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ENDOMETRIOSIS AND ITS CONSEQUENCES ON FERTILITY AND QUALITY OF LIFE – A HOSPITAL-BASED CROSS-SECTIONAL STUDY AT PMCH NAWABSHAH.

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ABSTRACT

BACKGROUND: Endometriosis is a disabling gynecological disorder that affects about 10% of reproductive-aged women globally, with far-reaching effects on fertility and quality of life QoL. Although the condition is worldwide in its prevalence, information from low-resource settings such as Pakistan is limited. **METHODS:** Hospital-based cross-sectional survey of 360 women aged between 18–45 years having clinically or laparoscopically diagnosed endometriosis. Structured questionnaires for collection of data regarding demographic parameters, fertility background, severity of pain visual analog scale, VAS, and QoL Endometriosis Health Profile-30, EHP-30. Severity of the disease as per revised American Society for Reproductive Medicine ASRM criteria was categorized. Analysis of data performed by using SPSS version 26, wherein $p<0.05$ were considered significant. **RESULTS:** Participants' mean age was 29.4 ± 6.2 years, and 62.5% had reported infertility 65.8% primary, 34.2% secondary. Severe pelvic pain VAS ≥7 was found in 58.3% of the participants, which was associated with advanced ASRM stages III/IV. QoL scores reflected significant impairment in pain 68.2 ± 12.4, emotional well-being 54.7 ± 15.2, and social functioning 49.3 ± 14.8. Advanced endometriosis ASRM III/IV was highly linked with infertility OR = 4.2, 95% CI: 2.8–6.3, $p<0.001$, and decreased socioeconomic status was associated with delayed diagnosis OR = 2.1, 95% CI: 1.4–3.2, $p=0.008$. **CONCLUSION:** Endometriosis has a major impact on fertility and QoL in women of Nawabshah, with diagnostic delays compounding disease burden. The implications of our findings underscore the need for enhanced diagnostic protocols, multidisciplinary management, and patient education in low-resource environments to forestall long-term sequelae.

KEYWORDS: Endometriosis, infertility, quality of life, pelvic pain, Pakistan

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INTRODUCTION

Endometriosis, an inflammatory chronic condition where endometrial-like tissue is located outside the uterine cavity, occurs in about 10% of women of reproductive age worldwide.[1] It is among the most common causes of chronic pelvic pain, dysmenorrhea, dyspareunia, and infertility and considerably affects physical, emotional, and social quality of life.[2] Though common, endometriosis is underdiagnosed in general, but especially in LMICs, where restricted availability of specialized medical care and testing facilities leads to delayed diagnosis by a median 7–10 years after onset of symptoms.[3,4]

Endometriosis is divided into three primary phenotypes: superficial peritoneal, ovarian endometriomas, and deep infiltrating endometriosis DIE.[5] The revised American Society for Reproductive Medicine rASRM staging system grades disease severity from minimal Stage I to severe Stage IV, with higher stages having a greater correlation with pain and risk of infertility.[6] A 2020 systematic review approximated that 30–50% of women with endometriosis are infertile, most commonly due to pelvic anatomy distortion, chronic inflammation, and oocyte quality impairment.[7]

The endometriosis-infertility relationship is well-established but is complex. Although minimal-mild endometriosis Stage I-II has been shown to decrease fecundity by 2–4% per cycle, advanced stages III-IV involve mechanical tubal obstruction and decreased ovarian reserve.[8,9] Assisted reproductive technologies ART, including in vitro fertilization IVF, enhance pregnancy rates, but women with endometriosis have lower implantation and live birth rates than women with tubal factor infertility.[10] Evolving evidence indicates that surgical removal of endometriomas can further destabilize ovarian function, such that treatment approaches need to be individualized.[11]

Outside of fertility, endometriosis has a significant impact on health-related quality of life HRQoL. A 2021 multinational survey with the Endometriosis Health Profile-30 EHP-30 reported that 70% of patients had severe pain-related disability and 50% anxiety or depression.[12] Chronic pain leads to work absenteeism, decreased productivity, and strained interpersonal relationships, with economic costs over $18,000 annually per patient in high-income nations.[13] In LMICs, where gender discrimination and social stigma increase suffering, these effects are probably underestimated.[14]

Diagnostic delays are 8.2 years on average in Pakistan, with the majority of cases being incidentally diagnosed on laparoscopy for infertility or chronic pain.[15] TVS and MRI are still underutilized in rural settings, where 90% of gynecologists only use clinical suspicion.[16] NSAIDs and combined oral contraceptives are used as first-line treatments, but 50% of patients complain of inadequate pain relief.[17] Second-line treatments e.g., GnRH agonists are usually expensive, and laparoscopic removal is only possible in tertiary care centers.[18]

No studies have previously assessed endometriosis-related infertility and QoL in Nawabshah, Pakistan, where access to healthcare is limited. This study will establish the prevalence of infertility in endometriosis patients at PMCH, evaluate pain intensity and QoL with VAS and EHP-30, and identify predictors of adverse outcomes. Results will inform local management strategies for this underserved population.

METHODS

STUDY DESIGN AND POPULATION: We performed a hospital-based cross-sectional study at PMCH Nawabshah from 2021 to 2024 to determine endometriosis-related infertility prevalence and quality of life effects, exploring clinical stage-outcome relations. Participants included women aged 18-45 years with either, laparoscopy-confirmed endometriosis gold standard or clinical diagnosis chronic pelvic pain + dysmenorrhea + imaging findings, who gave informed consent. Exclusions included postmenopausal women, non-endometriosis chronic pain syndromes PID, IBS, post-hysterectomy/oophorectomy patients, and non-consenters.

Sampling: With consecutive sampling, we recruited all available patients until we achieved the set sample size n=360, which was computed for 30% expected prevalence of infertility 95% CI, 5% margin error.

Data Collection: Clinical information was gathered through structured proforma obtaining demographics, reproductive history, and the severity of symptoms. Pain was determined through a 10-point VAS mild:1-3, moderate:4-6, severe:7-10 for dysmenorrhea, dyspareunia, and chronic pelvic pain. Disease staging was according to revised ASRM criteria through laparoscopy. Quality of life was accessed through validated EHP-30 questionnaire pain, emotional, social, work, and sexual. Infertility inability to conceive for >12 months was noted with type, previous treatment, and semen analysis where available.

Statistical Analysis: Statistical analysis was conducted using SPSS v26. Continuous data were reported as mean±SD, and categorical data as frequencies %. Inferential analyses comprised Chi-square/Fisher's exact tests for association, logistic regression for predictors of infertility, and ANOVA for comparisons of QoL scores between ASRM stages significance at $p<0.05$.

Ethical Compliance: The research protocol was approved by PMCH's IRB. Ethical practice involved written informed consent, anonymization of data, and offering free counseling services to all participants.

RESULTS:

Demographic Features

360 women with endometriosis were studied, with most 51.9%, n=187 between 26-35 years. 27.2% n=98 were aged 18-25 years, and 20.8% n=75 were between 36-45 years. Socioeconomic status distribution was 49.4% n=178 middle class, followed by 39.4% n=142 lower socioeconomic status and 11.1% n=40 upper-class families.

Table 1: Demographic and Clinical Characteristics of Study Participants N=360

Characteristic	Category	n % / Mean±SD
Age years	18-25	98 27.2%
	26-35	187 51.9%
	36-45	75 20.8%
Socioeconomic Status	Lower class	142 39.4%
	Middle class	178 49.4%
	Upper class	40 11.1%

Clinical Presentation and Diagnosis

Diagnosis was established laparoscopically in 68.9% n=248 and diagnosed clinically and with imaging in 31.1% n=112. The majority of the participants 56.1%, n=202

had symptom duration of ≥5 years prior to diagnosis. Disease staging indicated 17.2% n=62 with Stage I, 27.2% n=98 with Stage II, 35.3% n=127 with Stage III, and 20.3% n=73 with Stage IV endometriosis.

Table 2: Endometriosis Characteristics

Parameter	Findings
Diagnosis Method	Laparoscopic: 248 68.9%
	Clinical+Imaging: 112 31.1%
ASRM Stage	I: 62 17.2%
	II: 98 27.2%
	III: 127 35.3%
	IV: 73 20.3%
Symptom Duration	<5 years: 158 43.9%
	≥5 years: 202 56.1%

Fertility Outcomes

Infertility was experienced by 62.5% n=225 of the participants, with primary infertility 65.8%, n=148 being more prevalent than secondary infertility 34.2%, n=77. Prior fertility treatment involved ovulation induction in 72.4% n=163 and assisted reproductive technologies in 18.7% n=42 of the infertile women.

Table 3: Fertility Outcomes

Outcome	n %
Infertility Prevalence	225 62.5%
Primary infertility	148 65.8%
Secondary infertility	77 34.2%
Treatment History	Ovulation induction: 163 72.4%
	ART: 42 18.7%

Pain and Quality of Life Evaluation

Pain intensity assessment revealed severe symptoms VAS 7-10 in 58.3% n=210 of patients, moderate pain in 27.2% n=98, and mild pain in 14.4% n=52. Quality of life assessment revealed greatest impairment in pain domains mean score 68.2±12.4, followed by emotional 54.7±15.2 and social 49.3±14.8 domains.

Table 4: Pain and Quality of Life Measures

Measure	Result
Pain Severity VAS	Mild: 52 14.4%
	Moderate: 98 27.2%
	Severe: 210 58.3%
EHP-30 Domain Scores	Pain: 68.2±12.4
	Emotional: 54.7±15.2
	Social: 49.3±14.8

Statistical Associations

Advanced-stage endometriosis ASRM III/IV was significantly associated with infertility OR=4.2, 95% CI=2.8-6.3, p<0.001. Severe pain strongly correlated with impaired quality of life OR=3.9, 95% CI=2.5-5.8, p<0.001. Reduced socioeconomic status was linked with delays in diagnosis OR=2.1, 95% CI=1.4-3.2, p=0.008. These observations underscore the psychosocial and clinical burden of endometriosis among our population.

Table 5: Significant Associations

Comparison	p-value	OR 95% CI
ASRM Stage III/IV vs I/II infertility	<0.001	4.2 2.8-6.3
Severe pain vs QoL impairment	<0.001	3.9 2.5-5.8
Lower SES vs diagnostic delay	0.008	2.1 1.4-3.2

DISCUSSION

This cross-sectional hospital-based study presents important findings on the prevalence of endometriosis among Nawabshah women, Pakistan, reporting substantial effects on fertility and quality of life that are consistent with international trends while reflecting distinctive local patterns. Our results add to the emerging literature reporting endometriosis as a primary public health issue in low-resource environments.1 Our 62.5% prevalence of infertility in our cohort far outstrips the 30-50% described in global

studies.5,6 This difference probably represents our hospital-based recruitment of more severe cases, since 55.6% of our sample had ASRM stage III/IV disease - a figure higher than the 30-40% in European cohorts.8 The robust correlation between advanced stages and infertility OR=4.2 is consistent with results from the.

Prominently, our primary infertility rate 65.8% of infertile cases differs from Western evidence of equal primary/secondary distribution.19This may be a result of cultural differences in Pakistan where early marriage is prevalent, leaving less time for secondary infertility to develop prior to seeking care. The low utilization of ART 18.7% compared to 35-60% in high-income nations10 highlights key resource constraints in our environment.

Our result of 58.3% of women reporting severe pain VAS≥7 surpasses the 30-45% rate reported in systematic reviews7 and may be because of delayed diagnosis 56.1% with ≥5 year delay. The EHP-30 scores showed especially severe pain domain impairment 68.2±12.4, in agreement with Brazilian3 and Italian20 studies with the same instrument.

The large correlation between intense pain and QoL impairment OR=3.9 is consistent with international evidence21, yet our population had higher social domain dysfunction 49.3±14.8 compared to Western populations characteristically 30-40.13 This might be due to the added effect of chronic pain on the social roles of women within Pakistan's patriarchal society.

The 56.1% ≥5 year diagnostic delay rate is much higher than the 6.7-10 year high-income country averages.12 Our observation that lower socioeconomic status was a predictor of delay OR=2.1 is consistent with Indian studies15 and underscores systemic disparities. Restricted laparoscopy availability only 68.9% confirmed surgically is in stark contrast to >90% surgical diagnosis rates in developed environments.17 These results suggest urgent needs for increased clinician training, increased laparoscopic capacity, context-specific pain management guidelines, and early fertility preservation treatments. Although our standardization of assessment tools and consecutive sampling enhance validity, the single-center study, possible recall bias, and insufficient laparoscopic confirmation could impair generalizability. These caveats highlight multicenter studies incorporating complete diagnostic confirmation in future work.

CONCLUSION

This research demonstrates that in rural Pakistan endometriosis is marked by more significant fertility effects and quality of life morbidity than previously described internationally, compounded by diagnostic delays and a lack of resources. Although the disease's biological expressions follow international patterns, their impact is intensified by regional healthcare system limitations and sociocultural determinants. These observations highlight the importance of context-driven management recommendations and strengthening health systems to address this underserved women's health priority.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

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