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**Original Research Article**

# Risk factor analysis of endometriosis in women of reproductive age: a tertiary care level hospital study in Bangladesh

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## ABSTRACT

**Background:** Endometriosis is a disease in which tissue near the lining of the uterus grows outside the uterus. It can originate severe pain in the pelvis and make it harder to get pregnant. In several studies, several factors have been identified as the risk factors of endometriosis. But in Bangladesh, we have very limited research-based information regarding this issue. This study aimed to assess the risk factors of endometriosis in women of reproductive age.
**Methods:** This case-control study was conducted in the department of obstetrics and gynecology, Anwer Khan modern medical college, Dhaka, Bangladesh from January 2019 to December 2019. As per the inclusion criteria, in total 24 women of reproductive age with endometriosis were enrolled in the case group (Group 1). On the other hand, 24 age-matched women without endometriosis were enrolled in the control group (Group 2). A purposive sampling technique was used in sample selection. All the demographic and clinical data were analyzed by using the SPSS version 23.0 program and disseminated by the MS office program.
**Results:** In this study, assessing the risk factors of endometriosis among various reproductive histories of the participants revealed statistically significant correlations between the groups for the age of 30-40 years, late marriage, late childbearing, dysmenorrhea, and family history of endometriosis, with p values less than 0.05. However, when comparing genital tract obstruction, frequent and prolonged menstrual cycles, and nulliparity, we observed noticeable differences between the groups, but these were not statistically significant.
**Conclusions:** Age of 30-40 years, late marriage, late childbearing, dysmenorrhea, and family history of endometriosis may be considered the potential risk factors for endometriosis in women of reproductive age.

**Keywords:** Endometriosis, Risk factors, Reproductive age, Dysmenorrhea, Late childbearing

## INTRODUCTION

Endometriosis is a chronic condition that affects millions of women worldwide. It is a painful and often debilitating condition that affects women of reproductive age. Endometriosis occurs when the tissue that lines the uterus, grows outside of the uterus and causes pain along with other symptoms. In the general population, the prevalence of endometriosis is estimated at 7%-10% although its prevalence in infertile women may be over 30%.[1,2] The prevalence of symptoms of endometriosis in women suffering from pain, infertility, or both is over 35%-50%.[3,4] While the exact causes of endometriosis are not fully understood, several risk factors have been identified that can increase a woman's likelihood of developing the condition. Endometriosis typically develops during a woman's reproductive years, with symptoms typically appearing in the late teenage years or early twenties. The average age of the diagnosis is about 25-29 years old.[5] Endometriosis has a complex and multifactorial etiology.[6] Understanding these risk factors is essential in preventing and managing endometriosis in women of reproductive

age. This article will explore the various risk factors associated with endometriosis in women, including age, menstrual history, reproductive history, immunological factors, and lifestyle factors. Women who have shorter menstrual cycles (less than 27 days) or longer periods (more than seven days) are more likely to develop endometriosis. Additionally, women who experience heavy menstrual bleeding, known as menorrhagia, may also be at increased risk. The incidence rate of endometriosis in women with long-term menstrual bleeding and short intervals between menstruations is high.[7,8] By understanding these risk factors, women can take proactive steps to reduce their risk of developing endometriosis and improve their overall health and well-being. These changes in national and global contexts have prompted this work. The objective of this study was to evaluate the risk factors analysis of endometriosis in women of reproductive age in a tertiary care hospital in Bangladesh.

## METHODS

This case-control study was conducted in the department of obstetrics and gynecology, Anwer Khan modern medical college, Dhaka, Bangladesh from January 2019 to December 2019. As per the inclusion criteria of this study, in total 24 women of reproductive age with endometriosis were enrolled in the case group (Group 1). On the other hand, 24 age-matched women without endometriosis were enrolled in the control group (Group 2). A purposive sampling technique was used in sample selection. Diagnosis of endometriosis was confirmed by open surgery or laparoscopy and histologic diagnosis of endometriosis. As per the exclusion criteria of this study cases with amenorrhea for over a year, cases with endometriosis or endometrioma, or having endometriosis in the surgical site or the involvement of remote areas like lungs or brain were excluded. Besides, patients who were suffering from breast, ovarian, or endometrial cancers, having polycystic ovarian syndrome, having any life-threatening disease, and suffering from chronic pelvic pain according to the woman's expression were rejected. Prior data collection, the ethical clearance was obtained from the ethics committee of the institution. All the demographic and clinical data were recorded and analyzed by using the SPSS version 23.0 program and disseminated by the MS office program.

## RESULTS

In this study, among a total of 48 participants, 24 patients were with endometriosis (Group 1) and the other 24 patients were without endometriosis (Group 2). In group 1, 42% of participants were aged 30-40 years, compared to only 12% in group B. According to the distribution of the educational status, we observed that the highest number of patients in both group 1 (46%) and group 2 (42%) were educated up to the SSC level. Only 17% and 21% of patients from both groups were graduated and above level educated respectively. As per their BMI, only 21% and 13% were underweight, 67% and 79% had normal weight and 13% as well as 8% were overweight in Group 1 and 2 respectively. In distributing the study population by menstrual history, we observed that in the majority of the participants in both groups, the age at menarche (years) was ≥12 years. Most of the participants in each of the groups were having regular menstrual cycles. In this study, in each of the groups, 29% of cases were on light flow. The heavy flow was found in 46% and 42% of cases in group 1 and group 2 respectively. Among the total of our participants, dysmenorrhea was found in 50% and 21% of cases in group 1 and group 2 respectively and we found a significant correlation between the group (p=0.029). In this study, evaluating the risk factors of endometriosis among various reproductive histories of the participants revealed statistically significant correlations between the groups for age 30-40 years, late marriage, late childbearing, dysmenorrhea, and family history of endometriosis, with p values less than 0.05. Besides comparing genital tract obstruction, frequent and prolonged menstrual cycle, and nulliparity, we observed noticeable differences between the groups but that was not statistically significant.

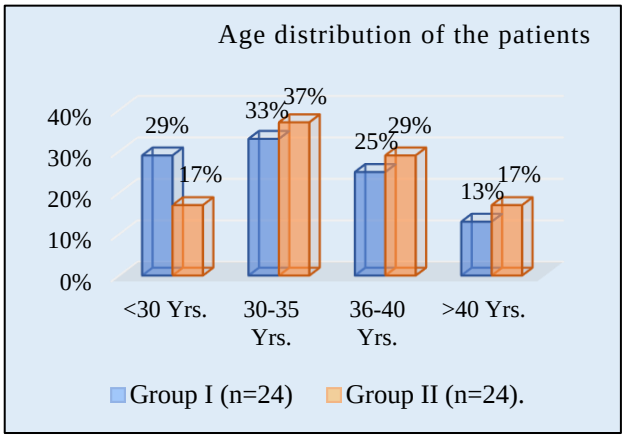


**Figure 1: Age group wise patients' distribution, (n=48).**

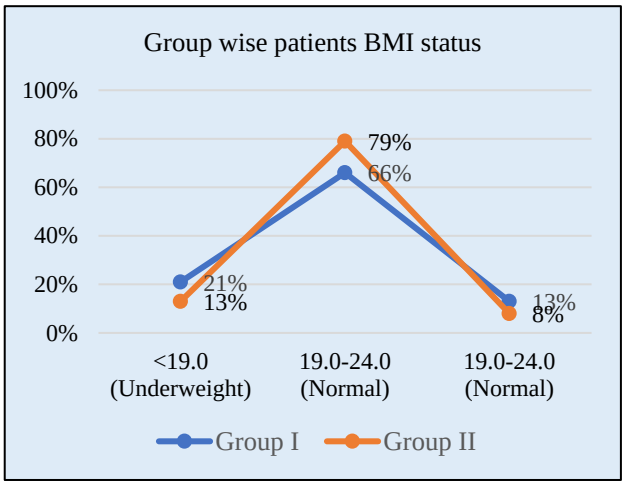


**Figure 2: Group-wise patients' BMI distribution, (n=48).**

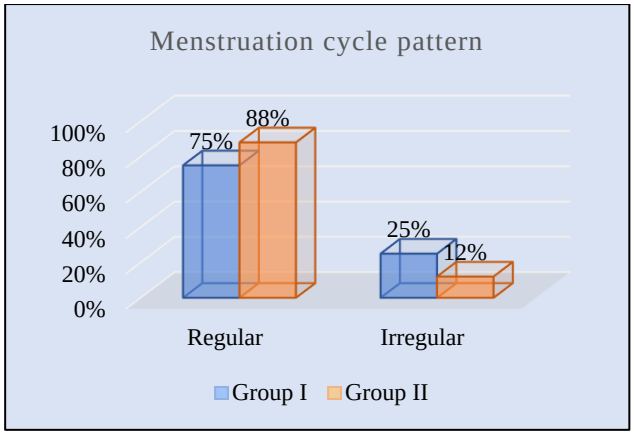


**Figure 3: Group-wise menstrual cycle pattern of the patients, (n=48).**

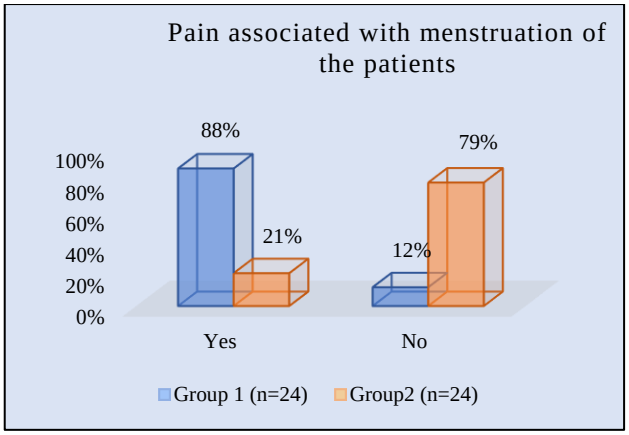


**Figure 4: Menstrual history-wise pain associated with the patients, (n=48).**

**Table 1: Distribution of the study population as per age, education, and BMI, (n=48).**

| Variables | Group 1, (n=24) | | Group 2, (n=24) | |
|---|---|---|---|---|
| | N | % | N | % |
| **Age distribution (in years)** | | | | |
| <30 | 8 | 33 | 10 | 42 |
| 30-35 | 5 | 21 | 1 | 4 |
| 36-40 | 5 | 21 | 2 | 8 |
| >40 | 6 | 25 | 11 | 46 |
| **Educational status** | | | | |
| SSC level or below | 11 | 46 | 10 | 42 |
| HSC level | 9 | 37 | 9 | 37 |
| Graduate and above | 4 | 17 | 5 | 21 |
| **BMI (kg/m$^2$)** | | | | |
| <19.0 (Underweight) | 5 | 21 | 3 | 13 |
| 19.0-24.0 (Normal) | 16 | 67 | 19 | 79 |
| >24.0 (Overweight) | 3 | 12 | 2 | 8 |

**Table 2: Distribution of the study population as per menstrual history, (n=48).**

| Variables | Group 1, (n=24) | | Group 2, (n=24) | | P value |
|---|---|---|---|---|---|
| | N | % | N | % | |
| **Age at menarche (in years)** | | | | | |
| ≤11 | 8 | 33 | 5 | 21 | 0.814 |
| 12 | 9 | 37 | 7 | 29 | |
| 13 | 4 | 17 | 8 | 33 | |
| ≥14 | 3 | 13 | 4 | 17 | |
| **Cycle length (in day)** | | | | | |
| ≤25 | 18 | 75 | 16 | 67 | 0.034 |
| 26-31 | 5 | 21 | 6 | 25 | |
| >31 | 1 | 4 | 2 | 8 | |
| **Cycle pattern** | | | | | |
| Regular | 18 | 75 | 21 | 88 | 0.358 |
| Irregular | 6 | 25 | 3 | 12 | |
| **Amount of flow** | | | | | |
| Light | 7 | 29 | 7 | 29 | 0.121 |
| Moderate | 6 | 25 | 7 | 29 | |
| Heavy | 11 | 46 | 10 | 42 | |
| **Dysmenorrhea** | | | | | |
| Yes | 12 | 50 | 6 | 21 | 0.029 |
| No | 12 | 50 | 18 | 79 | |

**Table 3: Risk factor analysis between the groups, (n=48).**

| Variables | Group 1, (n=24) | | Group 2, (n=24) | | P value | Odd ratio | 95% CI | Z score |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | | | | |
| **Age >18 years at first coitus** | | | | | | | | |
| Yes | 16 | 67 | 18 | 75 | 0.263 | 0.67 | [1.165, 21.459] | 0.633 |
| No | 8 | 33 | 6 | 25 | | | | |
| **Age of 30-40 years** | | | | | | | | |
| Yes | 10 | 42 | 3 | 13 | 0.030 | 5.00 | [0.190, 2.338] | 2.165 |
| No | 14 | 58 | 21 | 88 | | | | |
| **Late marriage** | | | | | | | | |
| Yes | 8 | 33 | 2 | 8 | 0.047 | 5.50 | [1.027, 29.452] | 1.991 |
| No | 16 | 67 | 22 | 92 | | | | |
| **Late childbearing** | | | | | | | | |
| Yes | 10 | 42 | 3 | 12 | 0.030 | 5.00 | [1.165, 21.459] | 2.165 |
| No | 14 | 58 | 21 | 88 | | | | |
| **Genital tract obstruction** | | | | | | | | |
| Yes | 4 | 17 | 1 | 4 | 0.188 | 4.60 | [0.474, 44.606] | 1.317 |
| No | 20 | 83 | 23 | 96 | | | | |
| **Frequent and prolonged menstrual cycle** | | | | | | | | |
| Yes | 6 | 25 | 3 | 13 | 0.275 | 2.33 | [0.509, 10.692] | 1.091 |
| No | 18 | 75 | 21 | 88 | | | | |
| Dysmenorrhea | | | | | | | | |
| Yes | 12 | 50 | 6 | 25 | 0.039 | 3.00 | [0.884,10.184] | 1.762 |
| No | 12 | 50 | 18 | 75 | | | | |
| **Family history of endometriosis** | | | | | | | | |
| Yes | 10 | 8 | 3 | 4 | 0.030 | 5.00 | [1.165, 21.459] | 2.165 |
| No | 14 | 92 | 21 | 96 | | | | |
| **Nulliparity** | | | | | | | | |
| Yes | 9 | 37 | 4 | 17 | 0.112 | 3.00 | [0.774, 11.628] | 1.589 |
| No | 15 | 63 | 20 | 83 | | | | |
| **Dyspareunia** | | | | | | | | |
| Yes | 8 | 33 | 5 | 21 | 0.333 | 1.90 | [0.518, 6.974] | 0.967 |
| No | 16 | 67 | 19 | 79 | | | | |
| **History of tubal patency test** | | | | | | | | |
| Yes | 12 | 50 | 6 | 25 | 0.039 | 3.00 | [0.884,10.184] | 1.762 |
| No | 12 | 50 | 18 | 75 | | | | |
| **Low BMI** | | | | | | | | |
| Yes | 5 | 21 | 3 | 13 | 0.443 | 1.84 | [0.387, 8.767] | 0.767 |
| No | 19 | 79 | 21 | 88 | | | | |
| **Heavy consumption of alcohol or caffeine** | | | | | | | | |
| Yes | 2 | 8 | 1 | 4 | 0.558 | 2.09 | [0.177, 24.735] | 0.585 |
| No | 22 | 92 | 23 | 96 | | | | |

## DISCUSSION

This study aimed to assess the risk factors of endometriosis in women of reproductive age. In the study conducted by Haichian et al no statistically significant difference was pointed out in the participants' age, educational level, duration of infertility, and menstrual flow.[9] In this study, there was no significant dissimilarity in the educational status of women with or without endometriosis. According to the distribution of the educational status, we observed that the highest number of patients in both group 1 (46%) and group 2 (42%) were educated up to the SSC level. Only 17% and 21% of patients from both groups were graduated and above level educated respectively. Which was compatible with the findings of the study organized by Darwish et al.[10] Moreover, an Italian group; Berube et al found no connection between education and the presence of endometriosis.[11,12] Chaichian et al also found that there was no difference concerning the educational level of the two groups.[13] Most of the participants in each of the groups were having regular menstrual cycles. In this study, in each of the groups, 29% of cases were on light flow. The heavy flow was found in 46% and 42% of cases in group 1 and group 2 respectively. The difference was not statistically significant between the two groups; a similar finding was observed in Darwish et al study.[10] Moini et al found that BMI had the opposite connection with endometriosis as infertile obese women were at a lower possibility for endometriosis.[14] A similar result was also found by Missmer et al.[15] But we did not find any correlation. Matalliotakis et al as well as Missmer et al reported that women who have a menstrual cycle that is less than 27-28 days in length are at a greater risk of developing endometriosis.[15,16] Among the total of our participants,

dysmenorrhea was found in 50% and 21% of cases in group 1 and group 2 respectively and we found a significant correlation between the group (p=0.029). In comparing the reproductive history between case and control groups, we found significant correlations in age 30-40 years, late marriage, late childbearing, dysmenorrhea, and family history of endometriosis, with p values less than 0.05. All the findings of this current study may be helpful in further similar studies. Heilier et al investigated individual and environmental risk factors associated with endometriosis and found that there was an inverse relationship between high parity and endometriosis. The case group often reported dyspareunia more than the control group.[17]

***Limitations***

This was a single-centered study with small samples. Moreover, the study was conducted over a very short period. So, the findings of this study may not reflect the exact scenario of the whole country.

## CONCLUSION

The potential risk factors for endometriosis in women of reproductive age include being between 30-40 years old, late marriage, late childbearing, experiencing dysmenorrhea, and having a family history of endometriosis. These factors may contribute to the development and progression of endometriosis, a condition characterized by the presence of endometrial tissue outside the uterus, causing pain and infertility. Recognizing these risk factors can aid in the early identification and management of endometriosis, enabling timely intervention and improved quality of life for affected women.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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