research and Training (NIPORT), ICF International, USA, and Mitra & Associates. The BDHS 2022 data were obtained following the guidelines and standards set forth by the Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS) (The DHS Program, 2022).

Study Design and Sampling Strategy

The sample frame for the BDHS 2022 is the Integrated Multi-Purpose sample Master Sample, derived from a comprehensive list of enumeration areas (EAs), including the whole nation. The Bangladesh Bureau of Statistics (BBS) prepared it for the 2011 population census of the People's Republic of Bangladesh. The sample frame includes data on EA location, concentrating type (city corporation, non-city corporation, or rural), and the projected number of residential households. A sample map illustrating geographic boundaries is provided for each EA. The survey uses a two-stage stratified sampling method of households. Initially, 675 EAs were chosen, including 237 in urban regions and 438 in rural areas, using probability proportionate to each EA's size. The BBS established the sample in the initial phase according to the parameters supplied by ICF. Mitra and Associates subsequently conducted a comprehensive household listing operation in all designated enumeration areas to establish a sampling frame for the second-stage selection of households. During the second phase of sampling, a systematic sample averaging 45 families per enumeration area was chosen to generate statistically acceptable estimates of essential

demographic and health variables for both urban and rural regions, and for each of the eight divisions in Bangladesh (BDHS, 2022b).

Study Population

The BDHS 2022 final report provides a detailed overview of the survey design, applied methodology, sample size, employed questionnaires, and findings (BDHS, 2022b). This study's data was limited to married young adult women aged 15-29. Consequently, a final sample of 4,914 women (1,649 from urban areas and 3,265 from rural areas) was used for the current research after any missing responses were eliminated individually.

Outcome variable

This study examined the continuation of education after marriage as the dependent variable. The assessment of post-marital educational continuation in the BDHS 2022 focused on women who were enrolled in school prior to marriage. The survey question was: 'Did you continue your studies after marriage?' The response options were no (< 1 year) and yes (1-2 years; 3-4 years; and > 5 years). For analysis, this variable was dichotomized with no, coded as 0 (did not continue education after marriage), and yes, coded as 1 (continued education after marriage).

Explanatory variables

The analysis considered several individual, household, and community-level factors that may affect the continuation of education after marriage. This study explores a range of individual-level factors. These factors include the age of the respondent (grouped into three categories: 15-19, 20-24 or 25-29), age at first marriage (<18 years or $\geq$ 18 years), residing with husband (yes, or no), husband's education (no education, primary, secondary, or higher), husband's occupation (none/others, farmer/worker, professional, business, or carpenter/masson), age difference between

husband (<5 years, 5-10 years, or ≥ 11 years). For the household-level variables, we included number of household members (≤ 4 , 5-8, or ≥ 9), sex of household head (male, or female), media access (yes, or no), wealth index (poorest, poorer, middle, richer, or richest), household water sources (improved, or unimproved), household toilet facilities (improved, or unimproved) religion (Muslim or others). The wealth variable categories respondents into quintiles based on their household's score on the DHS wealth index, which considers durable consumer goods, housing quality, and water and sanitation facilities. We include the region (Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur or Sylhet) to assess community-level indicators.

Data analysis

Datasets were cleaned before the analysis. Descriptive statistics were calculated, including frequency and percentage distribution for each variable. Pearson's χ^2 test statistics were performed to assess associations between continuing education after marriage and individual socio-demographic, household, and community-level variables included in the study. To visualize spatial differences, we mapped the percentage of continuing education after marriage across eight divisions, differentiating between urban and rural areas. We used the sampling weight given by the BDHS in all analyses to ensure the validity of our results at the national level. In the BDHS data set, respondents were organized in multiple levels, such that respondents were nested within households and households were nested within clusters. To properly analyze the hierarchical data structure, we used a multilevel mixed-effects binary logistic regression model to investigate the relationship between post-marriage educational continuation and numerous individual, household, and community-level characteristics. Five separate nested models were fitted. We first estimated a 'null' model (model 0, containing only the outcome variable). In model 1, only individual-level variables were added. Model 2 contains only household-level variables. Model 3 contains only

community-level variables along with the outcome. Finally, all the individual-level, household-level and community-level variables were included in model 4. The model 4 was selected and interpreted due to its superior goodness of fit, as evidenced by a lower Akaike information criterion (AIC) value. Fixed effects were reported as adjusted ORs (aOR) with 95% CIs. The random effect, area variance, intraclass correlation coefficient, proportionate change in variance, and median odds ratio were documented to evaluate the variability of continuing education among clusters/communities. Furthermore, the AIC was employed to assess the model's goodness of fit. The age of childbirth, husband's education, and husband's occupation were not included in the multivariate models due to the potential issue of multicollinearity. The multicollinearity among the remaining variables was evaluated by analyzing the tolerance values and variance inflation factor. Tolerance values and variance inflation factor values were about one, indicating an absence of multicollinearity problems. All statistical tests were two-sided and considered significant at the $p < 0.05$ level. Data were analyzed using Stata V.15.2 (Stata Corp).

Ethical Considerations

We used secondary data from BDHS 2022, which is publicly available. Therefore, the authors were not required to get ethical permission for conducting this study. The comprehensive ethical approval protocols for implementing this survey are documented in the BDHS report 2022.

Results

Background characteristics

This study focused on young, ever-married women aged 15 to 29, with an average age of about 24. Early marriage was quite common; around 7 in 10 women married before turning 18, which was even more widespread in rural areas. Most women (around 81%) lived with their

husbands during the survey, with slightly higher rates in urban areas. Media access also showed a big difference between rural and urban areas, almost 73% of urban women having access to media, compared to just under 58% in rural areas. On a positive note, most households had access to clean water and decent toilet facilities, though urban households had slightly better sanitation overall (Table 1). Figure 1 shows the percentage of women continuing their education after marriage. Overall, only 19.16% continue their education, with 25.51% in urban areas and 16.80% in rural areas.

Prevalence of Continuation of Education after Marriage

The 2022 BDHS data show a clear difference between urban and rural areas regarding continuing education after marriage. Overall, young married women in urban areas were more likely to stay in school than their rural counterparts (25.5% versus 16.8%). Age played an essential role in continuing education after marriage. Among teenagers aged 15-19, rural girls had a slightly higher continuation rate (16.4%) than those in urban areas (14.2%). Nearly one-third (30.6%) of women aged 25-29 in urban areas continued their education, compared to just 15.5% in rural areas. Age at first marriage was also important. Women who married at 18 or older were more likely to keep studying, 35.2% in urban areas and 25.4% in rural ones. On the other hand, married before 18 years had much lower rates, especially in rural settings. Interestingly, women with a 5-10-year age gap with their husbands had higher continuation rates than those with smaller or larger gaps, especially in urban areas.

Household size can influence women's post-marriage education. In urban areas, women in medium-sized households (5-8 members) had the highest continuation rates. In rural areas, smaller households had a higher education continuation rate than larger households. Women with access to TV, radio, or newspapers were far more likely to continue their education after marriage, 28.6%

in urban areas and 20.3% in rural areas. Women from the richer and the richest households had a higher percentage of continuation of education. In urban areas, over half of the richest women continued their education after marriage, compared to only 10.3% of the poorest. Rural women followed the same trend but with lower percentages. Even the household's access to clean water and toilets had an effect. Women in households with improved toilet facilities were more likely to keep studying, particularly in rural areas. Regionally, there were some significant differences. Urban women in Rangpur and Barishal had the highest continuation rates, while Sylhet had the lowest (Figure 2). Sylhet again shows the lowest rate for rural women, only 6.7% (Figure 3).

Factors Associated with Continuation of Education

Table 3 presents the association of continuation of education with individual, household, and community-level factors using multilevel mixed-effect binary logistic regression models among currently married young adults in urban Bangladesh. In the null model (Model 0), the cluster-level variance was 0.55, and the intraclass correlation coefficient (ICC) was 17.09%, indicating that 17.09% of the total variation was due to differences between clusters. After adjusting all individual-, household-, and community-level variables, the ICC reduced to 10.22%, and the cluster-level variance dropped to 0.082 in Model 4. Among the models, Model 4 had the lowest AIC and BIC values and was considered the best-fitting model.

From Model 4, it was observed that getting married at the age of 18 years or older was significantly associated with higher odds of continuing education (AOR: 1.71, 95% CI: 1.29-2.28). Respondents who did not reside with their husband had 1.77 times higher odds of continuing education (AOR: 1.77, 95% CI: 1.19-2.61) than that of those who did. Regarding household-level factors, respondents from poorer (AOR: 1.79, 95% CI: 1.11-2.90), middle (AOR: 2.71, 95% CI: 1.69-4.33), richer (AOR: 3.72, 95% CI: 2.95-7.57), and richest wealth quintiles (AOR: 4.92, 95%

CI: 3.99-9.41) had significantly higher odds of continuing their education compared to their poorest counterpart. At the community level, regional variations were also observed. Compared to Sylhet, young women residing in the Barishal division (AOR: 4.01, 95% CI: 1.93-8.34), Khulna (AOR: 2.73, 95% CI: 1.29-5.39), Mymensingh (AOR: 2.78, 95% CI: 1.23-6.31), and Rangpur (AOR: 5.85, 95% CI: 2.74-12.50) were significantly more likely to continue education after their marriage (Table 3).

In rural areas, Table 4 shows the multilevel mixed-effect binary logistic regression results examining the continuation of education among currently married young adults aged 15-29. The null model (Model 0) showed a cluster-level variance of 0.68 with an ICC of 15.50%, indicating moderate cluster-level variation. After adjusting for all levels of covariates in Model 4, the ICC dropped to 8.28% with a reduced cluster-level variance of 0.083. Model 4 had the lowest AIC and BIC values and was selected as the best model.

From Model 4, it was found that age at marriage was a key predictor. Those who got married at the age of 18 years or older had 2.26 times higher odds of continuing their education (AOR: 2.26, 95% CI: 1.80-2.83). Regarding household size, respondents from households with four or fewer members (AOR: 1.46, 95% CI: 1.00-2.16) or 5–8 members (AOR: 1.44, 95% CI: 1.00-2.08) were more likely to continue their education than those in larger households. Access to media (AOR: 1.38, 95% CI: 1.10-1.73), improved toilet facilities (AOR: 1.55, 95% CI: 1.10-1.78), and access to unimproved water sources (AOR: 1.76, 95% CI: 1.16-2.65) were positively associated with continued education. A clear gradient was observed with wealth: respondents from middle (AOR: 1.99, 95% CI: 1.32-3.00), richer (AOR: 2.62, 95% CI: 1.73-3.97), and richest (AOR: 4.01, 95% CI: 3.41-7.23) households were significantly more likely to continue education compared to those in the poorest households. In terms of regional differences, young adults living

in Barishal (AOR: 4.93, 95% CI: 3.93-8.51), Dhaka (AOR: 3.12, 95% CI: 2.05-5.96), Khulna (AOR: 3.01, 95% CI: 2.01-5.54), Mymensingh (AOR: 4.48, 95% CI: 2.96-7.96), Rajshahi (AOR: 4.12, 95% CI: 2.30-8.12), and Rangpur (AOR: 4.66, 95% CI: 2.74-12.50) divisions had significantly higher odds of continuing education compared to Sylhet (Table 4).

Discussion

This study aims to examine how different individual, household, and community-level factors affect the continuation of women's education after marriage in Bangladeshi urban and rural areas. In this national sample of married young women, just 19.16% pursued further education after getting married, where only 16.80% in rural areas and 25.51% in urban areas. Several factors were identified as being associated with continuing education after marriage in both urban and rural areas. In urban areas, these factors included the respondents' age, age at first marriage, residing with husband, husband's education, husband's occupation, media access, wealth index, household toilet facilities, and division. In rural areas, similar factors were identified, such as respondents' age, age at first marriage, residing with husband, husband's education, husband's occupation, age differences with husband, household members, media access, wealth index, household toilet facilities, household water source, and division. Policymakers should consider these factors to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG Goal 4).

This study found that women who married at age 18 or older were more likely to continue their education in urban and rural areas. Early marriage also compromises girls' ability to attend school post-marriage (Bhowmik et al., 2021; Raj et al., 2019). It is often associated with early childbirth, which is a significant barrier to continuing education after marriage (Howlader et al.,

2023; Raj et al., 2019). Early marriage and childbirth impede their capacity to pursue education post-marriage (Lloyd & Mensch, 2008). Post-marriage educational decisions are typically determined by in-laws or spouses, who are often unsupportive, especially in South Asian cultures (Raj et al., 2019). Our study revealed that women residing with their husbands were more likely to continue their education after marriage in urban areas. Urban husbands are often exposed to more progressive gender norms, higher education levels, and greater economic opportunities (Zhang & Zhu, 2024). This tends to be more supportive of their wife's pursuing education.

This study revealed many household-level factors that substantially influenced the pursuit of education after marriage. We found that women in households with media access were more likely to continue their education after marriage in rural areas. Previous studies also found that (Ghose et al., 2023; Howlader et al., 2023). Access to media can act as a silent agent of social change, especially in more traditional or isolated environments like rural areas (Jensen & Oster, 2009). Additionally, our research revealed that household size plays an important role in women's education after marriage in rural areas. This may be because smaller or medium-sized households often provide a stronger familial support system both emotionally and financially, for managing domestic responsibilities, which can enable women to continue their education (Ghose et al., 2023). Previous studies showed that rural households' savings decrease as household size increases (Fanta et al., 2024; Hone & Marisennayya, 2019; Kiran & Dhawan, 2015). Therefore, women in smaller households may have greater opportunities to pursue education in rural areas.

The study highlighted that households with a higher wealth index were more likely to encourage continued education for married young women in urban or rural areas. Wealthier households are generally more capable of easily covering essential educational costs, including tuition, materials, transportation, and housing. The availability of financial support significantly

enhances a student's ability to manage these costs, which, in turn, plays a critical role in maintaining academic focus and performance (Rosal et al., 2025). Women with improved toilet facilities were more likely to continue their education after marriage. Improved toilet facilities in households can positively influence the continuation of education after marriage for women, especially in low- and middle-income countries, due to several interconnected health, safety, and social factors. Poor sanitation increases the risk of urinary tract infections (UTIs), diarrheal diseases, and reproductive tract infections in women (Kawade et al., 2019; Kumwenda, 2019). That may prevent women from continuing their education after marriage.

An unexpected result found in this study was that women residing in households with an unimproved water source were more likely to continue their education after marriage. Further investigation is needed to understand better the contextual factors that influence the continuation of women's post-marriage education.

This study offers several notable strengths as well as some limitations. Key strengths include the use of a large, nationally representative sample, standardized data collection procedures, and a considerable sample size, all of which contribute to the results' robustness, accuracy, and statistical reliability. Nevertheless, assessing the findings within the context of the study's limitations is essential. First, the retrospective nature of reporting post-marriage education may be subject to recall bias. Second, since the study utilizes secondary data, the analysis is limited to the variables available, excluding important sociocultural and institutional dimensions, such as prevailing social norms, gender roles, education opportunities, and access to childcare, that could influence women's employment decisions after marriage. Third, the exclusive reliance on quantitative methods means the study lacks qualitative depth, particularly regarding women's experiences, motivations, and challenges in continuing post-marriage education. Future research

would benefit from incorporating rich qualitative approaches to explore these aspects more thoroughly. Lastly, the study's cross-sectional design allows for the identification of associations but not causal inferences.

Conclusions

The present study revealed a low prevalence of educational continuation among young adult women after marriage both in urban and rural areas. Additionally, it identified various individual, household, and community-level factors for urban and rural areas, including age at first marriage, residing with husband, household wealth index, and division for rural areas, and age at first marriage, household members, media access, household wealth index, household water sources, household toilet facilities, and division for urban areas, that exert a significant influence on the likelihood of educational continuation after marriage. These findings can guide policymakers in designing and implementing targeted intervention programs for vulnerable women in both urban and rural areas, particularly within low-literacy communities. Such initiatives could help improve educational retention among women across Bangladesh, thereby supporting the nation's efforts to achieve the relevant SDGs by 2030.

Table 1: Socio-demographic and other characteristics of the respondents, BDHS 2022

Variables	Categories	Overall Number weighted % (95%CI)	Urban Number weighted % (95%CI)	Rural Number weighted % (95%CI)
Respondent's age (in years) (Mean 23.93 (SD: 3.39) Age range: 15- 29	15-19	12.9 (11.86-14.00)	11.1 (9.34-13.16)	13.6 (12.33-14.49)
	20-24	40.2 (38.68-41.81)	39.7 (36.51-42.96)	40.4 (38.66-42.23)
	25-29	46.9 (45.26-48.49)	49.2 (45.88-52.54)	46.0 (44.18-47.84)
Age at first marriage (in years)	<18	71.3 (69.61-72.94)	66.7 (63.13-70.04)	73.0 (71.08-74.88)
	≥18	28.7 (27.06-30.39)	33.3 (29.96-36.85)	27.0 (25.12-28.92)
Residing with husband	Yes	80.6 (78.98-82.3)	85.4 (82.47-87.99)	78.9 (76.81-80.89)
	No	19.3 (17.7-21.02)	14.5 (12.01-17.53)	21.1 (19.11-23.19)
Husband's education	No education	9.7 (8.26-10.90)	7.2 (5.31-9.73)	10.6 (9.37-12.04)
	Primary	29.2 (27.5-30.91)	23.8 (20.75-27.17)	31.2 (29.22-33.21)
	Secondary	40.2 (38.49-42.01)	40.7 (37.26-44.27)	40.1 (38.04-42.12)
	Higher	20.9 (19.22-22.63)	28.3 (24.21-32.67)	18.1 (16.47-19.92)
Husband's occupation	None/Others	2.0 (1.58-2.53)	2.1 (1.35-3.38)	1.9 (1.48-2.55)
	Farmer/worker	43.2 (41.37-45.1)	37.1 (33.37-41.03)	45.5 (43.36-47.65)
	Professional	6.4 (5.529-7.448)	9.8 (7.48-12.7)	5.2 (4.36-6.13)
	Business	19.7 (18.37-21.1)	23.7 (20.88-26.77)	18.2 (16.72-19.8)
	Carpenter/Masson	28.7 (26.88-30.49)	27.3 (23.48-31.4)	29.2 (27.22-31.2)
Age difference with husband (in years)	<5	24.4 (22.85-26.09)	26.2 (23.3-29.3)	23.8 (21.9-25.76)
	5-10	50.2 (48.66-51.72)	48.6 (45.56-51.67)	50.8 (49.01-52.54)
	>10	25.4 (23.95-26.87)	25.2 (22.44-28.17)	25.4 (23.79-27.18)
Household members	≤4	42.4 (40.54-44.22)	40.0 (37.97-42.09)	40.0 (37.97-42.09)
	5-8	48.0 (46.24-49.74)	49.6 (47.63-51.55)	49.6 (47.63-51.55)
	≥9	9.6 (8.64-10.75)	10.4 (9.68-11.78)	10.4 (9.17-11.78)
Sex of household head	Male	87.5 (86.08-88.76)	87.6 (85.07-89.77)	87.4 (85.72-88.97)
	Female	12.5 (11.24-13.92)	12.4 (10.23-14.93)	12.6 (11.03-14.28)
Media access	No	38.2 (36.05-40.43)	27.1 (23.86-30.57)	42.4 (39.68-45.09)
	Yes	61.8 (59.57-63.95)	72.9 (69.43-76.14)	57.6 (54.91-60.32)
Wealth index	Poorest	16.3 (14.85-17.88)	18.4 (14.99-22.27)	16.0 (14.37-17.87)
	Poorer	19.9 (18.5-21.46)	22.2 (19.16-25.56)	18.6 (17.01-20.28)
	Middle	21.65 (20.13-23.25)	21.2 (18.42-24.33)	20.9 (19.30-22.76)
	Richer	21.96 (20.32-23.71)	21.3 (18.2-24.71)	21.4 (19.84-23.15)
	Richest	20.13 (18.20-22.22)	17.0 (13.0-21.8)	22.9 (20.73-25.31)
Household water source	Improved	88.3 (87.04-89.44)	89.0 (86.74-90.87)	88.0 (86.5-89.4)
	Unimproved	11.7 (10.56-12.96)	11.0 (9.13-13.26)	12.0 (10.58-13.59)
Household toilet facilities	Improved	73.7 (71.91-75.33)	78.3 (74.93-81.26)	71.9 (69.86-73.93)
	Unimproved	26.3 (24.67-28.09)	21.7 (18.74-25.07)	28.1 (26.07-30.14)
Religion	Islam	91.8 (89.81-93.4)	91.9 (89.02-94.14)	91.7 (89.16-93.72)
	Others	8.2 (6.60-10.19)	8.1 (5.86-10.98)	8.3 (6.28-10.84)
Division	Barishal	5.9 (5.31-6.67)	3.5 (2.59-4.78)	6.9 (6.08-7.79)
	Chattogram	19.2 (17.21-21.28)	17.5 (14.89-20.45)	19.8 (17.33-22.49)
	Dhaka	25.3 (23.33-27.28)	47.3 (42.82-51.83)	17.0 (15.44-18.77)
	Khulna	13.8 (12.62-14.96)	10.2 (8.32-12.4)	15.1 (13.7-16.5)
	Mymensingh	7.2 (6.50-7.98)	3.41 (2.80-4.14)	8.6 (7.69-9.66)
	Rajshahi	12.7 (11.5-14.03)	10.1 (7.60-13.21)	13.7 (12.36-15.16)
	Rangpur	11.5 (10.44-12.62)	5.5 (4.43-6.77)	13.7 (12.37-15.19)
	Sylhet	4.5 (3.88-5.16)	2.6 (2.08-3.27)	5.2 (4.39-6.09)
Place of residence	Urban	27.1 (25.21-29.15)	-	-
	Rural	72.9 (70.85-74.79)	-	-

Note: 'BDHS, Bangladesh Demographic and Health Survey- 2022', 'CI, confidence interval,

Table 2: Urban-rural difference in the prevalence of continuation of education after marriage, BDHS, 2022

Variables	Characteristics	Urban (%)		Rural	
		Prevalence (95% CI)	p-values	Prevalence (95% CI)	p-values
Respondent's age (in years)	15-19	14.2 (9.771-20.26)	0.000	16.4 (12.42-21.39)	0.029
	20-24	22.3 (17.88-27.52)		18.4 (16.1-20.99)	
	25-29	30.6 (25.87-35.83)		15.5 (13.6-17.59)	
Age at first marriage (in years)	<18	20.7 (17.01-24.93)	0.000	13.6 (12.1-15.35)	0.000
	≥18	35.2 (29.25-41.57)		25.4 (22.13-28.87)	
Residing with husband	Yes	24.1 (20.73-27.9)	0.000	16.5 (14.97-18.2)	0.000
	No	33.6 (25.54-42.74)		17.8 (14.47-21.8)	
Husband's education	No education	2.5 (0.7663-8.096)	0.000	3.3 (1.751-6.143)	0.000
	Primary	4.9 (3.197-7.523)		5.4 (3.968-7.29)	
	Secondary	23.4 (19.00-28.41)		15.9 (13.91-18.13)	
	Higher	51.8 (46.68-56.88)		46.3 (41.83-50.85)	
Husband's occupation	None/Others	21.9 (10.04-41.31)	0.000	28.9 (18.59-41.85)	0.000
	Farmer/worker	25.3 (20.01-31.49)		15.2 (13.27-17.31)	
	Professional	61.7 (51.76-70.73)		43.6 (35.7-51.77)	
	Business	26.5 (21.42-32.18)		20.7 (17.18-24.75)	
	Carpenter/Masson	12.3 (8.486-17.37)		11.3 (9.372-13.67)	
Age difference with husband (in years)	<5	19.0 (14.94-23.9)	0.152	13.9 (11.45-16.89)	0.034
	5-10	29.3 (24.48-34.66)		17.1 (15.05-19.3)	
	>10	24.9 (19.22-31.65)		18.9 (15.79-22.51)	
Household members	≤4	22.7 (18.53-27.59)	0.194	15.8 (13.66-18.2)	0.024
	5-8	28.5 (23.29-34.23)		18.4 (16.25-20.76)	
	≥9	26.4 (18.61-35.9)		13.1 (9.751-17.3)	
Sex of household head	Male	25.0 (21.44-29.0)	0.395	16.9 (15.33-18.56)	0.453
	Female	28.9 (21.02-38.31)		16.2 (12.37-21.03)	
Media access	No	17.3 (13.41-22.03)	0.000	12.0 (10.19-14.04)	0.000
	Yes	28.6 (24.4-33.13)		20.3 (18.23-22.64)	
Wealth index	Poorest	10.3 (6.665-15.69)	0.000	7.9 (5.735-10.9)	0.000
	Poorer	14.2 (9.862-19.96)		10.6 (8.31-13.5)	
	Middle	23.8 (18.44-30.13)		15.4 (12.74-18.49)	
	Richer	31.9 (25.38-39.25)		17.3 (14.58-20.49)	
	Richest	50.9 (42.99-58.74)		28.8 (24.86-33.05)	
Household water source	Improved	24.9 (21.43-28.92)	0.105	16.1 (14.58-17.84)	0.045
	Unimproved	29.7 (23.21-37.23)		21.7 (17.35-26.73)	
Household toilet facilities	Improved	26.3 (22.7-30.18)	0.073	17.8 (15.98-19.74)	0.000
	Unimproved	22.8 (17.23-29.52)		14.3 (11.62-17.43)	
Religion	Islam	26.0 (22.28-30.09)	0.321	16.6 (14.96-18.3)	0.217
	Others	20.0 (13.09-29.3)		19.5 (14.7-25.27)	
Division	Barishal	37.6 (28.45-47.69)	0.000	23.6 (18.42-29.79)	0.000
	Chattogram	17.8 (12.93-24.06)		10.3 (6.927-15.1)	
	Dhaka	25.6 (19.44-32.89)		19.3 (15.08-24.42)	
	Khulna	29.9 (23.51-37.23)		17.8 (14.53-21.57)	
	Mymensingh	27.8 (16.73-42.55)		18.9 (14.46-24.25)	
	Rajshahi	23.7 (14.98-35.77)		18.4 (14.43-23.26)	
	Rangpur	39.9 (29.95-50.84)		19.3 (15.56-23.83)	
	Sylhet	15.4 (9.45-24.19)		6.7 (4.378-10.23)	
Total		25.5 (22.01-29.35)		16.8 (15.26-18.47)	

Note: 'BDHS, Bangladesh Demographic and Health Survey- 2022', 'CI, confidence interval,

Table 3: Multilevel logistic regression analysis of the factors associated with continuation of education after marriage in urban areas- BDHS- 2022

Characteristics	Model 0	Model 1 AOR (95%CI)	Model 2 AOR (95%CI)	Model 3 AOR (95%CI)	Model 4 AOR (95%CI)
Individual-level variables					
Respondent's age (in years) (Ref.: 15-24)					
25-34		1.04 (0.85-0.66)			0.95 (0.56-1.52)
≥35		1.45 (0.098-2.26)			1.25 (0.79-1.99)
Age at first marriage (in years) (Ref.: <18)					
≥18		2.28 (1.75-2.97)***			1.71 (1.29-2.28)**
Residing with husband (Ref.: Yes)					
No		1.63 (1.15-2.31)***			1.77 (1.19-2.61)***
Age difference with husband (in years) (Ref.: <5)					
5-10		1.24 (0.91-1.67)			1.12 (0.82-1.54)
>10		1.22 (0.86-1.72)			1.04 (0.72-1.51)
Household-level variables					
Household members (Ref.: ≥9)					
≤4			1.08 (0.68-1.71)		1.12 (0.71-1.78)
5-8			1.11 (0.71-1.73)		1.11 (0.71-1.75)
Sex of household head (Ref.: Female)					
Male			1.01 (0.68-1.51)		1.22 (0.78-1.88)
Media access (Ref.: No)					
Yes			1.24 (0.91-1.69)		1.25 (0.91-1.72)
Wealth index (Ref.: Poorest)					
Poorer			1.79 (1.11-2.88)*		1.79 (1.11-2.90)*
Middle			2.96 (1.86-4.70)***		2.71 (1.69-4.33)***
Richer			4.78 (2.32-8.42)***		3.72 (2.95-7.57)***
Richest			5.73 (4.13-9.29)***		4.92 (3.99-9.41)***
Household water source (Ref.: Improved)					
Unimproved			1.89 (1.06-3.35)*		1.73 (0.98-3.09)
Household toilet facilities (Ref.: Improved)					
Unimproved			1.89 (1.06-3.35)*		1.41 (0.86-2.30)
Religion (Ref.: Islam)					
Others			0.78 (0.50-1.23)		0.75 (0.47-1.17)
Community-level variables					
Division (Ref.: Sylhet)					
Barishal				3.01 (1.44-6.32)***	4.01 (1.93-8.34)***

Chattogram			1.09 (0.53-2.23)	1.10 (0.54-2.24)
Dhaka			1.74 (0.88-3.45)	1.54 (0.77-03.06)
Khulna			2.39 (1.18-4.94)*	2.63 (1.29-5.39)**
Mymensingh			2.13 (0.93-4.88)	2.78 (1.23-6.31)*
Rajshahi			1.93 (0.93-3.98)	1.91 (1.01-3.95)
Rangpur			3.78 (1.76-8.10)***	5.85 (2.74-12.50)***
Random effects				
Cluster level variance	0.557 (0.330-0.940)	0.567 (0.342-1.006)	0.548 (0.290-1.073)	0.212 (0.092-0.566)
ICC	17.09%	17.14%	15.94%	13.56%
MOR	2.20	2.21	2.14	1.92
Goodness of fit				
AIC	1868.02	1816.95	1718.55	1862.11
BIC	1884.24	1865.62	1794.26	1910.78

Note: Model 0: Null model, Model 1: Adjusted for individual-level factors, Model 2: Adjusted for household-level factors, Model 3: Adjusted for community-level factors, Model 4: Adjusted for individual- household- and community-level factors.

AOR = adjusted odds ratio- 95% CI: 95% confidence interval, 'BDHS, Bangladesh Demographic and Health Survey- 2022', and "*" refers to the level of significance. Here * p<0.05- **p<0.01- and***p<0.001.

AIC: Akaike Information Criterion

BIC: Bayesian Information Criterion

ICC: Intra Class Correlation

MOR: Median Odds Ratio

Table 4: Multilevel logistic regression analysis of the factors associated with continuation of education among married young adults aged 15-29 years in rural areas- Bangladesh Demographic and Health Survey- 2022

Characteristics	Model 0	Model 1 AOR (95%CI)	Model 2 AOR (95%CI)	Model 3 AOR (95%CI)	Model 4 AOR (95%CI)
Individual-level variables					
Respondent's age (in years) (Ref.: 15-24)					
25-34		1.10 (0.79-1.52)			0.99 (0.71-1.39)
≥35		0.83 (0.59-1.15)			0.73 (0.52-1.02)
Age at first marriage (in years) (Ref.: <18)					
≥18		2.67 (2.15-3.33)***			2.26 (1.80-2.83)***
Residing with husband (Ref.: Yes)					
No		1.25 (1.01-2.31)*			1.08 (0.82-1.43)
Age difference with husband (in years) (Ref.: <5)					
5-10		1.40 (1.08-1.82)**			1.26 (0.97-1.65)
>10		1.57 (1.17-2.11)***			1.30 (0.97-1.77)
Household-level variables					
Household members (Ref.: ≥9)					
≤4			1.59 (1.07-2.35)*		1.46 (1.00-2.16)*
5-8			1.64 (1.33-2.37)**		1.44 (1.00-2.08)*
Sex of household head (Ref.: Female)					
Male			0.94 (0.68-1.29)		0.89 (0.63-1.28)
Media access (Ref.: No)					
Yes			1.37 (1.09-1.73)***		1.38 (1.10-1.73)***
Wealth Index (Ref.: Poorest)					
Poorer			1.39 (1.11-2.88)***		1.35 (0.88-2.07)
Middle			2.11 (1.40-3.17)***		1.99 (1.32-3.00)***
Richer			2.82 (1.86-4.25)***		2.62 (1.73-3.97)***
Richest			4.20 (3.10-7.34)***		4.01 (3.41-7.23)***
Household water source (Ref.: Improved)					
Unimproved			2.09 (1.39-3.3.15)***		1.76 (1.16-2.65**
Household toilet facilities (Ref.: Unimproved)					
Improved			1.61 (1.15-2.25)***		1.55 (1.10-1.78)**
Religion (Ref.: Islam)					

Characteristics	Model 0	Model 1 AOR (95%CI)	Model 2 AOR (95%CI)	Model 3 AOR (95%CI)	Model 4 AOR (95%CI)
Others			1.25 (0.84- 1.84)		1.20 (0.81-1.78)
Community-level variables					
Division (Ref.: Sylhet)					
Barishal				3.84 (2.51- 8.36)***	4.93 (3.93- 8.51)***
Chattogram				1.42 (0.75- 2.67)	1.49 (0.79-2.83)
Dhaka				3.31 (1.69- 6.01)***	3.12 (2.05- 5.96)**
Khulna				3.03 (1.69- 5.44)***	3.01 (2.01- 5.54)**
Mymensingh				3.39 (1.87- 6.16)***	4.48 (2.96-7.96)*
Rajshahi				3.20 (1.76- 5.81)***	4.12 (2.30- 8.12)***
Rangpur				3.54 (1.97- 6.37)***	4.66 (2.74- 12.50)***
Random effects					
Cluster level variance	0.154 (0.099- 0.235)	0.176 (0.104- 0.282)	0.172 (0.100- 0.279)	0.108 (0.067- 0.170)	0.083 (0.043- 0.153)
ICC	15.50%	17.55%	17.17%	10.79%	8.28%
MOR	1.94	2.06	2.04	1.72	1.56
Goodness of fit					
AIC	2921.66	2837.84	2749.41	2909.46	2686.45
BIC	2939.93	2892.66	2834.69	2964.28	2844.81

Note: Model 0: Null model, Model 1: Adjusted for individual-level factors, Model 2: Adjusted for household-level factors, Model 3: Adjusted for community-level factors, Model 4: Adjusted for individual- household- and community-level factors.

AOR = adjusted odds ratio- 95% CI: 95% confidence interval- and “*” refers to the level of significance. Here * p<0.05- **p<0.01- and***p<0.001.

AIC: Akaike Information Criterion

BIC: Bayesian Information Criterion

ICC: Intra Class Correlation

MOR: Median Odds Ratio

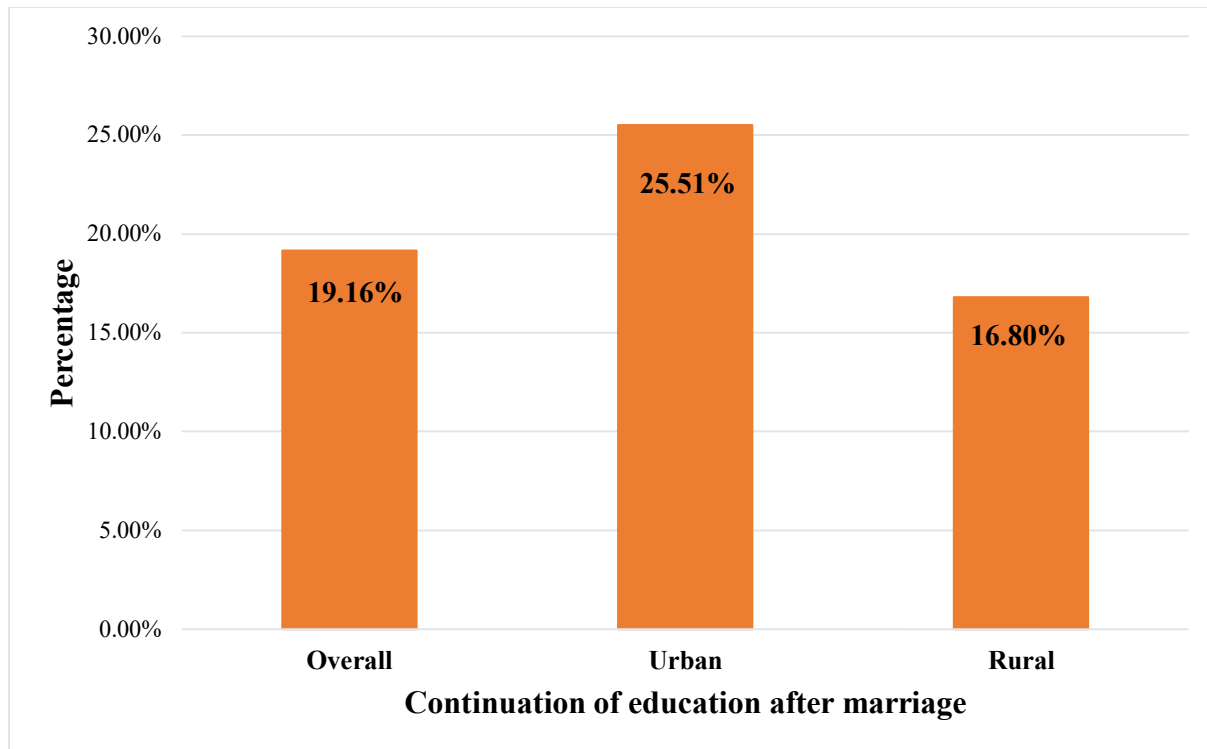


Figure 1. Percentage of women who continue their education after marriage.

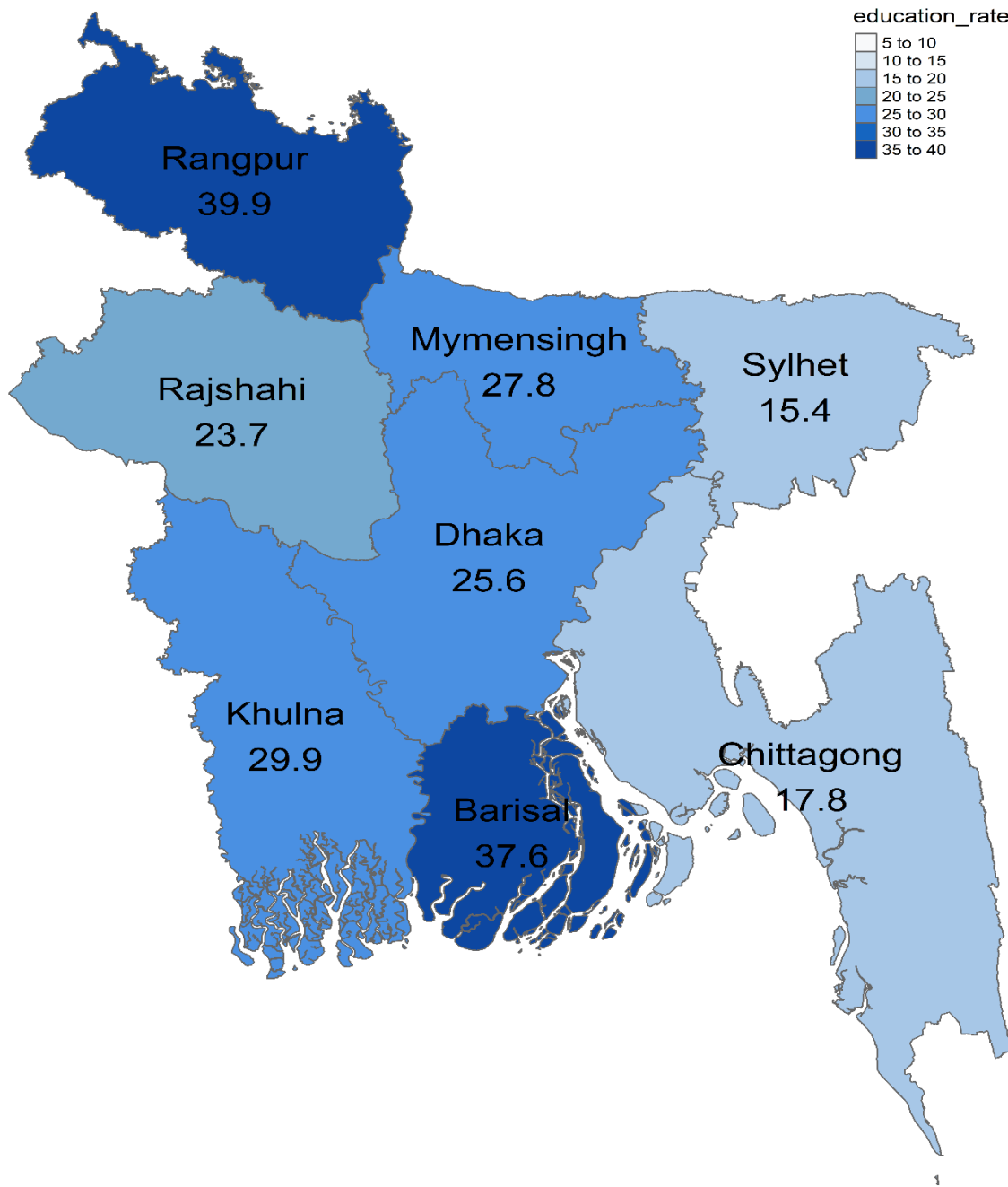


Figure 2. Regional distribution of the percentage of women continuing education after marriage in urban areas.

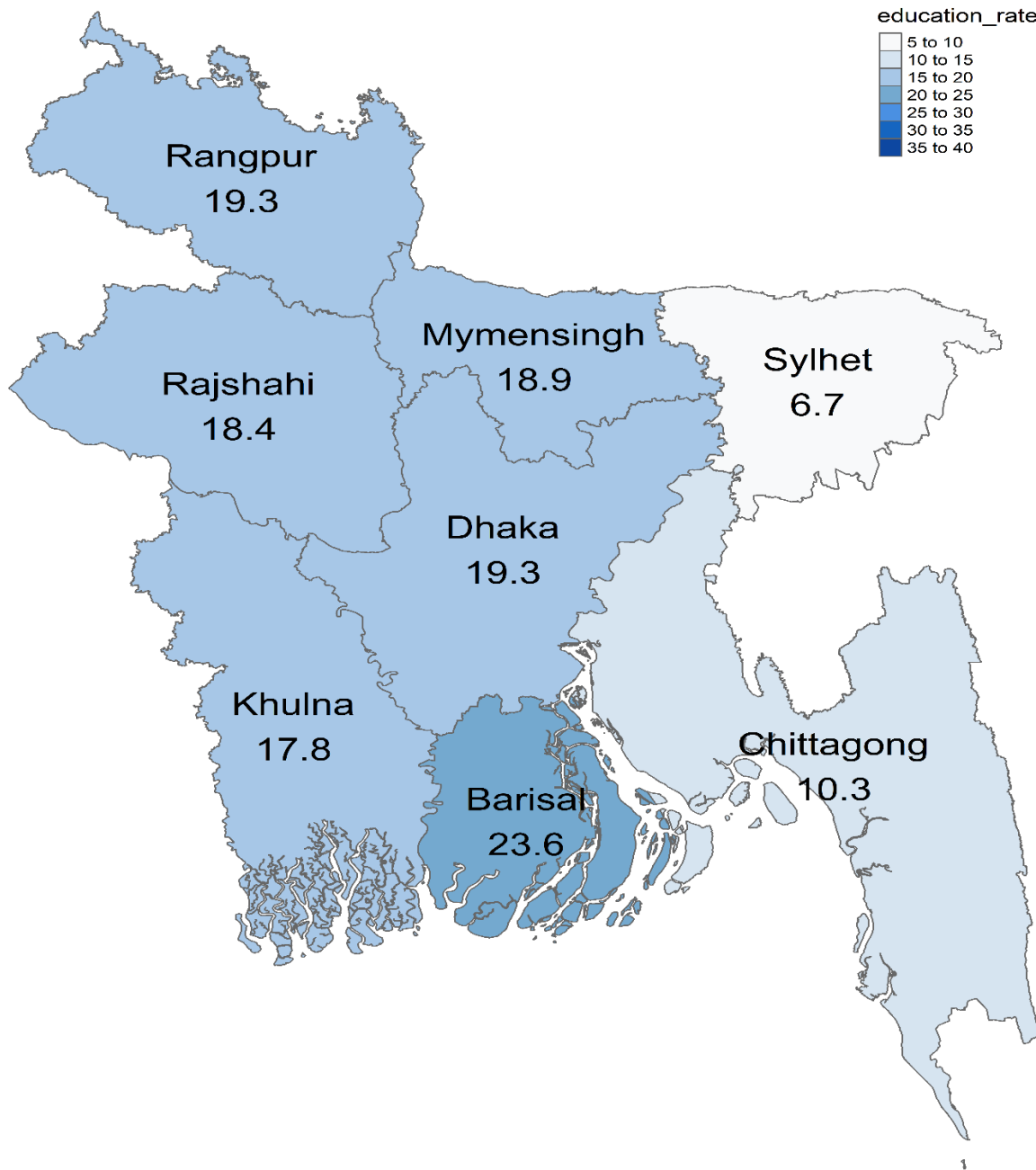


Figure 3. Regional distribution of the percentage of women continuing education after marriage in rural areas.

List of abbreviations:

AOR	Adjusted Odds Ratio
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BIGD	Institute of Governance and Development
CI	Confidence Interval
EAs	Enumeration Areas
MEASUREDHS	Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys
NIPORT	National Institute of Population Research and Training
OR	Odds Ratio
SDGs	Sustainable Development Goals
TAF	The Asia Foundation
UTIs	Urinary Tract Infections
VIF	Variance Inflation Factor

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