

Barriers to Cervical Screening in Low Income Population in Peri Menopausal Women

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Abstract

Background: Cervical cancer remains a major health concern among low-income women, especially in the perimenopausal age group, due to poor screening uptake.

Method: A cross-sectional study was conducted among 150 low-income women aged 40–49 years using a structured questionnaire.

Results: Only 27.3% had undergone cervical screening. Awareness was limited, and barriers included low education, fear, and cultural beliefs, though none were statistically significant.

Conclusion: Multifactorial barriers hinder screening. Targeted education and improved access are essential.

Keywords: Cervical cancer, Screening barriers, Low-income women, Perimenopause, Pap smear

INTRODUCTION

Cervical cancer is one of the leading causes of cancer-related deaths among women worldwide, particularly in low- and middle-income countries (LMICs) where healthcare resources and access to preventive services are limited. In India, it is the second most common cancer among women, with an incidence rate of 18.3% [1]. The availability of effective screening methods such as the Papanicolaou (Pap) smear and Human Papillomavirus (HPV) testing has significantly reduced cervical cancer incidence and mortality in high-resource settings. However, these benefits have not been uniformly realized in low-income populations, especially among perimenopausal women, due to a multitude of persistent barriers [2].

Cervical screening plays a critical role in early detection of precancerous changes and cervical malignancies, enabling timely and potentially life-saving treatment. Despite the importance of early screening, uptake among low-income women remains suboptimal. Numerous studies have pointed to a complex interplay of socioeconomic, cultural, psychological, and healthcare system-related factors that hinder access to and utilization of cervical screening services [3,4]. Financial burdens, lack of awareness, cultural taboos, fear of diagnosis, and mistrust in the healthcare system are all prominent challenges that contribute to this gap [5].

Women from socioeconomically disadvantaged backgrounds are often more vulnerable due to limited education, restricted autonomy in healthcare decision-making, and logistical difficulties such as transportation or time off work [6]. Additionally, myths surrounding the Pap smear, stigma associated with reproductive health, and embarrassment about the procedure act as significant deterrents to participation [7]. In rural and underserved urban areas, structural limitations such as scarcity of trained personnel, lack of organized screening programs, and inadequate health communication strategies further aggravate the problem [8].

Understanding these barriers is essential for designing targeted and context-sensitive interventions aimed at increasing screening participation among low-income and perimenopausal women. Such efforts could play a pivotal role in reducing the burden of cervical cancer through early diagnosis and treatment. This study aims to identify and analyze the key barriers faced by women in low-income communities in accessing cervical cancer screening services, thereby contributing to evidence-based policy formulation and healthcare planning that is inclusive, equitable, and effective [9].

Aim of the Study:

To identify and analyze the barriers that prevent women from low-income populations in the perimenopausal age group from accessing cervical cancer screening services.

MATERIALS AND METHODS

Study Design

This study was designed as a descriptive, cross-sectional, questionnaire-based observational survey aimed at identifying the barriers that prevent perimenopausal women from low-income populations from

participating in cervical cancer screening. The research employed both quantitative and qualitative elements to gather comprehensive information on sociocultural, economic, psychological, and healthcare-related obstacles influencing screening behaviors. The cross-sectional nature of the study enabled the collection of data at a single point in time, ensuring an efficient assessment of prevalent trends, attitudes, and behaviors in the target population.

Study Setting

The study was conducted in the Department of Obstetrics and Gynaecology at Sree Balaji Medical College and Hospital, Bharath University, Chennai, Tamil Nadu, India. The institution is a tertiary care teaching hospital catering to a wide demographic of urban and semi-urban populations, including a significant proportion of individuals from economically disadvantaged backgrounds. The study site was selected due to its accessibility to a representative sample of low-income women, many of whom seek routine obstetric and gynecological care at the institution.

Study Population

The target population included perimenopausal women aged between 40 and 49 years who belonged to low-income socioeconomic groups as determined by the Modified Kuppaswamy Socioeconomic Scale. The participants were selected from women attending outpatient services in the Obstetrics and Gynaecology department, who met the inclusion criteria and consented to participate in the study.

Inclusion Criteria

Women aged between 40 and 49 years (perimenopausal age group).

Belonging to low socioeconomic status as per the Modified Kuppaswamy Scale.

Willingness to provide informed consent.

Ability to understand and complete the questionnaire (either independently or with assistance).

Exclusion Criteria

Women who were pregnant at the time of the study.

Women in the reproductive age group (below 40 years) or postmenopausal (above 49 years).

Women from middle or high-income backgrounds.

Women with a history of cervical cancer or those currently undergoing treatment for any malignancy.

Sample Size Estimation

The sample size was calculated using the standard formula for cross-sectional studies:

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{E^2}$$

Where:

n = required sample size

Z = Z-value (1.96 for a 95% confidence level)

p = estimated proportion of the population (assumed to be 0.5 for maximum variability)

E = margin of error (set at 8%)

Based on this formula and a target population of 150 eligible women within the institution, the minimum required sample size was calculated to be 92. However, to enhance the reliability of the findings and account for non-responses or incomplete forms, the study included a total of 150 participants.

Sampling Technique

A non-probability convenience sampling technique was used. Eligible participants visiting the outpatient department during the data collection period were approached and invited to participate in the study. After verifying eligibility and obtaining written informed consent, the women were enrolled in the study.

Study Duration

The study was conducted over a period of three months, from March 2025 to May 2025. This period allowed adequate time for recruitment, administration of the questionnaire, data collection, and preliminary analysis.

Study Tools

The primary tool for data collection was a **pre-designed, structured, self-administered questionnaire**, which was made available in both English and Tamil languages to ensure comprehensibility. For illiterate participants, the questions were read aloud and explained in the local language by trained interviewers to assist in completion. The questionnaire included both closed and open-ended questions to capture detailed responses.

The questionnaire was divided into the following sections:

Demographic Information: Included age, BMI, religion, education level, occupation, monthly income, type of family, place of residence (urban/rural), and parity.

Knowledge and Awareness: Assessed participants' awareness of cervical cancer, knowledge about Pap smear, frequency of recommended screening, and sources of information.

Cultural and Social Barriers: Explored beliefs about health discussions within the family, perceived support from family members for screening, presence of cultural taboos, and previous exposure to cancer awareness campaigns.

Healthcare Provider-Related Barriers: Assessed comfort level with healthcare providers, gender preference of provider, and prior negative experiences with medical professionals.

Psychological and Logistical Barriers: Evaluated fear of the test, concerns about pain or embarrassment, anxiety about test results, health conditions preventing screening, and challenges related to taking time off work.

The questionnaire was validated for content and face validity through consultation with three experts in obstetrics, community medicine, and public health. A pilot study involving 10 participants was conducted to refine the wording and flow of questions.

Data Collection Procedure

After obtaining ethical clearance from the Institutional Ethics Committee, eligible participants were recruited. The purpose and significance of the study were explained to each participant, and confidentiality of the data was assured. Written informed consent was obtained prior to the administration of the questionnaire. Participants were given adequate time to read and complete the form. Assistance was provided to those who required help in understanding or filling out the form.

Each interview or form completion took approximately 20–30 minutes. Data were collected and monitored on a daily basis by the principal investigator to ensure completeness and accuracy.

Data Management and Statistical Analysis

All completed questionnaires were coded and entered into Microsoft Excel sheets. Data cleaning was performed to remove duplicate or incomplete entries. Statistical analysis was carried out using SPSS version 25.0.

Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize continuous and categorical variables. **Chi-square tests** were used to analyze associations between categorical variables such as income level and screening behavior. **Logistic regression analysis** was performed to identify predictors of non-participation in cervical screening. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

This study was conducted following the ethical principles outlined in the Declaration of Helsinki. Approval was obtained from the Institutional Ethical Committee of Sree Balaji Medical College and Hospital, Chennai. All participants provided informed written consent. The consent form was made available in both English and Tamil. Participation was voluntary, and participants had the right to withdraw at any point without any consequences.

No invasive procedures or biological sample collections were involved in this study. Anonymity and confidentiality were ensured by assigning unique identification codes to each questionnaire and storing all data in password-protected systems accessible only to the research team.

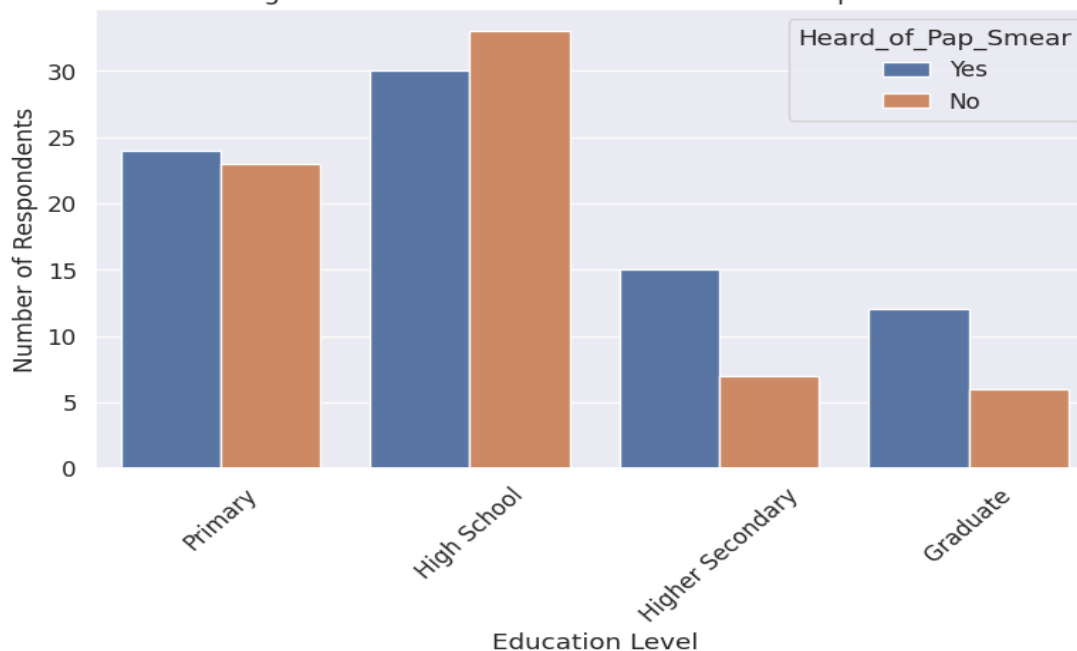
RESULTS

Table 1: Education vs. Awareness of Pap Smear

This table examines the relationship between participants' education level and their awareness of Pap smear testing.

Education	Heard of Pap Smear: No Yes Total		
Graduate	6	12	18
High School	33	30	63
Higher Secondary	7	15	22
Primary	23	24	47
Total	69	81	150

Figure 1: Education Level vs. Awareness of Pap Smear



Chi-square = 4.14, p = 0.2468

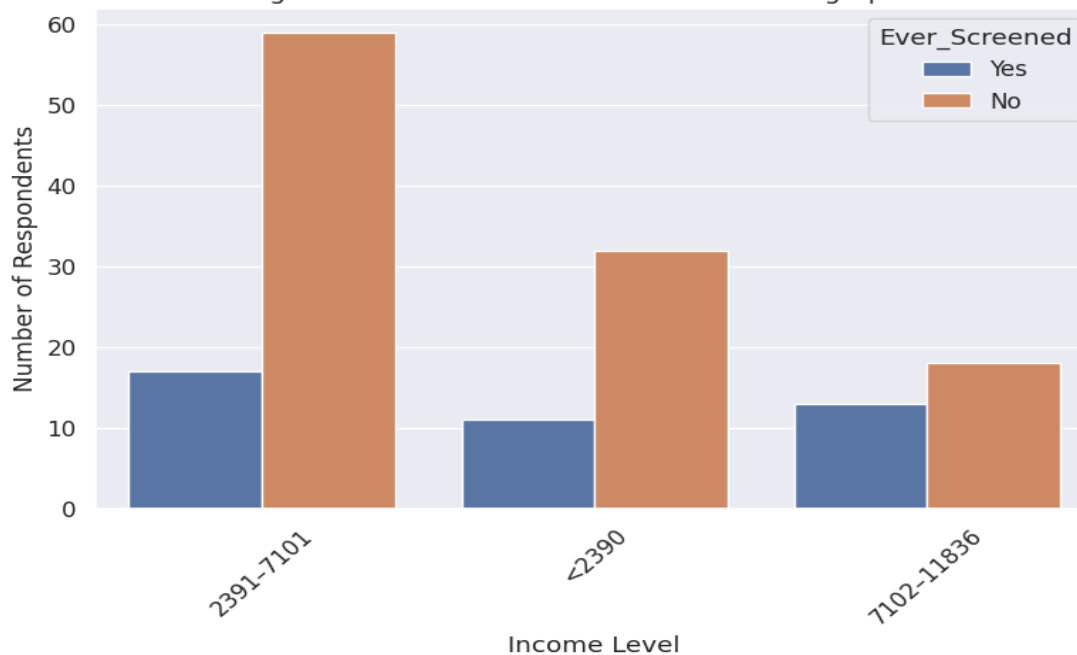
Interpretation: No statistically significant association was observed between education level and awareness of Pap smear.

Table 2: Income Level vs. Ever Screened

This table analyzes whether income level is associated with ever undergoing cervical screening.

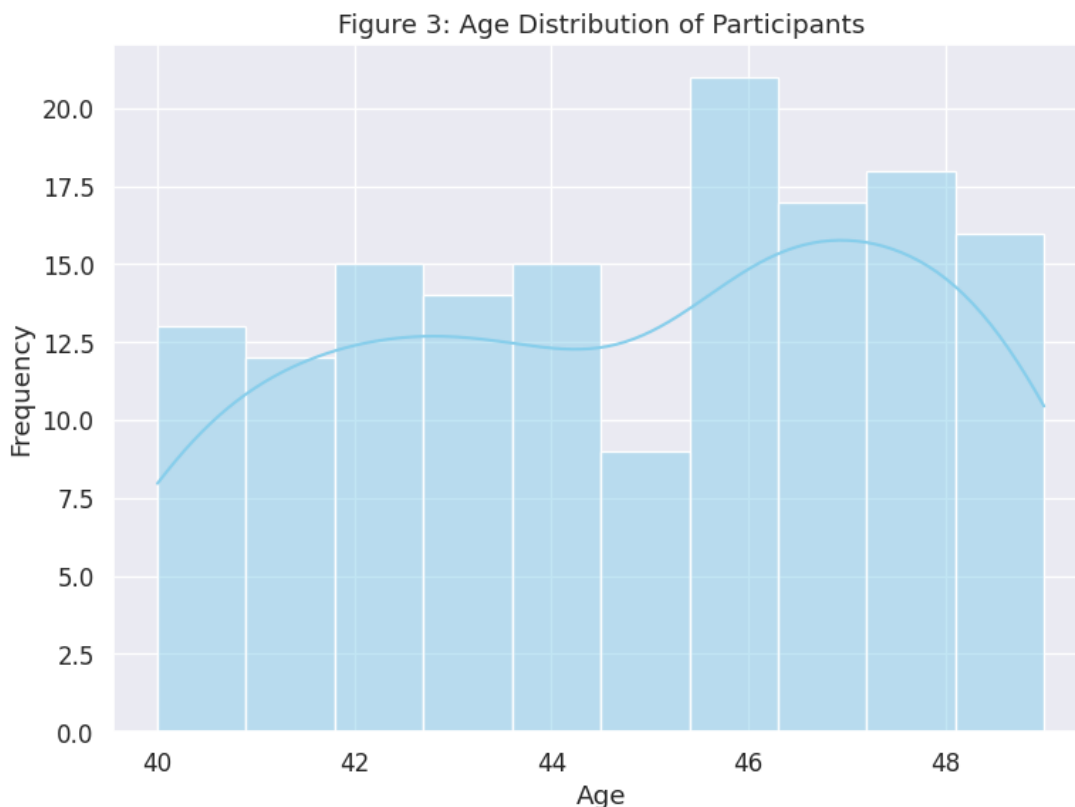
Income Level	Never Screened	Screened	Total
<2390	32	11	43
2391-7101	59	17	76
7102-11836	18	13	31
Total	109	41	150

Figure 2: Income Level vs. Cervical Screening Uptake



Chi-square = 4.34, p = 0.1143

Interpretation: Although more women in lower income groups reported not being screened, the association was not statistically significant.



As shown, the distribution is relatively even across the 40–49 age range, with a slight concentration around 44–46 years. The smooth curve (KDE) confirms a moderately normal distribution, indicating a balanced representation of perimenopausal women within the study sample.

Table 3: Cultural Belief Barrier vs. Ever Screened

This table shows how cultural beliefs influenced participation in screening.

Cultural Belief Barrier	Never Screened	Screened	Total
Yes	41	14	55
No	68	27	95
Total	109	41	150

Chi-square = 0.04, p = 0.8393

Interpretation: Cultural beliefs did not significantly influence cervical screening uptake in this study population.

Table 4: Comfort with Provider vs. Ever Screened

This table assesses if participants' comfort level with their healthcare provider was associated with screening behavior.

Comfort with Provider	Never Screened	Screened	Total
Yes	58	23	81
No	51	18	69
Total	109	41	150

Chi-square = 0.02, p = 0.8947

Interpretation: No significant relationship was found between provider comfort and screening behavior.

Table 5: Fear of Test vs. Ever Screened

This table evaluates if fear related to the screening procedure affected the likelihood of screening.

Fear of Test	Never Screened	Screened	Total
Yes	46	18	64
No	63	23	86
Total	109	41	150

Chi-square = 0.00, p = 0.9980

Interpretation: Fear of the test was not statistically associated with lower screening rates.

The age distribution of the study participants ranged from 40 to 49 years, with a relatively even spread across this range. Figure 3 illustrates the age distribution, showing a slight clustering around the ages of 44 to 46. The sample was representative of the perimenopausal age group, and the even distribution minimizes age-related bias in screening behavior analysis.

In terms of socioeconomic status, the majority of participants belonged to the income category of ₹2391–7101 (50.7%), followed by those earning less than ₹2390 per month (28.7%), and the remaining 20.6% fell in the ₹7102–11836 bracket. Educationally, most participants had completed primary (31.3%) or high school education (42.0%), with fewer reaching higher secondary (14.7%) or graduate levels (12.0%).

Awareness and Knowledge of Cervical Screening

One of the key areas examined was awareness of Pap smear testing, which is a primary method for cervical cancer screening. Only 55% of women reported having heard of the Pap smear, and among them, an even smaller proportion knew how frequently it should be done. Table 1 explored the relationship between education level and awareness. While awareness was slightly higher among those with secondary and graduate education, the difference was not statistically significant (Chi-square = 4.14, p = 0.2468).

Screening Uptake and Influencing Factors

Only 41 out of 150 women (27.3%) reported ever undergoing cervical screening, highlighting a significantly low uptake rate. Table 2 examined the association between income level and screening status. Although women in the higher income group (₹7102–11836) were more likely to have been screened compared to those in the lower brackets, the association did not reach statistical significance (Chi-square = 4.34, p = 0.1143).

Cultural, Psychological, and Provider-Related Barriers

Cultural beliefs and stigmas surrounding cervical cancer and screening procedures were present in 36.7% of the participants. However, as shown in Table 3, the association between cultural belief barriers and screening participation was not significant (Chi-square = 0.04, p = 0.8393). This indicates that while cultural beliefs may exist, they did not have a measurable impact on the decision to undergo screening in this sample.

Comfort with healthcare providers was evaluated next. Approximately 60% of participants stated that they were comfortable discussing cervical screening with a healthcare provider. As seen in Table 4, the comfort level did not significantly affect screening uptake (Chi-square = 0.02, p = 0.8947), suggesting that provider interaction was not a primary deterrent in this group.

Psychological factors such as fear—of pain, embarrassment, or diagnosis—were also analyzed. Nearly 43% of women reported experiencing fear related to the Pap smear. However, Table 5 showed no statistically significant relationship between fear of the test and screening status (Chi-square = 0.00, p = 0.9980).

DISCUSSION

This study aimed to explore the barriers to cervical cancer screening among low-income women in the perimenopausal age group. The findings highlight a concerning low uptake of cervical screening, with only 27.3% of participants reporting having ever undergone a Pap smear test. Despite the availability of cervical cancer screening services, multiple factors continue to inhibit access and participation in underserved populations.

One of the most notable findings was the lack of awareness about Pap smear testing. Only slightly more than half of the participants had heard of the test, and even fewer understood its recommended frequency. This is consistent with the findings of Ndejjo et al. (2016), who reported that knowledge gaps were among the most significant barriers in a similar population in Uganda [5]. Likewise, Ebu and Ogah (2018) emphasized that inadequate awareness and misconceptions about screening procedures lead to underutilization of services, even in urban settings where such services are available [3].

Educational status appeared to have a modest impact on awareness, with higher awareness noted among women with secondary or higher education. However, this association was not statistically significant in our study, possibly due to the predominance of participants with low to moderate education levels. A similar pattern was observed in a study by Petersen et al. (2022), where education improved awareness but did not always translate into increased screening participation due to other overriding barriers like fear and financial constraints [1].

Income level, often a strong determinant of healthcare access, did not show a significant association with screening uptake in this study. Nonetheless, a visible trend suggested that women in higher income brackets were slightly more likely to be screened. Maseko et al. (2023) reported comparable findings in their systematic review, indicating that while economic disadvantage plays a role, it is often compounded by systemic and cultural challenges that further reduce screening rates [2].

Interestingly, cultural beliefs and social norms were reported by over a third of participants, yet they were not significantly associated with screening behavior in this study. While previous studies, such as Holroyd et al. (2004), identified strong cultural taboos as barriers to screening among Chinese women in Hong Kong [4], it is possible that in this Indian urban setting, these beliefs are gradually being overridden by evolving societal norms or are underreported due to social desirability bias.

Psychological barriers, including fear of pain, embarrassment, or a potential diagnosis, were also frequently cited but did not show statistical significance. This finding contrasts with studies like Spadea et al. (2010), where fear was a significant predictor of screening avoidance. In our study, the influence of fear may have been diluted by overlapping factors such as lack of knowledge and limited access to healthcare facilities.

CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

This study highlights the low uptake of cervical cancer screening among low-income, perimenopausal women, with only 27.3% having undergone a Pap smear. While no single factor showed a statistically significant impact, lack of awareness, low education, fear, and cultural influences collectively contribute to poor screening behavior.

Limitations include the use of convenience sampling, which may limit generalizability, and reliance on self-reported data, which could introduce recall or social desirability bias. The cross-sectional design also restricts causal interpretations.

Recommendations include implementing targeted awareness campaigns at community levels, integrating cervical screening with routine health services, training healthcare workers in culturally sensitive communication, and offering mobile screening units to improve accessibility. Policymakers must prioritize screening programs within national health agendas, ensuring equitable access for underserved women. Future research should adopt longitudinal approaches to evaluate the impact of specific interventions over time in similar populations.

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