

Awareness, perception and behavioral determinants associated with cancer prevention among adults: Results from a cross-sectional study in urban field practice area of a tertiary care hospital, Kolkata



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ABSTRACT

Background: Cancer is emerging as a major public health problem. Two-thirds of cancer patients are in the advanced stage at the time of diagnosis. Public awareness plays a big role in cancer prevention. **Aims and Objectives:** To assess awareness, perception, and behavioral determinants of cancer prevention of urban adults. **Materials and Methods:** An observational, cross-sectional study was conducted in the urban slum of Kolkata. Four hundred fifteen respondents were interviewed using a pre-tested questionnaire after having consent. **Results:** Though majority (72.3%) of respondents had satisfactory awareness but had limited awareness on screening tests (58.6%) and vaccination (1.6%). Half of them had a favorable perception on cancer prevention but the perceived barrier was more. The behavior score was poor among the majority of participants. The main source of information was T.V. (88.2%) and friends and relatives (80.2%). Only one-fourth of participants mentioned of health workers and health camps as sources of information indicating inadequate activities on cancer awareness programs. Age (OR 7.08, 95% CI = 1.07–46.74), sex (OR 0.38, 95% CI = 0.19–0.76) education (OR 4.81, 95% CI = 2.50–9.27) were significant predictors of satisfactory awareness. Higher levels of education, younger age, and female gender were factors that shaped perception. Only education level (OR 0.29, 95% CI = 0.15–0.59) had a significant association with cancer preventive behavior. **Conclusions:** Though awareness on primary preventive measures was satisfactory but behavior was unsatisfactory among study participants. They had more perceived barriers while taking preventive measures. The finding indicates a need to promote health education and motivate people to recognize and modify cancer-related behavioral risk factors.

Key words: Awareness; Perception; Cancer; Urban population

INTRODUCTION

Worldwide cancer is a major public health problem with 20 million people living with cancer and it is the second leading cause of death.¹⁻³ According to the WHO, two-thirds of cancer cases present themselves to medical

facilities in advanced stages when they are untreatable.⁴ In India, despite of availability of screening tests for cervical, breast, and oral cancers but facilities for screening and public awareness are limited.⁵⁻⁷ Cancer is avoidable through lifestyle modification and reducing risk factors, such as tobacco use, alcohol consumption, physical inactivity, and

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dietary factors. Limited knowledge and failure to involve people in cancer education programs are the root causes of delayed diagnosis and poor outcomes.^{8,9} It is equally important to consider sociocultural barriers that delay help-seeking¹⁰ To understand the lack of motivation and underutilization of preventive services, a health belief model was created. The constructs include domains, such as perceived benefits, perceived barriers, perceived severity, and perceived susceptibility.¹¹ The only feasible solution is to create cancer awareness and motivate people to take preventive measures. Currently available data are limited to some sections of society particularly in urban slums.

Aims and objectives

Our study was conducted to assess awareness of urban adults, their perception and behavior on cancer prevention.

MATERIALS AND METHODS

The observational, cross-sectional study was conducted in the urban field practice area of RGKMCH, Kolkata from June 2019 to January 2020. Institutional ethical clearance was taken.

Inclusion criteria

All residing families with a list of adult members were included for complete enumeration.

Exclusion criteria

Participants who were not willing to participate were excluded.

Thirty-seven out of 452 families expressed their unwillingness. The remaining 415 families participated in the study. One adult member from each family was chosen by simple random sampling and was interviewed after taking consent. Data were collected by a pre-tested, semi-structured schedule. Outcomes of interest were total individual scores in each section of awareness, perception, and behavior. Independent variables were age, sex, religion, marital status, education, socioeconomic status, etc. Total and median scores for every respondent were calculated. The median score was used as a cut-off point to determine if respondents did average or below average in each section. Perception score was taken on a Likert scale, consisting of 19 items based on the health belief model. Reverse coding was used for negative statements. The total score on perception ranged from 19 to 95. To assess the probability of having satisfactory or unsatisfactory scores separate multivariate logistic regression models were developed. Results of the descriptive study were presented in frequency and percentage and logistic regression analysis were reported as odds ratios with a 95% confidence interval. Final analyses were done in Excel and IBM SPSS version 16.

RESULTS

Participants' mean (SD) age was 48.60 (9.93) years with the majority belonging to the age-group of 41–50 years (Table 1). 48% were male and 52% were female participants.

The main sources of information were friends, relatives, and neighbors (80.2%) followed by social media and newspapers (88.2%). One-fourth of respondents mentioned health-warnings on tobacco products, health campaigns, and health workers as sources of information. The role of healthcare workers and health-camps in information dissemination among people were low (24.6%) indicating inadequate health education being held in the study area (Table 2).

94.2% of participants mentioned reducing or quitting on tobacco followed by reducing or quitting on alcohol (63.9%), taking fruits and vegetables (10.1%),^{12,13} regular physical exercise (3.4%),¹⁴ clinical check-ups and screening test (58.6%) and vaccination (1.6%), respectively, as cancer preventive measures.

The awareness score was ranging between 0 and 6 with a median score of three (Table 3). A score <3 was categorized as below-satisfactory and score ≥3 as satisfactory awareness.

Compared to the elder age-group, the younger age-group (<30 years) had 7.089 times higher odds of satisfactory awareness on cancer prevention, (95% CI 1.075–46.745) (Table 4). However, males had significantly lower odds of satisfactory awareness in comparison to females (95% CI 0.194–0.764). Compared to lower-education levels, participants with higher-educational levels have 4.815 times higher odds of satisfactory awareness (95% CI 2.505–9.272). Perception was assessed by the Likert scale based on the health belief model.¹⁵ Total perception score ranged from 19 to 95 with a median score of 61.

A score <61 was categorized as unfavorable perception and a score ≥61 as favorable perception. Median scores obtained by the study participants in each construct of the health belief model in comparison to maximum attainable scores are shown in Figure 1. Median scores in perceived benefit coincided with the maximum attainable scores in that construct. In comparison to females, males had 0.391 times lower odds of favorable perception (95% CI 0.225–0.680). Participants belonging to lower socioeconomic status had 0.222 times lower odds of favorable perception to prevent cancer (95% CI 0.074–0.663) which was statistically significant.

Regarding behavior, participants were asked about smoking habits and measures taken to reduce or quit smoking.

Table 1: Sociodemographic characteristics of the study participants (n=415)

Variables	Frequency	Percentage
Age		
<30 years	22	5.3
31–60 years	342	82.4
>60 years	51	12.3
Sex		
Male	199	48.0
Female	216	52.0
Caste		
General	398	95.9
SC, ST and others	17	4.1
Educational status		
Illiterate	51	12.3
Middle school	276	66.5
High school and above	88	21.2
Occupational status		
Unemployed	135	32.5
Employed	280	67.5
Religion		
Hindu	415	100.0
Marital status		
Ever married	402	96.9
Unmarried	13	3.1
Socioeconomic status		
Upper lower	293	70.6
Lower middle	96	23.1
Upper middle	26	6.3

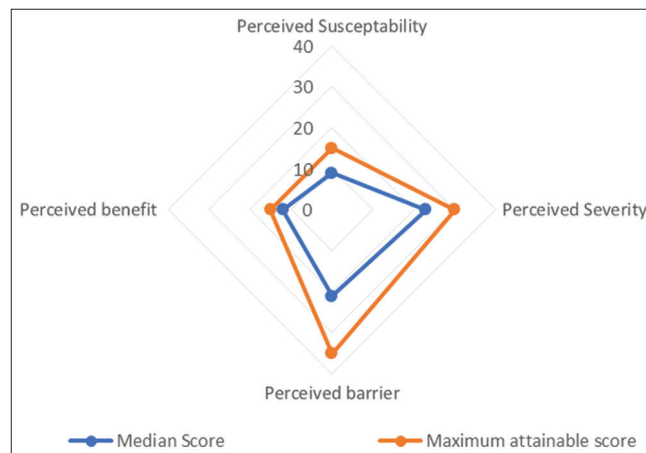
Table 2: Source of information among study participants (n=415)

Source of information	Frequency	Percentage
Friends, relatives, neighbor	332	80.2
TV, Media, Newspaper	366	88.2
Health warning on tobacco package	95	0.8
Health workers and camp	102	24.6

Table 3: Awareness, perception, and behavioral scores of study participants (n=415)

Variables	Awareness score	Perception score	Behavioral score
Total score	6	95	5
Median score	3	61	2
Average score	300 (72.3)	193 (46.5)	71 (17.1)
Below average score	115 (27.7)	222 (53.5)	344 (82.9)

Similarly, preventive measures taken for smokeless tobacco and alcohol consumption were asked. Daily intake (2–6 cups daily) of fruits-vegetables, regular physical activity (150 min of moderate physical activity per week), and participation in screening tests were asked. Only 14% (31) and 1% (2) women respondents had ever went through mammography and pap-smear test, respectively. Behavior scores ranged from 0 to 5 with a median score of 2 (Table 5). A score <2 was categorized as unsatisfactory and a score ≥ 2 as satisfactory behavior. Male and participants with lower educational levels had significantly 0.158 and

**Figure 1: Radar chart showing median scores of study participants among domain of health belief construct**

0.299 times lower odds, respectively, in taking cancer prevention (OR 0.158, 95% CI 0.075–0.335 and OR 0.299, 95% CI 0.151–0.590) (Table 6).

DISCUSSION

To improve survival, emphasis is given on community-based approaches for information dissemination, cancer prevention programs, and cancer education.¹⁵ In our study, all respondents were aware of cancer similar to studies conducted by Ray and Mandal in West Bengal and Seth et al., in New Delhi where a survey revealed that 98% of respondents had heard of “Cancer.”^{16,17} About 24.6% of respondents received cancer-related information from healthcare providers. This finding shows that television and social media are playing important, whereas information from health providers is less. Findings are similar to studies conducted by Abdullahi et al., and Narayana et al., Andhra Pradesh, India.^{18,19}

Predictors of awareness, perception, and behavior were younger age-group, higher educational levels, and higher socioeconomic status. In our study, though 72.3% of participants had average awareness on cancer prevention, almost half of them have unfavorable perceptions and the majority had unsatisfactory behavior. These findings were similar to a study done in South Africa and New Delhi.^{16,20} This highlights the importance of concerted efforts to raise awareness and emphasis on screening.

The majority of participants had satisfactory perceptions of cancer in three constructs of the Health Belief Model, such as severity, susceptibility, and benefit. However, they had perceived barriers in taking preventive measures. The study by Shirazi Zadeh Mehraban et al., revealed comparable results, showing that perceived benefits and severity were both good at 56.5% and 73%, respectively, while perceived barriers were only moderate (46.5%).²¹

Table 4: Association of perception on cancer prevention with sociodemographic profile

Variable	Perception score		B	(95% CI)			P-value
	Unfavorable	Favorable		AOR	Lower	Upper	
Age							
<30 years	11 (50.0)	11 (50.0)	0.389	0.678	0.169	2.717	0.583
31–60 years	182 (53.2)	160 (46.8)	0.207	0.813	0.398	1.661	0.571
>60 years	29 (56.9)	22 (43.1)	-	R			-
Sex							
Male	125 (62.8)	74 (37.2)	0.938	0.391	0.225	0.68	0.001*
Female	97 (44.9)	119 (55.1)	-	R			
Caste							
General	213 (53.5)	185 (46.5)	0.062	1.064	0.384	2.945	0.905
SC, ST, and others	9 (52.9)	8 (47.1)	-				-
Education							
Illiterate	34 (66.7)	17 (33.3)	0.096	0.909	0.357	2.316	0.841
Middle school	141 (51.1)	135 (48.9)	0.843	2.324	1.272	4.244	0.006*
High school and above	47 (53.4)	41 (46.6)	-	R	-		-
Job							
Unemployed	65 (48.1)	70 (51.9)	0.125	0.882	0.489	1.59	0.676
Employed	157 (56.1)	123 (43.9)	-	R			
SES							
Upper lower	169 (57.7)	124 (42.3)	1.832	0.16	0.054	0.472	0.001*
Lower middle	47 (49.0)	49 (51.0)	1.505	0.222	0.074	0.663	0.007*
Upper middle	6 (23.1)	20 (76.9)	-	R	-		
Marital							
Ever married	215 (53.5)	187 (46.5)	0.019	0.981	0.205	4.701	0.981
Unmarried	7 (53.8)	6 (46.2)	-	R	-	-	

Omnibus test of model fitness: (χ^2 [10]=97.09, $P<0.05$). Hosmer and Lemeshow $P>0.05$ Nagelkerke pseudo- R^2 :30%, overall percentage of classification table: 77.1%, * $P<0.05$ is significant

Table 5: Association of perception on cancer prevention with sociodemographic profile

Variable	Perception score		B	(95% CI)			P-value
	Unfavorable	Favorable		AOR	Lower	Upper	
Age							
<30 years	11 (50.0)	11 (50.0)	0.389	0.678	0.169	2.717	0.583
31–60 years	182 (53.2)	160 (46.8)	0.207	0.813	0.398	1.661	0.571
>60 years	29 (56.9)	22 (43.1)	-	R			-
Sex							
Male	125 (62.8)	74 (37.2)	0.938	0.391	0.225	0.68	0.001*
Female	97 (44.9)	119 (55.1)	-	R			
Caste							
General	213 (53.5)	185 (46.5)	0.062	1.064	0.384	2.945	0.905
SC, ST, and others	9 (52.9)	8 (47.1)	-				-
Education							
Illiterate	34 (66.7)	17 (33.3)	0.096	0.909	0.357	2.316	0.841
Middle school	141 (51.1)	135 (48.9)	0.843	2.324	1.272	4.244	0.006*
High school and above	47 (53.4)	41 (46.6)	-	R	-		-
Job							
Unemployed	65 (48.1)	70 (51.9)	0.125	0.882	0.489	1.59	0.676
Employed	157 (56.1)	123 (43.9)	-	R			
SES							
Upper lower	169 (57.7)	124 (42.3)	1.832	0.16	0.054	0.472	0.001*
Lower middle	47 (49.0)	49 (51.0)	1.505	0.222	0.074	0.663	0.007*
Upper middle	6 (23.1)	20 (76.9)	-	R	-		
Marital							
Ever married	215 (53.5)	187 (46.5)	0.019	0.981	0.205	4.701	0.981
Unmarried	7 (53.8)	6 (46.2)	-	R	-	-	

Omnibus test of model fitness: (χ^2 (10)=36.41, $P<0.05$) Hosmer and Lemeshow $P>0.05$ Nagelkerke pseudo- R^2 :29%, overall percentage of classification table: 69%, * $P<0.05$ is significant

In our study, half of the participants had no awareness on screening tests and the majority of them had limited

awareness on vaccination which was in accordance with the findings of a study by Roy and Tang showing that 84%

Table 6: Association of behavior regarding cancer-preventive with sociodemographic variable

Variable	Behavior		B	AOR	(95% CI)		P-value
	unsatisfactory	satisfactory			lower	upper	
Age							
<30 Years	14 (63.6)	8 (36.4)	0.881	2.413	0.39	14.915	0.343
31–60 years	284 (83.0)	58 (17.0)	0.643	1.903	0.568	6.37	0.297
>60 Years	46 (90.2)	5 (9.8)	-	R	-	-	-
Sex							
Male	189 (95.0)	10 (5.0)	1.845	0.158	0.075	0.335	0.010*
Female	155 (71.8)	61 (28.2)	-	R	-	-	-
Caste							
General	328 (82.4)	70 (17.6)	1.08	2.945	0.361	24.037	0.313
SC/ST/Others	16 (94.1)	1 (5.9)	-	R	-	-	-
Education							
Illiterate	43 (84.3)	8 (15.7)	0.702	0.496	0.155	1.581	0.236
Upto middle school	249 (90.2)	27 (9.8)	1.209	0.299	0.151	0.59	0.001*
High school and above	52 (59.1)	36 (40.9)	-	R	-	-	-
Job							
Unemployed	99 (73.3)	36 (26.7)	0.352	1.175	0.589	2.343	0.648
Employed	245 (87.5)	35 (12.5)	-	R	-	-	-
SES							
Upper lower	255 (87.0)	38 (13.0)	0.941	0.39	0.141	1.08	0.070
Lower middle	78 (81.3)	18 (18.8)	0.859	0.424	0.146	1.227	0.113
Upper middle	11 (42.3)	15 (57.7)	-	R	-	-	-
Marital							
Ever married	336 (83.6)	66 (16.4)	-	R	-	-	-
Unmarried	8 (61.5)	5 (38.5)	0.315	2.463	0.425	14.284	0.315

Omnibus test of model fitness: $\chi^2(10)=79.73, P<0.05$. Hosmer and Lemeshow $P>0.05$ Nagelkerke pseudo-R²:29%, overall percentage of classification table 85%, * $P<0.05$ is significant

of participants had limited awareness.²²To avail preventive facilities sufficient awareness on cancers and screening modalities is essential. More efforts under the National Cancer Control Program are needed to raise awareness so that cancer screening and vaccination will emerge as a routine procedure. The reason for including both women and men in sample selection was that attention should be paid to all irrespective of gender to further increase understanding of cancer and the performing of appropriate preventive practices.

Limitations of the study

Regarding limitation, as a semi-structured schedule was used as a tool in our study, the possibility of social desirability bias could not be eliminated from the findings.

CONCLUSION

As cancer is becoming a public health concern worldwide, analysis of our study revealed that though participants were aware of some cancer preventive measures but awareness was limited on screening and vaccination. Practice was lacking on the primary prevention part. The single largest predictor of cancer survival is early diagnosis. Especially in developing countries due to the resource crunch for

diagnostic and treatment facilities, a combined approach with primary prevention has to be emphasized. Participants also perceived barriers in adopting preventive measures. Participation in screening tests was limited. The main reason for this could be either lack of any symptoms or not being advised by any health personnel. Organizing educational and training programs with the cooperation of healthcare workers, doctors, and the media is crucial to increase awareness and motivate them to improve participation in early diagnostic tests and adopt a healthy lifestyle.

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REFERENCES

1. World Cancer Research Fund International. Cancer facts and figures: worldwide data. Available from: <https://www.wcrf.org/int/cancer-facts-figures/worldwide-data> [Last accessed 2024 May 06].

2. India State-Level Disease Burden Initiative Cancer Collaborators. The burden of cancers and their variations across the states of India: The Global Burden of Disease Study 1990-2016. *Lancet Oncol.* 2018;19(10):1289.
[https://doi.org/10.1016/S1470-2045\(18\)30447-9](https://doi.org/10.1016/S1470-2045(18)30447-9)
3. Park K. *Park's Textbook of Preventive and Social Medicine.* 26th ed. Jabalpur: Banarsidas Bhanot Publishers; 2021.
4. Development of an atlas of cancer in India. First all India report 2001-2002: an overview. New Delhi: ICMR, supported by the World Health Organization; 2004. Available from: <https://www.mohfw.nic.in> [Last accessed 2024 Feb 12].
5. San Turgay A, Sari D and Türkistanli EC. Knowledge, attitudes, risk factors, and early detection of cancer relevant to the school teachers in Izmir, Turkey. *Prev Med.* 2005;40(6):636-641.
<https://doi.org/10.1016/j.ypmed.2004.09.038>
6. Odusanya OO. Breast cancer: Knowledge, attitudes and practices of female school teachers in Lagos, Nigeria. *Breast J.* 2001;7(3):171-175.
<https://doi.org/10.1046/j.1524-4741.1998.410062.x-i1>
7. Parsa P, Kandiah M, Mohd Zulkefli NA and Rahman HA. Knowledge and behaviour regarding breast cancer screening among female teachers in Selangor, Malaysia. *Asian Pac J Cancer Prev.* 2008;9(2):221-227.
8. Bhattacharya D. Cancer Perception in Community. In: Paper Presented at DCHRC National Oncology Conference. New Delhi; 2003.
9. Prabhakar V and Prabhakar JR. Breast cancer in India and a voluntary organization in Andhra Pradesh. *Reprod Health Matters.* 2008;16(32):124-125.
10. Khokhar A. Level of awareness regarding breast cancer and its screening amongst Indian teachers. *Asian Pac J Cancer Prev.* 2009;10(2):247-250.
11. Glanz K, Rimer BK and Lewis FM, editors. *Health Behavior and Health Education: Theory, Research, and Practice.* 3rd ed. San Francisco: Jossey-Bass; 2002. p. 47-48.
12. Boston, 677 Huntington Avenue, & Ma 02115+14951000. High fruit and vegetable consumption may reduce risk of breast cancer, especially aggressive tumors. *News*; 2018. Available from: <https://www.hsph.harvard.edu/news/press-releases/fruit-vegetables-breast-cancer> [Last accessed 2024 May 12].
13. Fruit and vegetable consumption. *Cancer trends progress report.* Available from: https://progressreport.cancer.gov/prevention/fruit_vegetable [Last accessed 2024 May 12].
14. Kundapur R, Khan AM and Kakkar R. *IAPSM's Textbook of Community Medicine.* New Delhi: Jaypee Brothers; 2019. p. 616-633.
15. Union for International Cancer Control (UICC). *Advocacy Toolkit 2014.* World Cancer Day. Geneva: UICC; 2014.
16. Ray K and Mandal S. Knowledge about cancer in West Bengal - a pilot survey. *Asian Pac J Cancer Prev.* 2004;5(2):205-212.
17. Seth T, Kotwal A, Thakur R, Singh P and Kochupillai V. Common cancers in India. Knowledge, attitudes and behaviours of urban slum dwellers in New Delhi. *Public Health.* 2005;119(2):87-96.
<https://doi.org/10.1016/j.puhe.2004.05.013>
18. Abdullahi A, Copping J, Kessel A, Luck M and Bonell C. Cervical screening: Perceptions and barriers to uptake among Somali women in Camden. *Public Health.* 2009;123(10):680-685.
<https://doi.org/10.1016/j.puhe.2009.09.011>
19. Narayana G, Suchitra MJ, Sunanda G, Ramaiah JD, Kumar BP and Veerabhadrapa KV. Knowledge, attitude, and practice toward cervical cancer among women attending Obstetrics and Gynecology Department: A cross-sectional, hospital-based survey in South India. *Indian J Cancer.* 2017;54(2):481-487.
https://doi.org/10.4103/ijc.IJC_251_17
20. Ministry of Health and Family Welfare, Government of India. *Annual Report 2009-2010.* Ministry of Health and Family Welfare. The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 and Related Rules and Regulations; 2003.
21. Shirazi Zadeh Mehraban S, Namdar A and Naghizadeh MM. Assessment of preventive behavior for cervical cancer with the health belief model. *Asian Pac J Cancer Prev.* 2018;19(8):2155-2163.
<https://doi.org/10.22034/APJCP.2018.19.8.2155>
22. Roy B and Tang TS. Cervical cancer screening in Kolkata, India: beliefs and predictors of cervical cancer screening among women attending a women's health clinic in Kolkata, India. *J Cancer Educ.* 2008;23(4):253-259.
<https://doi.org/10.1080/08858190802189105>

Authors Contribution:

PS- Concept, design, clinical protocol, definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation and submission of article; **PD-** Clinical protocol, manuscript preparation, editing, and manuscript revision; **PSa-** Manuscript preparation, statistical analysis and interpretation; **RB-** Concept, design, review manuscript, coordination and manuscript revision.

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