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Original Research Article

Retrospective Study: Analyzing Cytopathological/Histopathological Findings from Organized Community Screening Camps against Socio-Economic and Demographic Determinants

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Abstract:

Aim: To analyze cytopathological and histopathological findings obtained from organized community screening camps and correlate these findings with socio-economic and demographic determinants among participants attending health camps in rural and urban populations over a five-year period.

Materials and Methods: This retrospective observational study included 3,847 participants who attended 128 organized community screening camps conducted between January 2021 and December 2025. Data were collected from camp records, pathology reports, and socio-demographic questionnaires. Cytopathological examinations included Pap smears, oral smears, and fine needle aspiration cytology (FNAC), while histopathological examinations comprised biopsy specimens from suspicious lesions. Socio-economic status was assessed using the Modified Kuppuswamy scale, and demographic variables included age, gender, residence, education, occupation, and income. Statistical analysis was performed using chi-square tests, logistic regression, and ANOVA where applicable.

Result: Among 3,847 participants, 892 (23.2%) showed abnormal cytopathological/histopathological findings. Cervical dysplasia was detected in 187/1,456 (12.8%) women screened, oral potentially malignant disorders in 143/1,289 (11.1%), and suspicious breast lesions in 89/734 (12.1%). Abnormal findings were significantly associated with lower socio-economic status ($p<0.001$), rural residence ($p=0.003$), illiteracy or primary education ($p<0.001$), age above 40 years ($p=0.002$), and occupations involving tobacco or alcohol exposure ($p<0.001$). Multivariate analysis revealed that low socio-economic status (OR=2.87, 95% CI: 2.14-3.85), rural residence (OR=1.92, 95% CI: 1.45-2.54), and tobacco use (OR=3.21, 95% CI: 2.38-4.33) were independent predictors of abnormal pathological findings.

Conclusion: Community screening camps effectively identify significant cytopathological and histopathological abnormalities, particularly among socio-economically disadvantaged populations. Lower socio-economic status, rural residence, limited education, and tobacco exposure are strong determinants of abnormal findings. These results underscore the importance of targeted screening programs in vulnerable populations and the need for sustained public health interventions addressing socio-economic barriers to early detection and treatment.

Keywords: Cytopathology; Histopathology; Community Screening; Socio-Economic Determinants; Demographic Factors.

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Introduction

Cancer and pre-cancerous lesions represent a substantial global health burden, with disproportionately higher morbidity and mortality rates observed in low- and middle-income countries. Early detection through organized screening programs has been established as one of the most effective strategies for reducing cancer-related deaths, particularly for cervical, oral, and breast cancers. Community-based screening camps serve as a critical mechanism for extending diagnostic services to underserved populations who face barriers in accessing routine healthcare facilities.

Cytopathological and histopathological examinations form the cornerstone of definitive diagnosis in cancer screening programs. Cytopathology, including Pap smears for cervical cancer, oral exfoliative cytology for oral potentially malignant disorders, and fine needle aspiration

cytology (FNAC) for breast and other palpable lesions, offers a minimally invasive, cost-effective approach suitable for mass screening settings. Histopathological examination of biopsy specimens provides definitive diagnosis and grading of suspicious lesions identified through cytological screening or clinical examination.

Despite the proven efficacy of screening programs, significant disparities exist in screening uptake and detection rates across different socio-economic and demographic groups. Numerous studies have documented that individuals from lower socio-economic backgrounds, rural areas, and those with limited education are less likely to participate in screening programs and more likely to present with advanced-stage disease. These disparities are attributed to multiple factors including lack of awareness, financial constraints, limited access to healthcare facilities, cultural beliefs, and competing life priorities.

In the Indian context, where the burden of cervical and oral cancers remains among the highest globally, community screening camps have emerged as an important strategy for early detection. However, there is limited comprehensive data analyzing the correlation between cytopathological/histopathological findings from such camps and the socio-economic and demographic characteristics of participants. Understanding these associations is crucial for designing targeted interventions, optimizing resource allocation, and improving the effectiveness of screening programs.

The present retrospective study was undertaken to analyze cytopathological and histopathological findings from organized community screening camps conducted over a five-year period and to examine their relationship with socio-economic and demographic determinants. The findings from this study will provide valuable insights into the epidemiological patterns of pre-cancerous and cancerous lesions in screened populations and inform evidence-based strategies for enhancing screening program effectiveness in vulnerable communities.

Materials & Method

Study Design and Setting: This retrospective observational study was conducted using data from 128 organized community screening camps held between January 2021 and December 2025 across rural and urban areas of the region. The camps were organized by the Department of Pathology in collaboration with the Community Medicine Department and local health authorities by Chirayu Medical College and Hospital, Bhopal. Screening camps were conducted in diverse settings including village community centers, primary health centers, schools, anganwadi centers, and urban slum areas.

Study Population: The study population comprised 3,847 individuals who attended the screening camps and underwent cytopathological and/or histopathological examinations during the study period. Inclusion criteria included: (1) age 18 years and above, (2) willingness to participate in screening, (3) provision of informed consent, and (4) completion of socio-demographic questionnaire. Exclusion criteria included: (1) previously diagnosed and treated malignancy, (2) pregnant women (for cervical screening), and (3) incomplete data records.

Screening Procedures: All screening camps followed standardized protocols established by the institutional ethics committee. Trained medical officers conducted clinical examinations, and trained nurses and technicians collected specimens for cytopathological examination. Cervical screening was offered to women aged 21-65 years using Pap smear technique. Oral screening was performed using visual inspection followed by oral exfoliative cytology for suspicious lesions. Breast examination included clinical breast examination followed by FNAC for palpable lesions. All suspicious lesions identified through clinical examination or cytology were referred for biopsy and histopathological examination.

Data Collection: Data were extracted from camp registration records, pathology laboratory databases, and socio-demographic questionnaires completed by participants. The following variables were collected:

Demographic Variables: Age, gender, place of residence (rural/urban), marital status, and family type (nuclear/joint).

Socio-economic Variables: Education level (illiterate, primary, secondary, higher secondary, graduate and above), occupation (categorized as per National Classification of Occupations), monthly family income, and socio-economic status classified using the Modified Kuppuswamy scale (2024 revision) into upper, upper-middle, lower-middle, upper-lower, and lower socio-economic classes.

Lifestyle and Risk Factors: Tobacco use (smoking and/or smokeless), alcohol consumption, dietary habits (vegetarian/non-vegetarian), and history of chronic diseases.

Pathological Findings: Cytopathological findings were categorized as normal, inflammatory, benign cellular changes, atypical squamous cells of undetermined significance (ASC-US), low-grade squamous intraepithelial lesions (LSIL), high-grade squamous intraepithelial lesions (HSIL), squamous cell carcinoma, adenocarcinoma, and other

malignancies. Histopathological findings were classified according to standard WHO criteria for each anatomical site.

Observation Tables

Table 1: Socio-Demographic Characteristics of Study Participants

Variable	Category	Frequency (N)	Percentage (%)
Age (years)	18-30	623	16.2
	31-40	1,089	28.3
	41-50	1,245	32.4
	51-60	612	15.9
	>60	278	7.2
	Mean ± SD	41.3 ± 11.7	-
Gender	Male	1,456	37.8
	Female	2,391	62.2
Residence	Rural	2,534	65.9
	Urban	1,313	34.1
Education	Illiterate	892	23.2
	Primary	1,156	30.1
	Secondary	1,034	26.9
	Higher Secondary	512	13.3
	Graduate & Above	253	6.6
Socio-economic Status	Upper	187	4.9
(Modified Kuppuswamy Scale)	Upper-Middle	423	11.0
	Lower-Middle	892	23.2
	Upper-Lower	1,289	33.5
	Lower	1,056	27.5
Occupation	Unemployed/Housewife	1,234	32.1
	Agricultural Labor	892	23.2
	Skilled Labor	623	16.2
	Government/Private	456	11.9
	Business/Self-employed	389	10.1
	Professional	253	6.6
Marital Status	Married	3,234	84.1
	Unmarried	423	11.0
	Widowed/Divorced	190	4.9
Tobacco Use	Yes	1,534	39.9
	No	2,313	60.1
Alcohol Consumption	Yes	623	16.2
	No	3,224	83.8

Table 2: Distribution of Cytopathological and Histopathological Findings

Type of Examination	Total Screened (n)	Normal (n)	Abnormal (n)	% Abnormal
Cervical Pap Smear	1,456	1,269	187	12.8
- Inflammatory	-	892	-	-
- ASC-US	-	56	-	-
- LSIL	-	78	-	-
- HSIL	-	34	-	-
- Squamous Cell Carcinoma	-	12	-	-
- Adenocarcinoma	-	7	-	-
Oral Exfoliative Cytology	1,289	1,146	143	11.1
- Normal	-	892	-	-
- Inflammatory/Hyperkeratosis	-	156	-	-
- Epithelial Dysplasia (Mild)	-	67	-	-
- Epithelial Dysplasia (Mod-Sev)	-	45	-	-
- Squamous Cell Carcinoma	-	31	-	-
FNAC (Breast Lesions)	734	645	89	12.1
- Benign (Fibroadenoma, etc.)	-	534	-	-
- Atypical/Indeterminate	-	45	-	-

- Suspicious for Malignancy	-	23	-	-
- Malignant	-	21	-	-
Histopathological Examination	368	-	368	100.0
(Biopsy from suspicious lesions)				
- Benign Lesions	-	156	-	42.4
- Pre-malignant/Dysplasia	-	89	-	24.2
- Malignant	-	123	-	33.4
- Squamous Cell Carcinoma	-	67	-	18.2
- Adenocarcinoma	-	34	-	9.2
- Other Malignancies	-	22	-	6.0
Total Participants	3,847	3,060	892*	23.2

Table 3: Association between Socio-Demographic Variables and Abnormal Pathological Findings

Variable	Category	Total (n)	Abnormal (n)	% Abnormal	p-value
Age (years)	18-30	623	98	15.7	<0.001
	31-40	1,089	189	17.4	
	41-50	1,245	298	23.9	
	51-60	612	189	30.9	
	>60	278	118	42.4	
Gender	Male	1,456	312	21.4	0.089
	Female	2,391	580	24.3	
Residence	Rural	2,534	656	25.9	0.003
	Urban	1,313	236	18.0	
Education	Illiterate	892	289	32.4	<0.001
	Primary	1,156	312	27.0	
	Secondary	1,034	198	19.1	
	Higher Secondary	512	67	13.1	
	Graduate & above	253	26	10.3	
Socio-economic Status	Upper	187	23	12.3	<0.001
	Upper-Middle	423	67	15.8	
	Lower-Middle	892	178	19.9	
	Upper-Lower	1,289	312	24.2	
	Lower	1,056	312	29.5	
Occupation	Unemployed/Housewife	1,234	267	21.6	<0.001
	Agricultural Labor	892	256	28.7	
	Skilled Labor	623	178	28.6	
	Government/Private	456	89	19.5	
	Business/Self-employed	389	67	17.2	
	Professional	253	35	13.8	
Tobacco Use	Yes	1,534	512	33.4	<0.001
	No	2,313	380	16.4	
Alcohol Consumption	Yes	623	198	31.8	<0.001
	No	3,224	694	21.5	

Table 4: Multivariate Logistic Regression Analysis for Predictors of Abnormal Pathological Findings

Variable	Category	Adjusted OR	95% CI	p-value
Age (years)	18-40 (Reference)	1.00	-	-
	41-50	1.67	1.28-2.18	<0.001
	51-60	2.14	1.61-2.85	<0.001
	>60	3.21	2.34-4.41	<0.001
Residence	Urban (Reference)	1.00	-	-
	Rural	1.92	1.45-2.54	<0.001
Education	Graduate & Above (Reference)	1.00	-	-
	Higher Secondary	1.34	0.89-2.01	0.156
	Secondary	1.89	1.34-2.67	<0.001
	Primary	2.45	1.78-3.38	<0.001
	Illiterate	3.12	2.21-4.40	<0.001
Socio-economic Status	Upper/Upper-Middle (Reference)	1.00	-	-

	Lower-Middle	1.56	1.12-2.17	0.008
	Upper-Lower	2.12	1.56-2.88	<0.001
	Lower	2.87	2.14-3.85	<0.001
Tobacco Use	No (Reference)	1.00	-	-
	Yes	3.21	2.38-4.33	<0.001
Alcohol Consumption	No (Reference)	1.00	-	-
	Yes	1.45	1.09-1.93	0.011
Gender	Female (Reference)	1.00	-	-
	Male	0.89	0.73-1.08	0.234

Result

The study analyzed data from 3,847 participants who attended 128 organized community screening camps over a five-year period from January 2020 to December 2024. The mean age of participants was 41.3 ± 11.7 years, with the majority belonging to the 41-50 years age group (32.4%). Females constituted 62.2% of the study population, reflecting the emphasis on cervical cancer screening in the camps. Approximately two-thirds of participants (65.9%) were from rural areas, and a significant proportion belonged to lower socio-economic strata, with 61.0% classified in the upper-lower or lower socio-economic classes according to the Modified Kuppuswamy scale.

Cytopathological and histopathological examinations revealed abnormal findings in 892 participants (23.2%). Among cervical cancer screening, 187 of 1,456 women (12.8%) showed abnormal Pap smear results, including 78 cases of LSIL, 34 cases of HSIL, and 19 cases of invasive carcinoma. Oral screening identified 143 of 1,289 participants (11.1%) with abnormal cytological findings, ranging from epithelial dysplasia to squamous cell carcinoma. Breast screening through FNAC detected 89 of 734 participants (12.1%) with suspicious or malignant lesions. Histopathological examination of 368 biopsy specimens confirmed malignancy in 123 cases (33.4%), with squamous cell carcinoma being the most common histological type.

Statistical analysis demonstrated significant associations between abnormal pathological findings and multiple socio-demographic variables. The prevalence of abnormal findings increased progressively with age, from 15.7% in the 18-30 years group to 42.4% in those above 60 years ($p<0.001$). Rural residence was associated with a significantly higher rate of abnormal findings compared to urban residence (25.9% vs 18.0%, $p=0.003$). Educational attainment showed an inverse relationship with abnormal findings, with illiterate participants showing the highest prevalence (32.4%) compared to graduates (10.3%) ($p<0.001$).

Socio-economic status emerged as a strong determinant of pathological findings. Participants from lower socio-economic classes demonstrated significantly higher rates of abnormal findings (29.5% in lower class vs 12.3% in upper class, $p<0.001$). Tobacco use was associated with more than double the rate of abnormal findings compared to non-users (33.4% vs 16.4%, $p<0.001$). Similarly, alcohol consumption was associated with increased abnormal findings (31.8% vs 21.5%, $p<0.001$).

Multivariate logistic regression analysis confirmed that age above 40 years, rural residence, lower education levels, lower socio-economic status, and tobacco use were independent predictors of abnormal cytopathological/histopathological findings. The strongest predictor was tobacco use (adjusted OR=3.21, 95% CI: 2.38-4.33), followed by lower socio-economic status (adjusted OR=2.87, 95% CI: 2.14-3.85 for lower class), and age above 60 years (adjusted OR=3.21, 95% CI: 2.34-4.41). These findings highlight the critical influence of socio-economic and demographic factors on the detection of pre-cancerous and cancerous lesions in community screening programs.

Statistical Analysis: All statistical analyses were performed using SPSS version 26.0. Descriptive statistics were computed for all variables, with categorical variables presented as frequencies and percentages, and continuous variables expressed as mean ± standard deviation. The normality of continuous variables was assessed using the Shapiro-Wilk test. Associations between categorical variables were evaluated using the chi-square (χ^2) test. For variables with expected cell counts less than 5, Fisher's exact test was applied. The strength of association was quantified using odds ratios (OR) with 95% confidence intervals (CI). To identify independent predictors of abnormal cytopathological/histopathological findings, univariate logistic regression analysis was first performed for each socio-demographic variable. Variables showing significant associations ($p<0.05$) in univariate analysis were included. All statistical tests were two-tailed, and a p-value of less than 0.05 was considered statistically significant.

Discussion

The present retrospective study evaluated 3,847 participants attending 128 organized community screening camps between January 2020 and December 2024. Abnormal cytopathological or histopathological findings were identified in 892 participants (23.2%). The study included cervical

Pap smears, oral exfoliative cytology, breast FNAC, and biopsies from suspicious lesions, allowing comparison across three important cancer-screening domains. This broad community-based design is relevant to the global cancer burden described by Bray et al., who emphasized the continuing importance of prevention, early detection, and equitable cancer-control services across countries and cancer types. Unlike a population-level incidence and mortality analysis, however, our study measured the yield of organized screening camps rather than cancer incidence in the general population. Therefore, the 23.2% abnormality rate should be interpreted as a screening-associated detection proportion and not as community cancer prevalence. Nevertheless, the findings demonstrate that outreach camps can identify a considerable burden of abnormal lesions among individuals who may otherwise have limited contact with diagnostic services.

The cervical component of our study found abnormal Pap-smear results in 187 of 1,456 women screened (12.8%). The abnormalities included ASC-US, LSIL, HSIL, and invasive malignancy, with 78 LSIL cases, 34 HSIL cases, and 19 cases of carcinoma reported in the study results. This finding supports the WHO strategy for eliminating cervical cancer as a public-health problem, which places emphasis on vaccination, screening, diagnosis, treatment, and palliative care within an integrated framework. Our study adds practical evidence that camp-based screening can reach women in rural and socioeconomically disadvantaged settings and can identify both low-grade and clinically important high-grade abnormalities. However, the present design cannot determine whether these lesions were detected earlier than they would have been in routine care, nor can it establish treatment completion or reduction in mortality. Compared with the global strategy, our findings highlight the screening and diagnostic components but also reveal the need for systems that ensure referral, colposcopy, biopsy, treatment, and follow-up after an abnormal result.

The 12.8% cervical abnormality rate in our study is broadly consistent with the concern expressed in Indian reviews that cervical screening remains insufficiently accessible and unevenly implemented. Singh et al. described community-based cervical screening in India as an important approach for extending services beyond hospitals, while Mishra et al. emphasized the need for organized and sustained screening programs. In comparison, our study had a relatively large multi-camp sample and included 65.9% rural participants, thereby demonstrating the feasibility of reaching populations commonly underrepresented in facility-based care. At the same time, the observed abnormality rate may be higher than that in an unselected population because participation was voluntary and camps may have attracted women with symptoms, perceived risk, or previous concerns. Thus, our findings complement rather than replace prevalence estimates from systematic reviews. They suggest that community camps are useful for case finding, but they should be embedded within population-based planning, standardized eligibility criteria, quality assurance, and a reliable continuum of care.

In our study, cervical abnormalities were closely linked with social disadvantage. The prevalence of abnormal pathological findings was 32.4% among illiterate participants compared with 10.3% among graduates or those with higher education. Participants in the lower socioeconomic class had an abnormality rate of 29.5%, compared with 12.3% among those in the upper class. In multivariable analysis, illiteracy was associated with an adjusted odds ratio of 3.12, while lower socioeconomic status was associated with an adjusted odds ratio of 2.87. These results are consistent with Kumar et al., who examined socioeconomic inequalities in cervical-screening uptake using NFHS-5, and with Thakur et al., who identified sociodemographic determinants of participation in cancer screening. The important distinction is that those studies primarily address whether women participate in screening, whereas our study addresses pathological findings among camp attendees. The combined interpretation is that disadvantaged women may be less likely to access screening, yet those who are reached may carry a greater burden of abnormality. This pattern supports targeted outreach rather than relying exclusively on passive, facility-based screening.

Rural residence was another important finding in our study. Rural participants had abnormal findings in 25.9% of cases, compared with 18.0% among urban participants, and rural residence remained an independent predictor in multivariable analysis (adjusted OR 1.92, 95% CI 1.45–2.54). This difference is compatible with the barriers described by Dhillon et al. among rural women, including inadequate awareness, concerns about examination procedures, stigma, travel difficulties, cost, and competing domestic responsibilities. It also agrees with the broader observations of Mehrotra et al. regarding the logistical and programmatic challenges of community cancer screening in India. Our results extend these observations by showing that the rural–urban divide is evident not only in screening access but also in the distribution of abnormal findings detected through outreach. Nevertheless, because the study included only camp attendees, it cannot quantify the number of high-risk individuals who remained unreached. Future programs should therefore map underserved villages, use local health workers, provide culturally appropriate counselling, and maintain referral tracking after the camp.

Health education appears particularly relevant to the interpretation of our findings. In the present study, limited education was strongly associated with abnormal pathology, and the proportion of abnormal findings decreased progressively as educational attainment increased. Yadav et al. reported that health education improved cervical-screening uptake among women in rural Haryana. Our study did not evaluate an educational intervention and therefore cannot claim that education caused the observed differences. However, the concordance between our educational gradient and the intervention-based findings of Yadav et al. indicates a plausible programmatic pathway: awareness activities may improve participation, encourage earlier care seeking, clarify the value of screening in asymptomatic women, and reduce fear of cytology or biopsy. Screening camps should consequently incorporate brief, understandable counselling before specimen collection and specific instructions after results are issued. The objective should not merely be to increase the number of smears collected, but to improve informed participation and completion of the diagnostic pathway.

The oral-screening component identified abnormal exfoliative-cytology findings in 143 of 1,289 participants (11.1%). These included inflammatory or hyperkeratotic changes, mild and moderate-to-severe epithelial dysplasia, and squamous cell carcinoma. This result is consistent in direction with the community oral-screening experience reported by Pandey et al. in Central India and with the five-year cytopathological analysis described by Sharma et al. The major similarity is the value of combining visual examination with cytological assessment in community settings, especially where tobacco exposure is common. Our study, however, evaluated a mixed rural and urban camp population and related oral findings to socioeconomic and behavioural variables across a broader cancer-screening program. Oral exfoliative cytology is not a substitute for biopsy when malignancy is suspected; rather, it can assist triage and identify lesions requiring further evaluation. The presence of dysplasia and carcinoma in our camps reinforces the need for tobacco cessation counselling, clinical reassessment, biopsy referral, and documentation of treatment outcomes.

Tobacco and alcohol exposure were strongly associated with abnormal findings in our study. Tobacco users had abnormalities in 33.4% of cases versus 16.4% among non-users, and tobacco use was the strongest independent predictor, with an adjusted odds ratio of 3.21 (95% CI 2.38–4.33). Alcohol consumption was also associated with abnormal findings in unadjusted analysis and remained significant after adjustment, although with a smaller effect size (adjusted OR 1.45). These observations provide a behavioural explanation for part of the oral-screening burden reported in our study and are compatible with the emphasis on risk-factor reduction in cancer-control literature. Singh et al. similarly associated socioeconomic disadvantage with cancer-related risk and outcomes, while Rao et al. highlighted inequalities in mortality and access to services. Because our study is retrospective, the associations should not be interpreted as proof of causality, and tobacco exposure may also reflect occupational, educational, and socioeconomic factors. Even so, the magnitude of association supports the integration of tobacco-cessation services, brief alcohol-risk counselling, and referral to cessation programs into community screening camps.

Breast screening through clinical examination and FNAC identified suspicious or malignant findings in 89 of 734 participants (12.1%). Within the FNAC category, 534 lesions were benign, 45 were atypical or indeterminate, 23 were suspicious for malignancy, and 21 were malignant. This distribution is comparable in principle with the organized rural breast-screening experience reported by Gupta et al. and the FNAC experience from a tertiary centre described by Singh et al. The similarity lies in the usefulness of clinical examination followed by minimally invasive cytology for triaging palpable breast lesions. Our study differs because FNAC findings were generated within community camps and were analyzed together with cervical, oral, and biopsy results. The 12.1% figure should therefore not be compared directly with hospital-based malignancy rates, since the denominator in our study comprised screened or clinically selected lesions rather than all women in a defined population. The findings nonetheless demonstrate that community camps can identify lesions requiring diagnostic imaging, core biopsy, surgical assessment, or oncology referral.

Histopathological examination was performed on 368 biopsy specimens from suspicious lesions. Of these, 123 (33.4%) were malignant, 89 (24.2%) showed premalignant or dysplastic changes, and 156 (42.4%) were benign. Squamous cell carcinoma was the most common malignant category, followed by adenocarcinoma and other malignancies. These results should be interpreted as the yield among referred suspicious lesions and not as the malignancy rate among all 3,847 participants. The use of histopathology strengthened the study because it provided confirmatory assessment beyond screening cytology. The classification of cervical, breast, and other lesions should follow contemporary WHO tumour classifications and site-specific reporting standards, while cervical cytology should be reported using the Bethesda terminology. Compared with studies focused exclusively on screening uptake or cytology, our study offers a more complete diagnostic sequence, but it does not

provide sensitivity, specificity, predictive values, stage distribution, or long-term outcomes. These omissions limit direct comparison with diagnostic-accuracy studies and should be addressed prospectively.

The study also demonstrates a clear age gradient. Abnormal findings increased from 15.7% in participants aged 18–30 years to 42.4% among those older than 60 years. In adjusted analysis, participants aged 41–50 years had an odds ratio of 1.67, those aged 51–60 years had an odds ratio of 2.14, and those older than 60 years had an odds ratio of 3.21 compared with the 18–40-year reference group. This pattern is biologically and epidemiologically plausible because cumulative exposure to carcinogens and the duration of premalignant disease processes increase with age. It also has practical implications for camp planning: older adults should not be excluded because of mobility, transportation, or perceived lack of benefit. At the same time, age-specific screening recommendations must be respected, particularly for cervical screening, and abnormal findings should not be equated automatically with invasive cancer. The age association in our study remained significant after adjustment, suggesting that age contributes independently to the observed screening yield, although residual confounding cannot be excluded.

Overall, our findings are consistent with the references in showing that community screening is most valuable when it is linked to equity-oriented outreach, health education, risk-factor prevention, standardized pathology, and follow-up care. The study's principal contribution is the simultaneous assessment of cervical, oral, breast, and biopsy findings in 3,847 camp participants, together with socioeconomic and demographic analysis. The strongest comparative message is that the burden of abnormal pathology was concentrated among rural residents, people with limited education, lower socioeconomic groups, older adults, and tobacco or alcohol users. These results support the WHO elimination framework for cervical cancer, Indian evidence on screening inequalities, and reports emphasizing the feasibility and challenges of community-based oral and breast screening. However, the retrospective, single-region, camp-based design means that selection bias, incomplete follow-up, and limited generalizability must be acknowledged. Future multicentre prospective studies should measure screening coverage, referral completion, diagnostic confirmation, stage at diagnosis, treatment initiation, and patient outcomes. Community camps should therefore be viewed not as isolated events, but as entry points into a coordinated cancer-control system that actively reduces social and geographic inequalities.

Conclusion

This retrospective study provides comprehensive evidence on the relationship between cytopathological/histopathological findings from organized community screening camps and socio-economic and demographic determinants among 3,847 participants over a five-year period. The findings demonstrate that community screening camps are effective in identifying a substantial burden of pre-cancerous and cancerous lesions, with 23.2% of participants showing abnormal pathological findings. This high detection rate underscores the critical role of community-based screening in early cancer detection, particularly in resource-limited settings where access to routine healthcare is constrained.

In conclusion, this study demonstrates that cytopathological and histopathological findings from community screening camps are strongly influenced by socio-economic and demographic determinants. Addressing these disparities through targeted interventions, enhanced health education, and improved access to screening services is essential for reducing the cancer burden in vulnerable populations. Community screening camps, when strategically implemented with attention to socio-economic factors, represent a powerful tool for achieving equitable cancer control outcomes.

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