Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2026, 16(5), 687-699
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Prevalence and Correlates of Pelvic Endometriosis in an Urban Center of Cameroon: A Cross-Sectional Study

Théophile Njamen Nana[1,2], Alida Estelle Noundjeu Tongna[1], Robert Tchounzou[2,3*], Fulbert Mangala Nkwele[1,4], Humphry Neng[2,3], Cedric Junior Nana Njamen[1], Fidelia Kobenge Mbi[1], Chrisantus Ndzometia[2], Isaac Mboh Eyong[2], Andre Gaetan Simo Wambo[2], Alphonse Ngalame[2], Charlotte Tchente Nguefack[1,4], Gregory Halle Ekane[1,2], Thomas Obinchemti Egbe[1,2], Henri Essome[4], Emile Mboudou[3,5]

[1]Department of Obstetrics and Gynecology, Douala General Hospital, Douala, Cameroon
[2]Department of Obstetrics and Gynecology, Faculty of Health Sciences, University of Buea, Buea, Cameroon
[3]Department of Obstetrics and Gynaecology, Gynaeco-Obstetric and Pediatric Hospital of Douala, Douala, Cameroon
[4]Department of Surgery and Specialties, Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon
[5]Department of Obstetrics and Gynaecology, Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon
Email: *rtchounzou@yahoo.fr

How to cite this paper: Nana, T.N., Tongna, A.E.N., Tchounzou, R., Nkwele, F.M., Neng, H., Njamen, C.J.N., Mbi, F.K., Ndzometia, C., Eyong, I.M., Wambo, A.G.S., Ngalame, A., Nguefack, C.T., Ekane, G.H., Egbe, T.O., Essome, H. and Mboudou, E. (2026) Prevalence and Correlates of Pelvic Endometriosis in an Urban Center of Cameroon: A Cross-Sectional Study. *Open Journal of Obstetrics and Gynecology*, **16**, 687-699.
https://doi.org/10.4236/ojog.2026.165067

Received: March 5, 2026
Accepted: May 6, 2026
Published: May 9, 2026

Abstract

Background: Endometriosis is a common gynecological condition worldwide but remains poorly documented in sub-Saharan Africa, largely due to limited access to diagnostic laparoscopy. Understanding its prevalence and associated factors is essential for improving clinical recognition and management. **Objective:** To determine the surgical prevalence and factors associated with pelvic endometriosis among women undergoing gynecological laparoscopy in Douala, Cameroon. **Methods:** We conducted a retrospective cross-sectional study over a 10-year period (January 2014-December 2022) in three tertiary hospitals in Douala. Medical records of women who underwent gynecological laparoscopy for indications such as infertility, chronic pelvic pain, adnexal masses, or suspected ectopic pregnancy were reviewed. Pelvic endometriosis was primarily diagnosed by direct laparoscopic visualization of characteristic lesions by experienced surgeons. Biopsy with histological confirmation was performed when lesions were atypical or when diagnostic uncertainty existed. Data were analyzed using SPSS version 24.0. Bivariate and multivariate logistic regression analyses were performed to identify factors associated with pelvic endometriosis. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated, and statistical significance was set at $p < 0.05$. **Results:**

A total of 440 women were included. The surgical prevalence of laparoscopically diagnosed pelvic endometriosis was 22.5%. Histological confirmation was obtained in 81 of the 88 biopsied cases (92.0%). In multivariate analysis, age at menarche ≤ 11 years (AOR = 5.14; 95% CI: 2.49 - 10.64; $p < 0.001$) and menstrual cycle length ≤ 27 days (AOR = 5.20; 95% CI: 2.91 - 9.30; $p < 0.001$) were independently associated with increased odds of endometriosis. Conversely, a history of pelvic surgery (AOR = 0.30; 95% CI: 0.14 - 0.61; $p < 0.001$), primigravidity (AOR = 0.49; 95% CI: 0.25 - 0.98; $p = 0.045$), and paucigravidity (AOR = 0.34; 95% CI: 0.16 - 0.70; $p = 0.003$) were inversely associated with endometriosis. **Conclusion:** Nearly one-quarter of women undergoing gynecological laparoscopy in three tertiary hospitals in Douala had pelvic endometriosis. Early menarche and short menstrual cycles were strongly associated with the condition, while prior pelvic surgery and low gravidity showed inverse associations. These findings highlight the importance of improving access to laparoscopic diagnostic services to enhance the detection and management of endometriosis in similar resource-limited settings.

Keywords

Pelvic Endometriosis, Prevalence, Associated Factors, Laparoscopy, Cameroon, Sub-Saharan Africa

1. Introduction

Endometriosis is a chronic gynecological condition characterized by the presence of endometrial glands and/or stroma outside the uterine cavity, commonly involving the ovaries, fallopian tubes, and pelvic peritoneum, with possible extra-pelvic manifestations [1]-[3]. Its clinical presentation is heterogeneous, ranging from severe symptoms to asymptomatic disease, which often leads to delayed diagnosis.

Globally, endometriosis affects approximately 10% of women of reproductive age, representing nearly 190 million individuals worldwide and constituting a major public health concern [4]. The true burden of disease is likely underestimated due to nonspecific symptoms, such as chronic pelvic pain and infertility, and limited access to diagnostic laparoscopy in many settings [5]-[7].

In sub-Saharan Africa, reported prevalence rates are relatively low, largely reflecting underdiagnosis and restricted availability of minimally invasive surgical techniques [8]. However, hospital-based studies in Cameroon have documented prevalence rates between 13.5% and 22.5% among women undergoing surgery for infertility or chronic pelvic pain, suggesting a substantial but under recognized disease burden [9] [10].

Several reproductive, menstrual, and surgical factors have been associated with endometriosis, although reported risk profiles vary across studies due to differences in populations, diagnostic methods, and study designs [11]-[13]. In resource-limited settings, identifying context-specific associated factors is essential to improve clinical suspicion and guide appropriate referral for surgical diagnosis.

In Cameroon, data on endometriosis remain scarce, and limited access to laparoscopy contributes to delayed diagnosis, with significant consequences for fertility, quality of life, and psychological well-being [14]. As the surgical prevalence and associated factors of endometriosis in urban Cameroonian settings remain insufficiently characterized, this study aimed to determine the prevalence and identify factors associated with pelvic endometriosis among women undergoing laparoscopic surgery in three hospitals in Douala, Cameroon.

2. Materials and Methods

2.1. Study Design and Period

We conducted a hospital-based cross-sectional analytical study with retrospective data collection. Medical records covering a 10-year period from January 1, 2014 to December 31, 2022 were reviewed. Data collection and analysis were conducted over a five-month period from January to June 2025.

2.2. Study Setting

The study was conducted in the gynecology departments of three specialized healthcare facilities in Douala, Cameroon:

- Douala General Hospital (HGD)
- Douala Gyneco-Obstetrics and Pediatrics Hospital (DGOPH)
- Clinique de l'Aéroport (CA)

The first two institutions are tertiary-level teaching and referral hospitals providing advanced gynecological care and specialist training. Clinique de l'Aéroport is a private healthcare facility specialized in minimally invasive gynecological surgery and assisted reproductive techniques.

All three centers are equipped with video-laparoscopy systems enabling direct visualization of pelvic structures. Laparoscopic procedures were performed by experienced gynecologic surgeons with 8 - 35 years of surgical experience.

2.3. Study Population and Eligibility Criteria

A non-probabilistic exhaustive sampling method was used.

We included all medical records of women who underwent diagnostic and/or operative gynecological laparoscopy during the study period for indications including infertility, chronic pelvic pain, adnexal masses, or suspected ectopic pregnancy.

A diagnosis of pelvic endometriosis was retained when one of the following criteria was met:

1) Laparoscopic diagnosis: Direct visualization of typical endometriotic lesions such as powder-burn lesions, ovarian endometriomas, or deep infiltrating nodules by experienced surgeons.

2) Histological confirmation: Identification of endometrial glands and/or stroma on histopathological examination of biopsy specimens obtained during laparoscopy.

Diagnosis was primarily based on laparoscopic visualization. Biopsy with histological examination was performed when lesions appeared atypical or when diagnostic uncertainty existed.

Medical records with incomplete data (defined as missing more than 20% of required study variables) were excluded from the analysis.

2.4. Data Collection and Study Variables

Following administrative authorization and ethical approval, surgical registers were reviewed to identify eligible cases. Complete medical files were subsequently retrieved from hospital archives. Data were collected using a standardized data extraction form developed in accordance with the study objectives and relevant literature. The form was pretested on a subset of medical records not included in the final analysis and refined accordingly. Data extraction was carried out by trained physicians under the supervision of the principal investigator. To ensure data quality and consistency, a random sample of records was cross-checked, and any discrepancies were resolved through consensus.

Sociodemographic characteristics: Age, marital status, education level, and occupation.

Gynaecological and reproductive variables: Age at menarche, menstrual cycle length and regularity, gravidity, parity, and family history of endometriosis.

Medical and surgical history: History of diabetes mellitus, hypertension, prior abdominal or pelvic surgery.

Lifestyle factors: Alcohol consumption and tobacco use.

All laparoscopic procedures were performed by senior surgeons with documented expertise in minimally invasive gynaecological surgery.

2.5. Sampling Method and Sample Size

An exhaustive sampling approach was adopted, including all eligible cases that met the inclusion criteria during the study period. As a result, no a priori sample size calculation was performed. The final sample size corresponded to the total number of complete medical records available and eligible across the three study sites.

2.6. Data Management and Statistical Analysis

Data were entered and analyzed using SPSS version 24.0.

Categorical variables were summarized as frequencies and percentages.

Bivariate analysis was performed to evaluate associations between pelvic endometriosis and independent variables using crude odds ratios (ORs) with their 95% confidence intervals (CIs).

Variables with $p < 0.20$ in bivariate analysis were included in a multivariate logistic regression model to identify independent factors associated with endometriosis while controlling for potential confounders.

Adjusted odds ratios (AORs) with 95% confidence intervals were reported. Statistical significance was set at $p < 0.05$.

Family history of endometriosis was not included in the multivariate model due to complete separation, as no cases were observed among the control group, preventing reliable estimation of adjusted odds ratios.

2.7. Ethical Considerations

The study was conducted in accordance with the ethical principles of biomedical research involving human subjects. Ethical approval was obtained from the Institutional Ethics and Research Committee (**2025/083/UDM/PR/CEAQ**). Given the retrospective nature of the study, informed consent was waived. Patient confidentiality was strictly maintained by anonymizing all extracted data and restricting access to study files to the researchers.

3. Results

3.1. Study Population and Surgical Prevalence of Pelvic Endometriosis

During the study period, 506 women underwent gynecological laparoscopy in the three participating centres. Of these, 440 patients (87.0%) met the inclusion criteria and were included in the analysis.

Pelvic endometriosis was identified in 99 women, yielding a surgical prevalence of 22.5% among women undergoing laparoscopy.

Diagnosis was based on direct laparoscopic visualization of typical endometriotic lesions (Figures 1-3). Biopsies for histological confirmation were performed in 88 cases (20.0%), with histopathology confirming endometriosis in 81 cases, corresponding to a confirmation rate of 92.0%.

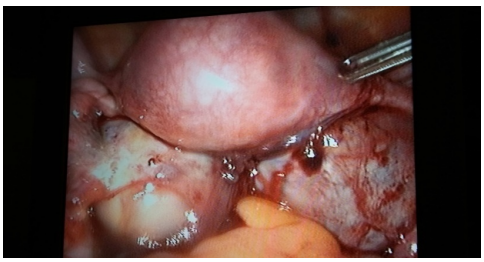

Figure 1. Bilateral endometrioma.

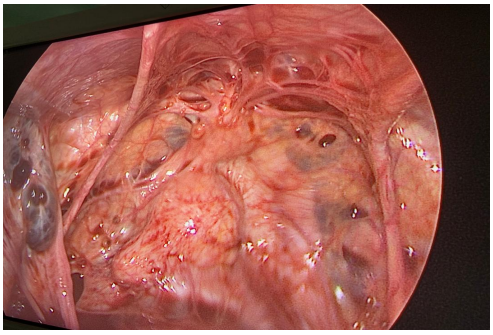

Figure 2. Laceration of the pelvic parietal peritoneum. Clear, reddish, and brownish endometriotic vesicles.

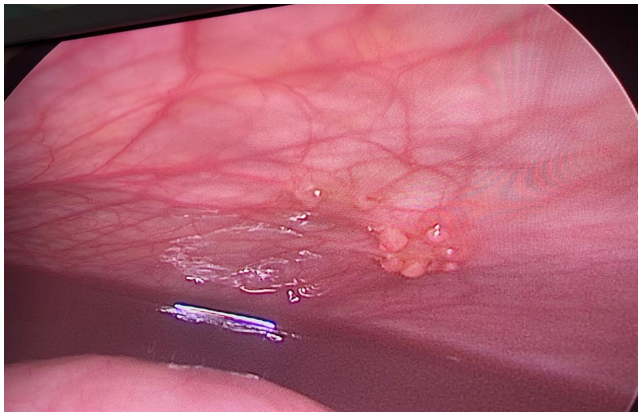

Figure 3. Brownish hemoperitoneum; clear endometriotic vesicles. On a hypervascularized parietal peritoneum.

3.2. Bivariate Analysis of Socio-Demographic Factors

In bivariate analysis, occupation in the private sector was significantly associated with pelvic endometriosis. Women working in the private sector had more than twice the odds of endometriosis compared with those in the informal sector (OR = 2.47; 95% CI: 1.20 - 5.09; p = 0.014).

Age, marital status, and level of education were not significantly associated with pelvic endometriosis in bivariate analysis (Table 1).

Table 1. Socio-demographic factors associated with pelvic endometriosis (Bivariate analysis).

Variables	Endometriosis Present (N = 99) n (%)	Endometriosis Absent (N = 341) n (%)	Odds Ratio (OR) (95% CI)	p-Value
Age (years)				
15 - 24	9 (9.1)	28 (8.2)	4.18 (0.48 - 36.53)	0.196
25 - 34	59 (59.6)	170 (49.9)	4.51 (0.58 - 35.24)	0.151
35 - 44	30 (30.3)	130 (38.1)	3.00 (0.38 - 23.83)	0.299
45 - 54	1 (1.0)	13 (3.8)	1 (reference)	
Marital status				
Single	33 (33.3)	146 (42.8)	1 (reference)	
Married	63 (63.6)	190 (55.7)	1.47 (0.91 - 2.35)	0.112
Widow/divorced	3 (3.0)	5 (1.5)	2.65 (0.60 - 11.67)	0.196
Occupation				
Private	22 (22.2)	43 (12.6)	2.47 (1.20 - 5.09)	0.014
Public	36 (36.4)	134 (39.3)	1.30 (0.69 - 2.43)	0.415
Informal	18 (18.2)	87 (25.5)	1 (reference)	
None	23 (23.2)	77 (22.6)	1.44 (0.72 - 2.87)	0.296

Continued

Level of education				
Primary	3 (3.0)	19 (5.6)	1 (reference)	
Secondary	26 (26.3)	129 (37.8)	1.28 (0.35 - 4.63)	0.710
Higher	70 (70.7)	193 (56.6)	2.30 (0.66 - 8.00)	0.191

Notes: 1) The reference group for Age is 45 - 54 years, 2) The reference group for Marital status is Single, 3) The reference group for Occupation is Informal, 4) The reference group for Level of education is Primary, 5) Significant result at $p < 0.05$: Occupation (Private) is associated with a higher odds of endometriosis (OR = 2.47, p = 0.014).

3.3. Bivariate Analysis of Clinical and Reproductive Factors

Several clinical and reproductive variables were significantly associated with pelvic endometriosis (Table 2).

Table 2. Clinical factors associated with pelvic endometriosis (Bivariate analysis).

Variables	Endometriosis Present (N = 99) n (%)	Endometriosis Absent (N = 341)	OR (95% CI)	p-Value
Age at menarche (years)				
≤11	**22 (22.2)**	**19 (5.6)**	**4.84 (2.50 - 9.39)**	**<0.001**
>11	77 (77.8)	322 (94.4)	1 (reference)	
Cycle length (days)				
≤27	**48 (48.5)**	**51 (15.0)**	**5.35 (3.27 - 8.77)**	**<0.001**
>27	51 (51.5)	290 (85.0)	1 (reference)	
Gravidity				
Nulligravid	49 (49.5)	102 (30.1)	1 (reference)	
Primigravid	**19 (19.2)**	**88 (26.0)**	**0.45 (0.25 - 0.82)**	**0.009**
Paucigravid	**18 (18.2)**	**106 (31.3)**	**0.35 (0.19 - 0.65)**	**<0.001**
Multigravid	12 (12.1)	31 (9.1)	0.81 (0.38 - 1.70)	0.57
Grand multigravid	1 (1.0)	12 (3.5)	0.17 (0.02 - 1.37)	0.097
Parity				
Nulliparous	72 (72.7)	207 (60.7)	1 (reference)	
Primiparous	18 (18.2)	82 (24.0)	0.63 (0.35 - 1.12)	0.117
Pauciparous	9 (9.1)	42 (12.3)	0.62 (0.29 - 1.33)	0.216
Multiparous	0 (0.0)	10 (2.9)	NA	0.965

Continued

Familial endometriosis	**12 (12.1)**	**0 (0.0)**	**NA**	**<0.001**
Late menopause	5 (5.1)	0 (0.0)	NA	0.976
Neoplasia	2 (2.0)	1 (0.3)	7.00 (0.63 - 77.97)	0.128
Lupus	1 (1.0)	0 (0.0)	NA	0.225
Hypertension	1 (1.0)	10 (2.9)	2.96 (0.37 - 23.42)	0.469
Diabetes	0 (0.0)	2 (0.6)	NA	1.000
Pelvic surgery	**13 (13.1)**	**121 (35.5)**	**0.27 (0.15 - 0.51)**	**<0.001**
Abdominal surgery	2 (2.0)	26 (7.6)	0.25 (0.06 - 1.07)	0.058
Alcohol consumption	35 (35.4)	121 (35.5)	0.99 (0.62 - 1.59)	0.981
Tobacco smoking	3 (3.0)	6 (1.8)	1.75 (0.43 - 7.11)	0.432

Notes: 1) OR: Odds ratio; CI: Confidence interval, 2) Reference category indicated where applicable, 3) NA: Not applicable (cell count = 0, OR not estimable), 4) Percentages are calculated per column, 5) Statistical significance set at $p < 0.05$.

An age at menarche ≤ 11 years was associated with a nearly fivefold increased risk of endometriosis (OR = 4.84; 95% CI: 2.50 - 9.39; $p < 0.001$). Similarly, a menstrual cycle length ≤ 27 days significantly increased the odds of endometriosis (OR = 5.35; 95% CI: 3.27 - 8.77; $p < 0.001$).

Conversely, primigravidity (OR = 0.45; 95% CI: 0.25 - 0.82; $p = 0.009$), paucigravidity (OR = 0.35; 95% CI: 0.19 - 0.65; $p < 0.001$), and a history of pelvic surgery (OR = 0.27; 95% CI: 0.15 - 0.51; $p < 0.001$) were associated with reduced odds of pelvic endometriosis.

A family history of endometriosis was significantly associated with the condition ($p < 0.001$). Other medical comorbidities and lifestyle factors, including hypertension, diabetes, alcohol consumption, and tobacco use, showed no significant association.

3.4. Multivariate Analysis of Factors Associated with Pelvic Endometriosis

After adjustment for potential confounders in multivariate logistic regression analysis (Table 3), five variables remained independently associated with pelvic endometriosis.

An age at menarche ≤ 11 years (aOR = 5.14; 95% CI: 2.49 - 10.64; $p < 0.001$) and a menstrual cycle length ≤ 27 days (aOR = 5.20; 95% CI: 2.91 - 9.30; $p < 0.001$) were independently associated with increased odds of pelvic endometriosis.

Table 3. Factors associated with endometriosis (Multivariate analysis).

Variables	Adjusted Odds Ratio (aOR) (95% Confidence Interval)	p-Value
Age at menarche (years)		
≤11	5.14 (2.49 - 10.64)	<0.001
Duration of cycle (days)		
≤27	5.20 (2.91 - 9.30)	<0.001
Gravidity		
Primigravid	0.49 (0.25 - 0.98)	0.045
Paucigravid	0.34 (0.16 - 0.70)	0.003
Pelvic surgery	0.30 (0.14 - 0.61)	

In contrast, a history of pelvic surgery (aOR = 0.30; 95% CI: 0.14 - 0.61; p < 0.001), primigravidity (aOR = 0.49; 95% CI: 0.25 - 0.98; p = 0.045), and paucigravidity (aOR = 0.34; 95% CI: 0.16 - 0.70; p = 0.003) were independently associated with reduced odds of endometriosis

4. Discussion

4.1. Summary of Findings

This study found a surgical prevalence of pelvic endometriosis of 22.5% among women undergoing gynecological laparoscopy in three hospitals in Douala between 2014 and 2022. This prevalence is consistent with the findings of Nana N. *et al.*, who also reported a prevalence of 22.5% among women undergoing laparoscopy for chronic pelvic pain in Cameroon [10]. However, it is higher than the 3.12% prevalence reported by Bilkissou *et al.* [15]. These differences may reflect variations in study design and patient selection. While Bilkissou *et al.* included clinically diagnosed cases, the present study focused exclusively on women undergoing laparoscopy, which likely increased the detection of endometriotic lesions.

Histological confirmation was not performed systematically in our study. Nevertheless, among cases where biopsy was performed, histopathology confirmed endometriosis in 92% of cases. This high concordance between laparoscopic and histological findings may reflect the expertise of the surgeons performing the procedures. McKee *et al.* reported that visual diagnosis during laparoscopy has high sensitivity but moderate specificity when compared with histological confirmation [16]. In contrast, Buchweitz *et al.* highlighted the variability in laparoscopic diagnosis and emphasized the importance of histological confirmation when feasible [17].

4.2. Interpretation of Associated Factors

Early menarche (≤11 years) and short menstrual cycle length (≤27 days) were strongly associated with pelvic endometriosis. Women with early menarche had

approximately fivefold higher odds of endometriosis (AOR = 5.14; 95% CI: 2.49 - 10.64; $p < 0.001$), while those with shorter menstrual cycles had a similarly increased risk (AOR = 5.20; 95% CI: 2.91 - 9.30; $p < 0.001$). These findings are consistent with those reported by Burghaus *et al.*, who identified early menarche and shorter menstrual cycles as important risk factors for the development of endometriosis [18]. From a pathophysiological perspective, early menarche increases lifetime exposure to estrogen, while shorter cycles increase the frequency of menstruation and the likelihood of retrograde menstruation, a central mechanism proposed in Sampson's theory of endometriosis pathogenesis [19].

A history of pelvic surgery was inversely associated with endometriosis in the present study (AOR = 0.30; 95% CI: 0.14 - 0.61; $p < 0.001$). This finding contrasts with the results of Ashrafi *et al.*, who reported pelvic surgery as a potential risk factor for endometriosis [20]. The observed inverse association should be interpreted cautiously, as it may reflect reverse causation or selection bias rather than a true protective effect. Women with prior pelvic surgery may have undergone procedures for conditions unrelated to endometriosis, or surgical history may influence referral patterns for laparoscopy.

Similarly, primigravidity and paucigravidity were inversely associated with endometriosis. This observation aligns with findings from Ashrafi *et al.*, who reported a negative association between the number of pregnancies and endometriosis [20]. Pregnancy reduces the number of menstrual cycles and is associated with prolonged exposure to progesterone, which exerts antiproliferative effects on endometrial tissue [21]. However, the relationship between pregnancy and endometriosis remains complex. A meta-analysis by Leeners *et al.* did not confirm a consistent protective effect of pregnancy, suggesting that residual confounding and reverse causation may influence these associations [22].

A family history of endometriosis was strongly associated with the disease in bivariate analysis ($p < 0.001$). However, this variable was not retained in the multivariate model due to complete separation, as no cases were reported among the control group. This prevented reliable estimation of adjusted odds ratios. Previous studies have demonstrated that genetic susceptibility plays an important role in the development of endometriosis, with familial aggregation suggesting involvement of hormonal, inflammatory, and immune regulatory pathways [23] [24].

The association observed between private-sector employment and endometriosis in bivariate analysis may reflect socioeconomic differences in access to healthcare. In many resource-limited settings, laparoscopic procedures may be more accessible to women with higher socioeconomic status, potentially leading to underdiagnosis among women in the informal sector.

4.3. Strengths and Limitations

This study has several strengths. It included a relatively large sample size and involved three specialized healthcare facilities performing laparoscopic surgery, which enhances the reliability of the findings. In addition, all procedures were

performed by experienced surgeons trained in minimally invasive gynecological surgery.

However, some limitations should be acknowledged. The retrospective design may have introduced information bias due to incomplete documentation in medical records. Histological confirmation was not performed systematically in all cases, which may introduce some diagnostic misclassification. Furthermore, the study population consisted exclusively of women undergoing laparoscopy for specific gynecological indications, which may limit the generalizability of the findings to the broader population.

5. Conclusion

Pelvic endometriosis was identified in 22.5% of women undergoing gynecological laparoscopy in three tertiary hospitals in Douala, Cameroon. Early menarche (≤11 years) and shorter menstrual cycle length (≤27 days) were strongly associated with increased odds of endometriosis, while prior pelvic surgery and lower gravidity showed inverse associations. These findings provide insight into the surgical prevalence and correlates of endometriosis among women undergoing laparoscopic evaluation in this urban Cameroonian setting. Improving access to laparoscopic diagnostic services and increasing clinical awareness may facilitate earlier detection and management of endometriosis in similar resource-limited settings.

Authors' Contributions

RT, TNN, AENT and FGMN conceptualized and designed the study. AEN, CNN, FKM, and CYN were responsible for participant recruitment at the study sites. AGS, ANN and HTN also contributed to participant recruitment and provided feedback on the manuscript. The manuscript was written by TNN, RT, CTN, and ETO. GHE, and CTN, ETO critically revised and reviewed the manuscript for important intellectual content. All authors read and approved the final version of the manuscript.

Conflicts of Interest

Authors declare no conflicts of interest.

References

[1] European Society of Human Reproduction and Embryology (ESHRE) (2022) Endometriosis Guideline. ESHRE. https://www.eshre.eu/Guideline/Endometriosis

[2] Lee, H.J., Park, Y.M., Jee, B.C., Kim, Y.B. and Suh, C.S. (2015) Various Anatomic Locations of Surgically Proven Endometriosis: A Single-Center Experience. *Obstetrics & Gynecology Science*, **58**, 53-58. https://doi.org/10.5468/ogs.2015.58.1.53

[3] Ngatchou, W., Nana-Njamen, T., Nguefack, T.C., Sango, R., Tchounzou, R., Nkana, A., *et al.* (2018) Surgical Treatment of Pelvic and Thoracic Endometriosis: A Case Report and Literature Review. *African Journal of Integrated Health*, **8**, 17-20.

[4] World Health Organization (WHO) (2021) Endometriosis. https://www.who.int/fr/news-room/fact-sheets/detail/endometriosis

[5] Ozkan, S., Murk, W. and Arici, A. (2008) Endometriosis and Infertility. *Annals of the New York Academy of Sciences*, **1127**, 92-100. https://doi.org/10.1196/annals.1434.007

[6] Nana-Njamen, T., Essome, H., Robert, T., Ekono, M.R., Nana, C.N., Tchounzou, R., *et al.* (2020) Pelvic Endometriosis in a Black Virgin Adolescent in Sub-Saharan Africa. *Archive of Obstetrics, Gynecology and Reproductive Medicine*, **3**, 95-98.

[7] Gao, X., Outley, J., Botteman, M., Spalding, J., Simon, J.A. and Pashos, C.L. (2006) Economic Burden of Endometriosis. *Fertility and Sterility*, **86**, 1561-1572. https://doi.org/10.1016/j.fertnstert.2006.06.015

[8] Lu, M., Niu, J. and Liu, B. (2022) The Risk of Endometriosis by Early Menarche Is Recently Increased: A Meta-Analysis of Literature Published from 2000 to 2020. *Archives of Gynecology and Obstetrics*, **307**, 59-69. https://doi.org/10.1007/s00404-022-06541-0

[9] Abd El-Kader, A.I., Gonied, A.S., Mohamed, M.L. and Mohamed, S.L. (2022) Risk Factors for Endometriosis among Egyptian Infertile Women with Different Disease Stages. *SAGE Open Nursing*, **8**. https://doi.org/10.1177/23779608221111718

[10] Peterson, C.M., Johnstone, E.B., Hammoud, A.O., Stanford, J.B., Varner, M.W., Kennedy, A., *et al.* (2013) Risk Factors Associated with Endometriosis: Importance of Study Population for Characterizing Disease in the ENDO Study. *American Journal of Obstetrics and Gynecology*, **208**, 451.e1-451.e11. https://doi.org/10.1016/j.ajog.2013.02.040

[11] Ohayi, S., Onyishi, N. and Mbah, S. (2022) Endometriosis in an Indigenous African Women Population. *African Health Sciences*, **22**, 133-138. https://doi.org/10.4314/ahs.v22i1.17

[12] Mboudou, E.T., Belley, E.P., Mayer, F.E., Ze Minkande, J., Foumane, P. and Doh, A.S. (2007) Prévalence de l'endométriose en laparoscopie chez les femmes infertiles à Yaoundé, Cameroun. *Clinics in Mother and Child Health*, **4**, 233-236.

[13] Nana-Njamen, T., Kasia, J.M., Toukam, M., Medou, A., Messina, R., Enama, B., *et al.* (2006) Coelioscopie pour douleur pelvienne: Résultats d'une série de 40 cas. *Clinics in Mother and Child Health*, **3**, 427-431.

[14] Mcleod, B.S. and Retzloff, M.G. (2010) Epidemiology of Endometriosis: An Assessment of Risk Factors. *Clinical Obstetrics & Gynecology*, **53**, 389-396. https://doi.org/10.1097/grf.0b013e3181db7bde

[15] Bilkissou, M., Ngaha, Y.J., Njalong, O., Humphry, T.N., Kamdem, D., Ngalame, A., *et al.* (2023) L'endométriose chez la femme camerounaise vivant à Douala: Aspects cliniques, paracliniques et thérapeutiques. *Health Sciences and Disease*, **24**, 46-51.

[16] McKee, D.C. and Wasson, M.N. (2021) How Good Is the Surgeon Eye? Evaluating Histopathologic Diagnosis of Endometriosis Compared to Gross Visualization. *Journal of Minimally Invasive Gynecology*, **28**, S109. https://doi.org/10.1016/j.jmig.2021.09.157

[17] Buchweitz, O., Wülfing, P. and Malik, E. (2005) Interobserver Variability in the Diagnosis of Minimal and Mild Endometriosis. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **122**, 213-217. https://doi.org/10.1016/j.ejogrb.2005.02.002

[18] Burghaus, S., Klingsiek, P., Fasching, P., Engel, A., Häberle, L., Strissel, P., *et al.* (2011) Risk Factors for Endometriosis in a German Case-Control Study. *Geburtshilfe und Frauenheilkunde*, **71**, 1073-1079. https://doi.org/10.1055/s-0031-1280436

[19] Sampson, J.A. (1940) The Development of the Implantation Theory for the Origin of Peritoneal Endometriosis. *American Journal of Obstetrics and Gynecology*, **40**, 549-

557. https://doi.org/10.1016/s0002-9378(40)91238-8

[20] Ashrafi, M., Sadatmahalleh, S.J., Akhoond, M.R. and Talebi, M. (2016) Evaluation of Risk Factors Associated with Endometriosis in Infertile Women. *International Journal of Fertility and Sterility*, **10**, 11-21.

[21] Quibel, A. (2012) Prise en charge diagnostique et thérapeutique de l'endométriose par les médecins généralistes de Seine-Maritime. Thesis, Université de Rouen.

[22] Leeners, B., Damaso, F., Ochsenbein-Kölble, N. and Farquhar, C. (2018) The Effect of Pregnancy on Endometriosis—Facts or Fiction? *Human Reproduction Update*, **24**, 290-299. https://doi.org/10.1093/humupd/dmy004

[23] Seli, E., Berkkanoglu, M. and Arici, A. (2003) Pathogenesis of Endometriosis. *Obstetrics and Gynecology Clinics of North America*, **30**, 41-61. https://doi.org/10.1016/s0889-8545(02)00052-9

[24] Kolanska, K., Bendifallah, S., Owen, C., Thomassin-Naggara, I., Bazot, M., d'Argent, E.M., *et al.* (2020) L'endométriose génitale: Épidémiologie et facteurs étiologiques. *Médecine de la Reproduction*, **22**, 111-114.