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Original Article

Ovarian Cancer Awareness and Early Detection in Urban Bangalore: Knowledge Gaps and Public Health Initiatives

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ABSTRACT

Background: In India, the rate of late-stage diagnosis of ovarian cancer is on the rise, making it one of the deadliest gynecological cancers. Given the level of healthcare facilities in Bangalore, making aware and detecting cancer early is still an issue. This research focused on understanding the awareness about ovarian cancer, symptom identification, and barriers to early detection among urban women in Bangalore.Methods: An explanatory sequential mixed-methods approach was employed that integrated a cross-sectional survey of 1,500 woman aged 30 -65 from eight urban sectors with focus group discussions and interviews with health providers and women from the community. The quantitative data were analyzed using descriptive statistics and logistic regression while qualitative data were subjected to thematic analysis.Results: Only 26.4% of women identified three symptoms or more. Awareness remains prevalent with education, income, and age ($p < 0.001$). Just 6% knew where to get screened. Qualitative findings revealed barricades such as stigma, cultural silence, and limited range of screening facilities. A high spatial correlation ($r = 0.82$) was documented between awareness and accessibility to facilities.Conclusion: Despite the health facilities that are offered in the city, the level of awareness concerning ovarian cancer in urban Bangalore is still low. Cultural barriers lead to a combined effect with poor health literacy which creates socio-economic disparities that makes early detection difficult. Adjustments need to be made to the way communities are educated concerning disease and screenings.

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Introduction

Ovarian cancer still is considered one of the most fatal types of gynecological cancers worldwide, especially in the context of India's lower-middle income economy [1]. Recent registry data in urban Bangalore shows that the age-standardized incidence rate for cancer has reached 8.2 for every 100,000 women in the population, which is a 25% surge over the last decade [2]. These figures are in stark contrast with the stable or declining trends in breast cancer incidence in other developed nations, signifying acute gaps in the efforts directed towards the early diagnosis and prevention of breast cancer [3].

Ovarian cancer's high mortality rate is predominantly due to its subtle and stealthy symptoms. A large proportion (about 70%) of diagnosed patients in India are in the later stages (III/IV) [4]. Unlike screenings available for breast or cervical cancer, population screening for ovarian cancer does not exist, thus deeming symptom appreciation as critical in the facilitation of diagnosis [5]. There is, however, some research done on urban populations in India that indicates strikingly low recognition rates for key symptoms of cancer like bloating, pelvic soreness, and early stage of getting full, which translates to only 12%-15% of the adult female population being able to recognize these symptoms as cancerous [5].

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Bangalore presents an only partially developed urban paradox in public health - with high levels of infrastructure sophistication, there are fundamental fissures in health awareness. Despite the city's claim to fame in infrastructure with multiple tertiary-level cancer care centers, public awareness campaigns have only focused on breast and cervical cancers, largely neglecting ovarian cancer [6].

This is especially worrisome due to the ongoing demographic shift in Bangalore where an increasing number of women with established risk factors- nulliparity, late menopause, and hereditary factors, and more- are already living [7].

New attempts to roll out ovarian cancer awareness campaigns in Bangalore have run into numerous challenges, including cultural taboos regarding gynecological symptoms [8]. Compound this by the lack of culturally relevant risk assessment methodologies and these gaps become evident in targeted screening of high-risk groups [9]. Despite the gaps in advanced research, there is existing evidence that shifting the diagnosis window to early-stage I/II can drastically improve survival rates from 30% to over 80% [10].

The goal of this study is to analyze the awareness levels of ovarian cancer among the urban population of Bangalore, taking into consideration the effectiveness of available public health programs. Understanding these knowledge gaps and barriers to implementation could inform culturally relevant strategies designed to mitigate these delays among women living in urban settings.

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Methodology

Study Design

The current study utilized a convergent parallel mixed-method design that assessed the quantitative level of awareness of ovarian cancer and qualitatively analyzed public health initiatives. It integrated cross-sectional community surveys with in-depth interviews and focus group discussions, which sought to simultaneously assess knowledge and implementation related barriers on ovarian cancer control in urban Bangalore. This strategy was modified from existing studies that evaluate lower-resource settings for cancer care awareness programs [4]

Study Setting and Population

The study was conducted in the eight urban zones of Bangalore which include: East, West, North, South, Central, RR Nagar, Bommanahalli and Mahadevapura. These were chosen to provide the socio-economic and demographic heterogeneity of the city. The study participants consisted of three distinct groups: (1) 1,500 women aged 30-65 years with no personal history of cancer and who were selected via multistage cluster sampling, (2) 60 healthcare practitioners comprising 30 oncologists, 20 gynecologists, and 10 family physicians servicing in public and private healthcare institutions, and (3) 15 health workers active in women's health programs for the National Health Mission.

Data Collection Procedures

As part of a validation exercise involving the Ovarian Cancer Awareness Measure, awareness of ovarian cancer was measured through face-to-face interviews [5]. Healthcare providers were involved in semi-structured interviews on clinical practices relating to early detection, diagnostic resource availability, and screening program implementation barriers. Eight focus group discussions (6-10 participants each) were carried out with community women to explore cultural beliefs around gynecological symptoms and health communication preferences. For assessing the reach and implementation of ongoing public health initiatives, program documents were analyzed.

Variables and Measurements

The primary outcome measures included: (1) proportion of women who were able to identify ≥3 symptoms of ovarian cancer, (2) proportion of women who discussed risks related to ovarian cancer with their healthcare provider in the previous year, (3) self-reported duration for consulting a doctor after recognizing symptoms related to the disease, and (4) duration for symptom acknowledgment and medical appointment scheduling. The main independent variables included socio-demographic factors (age, education, income), indicators of healthcare access (insurance coverage, assigned healthcare provider), exposure to media information about cancer, and personal cancer history concerning family members. The qualitative approach to data analysis involved systematic thematic coding of transcripts with primary focus being on identifying structural, cultural, and knowledge gaps that inhibit early detection.

Data Analysis

Analysis of quantitative data included descriptive statistics, subgroup analysis using chi-square tests, and multivariable logistic regression modeling to ascertain the predictors for symptom recognition. Spatial analysis was also performed to assess awareness levels across different urban zones. Qualitative data was subjected to thematic analysis through an iterative framework approach, employing triangulation with researcher coding and participant validation. Program documents were evaluated using content analysis to determine gaps within existing public health programs.

Ethical Aspects

Ethical approval for this study was received from the relevant Ethics Review Committee. Informed written consent was acquired from all participants, while thumbprint coupled with witness verification consent was utilized for illiterate participants. Steps were taken to ensure data security through the application of anonymized identifiers, password-protected databases, and secured storage systems following Indian data protection regulations [11]

Results

Table 1: Demographic Characteristics of Study Participants (N=1,500)

Characteristic	Category	n (%)	High Awareness* n (%)	p-value
Age Group	30-39	375 (25.0)	45 (12.0)	<0.001
	40-49	450 (30.0)	108 (24.0)	
	50-65	675 (45.0)	243 (36.0)	
Education	No formal	225 (15.0)	15 (6.7)	<0.001
	Primary	300 (20.0)	45 (15.0)	
	Secondary	525 (35.0)	158 (30.1)	
	Graduate+	450 (30.0)	178 (39.6)	
Income (Monthly)	<₹20,000	525 (35.0)	68 (13.0)	<0.001
	₹20,000-50,000	600 (40.0)	180 (30.0)	
	>₹50,000	375 (25.0)	148 (39.5)	

***High awareness defined as recognizing ≥3 ovarian cancer symptoms**

The analysis of the demographics uncovered important gaps in the awareness of ovarian cancer. Women in the age bracket of 50-65 years had an awareness level of 36.0%, which is higher than the younger cohorts with values between 12.0-24.0% (p<0.001). A pronounced education gradient was present, as 39.6% of graduates had high awareness compared to only 6.7% of participants with no formal schooling (p<0.001). Likewise, the higher income groups (>₹50,000/month) had almost three times more awareness than the lowest income group (39.5% vs 13.0%, p<0.001).

Table 2: Ovarian Cancer Knowledge and Symptom Recognition

Knowledge Item	Correct Response n (%)	95% CI
Recognized bloating as a symptom	315 (21.0)	18.9-23.1
Recognized pelvic pain as a symptom	285 (19.0)	17.0-21.0
Recognized early satiety as a symptom	150 (10.0)	8.5-11.5
Knew family history as a risk factor	240 (16.0)	14.1-17.9
Could name ≥3 symptoms	396 (26.4)	24.1-28.7

Symptom knowledge was alarmingly low, with only 21.0% recognizing bloating and 19.0% identifying pelvic pain as a potential warning sign. Just 10.0% were aware of early satiety as a symptom. Family history recognition as a risk factor was reported by only 16.0% of participants. Only 26.4% (95% CI: 24.1-28.7) demonstrated high knowledge by identifying ≥3 symptoms.

Table 3: Healthcare-Seeking Behavior and Screening

Behavior	n (%)	95% CI
Would consult a doctor for symptoms	825 (55.0)	52.4-57.6
Had heard of ovarian cancer screening	225 (15.0)	13.2-16.8
Have you ever discussed ovarian cancer with a doctor	120 (8.0)	6.7-9.3
Knew where to get screened	90 (6.0)	4.8-7.2

Healthcare-seeking behaviors showed concerning patterns, with only 55.0% reporting they would consult a doctor for potential symptoms. Awareness of screening options was minimal (15.0%), and a mere 8.0% had ever discussed ovarian cancer with their healthcare provider. Only 6.0% knew where to access screening services.

Qualitative Findings from Healthcare Providers (n=60)

Thematic analysis of provider interviews revealed three significant barriers to early detection:

1.Symptom normalization: 85% reported that patients often dismiss symptoms as everyday digestive issues

2.Diagnostic delays: 72% cited an average 6-8 month delay from symptom onset to specialist referral

3.Resource limitations: 63% noted insufficient ultrasound capacity for proper evaluation

Community Focus Group Themes (8 groups)
•Cultural reluctance to discuss "private parts" symptoms
•Preference for female doctors for gynecological concerns
•Strong interest in community-based awareness programs
•Limited trust in public hospital services

Spatial Analysis

Geographic mapping showed significant variation in awareness across Bangalore:
•Highest awareness in the Central zone (34.2%)
•Lowest awareness in RR Nagar (14.8%)
•A strong correlation (r=0.82) between awareness and density of healthcare facilities

These results demonstrate critical gaps in ovarian cancer awareness and early detection in urban Bangalore, with inferior knowledge among younger, less educated, and lower-income women. The findings highlight the urgent need for targeted education programs and improved healthcare access to address these disparities.

Discussion

The study's results highlight alarming gaps in ovarian cancer awareness and early detection practices among women living in urban areas of Bangalore, with far-reaching consequences for public health policy and clinical practice. The overall low rate of symptom recognition (26.4% for ≥3 symptoms) is especially troubling considering the level of healthcare available in Bangalore, which is much lower than that found in high-income countries [10]. This disparity persists despite having advanced healthcare infrastructure, suggesting that the mere availability of services is not helpful without concomitant improvements in health literacy.

This lack of awareness demonstrates stronger socioeconomic gradients than those documented in other Indian cancer studies [4] and is especially remarkable within this urban setting. The almost six-fold gap in awareness among graduates (39.6%) and those with no formal education (6.7%) is illustrative of the level of education as a barrier to health knowledge acquisition through health literacy, media, and healthcare utilization [12,13]. The financial differences (39.5% vs 13.0% awareness) indicate even more significant barriers to obtaining health information because of socioeconomic differences.

Recognition of the symptoms is indeed concerning and warrants further investigation. While 21.0% of respondents clustered bloating as a symptom, which is an ovarian cancer symptom [14], this figure is still concerningly low, given that bloating remains the most common presenting symptom for ovarian cancer. Fewer still identified pelvic pain (19%) or early satiety (10%), which are relatively common triggers for further workup in high-awareness groups. It appears that the advocacy campaigns focusing mainly on breast and cervical cancer in India [6] have somewhat neglected the symptoms of ovarian cancer.

The symptom management practices documented in this work illustrate an emerging crisis of over-familiarity with possible warning signals. The qualifying figure of 45% for women who would not seek medical help aligned with qualitative accounts of symptom dismissal and reflects observations made in other low-awareness populations [8]. The nominal ovarian cancer discourse among patients and healthcare practitioners (8.0%) suggests that there is a despairing lack of engagement, which, while primary care encounters may provide appropriate opportunities to educate vulnerable women, these windows are squandered.

The implications of the spatial analysis results are crucial for determining how best to allocate resources. The geographic linkage between population awareness levels and cancer care facility distribution was high (r=0.82). This means that the available population served by a given health facility influences the use of the facility's services and the knowledge about health services. This reinforces the argument for more significant program-decentralized cancer awareness outreach to low metropolitan peripheral areas [7].

Conclusion

This research indicates suboptimal levels of awareness regarding ovarian cancer in the heavily populated city of Bangalore, India, with consequences being the most chronic among socioeconomically vulnerable groups. Addressing these gaps calls for a combination of community mobilization educational campaigns and strengthening the health system simultaneously. Thus, these findings serve the purpose of baseline data aiming to prepare for further initiatives for awareness adjustment in the context of urbanizing India.

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Conflicts of Interest: The authors declare no conflict of interest.

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