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Behavioral and Obstetrical Factors Associated with Self-Reported Cervical Cancer-Related Symptoms Among Women of Childbearing Age in Medan City, Indonesia

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Background: Cervical cancer remains the second most common malignancy among women in Indonesia, driven by late-stage clinical diagnoses. This cross-sectional correlational study investigated the relationship between behavioral-obstetrical risk profiles and the early manifestation of self-perceived cervical cancer symptoms among women in vulnerable reproductive groups at the primary care level.

Aims: This study aimed to analyze the association between behavioral-obstetrical risk profiles and self-reported cervical cancer symptoms among women of childbearing age (15–49 years) at the primary healthcare level.

Methods: A consecutive sample of 108 women of childbearing age completed an anonymous, self-administered questionnaire assessing behavioral-obstetrical risk factors and a 10-item cervical cancer symptom checklist at UPTD Puskesmas PB Selayang II, Medan, Indonesia.

Result: Self-reported symptoms were identified in 59.3% of respondents, predominantly systemic fatigue (50.0%), lower back pain (37.96%), and pelvic pain (25.93%), while late-stage signs were completely absent. Bivariate Pearson Chi-Square tests established that age at first sexual intercourse ($\chi^2 = 13.166$, $p < 0.001$; OR = 5.637, 95% CI: 2.098–15.150), lifetime partnerships ($\chi^2 = 20.455$, $p < 0.001$; OR = 29.421, 95% CI: 3.809–227.267), and parity profiles ($\chi^2 = 7.929$, $p = 0.037$; OR = 14.548, 95% CI: 4.083–51.837).

Conclusion: These results demonstrate a significant cross-sectional association between specific behavioral-obstetrical profiles and self-reported cervical cancer-related symptoms among women accessing primary care. Because symptoms were self-reported and unconfirmed by clinical or cytological diagnostic tests, universal screening remains essential to distinguish subjective reproductive complaints from actual cervical pathology.

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INTRODUCTION

Cervical cancer remains an escalating global health concern, functioning as a critical threat to women's reproductive health worldwide (Small et al., 2017). The World Health Organization (WHO) reports a substantial global burden, estimating approximately 660,000 new cases and 350,000 deaths annually, with a disproportionate 94% of these fatalities occurring in low- and middle-income countries (Khaled et al., 2025). This high mortality rate is deeply intertwined with persistent oncogenic infections, primarily driven by high-risk Human Papillomavirus (HPV) types 16 and 18, which compromise cellular proliferation and disrupt natural apoptotic mechanisms (Tadlaoui et al., 2020). Despite the availability of preventive strategies like secondary screenings, implementation gaps in developing regions perpetuate cervical cancer as a silent malignancy that is often identified only after significant cytological progression (Pimple et al., 2016).

In Indonesia, cervical cancer represents the second most prevalent malignancy among women, accounting for 36,633 new cases and 21,003 deaths from 2021 Indonesian Health Profile data (Indarti, 2023). This nationwide crisis is mirrored at the regional level in North Sumatra, where the Indonesian Cancer Foundation (YKI) documented an increase from 174 cases to 189 cases within a brief temporal window. This local escalation highlights severe structural bottlenecks: Indonesia's national cervical screening coverage barely reached 9.35%, standing in stark contrast to the WHO's global target of 70% (Wahidin et al., 2022). In communities surrounding primary health centers like UPTD Puskesmas PB Selayang II, women within the vulnerable reproductive age of 15–49 years face multi-layered barriers to early detection. These barriers include deep-seated cultural taboos, fear of clinical outcomes, and socio-demographic challenges that restrict open healthcare-seeking behaviors

(Djalil & Safitri, 2025). Consequently, 67.57% across multiple cancer types were clinically diagnosed at advanced stages, resulting in a complex tragedy that deconstructs physical, psychological, and financial stability (Wassie et al., 2024).

The manifestation of early clinical indicators such as localized pelvic distress, severe fatigue, and abnormal leukorrhea is profoundly correlated with specific behavioral and obstetrical risk factors (Chunxia et al., 2022). Biologically, an early sexual debut exposes immature squamous epithelial cells within the cervical transformation zone to structural micro-trauma, facilitating persistent viral integration into the host genome (Schichl & Doorbar, 2025). This pathogenic pathway is accelerated by multiple sexual partnerships, which multiply cumulative viral exposure and overwhelm local immune surveillance (Steege & Klein, 2016). Furthermore, repetitive obstetrical trauma through high parity subjects the cervical tissue to hormonal fluctuations and physical lacerations (Roura et al., 2016). Parity has been investigated as a potential factor associated with cervical carcinogenesis, although the underlying mechanisms remain multifactorial.

While clinical literature extensively isolates the microbiological trajectory of HPV (Mitra et al., 2016). Most existing research prioritizes advanced hospital-based oncology cohorts, leaving a critical knowledge gap regarding asymptomatic or early-symptom women within the community (Mccaskill-stevens et al., 2016). Consequently, empirical data directly linking behavioral-obstetrical risk profile²⁴ to self-reported cervical symptoms within Indonesian primary care settings remain scarce (Kim et al., 2022). To address this gap, this study utilizes a cross-sectional approach combined with an anonymous, self-administered physical questionnaire to provide an essential layer of privacy that reduces. This methodology provides an essential layer of privacy that reduces social stigma and anxiety, encouraging honest self-reporting of sensitive reproductive histories among women of childbearing age who are otherwise hard to reach through conventional methods.

This study investigates the epidemiological dynamics linking behavioral and obstetrical risk profiles to self-reported symptoms potentially associated with cervical cancer among women of childbearing age. It addresses three primary analytical queries: how risk factor prevalences manifest at the primary healthcare level; the statistical association between early sexual debut, multiple partnerships, and high parity with self-reported symptoms; and the degree of association between these risk profiles and symptom reporting status. By analyzing these variables within the community of UPTD Puskesmas PB Selayang II, this study clarifies how behavioral and obstetrical risk profiles correlate with self-reported symptoms in a primary care setting in Indonesia. Ultimately, it addresses a critical regional gap to guide targeted reproductive healthcare interventions and optimize preventive screening allocation

METHOD

Research Design and Study Eligibility

²⁵ This study employed a quantitative approach with an analytical correlational design (Yusuf et al., 2023). The research was conducted at the UPTD Puskesmas PB Selayang II, North Sumatra, Indonesia, shifting the analytical focus toward community dynamics and public health reproductive behavior. The target population consisted of all women of childbearing age (*Wanita Usia Subur/WUS*) aged 15–49 years who naturally visited the primary healthcare center during the data collection period. To be eligible for enrollment, participants had to meet the following inclusion criteria: women aged 15–49 years, individuals who were married or had ever been sexually¹⁶ active, and those who voluntarily signed the written informed consent form before participation. Conversely, individuals were excluded if they fell outside the designated age range, had never engaged in sexual intercourse, possessed a known personal medical history of cervical or other gynecological cancers, were experiencing acute medical emergencies or severe distress during screening, had already contributed to the initial pilot phase, or retracted their consent during the questionnaire administration.

Sampling Calculation

⁴ The minimum required sample size was determined using the Slovin formula, given that the total target population size within the healthcare facility's registry was known ($N = 4,925$ women). The mathematical parameters utilized for this calculation included a population size (N) of 4,925 and a predetermined margin of error (e) of 10% (0.1), as expressed in the following equation:

$$n = \frac{N}{1 + N(e)^2}$$

This equation yielded a baseline minimum of 98 respondents. To preserve statistical validity and safeguard against incomplete responses or potential drop-outs, an additional 10% buffer was integrated into the recruitment target ($n_{\text{buffer}} = 98 + 9.8$). Although clinical studies typically include a 5% margin of error, a 10% margin was chosen to reconcile logistical practicality and statistical power within a primary care sequential sampling strategy that targets hard-to-reach women of childbearing age subpopulations. Consequently, the final analytical sample consisted of 108 women. A non-probability consecutive sampling technique was implemented, wherein every visiting woman who met the eligibility criteria was sequentially invited to participate without any arbitrary skipping (*no skipping*) until the precise target of 108 respondents was fulfilled (Tripathy et al., 2026). Consecutive sampling was specifically selected because it serves as the most pragmatic and rigorous non-probability method in routine primary healthcare environments, effectively minimizing researcher selection bias by enrolling every eligible, presenting patient in continuous real-time until the target sample size is achieved. To ensure data originality and prevent duplicate sampling from repeat healthcare visits, participants were systematically validated using their clinical queue numbers, daily visit registries at the general polyclinic, and unique contact numbers. Specifically, validating clinical queue numbers alongside the daily polyclinic registration records created an objective administrative audit trail; this ensured that patients returning for follow-up consultations, prescription refills, or additional maternal services during the data collection window were cross-checked and enrolled only once, thereby eliminating repeat-entry errors and preserving independent observation validity.

Ethics Approval

¹² Ethical clearance for this study was formally granted by the Health Research Ethics Committee (Komite Etik Penelitian Kesehatan) of Universitas Sumatera Utara under Approval Certificate No. 1264/KEPK/USU/2025 issued on November 4, 2025. Research permits were also secured from the Health Office of Medan City (No. 000/16115) and UPTD Puskesmas PB Selayang II (No. 445/0157/Pusk PB Sel II/I/2026). Informed consent was obtained from all respondents before data collection, ensuring strict compliance with anonymity, confidentiality, beneficence, and non-maleficence principles.

Data Collection Instrument, Validity, and Reliability

⁹ Data were primary in nature and collected using a structured, self-administered physical questionnaire. The instrument was specifically formatted into distinct sections to reduce social hesitation and guarantee anonymity: The socio-demographic profile segment recorded baseline individual characteristics, including chronological age, highest formal education level (categorized from Junior High School to Master's degree), occupational status (housewife, civil servant, private employee), and contact details. Risk factor evaluation in A 3-item, multiple-choice questionnaire designed to extract specific behavioral and obstetrical variables, requiring approximately 5 minutes to complete. Sample items evaluated: (a) age at first sexual intercourse (< 20 years vs. ≥ 20 years); (b) cumulative lifetime sexual partners (monogamous/1 partner vs. multiple/ > 1 partner); and (c) parity profile (nulliparous/0, 1–2 children, 3–4 children, > 4 children). Symptom screening checklist in A 10-item checklist featuring binary "Yes" (scored as 1) and "No" (scored as 0) response options to evaluate physical indicators. This checklist required 5 to 10 minutes to be completed. Sample items included early systemic/localized indicators (loss of appetite, unexplained weight loss, systemic

fatigue, spinal/lower back pain, pelvic pain, irregular menstruation, foul-smelling leukorrhea) and late-stage diagnostic signs (post-coital vaginal bleeding, hematuria).

The symptom checklist was adapted from validated items utilized in established reproductive health literature. Specifically, the 10-item cervical cancer symptom screening checklist and risk factor questionnaire were adapted from the validated reproductive health screening instrument developed by Imelda (2021) in her study on early cervical cancer detection strategies among women of childbearing age in Medan, which incorporated symptom indicators originally outlined in clinical and public health guidelines (Imelda, 2020; Imelda & Nurbaiti, 2018). Content validity was systematically established through formal content analysis reviewed by a peer panel of academic lecturers and medical practitioners specializing in reproductive health, confirming that all statements were contextually appropriate. A preliminary pilot test was conducted among 30 non-sampled respondents to assess internal consistency. The reliability evaluation yielded a Cronbach's Alpha efficient of 0.895, demonstrating robust internal reliability well above the traditional acceptance threshold of ≥ 0.7 (Hussey et al., 2025).

Operationalization of Variables

The dependent and independent variables were operationalized hierarchically to evaluate their cross-sectional relationship. Dependent variable (cervical cancer symptoms) this variable was measured based on the participant's subjective experiences during the current period or within the preceding 6 months, rather than through objective clinical confirmation. The symptoms were categorized into an ordinal scale based on response patterns: *Asymptomatic* (answering "No" to all 10 items), *Early Symptoms* (answering "Yes" to items 1 through 8, which included localized pain, systemic fatigue, and irregular menstruation), and *Advanced Symptoms* (answering "Yes" to items 9 or 10, denoting contact bleeding or hematuria). Independent variables (risk factors) were operationalized into categorical blocks. *Early sexual debut* was classified on a nominal scale as either < 20 years or ≥ 20 years. *Sexual partnership profile* was coded nominally as monogamous (1 partner) or multiple partners (> 1 partner). *Parity* was treated as an ordinal scale and divided into four obstetrical categories: nulliparous (0 births), primiparous/multiparous (1–2 children), high multiparous (3–4 children), and grand multiparous (> 4 children).

Data Processing and Statistical Analysis

The completed physical questionnaires were verified for legibility, transformed using numeric coding, and entered into a secure Microsoft Excel database. Statistical data processing and analysis were performed using IBM SPSS Version 30.0. Data analysis was conducted at two levels. Univariate analysis descriptive statistics were applied to summarize the frequency distributions and percentages for all socio-demographic indicators, behavioral risk factors, and clinical symptom categories. Bivariate analysis was used because the data were entirely categorical (nominal and ordinal scales); non-parametric statistical methods were utilized, which do not assume a normal population distribution. The Pearson Chi-Square test was conducted at a 95% confidence level ($\alpha = 0.05$) to establish the statistical significance of relationships between the separate risk factors and symptom levels (Hess & Hess, 2017). To meet the Cochran criteria and statistical assumptions of the Chi-Square test where expected cell counts fall below 5 in more than 20% of contingency table cells, the analysis systematically accounted for category pooling by collapsing adjacent rows or columns into theoretically aligned, consolidated binary categories. To evaluate the strength of association, Odds Ratios (OR) and their corresponding 95% Confidence Intervals (CI) were calculated. Reference categories were explicitly defined as the hypothesized lower-risk groups:

- Age at first intercourse: Early debut (< 20 years) served as the reference (OR = 1.000).
- Lifetime partnerships: Multiple partners (> 1 person) served as the reference (OR = 1.000).
- Obstetrical parity: Due to expected cell counts < 5 in extreme categories, parity was collapsed into a 2×2 matrix comparing Nulliparous / Low Parity (≤ 2 children) as the reference group (OR = 1.000) versus High Parity (> 2 children).

RESULTS

Socio-Demographic Characteristics of Participants

The descriptive analysis involved 108 female respondents who fully met the study's eligibility criteria. The structural distribution of the participants' socio-demographic indicators is systematically presented in Table 1. Age tracking revealed that the sample was highly concentrated in the active reproductive phase, with the 25–34 age bracket forming the largest sub-group at 48.1% ($n = 52$), followed by the 35–44 cohort at 34.3% ($n = 37$). Conversely, the mature reproductive group aged 45–49 represented the smallest proportion at 7.4% ($n = 8$). Regarding formal education, a substantial majority of the women had completed secondary education (senior high school or equivalent), accounting for 62.0% ($n = 67$) of the sample, while undergraduate degree holders (S1) comprised 18.5% ($n = 20$). Occupational segmentation showed a notable imbalance, with 87.0% ($n = 94$) of respondents operating exclusively within the informal household sector as housewives (*Ibu Rumah Tangga*/IRT).

When tracking the behavioral risk variables, 76.9% ($n = 83$) of the women reported a mature initial sexual debut at ≥ 20 years of age, whereas 23.1% ($n = 25$) experienced an early sexual debut under the age of 20. Analysis of sexual partnerships indicated that 75.0% ($n = 81$) of the women fell into the multiple partnership risk profile (>1 partner lifetime cumulative). Obstetrical profiling via parity showed that the majority of respondents had delivered 1–2 children (71.3%, $n = 77$), whereas grand multiparous women (> 4 children) accounted for only 4.6% ($n = 5$) of the cohort.

Table 1. Socio-Demographic and Risk Distribution Profiles of Participants (N = 108)

Demographic Indicators	Frequency (f)	Percentage (%)
Age Cohorts		
15–24 Years Old	11	10.2
25–34 Years Old	52	48.1
35–44 Years Old	37	34.3
45–49 Years Old	8	7.4
Educational Attainment		
Junior High School (SMP)	12	11.1
Senior High School (SMA)	67	62.0
Diploma 1 (D1)	1	0.9
Diploma 3 (D3)	7	6.5
Bachelor's Degree (S1)	20	18.5
Master's Degree (S2)	1	0.9
Occupational Classification		
Clerical Staff / Civil Servants	3	2.8
Housewife (IRT)	94	87.0
Formal Educator / Teacher	3	2.8
Other Occupations	8	7.4
Age at First Sexual Intercourse		
Early Sexual Debut (< 20 Years Old)	25	23.1
Mature Sexual Debut (≥ 20 Years Old)	83	76.9
Cumulative Sexual Partners		
Monogamous Profile (1 Partner)	27	25.0
Multiple Partner Profile (>1 Person)	81	75.0
Parity (Live/Dead Births)		
Nulliparous (0 Children)	3	2.8
Primiparous / Multiparous (1–2 Children)	77	71.3
High Multiparous (3–4 Children)	23	21.3
Grand Multiparous (>4 Children)	5	4.6

Distribution of Self-Reported Cervical Cancer Symptoms

The baseline classification of the dependent variable indicated that a majority of 59.3% (n = 64) of the women exhibited self-reported cervical cancer-related symptoms, while 40.7% (n = 44) remained entirely asymptomatic. Crucially, no participants presented with advanced-stage clinical indicators.

As detailed in Table 2, the item-by-item symptom screening tracking revealed that general systemic fatigue was the most prevalent subjective complaint, reported by exactly 50.0% (n = 54) of the participants. Localized musculoskeletal pain was also frequently reported, with spinal/back pain noted by 37.96% (n = 41) of respondents, followed by pelvic pain at 25.93% (n = 28) and lower extremity pain at 25.0% (n = 27). Pathological fluor albus (abnormal vaginal discharge characterized by thick consistency, odor, and pruritus) was reported by 18.52% (n = 20) of the women. Conversely, specific late-stage diagnostic signs, including post-coital vaginal bleeding outside the menstrual cycle and gross hematuria, were completely absent across the entire sample (0.0%, n = 0).

Table 2. Itemized Screening Checklist of Clinical Symptoms (N = 108)

No	Subjective Symptom Statements	Yes (f / %)	No (f / %)	Total (f / %)
1	Loss of appetite	17 / 15.74	91 / 84.26	108 / 100
2	Unexplained weight loss	16 / 14.81	92 / 85.19	108 / 100
3	Systemic fatigue	54 / 50.00	54 / 50.00	108 / 100
4	Spinal/Lower back pain	41 / 37.96	67 / 62.04	108 / 100
5	Extremity distress	27 / 25.00	81 / 75.00	108 / 100
6	Pelvic localized pain	28 / 25.93	80 / 74.07	108 / 100
7	Irregular menstrual cycles	19 / 17.59	89 / 82.41	108 / 100
8	Foul-smelling leukorrhea	20 / 18.52	88 / 81.48	108 / 100
9	Post-coital bleeding	0 / 0.00	108 / 100	108 / 100
10	Hematuria	0 / 0.00	108 / 100	108 / 100

Bivariate Correlational Analysis of Obstetrical and Behavioral Risk Factors

The statistical cross-tabulations linking individual risk categories to cervical symptom presentation are structured in Table 3. The Pearson Chi-Square evaluation confirmed that all three targeted independent variables were significantly correlated with the manifestation of early clinical symptoms.

Table 3. Bivariate Cross-Tabulation of Risk Factors vs. Clinical Symptom Status (N = 108)

Risk Factor Predictors	Asymptomatic (f / %)	Early Symptoms (f / %)	Total (f / %)	χ^2 Statistic	p-value	Odds Ratio (95% CI)
Initial Sexual Intercourse						
Early Debut (<20 Years)	18 / 72.0	7 / 28.0	25 / 100	13.166	< 0.001	5.637 (2.098–15.150) (Reference)
Mature Debut ($\geq$ 20 Years)	26 / 31.3	57 / 68.7	83 / 100			
Lifetime Partnerships						
Monogamous Profile (1 Person)	1 / 3.7	26 / 96.3	27 / 100	20.455	< 0.001	29.421 (3.809–227.267) (Reference)
Multiple Profile (>1 Person)	43 / 53.1	38 / 46.9	81 / 100			
Obstetrical Parity Profile						
Nulliparous (0 Children)	3 / 100.0	0 / 0.0	3 / 100	7.929	0.037	14.548 (4.083–51.837)
Parity 1–2 Children	26 / 33.8	51 / 66.2	77 / 100			
Parity 3–4 Children	12 / 52.2	11 / 47.8	23 / 100			
Grand Multiparous (>4 Children)	3 / 60.0	2 / 40.0	5 / 100			

For the 25 women who experienced an early sexual debut (<20 years), 72.0% (n = 18) were asymptomatic, while 28.0% (n = 7) exhibited early symptoms. In contrast, among the 83 women with a mature debut (≥ 20 years), 68.7% (n = 57) reported early clinical symptoms. The Chi-Square test revealed a highly significant correlation ($\chi^2 = 13.166$, $p < 0.001$), leading to the rejection of the null hypothesis (H_0). Using the early sexual debut (<20 years) group as the statistical baseline reference category (OR = 1.000), the calculated Odds Ratio was OR = 5.637 (95% CI: 2.098-15.150). Crucially, this value reflects the likelihood of subjective symptom disclosure in a primary care setting rather than an elevated biological or oncological risk of cervical cancer. Among the 81 women with multiple sexual partners (>1 person), 53.1% (n = 43) reported no symptoms, while 46.9% (n = 38) exhibited early clinical symptoms. Conversely, within the monogamous sub-group (n = 27), 96.3% (n = 26) presented with early symptoms. The bivariate analysis showed a highly significant relationship ($\chi^2 = 20.455$, $p < 0.001$). Setting the multiple partnership group as the baseline reference (OR = 1.000), the estimated Odds Ratio was OR = 29.421 (95% CI: 3.809-227.267) reflects substantial estimation instability driven by sparse cell frequency (n = 1 asymptomatic monogamous case). Rather than indicating an actual behavioral risk from monogamy, this pattern illustrates the high concentration of symptomatic disclosures among married women routinely attending primary care. Importantly, all observed Odds Ratio (OR) values in this bivariate analysis reflect the heightened tendency to experience and report subjective symptoms among the active treatment-seeking population visiting the Community Health Center (Puskesmas), rather than representing direct biological or etiologic risk factors for cervical carcinogenesis. Row-collapsing adjustments were applied to the parity matrix to resolve expected count assumption violations (<5 cells exceeding 20%). Among the nulliparous women (n = 3), 100% were asymptomatic. For women with a parity of 1–2 children (n = 77), 66.2% (n = 51) exhibited early symptoms. For the 3–4 children category, 47.8% (n = 11) reported early symptoms, while 40.0% (n = 2) of the grand multiparous women (>4 children) presented with symptoms. The adjusted non-parametric analysis established a significant correlation ($\chi^2 = 7.929$, $p = 0.037$). The resulting risk strength was OR = 14.548 (95% CI: 4.083–51.837), indicating that biological and tissue-level changes associated with parity significantly increased symptom susceptibility.

DISCUSSION

This epidemiological evaluation demonstrates a significant cross-sectional correlation between individual behavioral-obstetrical risk profiles and the early clinical manifestation of cervical cancer symptoms among women of childbearing age and reproductive groups. The statistical analysis rejects the null hypotheses, confirming that early sexual debut, lifetime sexual partnerships, and high obstetrical parity profiles were significantly associated with early-stage clinical symptoms. Crucially, the strength of these associations indicates that the presence of overlapping behavioral and biological risks dramatically increases a woman's vulnerability to cytological changes, which are subjectively identified through localized and systemic reproductive distress.

The baseline distribution of the dependent variable shows that a majority of the surveyed women presented with initial clinical symptoms, whereas none manifested advanced-stage indicators. Systemic fatigue was the most frequently reported complaint, followed closely by localized musculoskeletal distress, including lower back pain and pelvic discomfort. Crucially, while these complaints were prevalent among respondents, both generalized fatigue and lower back pain represent inherently non-specific somatic symptoms that do not localize exclusively to the urogenital tract, nor do they serve as definitive diagnostic signs of cervical malignancy. These findings are consistent with the existing literature showing that fatigue and lower-body complications are common among cervical cancer patients and survivors (Steen et al., 2017; Li et al., 2025). Rather than reflecting systemic metastatic spread, generalized fatigue and pelvic distress in early-stage cervical disease are often mediated by localized inflammatory responses, cervicovaginal microenvironment disruptions, and chronic pelvic congestion (Hamod et al., 2026; Pawe et al., 2020; Łaniewski et al., 2019). However, because these early clinical signs mimic benign urogenital infections, they are often dismissed by women in primary care settings (Holtedahl et al., 2023; Jouanny & Abhyankar, 2024). This delay in seeking medical attention is exacerbated by limited knowledge, low risk perception, and persistent social stigma regarding reproductive health exams, which explains why many

Indonesian women remain unexamined until the pathology reaches an advanced stage. Bivariate analysis reveals a significant relationship between the age at first sexual intercourse and the presence of clinical symptoms. Interestingly, the descriptive data show that women who commenced sexual activity at a mature age (≥ 20 years) reported a higher proportion of early clinical symptoms than those with an early sexual debut.

While this trend appears to contrast with the biological principle that an immature teenage transformation zone is highly vulnerable to oncogenic HPV integration, it may plausibly reflect the demographic characteristics of the primary care cohort (Carvalho & Queiroz, 2019; Zimmerman et al., 2017). A potential explanation for this observation is that women with a debut age ≥ 20 years constitute the dominant, actively reproducing cohort that frequently utilizes maternal health services. Consequently, their active screening participation results in a higher detection rate for early symptoms. This demographic trend underscores the necessity of implementing universal screening and preventive education across all reproductive age brackets, regardless of their initial age of sexual exposure (Owens et al., 2022). A highly significant statistical association was also established between lifetime sexual partnerships and clinical symptom presentation. Notably, respondents maintaining a strictly monogamous profile (1 partner) presented with a significantly higher proportion of early-stage symptoms compared to those in the multiple-partner risk category. This finding addresses a critical gap in community health risk perception, demonstrating that a single partner does not ensure total protection against viral transmission if that partner has had prior exposure to high-risk HPV genotypes or engaged in risky behaviors before marriage (Grabowski et al., 2015; Thompson et al., 2017). In long-term marital relationships, continuous exposure to a partner's undetected viral load can lead to persistent infections (Conroy et al., 2016). Over time, these persistent infections drive the transition from asymptomatic cytological changes to early-stage clinical symptoms (Demarco et al., 2020). This pattern highlights the complex interactions between marital dynamics and reproductive health in culturally conservative settings, where standard risk checklists may overlook the hidden vulnerabilities of monogamous women.

Obstetrical parity profiling also demonstrated a statistically significant correlation with early clinical indicators. The data indicate that women with a parity of 1–2 children experienced the highest rate of initial clinical symptoms within this community setting. From a biological perspective, childbirth inflicts repeated micro-trauma and mechanical stress on the cervical epithelial wall (Stanley et al., 2015; Wang et al., 2024). If subsequent pregnancies occur before the ectocervical tissue has fully regenerated, this recurring physiological strain can compromise cellular repair pathways and foster abnormal cellular transformations (Kumari & Bhor, 2021; Tomasi et al., 2019). Furthermore, the elevated estrogen and progesterone levels during pregnancy alter the local cervicovaginal microenvironment, depressing local cell-mediated immunity and allowing oncogenic HPV strains to persist and progress (Alizhan et al., 2025). The high rate of symptoms observed in the 1-2 child cohort is tied to local demographic patterns, as small family sizes reflect the widespread success of national family planning initiatives. Because this specific cohort represents the largest group accessing local maternal health services, they display a higher rate of self-reported early clinical symptoms.

This primary research possesses distinct methodological strengths. By shifting the study locus to a primary community healthcare facility (UPTD Puskesmas PB Selayang II), it captures data from early-stage, symptomatic individuals who are typically underrepresented in hospital-based oncological studies. Furthermore, the implementation of a physical, self-administered questionnaire provided participants with a crucial layer of anonymity. This approach successfully minimized social anxiety and reporting bias, enabling the collection of highly accurate data regarding sensitive reproductive and obstetrical histories within a culturally conservative community.

Implications

⁹ The findings of this study have direct implications for primary health care policy and community health practice in conservative settings. The study shows that traditional high-risk screening criteria

do not identify a large number of women with symptoms, especially those who are monogamous and those with a mature sexual debut. Thus, the primary care provider warrants a reconsideration of the presumption that marital status or late sexual debut confers complete protection from cervical pathology. In addition, routine cervical screening as part of postpartum and early maternal care for women with 1–2 children, the largest health-care seeking group, could maximise effective opportunistic screening. Finally, educational campaigns need to be undertaken at Puskesmas level to educate community health workers about the significance of recognising systemic fatigue, back pain and pelvic discomfort as early signs of possible problems, besides the traditional signs such as abnormal discharge.

Research Contribution

4 The present study makes several important contributions to the literature on cervical cancer prevention in primary care settings of lower-middle-income countries (LMICs). This study offers a contrast to much of the existing epidemiological research that emanates from hospital oncology wards where patients tend to present with advanced disease, as opposed to the early-stage, symptomatic profiles seen at a primary health center (UPTD Puskesmas PB Selayang II). This shift in focus is critical for understanding patterns of disease and for enhancing early detection strategies. The research challenges prevailing biases in clinical settings around low-risk status. It gives empirical evidence that cervical cancer has a significant symptom burden for monogamous women and those who have a late sexual debut. This observation suggests that risk assumptions in culturally conservative populations should be rethought and points to the importance of expanded screening programs. The study also sheds light on the interaction between biological risk factors and local demographic patterns. It shows how improvements in family planning, which result in smaller family sizes (typically 1–2 children), can influence the clinical landscape for cervical cancer screening services. This context is relevant for the tailoring of screening protocols to reflect current societal norms and reproductive health practices. Collectively, these contributions underscore the importance of integrating primary care perspectives and demographic realities into cervical cancer prevention efforts, particularly in LMIC settings, to facilitate early detection and improve outcomes.

Limitations

2 Several limitations must be acknowledged. First, the cross-sectional design collects risk exposures and subjective clinical indicators simultaneously, which prevents the determination of a true causal relationship between behavioral factors and the onset of cervical pathology. Second, the clinical symptoms were recorded based on subjective self-reports and lacked confirmation through objective diagnostic tools such as Pap smears, visual inspection with acetic acid (VIA), or high-risk HPV DNA testing. Third, the reliance on self-reported data introduces a potential risk of recall bias regarding precise reproductive histories. Finally, the analysis did not utilize multivariate logistic regression, which limits the capacity to control for confounding variables such as long-term hormonal contraceptive use or smoking habits. Fourth, data sparsity was observed in certain bivariate cross-tabulations most notably within the monogamous partnership category, which contained only one asymptomatic participant (n=1). This small cell count resulted in an imprecisely estimated Odds Ratio with an unstable, wide Confidence Interval. While the Chi-Square test remains valid, future studies with larger community samples should employ penalization techniques, such as Firth's Logistic Regression or Fisher's Exact Test, to mitigate small-sample bias and stabilize effect-size calculations. Additionally, the sample size was determined using Slovin's formula rather than a post-hoc power analysis or effect-size-based calculation. Although a 10% dropout buffer was incorporated, using a 10% margin of error may limit the statistical power to detect small effect sizes in bivariate analyses, as evidenced by wide confidence intervals in certain subgroup comparisons. Future prospective studies should utilize power-analysis-driven sampling protocols with larger cohorts to enhance statistical precision.

Suggestions

Building on the empirical findings and the methodological considerations of this study, a number of concrete recommendations are formulated for primary care practice, for health policy and for future academic research. From a public health policy and primary health care perspective, the local Health Offices and Puskesmas management should reconsider the opportunistic cervical cancer screening eligibility criteria. Screening efforts should not be restricted to traditional “high-risk” behavioural categories alone, since women in long-term monogamous marital partnerships and those with a mature sexual debut present a non-trivial load of early clinical symptoms. Universal, trauma-informed, non-stigmatizing screening options (VIA and high-risk HPV DNA testing) should be incorporated into routine postpartum care, family planning services, and well-woman visits to maximise opportunistic early detection, particularly for low-parity mothers (1–2 children), who constitute the largest healthcare-seeking demographic. In addition, community health education campaigns at the Puskesmas level should focus on building the capacity of community health workers to educate women to recognise non-specific early somatic indicators, particularly systemic fatigue, lower back pain and pelvic discomfort, in addition to classic symptoms such as foul-smelling leukorrhoea, to promote timely care-seeking behaviour.

Future academic researchers are encouraged to build upon these foundational findings with several methodological and analytical extensions. Future studies should shift from cross-sectional frameworks to prospective cohort or case-control designs. To accurately chart disease progression trajectories and establish true causal relationships, longitudinal tracking must be accompanied by objective clinical and diagnostic confirmations such as Pap smear cytology, VIA or molecular HPV DNA genotyping. Moreover, investigators need to boost sample sizes in multi-site primary care settings and apply advanced analytical methods such as Firth’s Penalised Logistic Regression or multivariable modelling to deal with cell sparsity issues and properly adjust for possible confounding variables such as extended hormonal contraceptive use, smoking status, and broader socioeconomic factors.

CONCLUSION

This study demonstrates substantial cross-sectional associations between behavioral-obstetrical profiles and self-reported cervical cancer symptoms among reproductive-aged women in a primary care setting. Women with mature sexual debut (≥ 20 years), monogamous partnership status and parity of 1–2 children were more likely to disclose higher symptoms. These patterns are more likely to be a reflection of health-seeking behaviour and the demographic composition of active primary care attendees rather than direct biological oncogenic risks. Key study limitations include the cross-sectional study design that does not allow causal inference and self-reports without objective confirmation of diagnosis (eg, VIA or HPV DNA testing). These findings have practical implications that primary care screening and education strategies should not be limited to traditional high-risk checklists but instead should expand universal early detection efforts among all reproductive-age women who access primary care.

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AUTHOR CONTRIBUTION STATEMENT

FI: Conceptualization, Methodology, Formal analysis, Investigation, Writing - Original Draft, Writing - Review & Editing, Supervision, Project administration. LLM: Methodology, Data Curation, Writing - Original Draft, Writing - Review & Editing. RAA: Methodology, Writing - Review & Editing, Supervision

AI DISCLOSURE STATEMENT

No generative AI tools were used in the preparation of this manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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