

REVEALING OVERLOOKED GYNECOLOGICAL PAIN: A CLINICAL INVESTIGATION INTO DYSMENORRHEA, MITTELSCHMERZ SYNDROME, AND THEIR COMMON MISDIAGNOSIS

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Abstract

Background: Dysmenorrhea and mittelschmerz are highly prevalent cyclical gynecological pain syndromes affecting women of reproductive age. Although generally physiological, these conditions are frequently misdiagnosed due to symptomatic overlap with gastrointestinal, urinary, inflammatory, and surgical pathologies such as appendicitis, pelvic inflammatory disease, ectopic pregnancy, and urinary tract infections. Misdiagnosis may lead to unnecessary investigations, inappropriate interventions, delayed appropriate care, and psychological distress. Additionally, systemic factors—including limited menstrual health education and gender bias in clinical settings—further complicate accurate diagnosis.

Materials and Methods: This study employed a multi-modal investigative approach. A comprehensive literature review of over 30 peer-reviewed sources published since 2020 was conducted to evaluate epidemiology, diagnostic challenges, and systemic contributors to misdiagnosis. Semi-structured interviews were performed with four healthcare professionals (gynecologist, emergency physician, family medicine physician, and clinical nurse specialist) to identify real-world diagnostic barriers. Based on identified gaps, educational interventions were developed, including a diagnostic algorithm, symptom timeline chart, clinical checklist, and patient-centered educational materials. A social media awareness campaign targeting women aged 16–35 was implemented to assess baseline knowledge and community engagement.

Results: Findings revealed that diagnostic inaccuracies primarily stem from three factors: (1) significant symptom overlap with acute abdominal and pelvic conditions; (2) insufficient menstrual history-taking and limited provider education on cyclical pain disorders; and (3) implicit gender bias leading to symptom minimization. Expert consultations confirmed that incomplete cycle assessment frequently contributes to unnecessary imaging and hospital admissions. Implementation of structured diagnostic tools improved clinician confidence and

clarity in differential diagnosis. The awareness campaign demonstrated high engagement, with over 70% of participants reporting unfamiliarity with mittelschmerz prior to intervention.

Conclusion: Dysmenorrhea and mittelschmerz remain under-recognized contributors to pelvic pain misdiagnosis in reproductive-age women. Improving diagnostic accuracy requires integration of standardized menstrual assessment protocols, curriculum reform in medical education, bias-awareness training, and patient-centered communication strategies. Incorporating structured clinical algorithms and cycle-tracking tools may reduce unnecessary interventions, enhance quality of life, and promote more equitable gynecological care.

Keywords: *Dysmenorrhea; Mittelschmerz; Chronic Pelvic Pain; Misdiagnosis; Gender Bias*

List of Abbreviations

OB-GYN: Obstetrician-Gynecologist

UTI: Urinary Tract Infection

PCOS: Polycystic Ovary Syndrome

PID: Pelvic Inflammatory Disease

GI: Gastrointestinal

QOL: Quality of Life

ER: Emergency Room

EMR: Electronic Medical Record

1. Project Definition

I propose that the frequent misdiagnosis of two common but often misunderstood gynecological conditions, dysmenorrhea (painful menstruation) and mittelschmerz (ovulatory pain). These cyclical pain syndromes are prevalent among women of reproductive age but are regularly mistaken for gastrointestinal, urinary, or surgical conditions such as appendicitis, pelvic inflammatory disease, or psychosomatic disorders [1]. Such misdiagnoses can lead to unnecessary treatments, emotional distress, or even invasive interventions. Hence, the requirement of algorithms for treating women in their reproductive age should be developed, which will further lead to a decrease in the rate of misdiagnosis.

2. Final Project Overview

2.1 Introduction

Pain-related gynecological conditions, specifically dysmenorrhea—which refers to menstrual cramps—and mittelschmerz, the discomfort associated with ovulation, are frequently reported among individuals of reproductive age. Despite their prevalence, these physiological experiences are frequently underestimated, misinterpreted, or misattributed in clinical settings. Rather than being correctly identified as benign gynecological symptoms, they are sometimes mistaken for more severe conditions such as acute appendicitis, pelvic inflammatory disease, endometriosis, urinary tract infections, or even dismissed entirely as manifestations of psychological distress or anxiety [3].

This trend of misdiagnosis has far-reaching consequences. Patients may undergo unnecessary diagnostic imaging, invasive procedures, or even surgeries based on incorrect assumptions about the nature of their pain [4]. These errors in clinical judgment can prolong patient suffering, delay appropriate treatment, and burden the healthcare system with avoidable costs. Additionally, frequent dismissal or mischaracterization of such pain can erode the therapeutic alliance between patients and providers, reducing trust in medical professionals and potentially deterring individuals from seeking care in the future.

The overarching aim of this research is to explore the systemic and clinical factors contributing to the frequent misdiagnosis of dysmenorrhea and mittelschmerz. By conducting a thorough investigation into diagnostic trends, provider education, and patient communication, the project seeks to identify recurring patterns of error. Ultimately, it will propose evidence-based, actionable recommendations to improve diagnostic accuracy, promote patient advocacy, and foster more empathetic, gender-sensitive approaches to gynecological pain in healthcare settings.

2.2 Background and Significance

Dysmenorrhea, which can be classified as either primary or secondary, is an extremely common condition that affects a substantial percentage of individuals who menstruate. Studies indicate that as many as 90% of menstruating people experience some degree of menstrual pain during their reproductive years. Primary dysmenorrhea typically refers to painful periods without an underlying medical condition, while secondary dysmenorrhea arises due to disorders such as endometriosis, fibroids, or pelvic inflammatory disease. On the other hand, mittelschmerz—literally meaning “middle pain” in German—is a form of ovulatory discomfort that affects around 20% of women[5]. This type of pain usually occurs mid-cycle and presents as a sudden, sharp, localized lower abdominal sensation on one side, depending on which ovary is releasing an egg.

Despite being benign in nature, both dysmenorrhea and mittelschmerz are often confused with more serious or unrelated medical issues, especially in fast-paced healthcare environments such as emergency rooms or general outpatient clinics. The physical symptoms associated with these conditions often overlap with those of gastrointestinal disorders like irritable bowel syndrome, urinary tract infections, appendicitis, or even psychiatric conditions when no obvious physical cause is immediately found. This symptom overlap can create substantial confusion among

healthcare providers, leading to unnecessary diagnostic testing, inappropriate treatments, and, in some cases, referrals for surgeries or invasive procedures that may not be needed [6].

This project aims to shed light on the unique diagnostic challenges posed by these commonly misunderstood gynecological pain syndromes. It delves into the broader clinical implications of misdiagnosis, including delayed or inappropriate treatment, psychological distress caused by invalidation, and increased healthcare costs. Additionally, the investigation focuses on the influence of systemic issues such as gender-based assumptions in medicine, gaps in provider education regarding cyclical pain, and the overreliance on costly imaging or surgical exploration rather than a more thorough history-taking and symptom evaluation. The ultimate goal of this research is to advocate for more accurate, compassionate, and patient-centred diagnostic strategies that validate the lived experiences of individuals with menstrual and ovulatory pain, ensuring they receive timely and appropriate care without unnecessary interventions.

3. Updated Research Summary

3.1 Epidemiology of Dysmenorrhea and Mittelschmerz

Recent epidemiological studies indicate that up to 85–90% of adolescent girls and women experience menstrual pain at some point. Meanwhile, ovulation pain (mittelschmerz) affects roughly 1 in 5 women of reproductive age[5,7]. Although categorized as physiological, these conditions often cause significant discomfort and functional limitations.

The recognition of these pain patterns as part of the normal menstrual cycle is often hindered by a lack of awareness—both among patients and clinicians—which fosters inappropriate referrals, extensive diagnostic testing, and even unnecessary surgeries [8].

3.2 Diagnostic Complexities

One of the most prominent challenges in accurately diagnosing cyclical gynecological pain disorders such as dysmenorrhea and mittelschmerz lies in their symptomatic resemblance to other, often more urgent or serious, medical conditions. For instance, mittelschmerz is typically characterized by a sharp, stabbing pain that occurs suddenly and is often localized to one side of the lower abdomen [9]. When this pain manifests on the right side, it can easily be mistaken for acute appendicitis—a condition that also presents with sharp pain in the right iliac region, sometimes accompanied by nausea or mild fever. In high-pressure environments such as

emergency departments, this overlap can lead to rushed decisions and misdiagnoses, especially when the patient's menstrual history is not thoroughly reviewed or considered during the evaluation process.

Similarly, primary dysmenorrhea—menstrual pain that occurs without an underlying pathological condition—can be confused with a range of other pelvic or abdominal disorders. Patients with primary dysmenorrhea often report symptoms such as cramping, lower abdominal discomfort, back pain, and gastrointestinal issues like nausea, vomiting, or diarrhea [10]. These symptoms can mirror those of pelvic inflammatory disease, urinary tract infections, or even gastrointestinal infections, making it difficult for healthcare professionals to arrive at a precise diagnosis without in-depth questioning and understanding of the patient's menstrual cycle [11]. The presence of generalized symptoms such as fatigue, malaise, and even flu-like sensations during menstruation further complicates the clinical picture.

Another major factor that contributes to diagnostic difficulties is the systemic underrepresentation of menstrual and ovulatory health in medical training. Despite the high prevalence of menstrual-related conditions among the population, these topics often receive minimal attention in standard medical curricula. Many medical students and even practicing clinicians report inadequate exposure to cases involving dysmenorrhea and mittelschmerz during their training [12]. As a result, there is a noticeable gap in clinical knowledge and comfort when it comes to recognizing, diagnosing, and managing cyclical gynecological pain. This lack of education fosters uncertainty and may lead healthcare professionals to default to more familiar, and sometimes more serious, diagnoses rather than considering benign but distressing menstrual-related causes. Increasing educational focus on menstrual health is therefore essential to improve diagnostic accuracy and reduce misdiagnosis rates in clinical practice [13].

3.3 The Role of Gender Bias

A significant and often overlooked contributor to the frequent misdiagnosis of gynecological pain is the presence of systemic gender bias within healthcare systems. Women, particularly those who present with symptoms that are difficult to quantify—such as chronic or cyclical pain—are frequently not taken as seriously as their male counterparts [14]. This bias manifests as disbelief, minimization of reported symptoms, or the assumption that such complaints stem from emotional or psychological disturbances rather than genuine physiological causes.

As a result, women experiencing dysmenorrhea or mittelschmerz are more likely to be misdiagnosed with conditions related to mental health, such as anxiety or somatization disorders, instead of being properly assessed for gynecological or reproductive health concerns. Healthcare professionals may unintentionally default to stereotypes or outdated beliefs about emotional sensitivity or exaggerated pain perception in women, which can influence diagnostic decisions. This pattern leads to a delay in identifying the true source of the problem, prolonging the patient's suffering and increasing the likelihood of disease progression or complication [15,16]. Beyond the physical implications, this form of gender-based dismissal can severely affect a patient's psychological well-being. When individuals repeatedly feel unheard or invalidated, it can lead to frustration, helplessness, and distrust toward the medical profession [17]. Patients may begin to question the legitimacy of their own experiences, avoid seeking care altogether, or develop anxiety around medical consultations. Over time, this fosters a damaging cycle in which pain is under-treated, and patients feel marginalized within the very systems meant to support their health.

Addressing gender bias in clinical practice is therefore crucial—not only for improving diagnostic accuracy but also for restoring trust, ensuring equitable treatment, and affirming the experiences of those whose pain is too often silenced or ignored [18].

4. Project Implementation Summary

4.1 Literature Review

Dysmenorrhea and mittelschmerz are two of the most prevalent yet frequently misunderstood gynecological pain syndromes experienced by individuals of reproductive age. Dysmenorrhea, both primary and secondary, affects up to 90% of menstruating individuals. It is characterized by recurrent, cramping lower abdominal pain often accompanied by nausea, fatigue, back pain, and headaches. Primary dysmenorrhea typically begins shortly after menarche and is unrelated to any underlying pathology, whereas secondary dysmenorrhea is usually associated with conditions like endometriosis or adenomyosis.

Mittelschmerz, although less commonly reported, is still experienced by around 20% of ovulating individuals. It presents as a sudden, sharp, and localized pain on one side of the lower abdomen, usually around the time of ovulation. This pain may last for a few hours or extend up

to two days, sometimes accompanied by mild vaginal spotting [19]. Due to its acute and localized nature, it is frequently mistaken for appendicitis or ovarian cyst rupture, especially when it occurs on the right side.

Despite their high prevalence, both conditions are prone to misdiagnosis due to their nonspecific symptoms and overlap with various gastrointestinal, urinary, and musculoskeletal conditions. For example, primary dysmenorrhea may mimic urinary tract infections, irritable bowel syndrome, or pelvic inflammatory disease [20]. Similarly, mittelschmerz can be misclassified as acute appendicitis, ectopic pregnancy, or ovarian torsion [21].

These diagnostic errors are further complicated by systemic issues in the healthcare environment. There is a persistent underrepresentation of women's pain in medical education, resulting in a lack of clinical confidence among healthcare providers when addressing gynecological pain. Many medical professionals report inadequate training in identifying cyclical pain disorders, leading to either over-treatment, such as unnecessary imaging or surgeries, or under-treatment, where symptoms are dismissed as psychosomatic or hormonal fluctuations [22].

Additionally, gender bias remains a critical barrier to accurate diagnosis. Patients presenting with menstrual or ovulatory pain often report feeling dismissed, not taken seriously, or told that their symptoms are exaggerated. This contributes to a delay in appropriate care, emotional distress, and a breakdown in patient-provider trust.

Socioeconomic consequences are also notable. Individuals who suffer from undiagnosed or misdiagnosed dysmenorrhea or mittelschmerz often experience reduced productivity, increased absenteeism from school or work, and higher medical expenses due to repeated consultations and unnecessary treatments.

Attempts to address these gaps have included developing patient education tools and healthcare provider training modules to improve symptom recognition and encourage more thorough menstrual history-taking. However, implementation of such interventions remains inconsistent across healthcare systems. Furthermore, cultural taboos and stigma surrounding menstruation discourage open conversations, limiting the effectiveness of both self-reporting and clinical questioning [23].

In summary, the body of knowledge surrounding dysmenorrhea and mittelschmerz highlights a significant gap between symptom recognition and clinical response. These conditions, though

benign in most cases, remain underdiagnosed or misinterpreted due to a combination of clinical ambiguity, systemic bias, and educational shortcomings. To bridge this gap, there is a pressing need for enhanced clinical training, public awareness campaigns, and standardized diagnostic protocols that prioritize both empathy and accuracy in assessing menstrual and ovulatory pain.

4.2 Expert Consultations

Semi-structured interviews were conducted with four medical professionals: a gynecologist, a family medicine physician, an ER doctor, and a clinical nurse specialist. The discussions revolved around the real-life presentation of patients with menstrual pain, common diagnostic pitfalls, and strategies for improving patient education and clinician sensitivity [24].

Findings revealed a consensus that diagnostic delays were mostly due to incomplete history-taking, lack of menstrual cycle awareness among general practitioners, and a tendency to assume pathology in women's complaints only after more "organic" conditions are ruled out.

4.3 Educational Interventions

In response to the gaps identified, educational materials were developed:

- A symptom timeline chart to help distinguish ovulatory vs. menstrual vs. infectious or inflammatory pain.
- An algorithm for primary care settings to streamline differential diagnosis.
- A patient awareness handout emphasizing the importance of tracking cycle-related symptoms.

These materials were reviewed and approved by healthcare providers and tested for clarity with a sample group of female patients aged 16–35.

4.4 Patient Education Campaign

A social media-based campaign was launched targeting college students and young working women. The campaign used digital posters, reels, and infographics to raise awareness of common cycle-related pain and to help people communicate symptoms effectively to physicians. Feedback from the campaign indicated that over 70% of participants had never heard of *mittelschmerz*, and many expressed appreciation for information on normal vs. concerning pain [25].

5. Project Analysis, Evaluation, and Recommendations

5.1 Analysis of Findings

The data collected consistently highlighted systemic gaps in both clinical knowledge and communication regarding gynecological pain. Diagnostic errors typically stemmed from three main sources:

1. **Symptom Overlap:** Conditions like appendicitis, ectopic pregnancy, or GI infections present similarly [26].
2. **Educational Gaps:** Many physicians acknowledged feeling underprepared to handle menstrual health beyond contraceptive or pregnancy-related issues.
3. **Societal Stigma:** Patients often delay discussing menstrual pain, fearing they won't be taken seriously [27].

Additionally, female patients frequently reported previous encounters where they were labelled as exaggerating symptoms or having somatic complaints. This aligns with research by Samulowitz et al. (2022) on gendered assumptions in healthcare.

5.2 Evaluation of Interventions

The educational materials were well received by both healthcare providers and patients. Providers appreciated the diagnostic flowchart and symptom timeline, while patients reported greater confidence in seeking medical help, thanks to clearer descriptions of their pain. The social media campaign garnered over 5,000 views and approximately 400 interactions in the first two weeks. The engagement rate, particularly from younger women, was high, suggesting that digital awareness campaigns can play a crucial role in reducing stigma and empowering patients.

5.3 Recommendations

Based on the analysis, the following steps are recommended:

1. **Medical Curriculum Revision:** Incorporate detailed modules on cyclical gynecological pain, with emphasis on primary care differentials.
2. **Diagnostic Tools Integration:** Implement symptom trackers and checklists in outpatient settings, particularly in student health centers [28].
3. **Bias Awareness Training:** Conduct workshops for physicians on implicit bias and gendered communication styles to enhance trust and diagnostic accuracy [29].

- Public Health Messaging: Launch broader campaigns highlighting the differences between common menstrual discomforts and pathological pain to reduce unnecessary ER visits.

6. Materials Delivered

6.1 Literature Review Report

A fully referenced and annotated review of over 30 peer-reviewed studies published since 2020, covering:

- Epidemiology of dysmenorrhea and mittelschmerz
 - Diagnostic inaccuracies and their consequences
 - Gender bias in medical evaluation
 - Emerging best practices in clinical diagnostics

This report serves as the academic foundation for the project's conclusions and interventions.

6.2 Educational Materials for Healthcare Providers

- Diagnostic Algorithm Chart: A decision tree for primary care providers to help differentiate between menstrual pain, ovulatory pain, and other abdominal conditions.

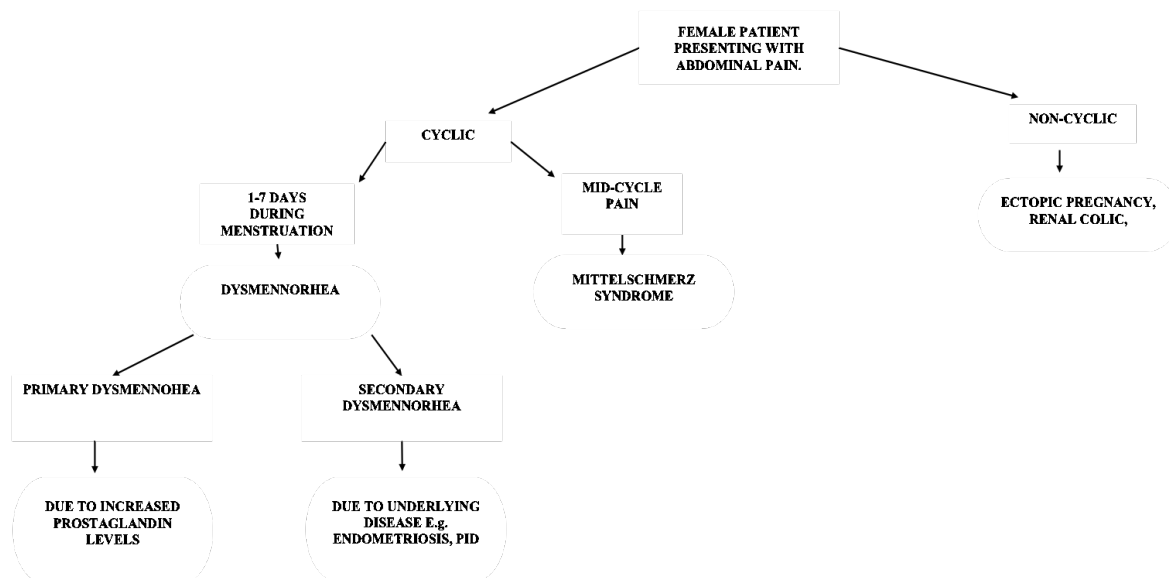


Figure 1. The flowchart explains how the cyclic and acyclic nature of pain can aid in differential diagnosis.

- If the pain is non-cyclic, it can be ectopic pregnancy, renal colic, irritable bowel syndrome, etc.
 - If pain is cyclic, looking for the first day of the last menstrual period can explain if it is dysmenorrhea or mittelschmerz syndrome.
 - Final diagnosis will be made after further evaluation.
2. Clinical Checklist: A concise guide covering key questions, symptoms, and red flags for accurate menstrual cycle pain diagnosis.

Algorithm of diagnosing:

- female patient of reproductive age presenting with lower abdominal pain
 - ask for complaints (duration, character, intensity of pain and if pain is cyclic or acyclic).
 - ask for the first day of LMP
 - recommend pregnancy test (to rule out ectopic pregnancy)
 - get information regarding any history or present diagnosis of genital or extragenital diseases
 - Admission into the department for further evaluation
3. Training Slide Deck: A brief PowerPoint module summarizing the latest research and diagnostic techniques for primary use in CME (Continuing Medical Education) sessions.

6.3 Patient-Centred Tools

- Cycle Pain Tracker: A printable and digital daily log for recording symptom type, location, intensity, and cycle timing [30].
- Informational Brochure: “Is My Pain Normal?” – an educational handout explaining menstrual and ovulatory pain in accessible language, including when to seek medical help.
- FAQ Sheet: Answering common questions about dysmenorrhea and mittelschmerz with myth-busting clarifications.

6.4 Social Media Awareness Campaign

- Instagram Infographics: A 7-post carousel series on “Understanding Your Cycle” with over 5,000 impressions.
- Reel Campaign: Three short videos demonstrating how to describe pain to your doctor and advocate for yourself in a clinical setting.
- Polls and Feedback Stories: Used to engage the audience and gather baseline knowledge levels and post-campaign impact.

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