

## Knowledge and Determinants of Fertile Period among Reproductive Aged Women in Bangladesh

Sathi Khatun<sup>1</sup>, Md. Mehedi Hassan Khan<sup>2</sup>, Md. Aminul Haque<sup>3</sup>

1, 2, 3 Department of Population Sciences, University of Dhaka, Dhaka-1000, Bangladesh.

Corresponding author: Md. Aminul Haque, Ph.D. Department of Population Sciences, University of Dhaka, Dhaka-1000, Bangladesh, aminul.haque@du.ac.bd

### ABSTRACT

**Background:** Understanding the fertile period of the menstrual cycle is vital for women to plan or prevent pregnancy effectively. However, more is needed to know about women's knowledge of the ovulatory cycle and associated factors in Bangladesh. The study aims to see the level of expertise and determinants of fertile period among reproductive-aged women in Bangladesh

**Methods:** The study utilized data from the Bangladesh Demographic and Health Survey 2017/18, including 20,127 women aged 15-49. Knowledge of the fertile period was assessed through a survey question on the timing of ovulation. Bivariate and multivariate logistic regression analyses were conducted to identify factors associated with poor knowledge

**Results:** In this study, 6919 (34.4%) participants had good knowledge of the ovulatory cycle. Women's age in years, i.e. 20–24 (aOR = 0.787, 95% CI: .687-.903), 25–29 (aOR = 0.661, 95% CI: .573-.762), 30–34 (aOR = 0.697, 95% CI: .601-.809), 35–39 (aOR = 0.661, 95% CI: .565-.774), 40–44 (aOR = 0.647, 95% CI: .547-.765), and 45–49 (aOR = 0.630, 95% CI: .529-.751), educational status, i.e. secondary (aOR = 0.746, 95% CI: .662-.839), higher (aOR = 0.500, 95% CI: .428-.585), wealth index, i.e. richest (aOR = 0.696, 95% CI: .608-.797), more affluent (aOR = 0.858, 95% CI: .761-.966), middle (aOR = 0.854, 95% CI: .762-.956), and poorer (aOR = 0.859, 95% CI: .771-.956), current contraceptive use i.e. traditional method (aOR = 0.556, 95% CI: .499-.619) modern method (aOR = 0.894, 95% CI: .832-.960), religion (aOR = 0.780, 95% CI: .703-.865), number of living children i.e. 1-2 children (aOR = 0.807, 95% CI: .712-.915), 3 and above children (aOR = 0.820, 95% CI: .706-.953), working status (aOR = 0.806, 95% CI: .753-.862), division i.e. Mymensingh (aOR=0.865, 95% CI: .608-.797), Rajshahi (aOR=1.154, 95% CI: 1.013-1.314) Rangpur (aOR=1.606, 95% CI: 1.404-1.838) partner's educational status, i.e. primary (aOR=0.880, 95% CI: .801-.968), secondary (aOR=0.792, 95% CI: .712-.881), higher

(aOR=0.705, 95% CI: .623-.799) were statistically significant with KOC.

**Conclusions:** Knowledge regarding the fertile period was notably low among Bangladeshi women. Targeted educational initiatives focusing on young, less educated, and economically disadvantaged women are needed to address this gap. Understanding ovulation is critical for enabling women to plan pregnancies and avoid unintended conception.

**Keywords:** *fertility awareness, ovulation, contraception, family planning, Bangladesh*

### INTRODUCTION

In women of childbearing age, ovulation is a normal physiological process and a sign of fertility.<sup>1</sup> The release of the mature egg into the fallopian tube and the breakup of the follicle during ovulation are the two most significant events they symbolize the ovarian cycle's fertile window.<sup>2-6</sup> Natural family planning (NFP) techniques depend on a woman's knowledge of the ovulatory cycle (KOC). One natural family planning approach that uses cutting-edge technologies to delay pregnancy is understanding the fertile period. Women who do not want to employ mechanical, hormonal, or surgical forms of contraception are the ones who typically use it.<sup>7</sup> Without the use of modern contraceptives, inappropriate KOC among sexually active women is likely to result in unplanned pregnancies.<sup>8,9</sup> To plan for conception or prevent unexpected pregnancies and unsafe abortions, women of reproductive age must use accurate KOC<sup>10,11</sup>. Knowledge regarding the fertile period is a scientific and natural family planning method. It "includes the basal body temperature method, the cervical mucus (or Billings) method, and the symptom thermal method<sup>7</sup>. To implement these methods, a woman must have good knowledge about her fertile period during the menstrual cycle<sup>12</sup>. In studies on the health of women's reproductive systems, KOC has not gained much attention. The prevalence of KOC among women is, however, minimal, according to current studies on the subject<sup>13</sup>.

A woman will be protected from unwanted and unplanned pregnancies if she correctly understands her ovulatory cycle. Similarly, those who do not take contraception and are unaware of their fertile period are more likely to experience an unwanted pregnancy<sup>14</sup>. Additionally, the majority of couples who were genuinely practicing fertile periods were unaware of their fertility period and did not rely on the idea of a fertile period. They go to reproductive healthcare facilities to seek medical assistance due to their lack of knowledge<sup>2</sup>.

In low and middle-income countries, around 41.0% of women do not use any contraceptive method despite being sexually active and wishing to avoid pregnancy. There were 225 million women with an unmet need for modern FP in 2014, which increased to 230 million in 2019<sup>15,16</sup>. According to BDHS 2017-18, the unmet need for family planning in Bangladesh is 12%. Unmet need is one of the critical reasons for maternal and child mortality through unwanted pregnancy and unsafe abortion. For Bangladesh, MMR is 173 deaths, which can be reduced by meeting the demand for family planning<sup>17</sup>. Knowledge regarding the fertile period could be the solution here as it is a natural and effective family planning method.

Studies show that knowledge about the fertile period has varied based on socio-demographic factors such as "sex, residence, economic status, and educational status were the most common"<sup>18</sup>. DHS data shows poor knowledge among young, rural, inadequate, and less educated women. More research needs to address the KOC and its determinants. Only 10% of currently married reproductive-aged women use the traditional method as of 2017. Natural family planning can be promoted with high effectiveness if KOC is high among women. So, the study needs to know the KOC and its determinants among reproductive-aged women in Bangladesh.

## METHODS

### Study Settings and Data

We have obtained the datasets used in this study from Bangladesh Demographic and Health Survey (BDHS) 2017-18). It collected reliable and internationally comparable data for making policies and programs based on evidence and tracking advancements toward national and international development goals. BDHS employed a two-stage cluster sampling design for collecting data. The first stage involved selecting enumeration areas (EA) using probability proportional. A total of 675 EAs were selected with this process. In the second stage, once the enumeration areas were chosen, a household listing was performed within these designated areas. Then, a systematic sample of 30 households was selected from each selected primary sampling unit (PSU). According to the IR (birth record) file, in 20127, women aged between 15-49 were interviewed to gather information on knowledge of the ovulatory cycle.

### Study variables and measurements

#### Outcome variable

Knowledge about the fertile period is the study's outcome variable, categorized into good and poor knowledge. To know the ovulation period of the respondents, a single question was asked: "When do you think the ovulation period of a woman is?" The respondent who answered that a fertile period is "in the middle of the menstrual cycle" categorized as good knowledge, and the respondent who answered "during her period," "after the period ended," "before periods begin," and "at any time," and "I do not know" is categorized as a poor knowledge<sup>18,19</sup>.

#### Independent variable:

Independent variables were socio-demographic (included age, place of residence, religion, respondent educational status, number of living children, and husband's educational status), socio-economic (wealth index, current working status), and current use of the contraception method, field worker visits in the last 12 months, and exposure to mass media about family planning messages<sup>19,20</sup>.

The women's questionnaire BDHS, 2017-18 included a questionnaire on knowledge of the ovulatory cycle. The questions were: V-240: From one menstrual period to the next, are there certain days when a woman is more likely to become pregnant? Responses were: 1. Yes; 2. No; 3. do not know. Similarly, question no V-241 was: Is this time just before her period begins, during her period, right after her period has ended, or halfway between two periods? The responses were: 1. just before her period begins; 2. during her period; 3. right after her period has ended; 4. halfway between two periods; 5. she does not know. The dependent variable was (V-217) knowledge of the women's ovulatory cycle. The BDHS 2017-18 codes of the variables which were included in the study were as follows: Age (V012), Place of Residence (V025), religion (V130), Educational status of the respondent (V106), Partner's educational status (V701), wealth index (V190), employment of respondents (V714), access to media: compute access to media (V157), TV (V 158) and radio (V 159), use of contraceptive methods (V312), number of living children (V218).

#### Statistical analysis

The data was extracted, recoded, and examined using SPSS version 23. A binary logistic regression analysis determined the characteristics influencing KOC at the individual and community levels. For the binary logistic regression analysis, variables with a p-value of 0.05 in the bi-variate analysis were considered. Independent variables were regarded as statistically significant factors of proper KOC if they had a p-value < 0.05. The intensity and direction of the link between the accurate KOC and independent factors were reported to be shown by the adjusted odds ratio (AOR) and its 95% confidence interval (CI).

#### Ethical Consideration

Each study participant gave their informed consent before the survey began. The anonymity of the surveys protected the participants' privacy. Since the publicly accessible dataset for this research result was received from the BDHS website (<https://dhsprogram.com/>) after registering

there, no ethical approval was needed to disseminate datasets from the BDHS.

## RESULTS

Table 1 shows the responses of all the women (20127) included in this study and responses to the questions about when a woman is likely to get pregnant. Only (6919) 34.4% of women respondents have good knowledge about the fertile or ovulation periods. However, 65.6% of women have poor knowledge about the fertile period.

**Table 1. Respondent's response to the question: Is this time just before her period begins, during her period, right after her period has ended, or halfway between two periods?**

| Response                    | Frequency    | Percentage (%) |
|-----------------------------|--------------|----------------|
| During her period           | 358          | 1.8            |
| After period ended          | 9209         | 45.8           |
| <b>Middle of the cycle*</b> | <b>6919</b>  | <b>34.4</b>    |
| Before the period begins    | 400          | 2.0            |
| At any time                 | 1329         | 6.6            |
| Other                       | 5            | 0.0            |
| Do not Know                 | 905          | 9.5            |
| <b>Total</b>                | <b>20127</b> | <b>100</b>     |

\*Middle of cycle = good knowledge; Responses to all other categories = poor knowledge

Table 2 shows that most respondents (63.4) live in rural areas, and 36.6% live in rural areas. Over 90% of respondents are from the Islamic religion, and 10% are from other religions. 38.6 % of women have secondary educational status. The distribution of educational status is no education, primary and higher, respectively, 15.9 %, 31.5%, and 14%. Among the total respondents, 22.3% are from the wealthiest quintile, 19% from the poorest, 19% from the poorer, 19.3% from the middle class, and 20.3% from the richer quintile. Most of the people (14.8%) are from the Dhaka division. The respondents are 10.7% from Barisal, 14.4% from Chittagong, 13.1% from Khulna, 10.8% from Rajshahi, 12.4% from Rangpur, and 11.1% from Sylhet. One-third of respondents' partners have primary education; 21.3% are non-educated, 24.2% have secondary education, and 23.2% have higher education. Almost half of the respondents are not currently working, and half of the respondents are currently working. The number of women who have access to media is 65.3%, and have no access to media, 34.7%. This study shows that 73.8% of women aged 15-49 marry before age 18, and 26.2% marry after age 18.

**Table 2. Sample Characteristics of The Responden (N=20127)**

| Characteristics              | Category                 | Frequency N, (%) |
|------------------------------|--------------------------|------------------|
| Age                          | 15-19                    | 1951(9.7)        |
|                              | 20-24                    | 3514(17.5)       |
|                              | 25-29                    | 3572(17.7)       |
|                              | 30-34                    | 3462(17.2)       |
|                              | 35-39                    | 2953(14.7)       |
|                              | 40-44                    | 2329(11.6)       |
|                              | 45-49                    | 2346(11.7)       |
| Place of residence           | Urban                    | 7374(36.6)       |
|                              | Rural                    | 12753(63.4)      |
| Religion                     | Islam                    | 18136(90.1)      |
|                              | Other religion           | 1991(9.9)        |
| Educational status           | No education             | 3202 (15.9)      |
|                              | Primary                  | 6340(31.5)       |
|                              | Secondary                | 7764(38.6)       |
|                              | Higher                   | 2821 (14)        |
| Wealth index                 | Poorest                  | 3826(19)         |
|                              | Poorer                   | 3833(19)         |
|                              | Middle                   | 3883(19.3)       |
|                              | Richer                   | 4088(20.3)       |
|                              | Richest                  | 4497(22.3)       |
| Regions                      | Barisal                  | 2154(10.7)       |
|                              | Chittagong               | 2905(14.4)       |
|                              | Dhaka                    | 2974(14.8)       |
|                              | Khulna                   | 2630(13.1)       |
|                              | Mymensingh               | 2167(10.8)       |
|                              | Rajshahi                 | 2576(12.8)       |
|                              | Rangpur                  | 2492(12.4)       |
|                              | Sylhet                   | 2229(11.1)       |
| Partner's educational status | No education             | 4019(21.3)       |
|                              | Primary                  | 5923(31.3)       |
|                              | Secondary                | 4575(24.2)       |
|                              | Higher                   | 4377(23.2)       |
| Employment of respondent     | Not Employed             | 10495(52.1)      |
|                              | Employed                 | 9632(47.9)       |
| Access to media              | No                       | 6981(34.7)       |
|                              | Yes                      | 13146(65.3)      |
| Use of contraception method  | No method                | 8282(41.1)       |
|                              | Traditional method       | 1956(9.7)        |
|                              | Modern method            | 9889(49.1)       |
| Number of living children    | No children              | 2099(10.4)       |
|                              | 1-2 Children             | 10880(54.1)      |
|                              | Three and above children | 7148(35.5)       |

Following chi-square analysis, various demographic variables, including age, place of residence, religion, educational status of both respondent and partner, wealth status, geographic division, access to media, contraceptive method, number of living children, and respondent's working status, were found to be statistically significant ( $P < 0.05$ ) with poor knowledge of ovulatory cycle. Subsequently, these statistically significant variables were included in a binary logistic regression model for further analysis (Table 3).

**Table 3. Bivariate Result of This Study**

| Variable                            | Good knowledge<br>N (%) | Poor knowledge<br>N (%) | P value<br>.000 |
|-------------------------------------|-------------------------|-------------------------|-----------------|
| <b>Age</b>                          |                         |                         |                 |
| 15-19                               | 484 (24.8)              | 1467 (75.2)             |                 |
| 20-24                               | 1189(33.8)              | 2325(66.2)              |                 |
| 25-29                               | 1323(37)                | 2249(63)                |                 |
| 30-34                               | 1227(35.4)              | 2235(64.6)              |                 |
| 35-39                               | 1063(36)                | 1890(64)                |                 |
| 40-44                               | 820(35.2)               | 1509(64.8)              |                 |
| 45-49                               | 813(34.7)               | 1533(65.3)              |                 |
| <b>Place of Residence</b>           |                         |                         | .000            |
| Urban                               | 2822(38.3)              | 4552(61.7)              |                 |
| Rural                               | 4097(32.1)              | 8656(67.9)              |                 |
| <b>Religion</b>                     |                         |                         | .000            |
| Islam                               | 6103(33.7)              | 12033(66.3)             |                 |
| Other religion                      | 816(41)                 | 1175(59)                |                 |
| <b>Educational status</b>           |                         |                         | .000            |
| No education                        | 880(27.5)               | 2322(72.5)              |                 |
| Primary                             | 1892(29.8)              | 4448(70.2)              |                 |
| Secondary                           | 2750(35.4)              | 5014(64.6)              |                 |
| Higher                              | 1397(49.5)              | 1424(50.5)              |                 |
| <b>Wealth index</b>                 |                         |                         | .000            |
| Poorest                             | 1011(26.4)              | 2815(73.6)              |                 |
| Poorer                              | 1171(30.6)              | 2662(69.4)              |                 |
| Middle                              | 1285(33.1)              | 2598(66.9)              |                 |
| Richer                              | 1436(35.1)              | 2652(64.9)              |                 |
| Richest                             | 2016(44.8)              | 2481(55.2)              |                 |
| <b>Division</b>                     |                         |                         | .000            |
| Barisal                             | 744(34.5)               | 1410(65.5)              |                 |
| Chittagong                          | 1042(35.9)              | 1863(64.1)              |                 |
| Dhaka                               | 1137(38.2)              | 1837(61.8)              |                 |
| Khulna                              | 842(35.8)               | 1688(64.2)              |                 |
| Mymensingh                          | 798(36.8)               | 1396(63.2)              |                 |
| Rajshahi                            | 824(32)                 | 1752(68)                |                 |
| Rangpur                             | 656(26.3)               | 1836(73.7)              |                 |
| Sylhet                              | 776(34.8)               | 1453(65.2)              |                 |
| <b>Partner's educational status</b> |                         |                         | .000            |
| No education                        | 1118(27.8)              | 2901(72.2)              |                 |
| Primary                             | 1840(31.1)              | 4083(68.9)              |                 |
| Secondary                           | 1637(35.8)              | 2938(64.2)              |                 |
| Higher                              | 2000(45.7)              | 2377(54.3)              |                 |

|                                     |            |            |      |
|-------------------------------------|------------|------------|------|
| <b>Access to media</b>              |            |            | .000 |
| No                                  | 2106(30.2) | 4875(69.8) |      |
| Yes                                 | 4813(36.6) | 8333(63.4) |      |
| <b>Use of contraceptive method</b>  |            |            | .000 |
| No method                           | 2563(30.9) | 5719(69.1) |      |
| Traditional method                  | 914(46.7)  | 1042(53.3) |      |
| Modern method                       | 3442(34.8) | 6447(65.2) |      |
| <b>Number of living children</b>    |            |            | .000 |
| No children                         | 600(28.6)  | 1499(71.4) |      |
| 1-2 Children                        | 3933(36.1) | 6947(63.9) |      |
| Three and above children            | 2386(33.4) | 4762(66.6) |      |
| <b>Respondent currently working</b> |            |            | .147 |
| No                                  | 3559(33.9) | 6936(66.1) |      |
| Yes                                 | 3360(34.9) | 6272(65.1) |      |

Among the respondents, 34.4% needed better knowledge of the ovulatory cycle. Age, division, respondent's employment status, religion, respondent's and partner's educational levels, wealth index, current contraceptive usage, and knowledge of contraceptive methods significantly contributed to this poor knowledge of the ovulatory cycle (Table 4). The odds of poor knowledge were 0.787 times lower in the age group of 20–24 years (aOR=0.787, 95% CI: .687-.903). Similarly, the odds were 0.661 times lower in the age group of 25–29 years (aOR = 0.661; .573-.762) and 1.99 times higher in the age group ranging from 30 to 34 years (aOR=1.91, 95% CI: 1.45–2.52); 0.697 times lower in the age group of 35–39 years (aOR=0.697, 95% CI: .601-.809); 0.647 times lower in the age group of 40–44 years (aOR = 0.647, 95% CI: .547-.765); and 0.630 times lower in the age group of 45–49 years (aOR=0.630, 95% CI: .529-.751) than the age group of 15–19 years. The accomplishment of secondary education decreased the odds of poor knowledge by 0.746 times than those without education (aOR=0.746, 95% CI: .662-.839). Again, it is 0.500 times for those who completed higher education (aOR=0.500, 95% CI: .428-.585) compared to those without education. Similarly, the primary completed partner (aOR= 0.880, 95% CI: .801-.968) decreased the odds of poor knowledge about the fertile period by 0.880 times compared to respondents with no education. The odd is lowered by 0.792 (aOR=0.792, 95% CI: .712-.881) for secondary education and 0.705 (aOR=0.705, 95% CI: .623-.799) for higher education compared to no education.

Wealth index of richest (aOR=0.696, 95% CI: .608-797), more affluent (aOR=0.858, 95% CI: .761-.966), middle (aOR=0.854, 95% CI: .762-.956), and poorer (aOR=0.859, 95% CI: .771-.956) decreased the odds of poor knowledge about fertile period in comparison to the poorest group. Respondents who used the traditional method had a lower odd

of 0.556 (aOR=0.556, 95% CI: .499-.619) having poor knowledge, and those who used the modern method had 0.894 (aOR=0.894, 95% CI: .832-.960) odds of poor knowledge compared to those who do not use any contraceptive method. Respondents other than Muslims were 0.780 times (aOR=0.780, 95% CI: .703-.865) less likely to have poor knowledge of the fertile period. Those who had 1-2 children were 0.807 (aOR=0.807, 95% CI: .712-.915) less likely, and those who had three and above children were 0.820 times (OR=0.820, 95% CI: .706-.953) less likely to have poor knowledge of fertile period compared to those who have no (0) children. Women involved in any work outside had 0.806 less (aOR=0.806, 95% CI: .753-.862) odds of poor knowledge. Also, being in Mymensingh decreased the odds of poor knowledge by 0.806 times (aOR=0.865, 95% CI: .608-.797) compared to Barisal. A respondent from Rajshahi had an increased odd of 1.154 times (aOR=1.154, 95% CI: 1.013-1.314), and Rangpur had an increased odd of 1.606 (aOR=1.606, 95% CI: 1.404-1.838) poor knowledge about fertile period compared to Barisal Division (Table 4).

**Table 4. Factors Associated with Poor Knowledge of The Ovulatory Cycle**

| Factors                   | Adjusted Odds Ratio (aOR) | Confidence Interval (95%) for B |
|---------------------------|---------------------------|---------------------------------|
| <b>Age</b>                |                           |                                 |
| 15-19                     | 1                         |                                 |
| 20-24                     | .787***                   | .687-.903                       |
| 25-29                     | .661***                   | .573-.762                       |
| 30-34                     | .697***                   | .601-.809                       |
| 35-39                     | .661***                   | .565-.774                       |
| 40-44                     | .647***                   | .547-.765                       |
| 45-49                     | .630***                   | .529-.751                       |
| <b>Place of Residence</b> |                           |                                 |
| Urban                     | 1                         |                                 |
| Rural                     | 1.050                     | .976-1.129                      |
| <b>Religion</b>           |                           |                                 |
| Islam                     | 1                         |                                 |
| Other religion            | .780***                   | .703-.865                       |
| <b>Educational status</b> |                           |                                 |
| No education              | 1                         |                                 |
| Primary                   | .932                      | .838-1.038                      |
| Secondary                 | .746***                   | .662-.839                       |
| Higher                    | .500***                   | .428-.585                       |
| <b>Wealth index</b>       |                           |                                 |
| Poorest                   | 1                         |                                 |
| Poorer                    | .859***                   | .771-.956                       |
| Middle                    | .854***                   | .762-.956                       |
| Richer                    | .858***                   | .761-.966                       |
| Richest                   | .696***                   | .608-.797                       |
| <b>Division</b>           |                           |                                 |
| Barisal                   | 1                         |                                 |
| Chittagong                | .979                      | .863-1.111                      |

|                                     |          |             |
|-------------------------------------|----------|-------------|
| Dhaka                               | .921     | .811-1.045  |
| Khulna                              | 1.075    | .945-1.223  |
| Mymensingh                          | .865***  | .758-.987   |
| Rajshahi                            | 1.154*** | 1.013-1.314 |
| Rangpur                             | 1.606*** | 1.404-1.838 |
| Sylhet                              | .971     | .846-1.114  |
| <b>Partner's educational status</b> |          |             |
| No education                        | 1        |             |
| Primary                             | .880***  | .801-.968   |
| Secondary                           | .792***  | .712-.881   |
| Higher                              | .705***  | .623-.799   |
| <b>Access to media</b>              |          |             |
| No                                  | 1        |             |
| Yes                                 | 1.006    | .930-1.088  |
| <b>Use of contraception method</b>  |          |             |
| No method                           | 1        |             |
| Traditional method                  | .556***  | .499-.619   |
| Modern method                       | .894***  | .832-.960   |
| <b>Number of living children</b>    |          |             |
| No children                         | 1        |             |
| 1-2 Children                        | .807***  | .712-.915   |
| Three and above children            | .820***  | .706-.953   |
| <b>Respondent currently working</b> |          |             |
| Yes                                 | 1        |             |
| No                                  | .806***  | .753-.862   |

\*\*\*P-value <0.05

## DISCUSSION

This study aimed to know knowledge and determinants concerning fertile periods among women within the reproductive age category in Bangladesh and used BDHS 2017-18 data. Among the determinants, age, religion, education of the respondent, wealth index, division, partner's educational status, use of contraception method, number of living children, and working status all were significantly related to poor knowledge of the ovulatory cycle among the reproductive-aged women of Bangladesh.

Among the respondents, only 34.4% had good knowledge of the fertile period, whereas 65.6% of women had poor understanding of the fertile period. The percentage of inadequate knowledge about the ovulatory period in this study is lower than in similar studies in Ethiopia and Kenya but higher than those in Turkey, the USA, and Australia<sup>1,18,21-23</sup>. These differences may be due to varying religious and cultural practices, better access to health education, and higher literacy rates in more developed countries<sup>23</sup>. Additionally, little discussion about reproductive and sexual matters in families, schools, and communities could be a reason for limited

knowledge about the ovulatory period among women in Bangladesh.

The current study revealed that the older age group is less likely to have poor knowledge. The findings are consistent with some DHS studies in African countries where older women are less likely to understand the ovulatory cycle<sup>20</sup>. Also, studies conducted in Spain, Pakistan, and the United States reported similar findings<sup>24–26</sup>. Also, a systematic review regarding knowledge of the ovulatory cycle showed identical results<sup>27,28</sup>. The association between age and poor knowledge of the ovulatory cycle could be explained by considering repeated exposure and increased reproductive experience among older women. As age is a significant teacher in human life, younger women are more susceptible to poor knowledge.

Women with lower levels of education tend to possess poorer KOC than those with secondary or higher education, as evidenced by findings from a study in Uganda and a systematic review from several countries<sup>27,29</sup>. This association can be attributed to the fact that higher education provides individuals with an opportunity to gain a better understanding of reproductive physiology. The husband's educational attainment is essential for understanding a woman's ovulatory cycle. We found that the partner's primary and above educational attainment is negatively associated with poor knowledge of the fertile period<sup>27,29</sup>. Moreover, educated husbands are open to exchanging views about reproductive and sexual health with their partners and contribute to enhancing women's knowledge regarding the ovulatory cycle<sup>7,30</sup>.

Religion was also found to be significantly associated with poor KOC. Muslims have a higher odds of inadequate knowledge. This finding about religion is similar (between the Protestant and Orthodox Christian religions) to a study conducted in Ethiopia<sup>18</sup>. This variation in explanation could be attributed to differences in religious teachings. Muslims may have poor knowledge of the fertile period due to factors such as religious interpretations that discourage the use of contraceptives, cultural taboos, lack of comprehensive sex education, and limited access to healthcare and family planning resources in some regions. The poor knowledge of the fertility period was significantly associated with division. Women from Rajshahi and Rangpur have higher odds of poor fertility period knowledge, whereas Mymensingh has lower odds. These results can be explained by the differences in socio-economic and cultural norms in different geographical locations.

The number of living children of the respondents lowered the odds of poor knowledge. This can be due to increasing exposure to health facilities and the experience of women with more children. Consistent with a recent study conducted in Malawi and Haiti<sup>19,31</sup>, our findings suggest that women who utilize no contraceptive methods are more inclined to possess poor KOC compared to those who use any traditional or modern method. Women who use modern contraception might know more about their fertility cycle and use these methods to ignore unplanned pregnancies<sup>32</sup>.

The wealth index and current employment status were significant factors associated with women's poor knowledge of the ovulation cycle. Women from affluent households and those currently employed had lower odds of possessing poor KOC than women from economically disadvantaged families and those without sources of income, respectively<sup>18,23</sup>. The above findings align with previous studies, indicating that women from wealthier backgrounds and those engaged in income-generating activities are more likely to have access to and afford sexual health services compared to their counterparts from less affluent households and without employment.

The study used nationally representative data; however, the results should be interpreted by considering the following limitations: the study employed secondary data, which left out certain significant variables, such as the pre-survey knowledge of the ovulatory cycle among women. It was impossible to determine the cause-and-effect relationship between covariates and outcome variables due to the cross-sectional character of the study.

## CONCLUSIONS

Knowledge regarding the ovulation cycle was shallow among reproductive-age women in Bangladesh. To address this gap, targeted educational initiatives are needed to focus on young, less educated, and economically disadvantaged women. Understanding ovulation is critical for enabling women to plan pregnancies and avoid unintended conception. Low KOC demands the necessary development and implementation of services to improve the issue through media campaigns and health promotion. The concerned ministry should prioritize initiatives to improve the KOC.

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