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Research Article

Community Perception of Cancer Awareness and Treatment Modalities in North Karnataka, India- A Cross-Sectional Study

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ABSTRACT

Multicausative diseases like cancer have been an important public health illness in the world. In our cancer hospital, we find patients invariably presenting in the advanced stage. Also, by the time they have passed through several doctors for relief. At this stage, a quality life relief is extremely difficult. Hence, our study assesses the awareness of cancer among the community. This is a cross-sectional study conducted among participants randomly sampled from rural and urban communities using a pretested, validated, structured, objective-type questionnaire, responses collected by trained staff, compiled, and analysed**.** The community awareness of cancer-related knowledge has several gaps that need fixing with an information campaign. This study throws light on the significance of knowledge towards cancer and the dietary preventive active acts towards cancer.

Keywords: Awareness, Community, Cancer, Symptoms, preventive acts

INTRODUCTION

The burden of cancer incidence and mortality is rapidly growing worldwide. In every country, cancer is a primary cause of death and a significant impediment to extending life expectancy.[1,2]

According to World Health Organization (WHO) projections from 2019, cancer is the primary or second major cause of death before the age of 70 in 112 of 183 countries.[3,4] Because of the distribution of different types of malignancies and higher case fatality rates in these locations, the number of cancer deaths in Asia (58.3%) and Africa (7.2%) is higher than the incidence of cancer (49.3 and 5.7%).[1] Annually, the burden of new cancer in India is approximately 1 million and the mortality rate is 67.2 per 10 Lakhs.[5]

In 2020, an estimated 19.3 million new cancer cases would be diagnosed worldwide, with around 10.0 million cancer deaths. With an anticipated 2.3 million new cases, female breast cancer (11.7%) has surpassed lung cancer as the most often diagnosed malignancy, followed by lung (11.4%), colorectal (10.0%), prostate (7.3%), and stomach (5.6%). With a projected 1.8 million fatalities (18%), lung cancer remained the top cause of cancer death, followed by colorectal (9.4%), liver (8.3%), stomach (7.7%), and female breast (6.9%) cancers.[6]

The global cancer burden is expected to reach 28.4 million cases in 2040, with a greater increase in transitioning (64%) than transitioned (32%) countries due to demographic changes, though this may be exacerbated further by increasing risk factors associated with globalization and a growing economy.

Socio-demographic Data Related to Cancer

Advancing age is a key risk factor for cancer overall and for numerous solitary cancer types. The frequency of cancer overall increases steadily as age advances, from fewer than 25 cases per 100000 people in age groups under age 20 to about 350 per 100000 people among those aged 45 to 49, to more than 1000 per 100000 people in age groups 60 years and older.[7,8]

According to the most recent statistical data from NCI's surveillance, epidemiology, and end results (SEER) Program, 66 years is the median age for diagnosing a cancer. This indicates that 50% of cancer cases develop in people below this age and 50% in people above this age. The median age for diagnosing breast cancer is 62, 67 years for colorectal cancer, 71 years for lung cancer, and 66 years for prostate cancer. For example, about one-fourth of bone cancer cases and 12% of brain and other nervous system cancers are most often diagnosed in children and adolescents and 1% of cancer overall is diagnosed in this age group.[9]

Occupational exposures make up a significant proportion of cancer-causing agents, involving workplace chemicals or employment in selected occupations and industries. At least 45 of the 113 agents classified by the International Agency for Research on Cancer (IARC)

as carcinogenic to humans.[10-15] Asbestos related diseases alone account for at least 100,000 deaths worldwide each year.[12]

According to Aichi Cancer Registry and census data in 1980-1984, the relationship between marital status and cancer incidence was based on 49,191 incident cases aged above 30years.[16] Some studies show that, if a person lives in a joint family, he or she will have a lower probability of being diagnosed with cancer.[17]

Compared to the educated population, illiterate individuals showed higher cancer incidence rates overall.[18] Even after advances in knowledge regarding risk factors and improvement in early detection and treatment for several cancers, socioeconomic inequalities persist in cancer incidence, morbidity, mortality, and survival.[19-22] This has also been linked to increased exposure to predisposing factors, including poor lifestyle choices, unemployment, low education levels and low housing quality.[23-25]

Previous reports have shown that people living in rural areas have higher death rates from all cancers compared to people living in urban areas. Developed and underdeveloped countries had a higher incidence of deaths from cancers related to tobacco use.[24]

Awareness

In India, late presentation is attributed to many factors and the important one being the lack of knowledge, a lazy attitude towards safe practices, lack of awareness among people about the various risk factors and preventive aspects of some common cancers, like early detection through screening tests and treatment of precancerous lesions.[25]

Present research suggests that many adolescent and college students lack cancer preventative knowledge and are involved in cancer risk behaviors such as unhealthy diet, frequent alcohol consumption and low physical activity. Educating adolescents about cancer prevention and creating awareness about modifiable risk factors is a significant step in the promotion of positive health outcomes and reducing the number of cancer-related deaths each year.[26,27]

Types of Cancer in India

The commonest cancers in India in females are breast and cervix cancers and tobacco-related cancers in males like lung, esophagus, lip and oral cancers.[28]

The ten cancers which make up the highest DALYs (deaths and disability-adjusted life-years) in India are cancers of the stomach, lung, pharynx, nasopharynx, colon and rectum, leukemia, esophageal, and brain and nervous system, in addition to breast, lip and oral cavity, and cervical cancer, which are presently the focus of screening and early detection programs.[28]

METHODS

We have obtained permission from our Institutional Research Committee (IRC 14/2021) and Ethical clearance has been obtained from IEC USM-KLE, International Medical Programme, reference no. being USM-KLE/IEC/09-2022-02. This project is compliant with the Helsinki Declaration and the ethical guidelines of the institutional review board. This is a cross-sectional, descriptive study to collect perceptions of the community on cancer awareness, using a pretested, validated, structured questionnaire. We selected the participants using a simple random technique. The participants are older than 18 years, able to spare a few minutes to answer our questions, or able to read the questionnaire and respond after being briefed about this study by the principal investigators or well-trained support staff and obtaining the participant's consent. The obtained data is kept confidential and anonymous.

The information was collected, compiled, and analyzed using SPSS Statistical software. Results: Total Participants:221 Male 57.9% Female 42.1%

Sampled among

Farmers, skilled/unskilled, business, housewife, student's background. Majority belonging to middle class family. Among these participants, 28% have some experience of cancer. A good number of participants 81% feel awareness can save lives.

Earlier, we conducted a pilot study to validate the questionnaire and estimated the sample size, with a convenient sample of 50 respondents, and estimated that the percentage of knowledge towards cancer to be 79.80%. Based on this work, we calculated a minimum sample size of 179 with a 99% confidential interval and a 5% permissible error. This figure was rounded off to 200 to minimize errors. The test and retest scores of total awareness of cancer were taken. Karl Pearson's product-moment technique has been applied to find out the reliability. We asked about age (in years), gender (male/female), marital status (single/married), educational level (illiterate, primary, secondary, higher secondary, degree, and postgraduate), family type (joint/nuclear), family income (in Indian rupees later classified as low, middle, and upper socioeconomic), and current residence (urban/rural).

The reliability coefficient was found to be 0.9168, and the intrinsic validity was found to be 95.75%. For each question in the knowledge section, there are three possible answers, i.e., "Yes", "No", and "not sure". These responses were coded as 1 for "Yes", while the "No" and "Don't know" responses were coded as 2 and 3.

Statistical Analysis

For data analysis, we used Microsoft Excel 2010 and SPSS version 20.0 (IBM, Bangalore, India) for data analysis. The data coding, sorting, editing, and cleaning were done using Microsoft Excel. The clean data in the Excel file was put into SPSS Software. Then descriptive statistics (i.e., frequencies, percentages, means, and standard deviations) and unit-variate analysis (i.e., chi-square tests, Fisher's exact tests) were performed. In the end, to estimate the joint impact of socio-demographic profile on knowledge and attitude scores, multiple linear regressions were carried out. The *p-value* was set at less than 0.05% for statistical significance.

RESULTS AND DISCUSSION

The present study population says that 73.3% (n= 162) agree with the fact that cancer is curable. 13.12% (n=29) responded not sure and 13.57% (n=30) responded no. There are treatments that may cure some cancer patients, but there are no cures for all kinds of cancer. There's no one-size-fits-all cure. Sometimes, when cancer symptoms disappear with treatment, people may say they are cured, but some cancer cells may remain somewhere in the body and can grow, divide, and become a new tumour (Table 1).[29]

The pre-validated questionnaire is as follows

SL. No.	*Questions* *(Please tick in the column of yes, no or not sure but notall)*	*Yes*	*No*	*Notsure*
1	Do you feel cancer is curable?			
2.	Do you think cancer awareness help saving lives?			
3.	Do you think cancer is result of karma/destiny?			
4.	Is cancer communicable?			
5.	Does cancer mean death?			
6.	Having cancer can lose social relation/ communicationwith people?			
7.	Should cancer be kept confidential?			
8.	Does life return to normal after getting treated forcancer?			
9.	Is Substance abuse a risk factor for cancer:			
	i. alcohol			
	ii. tobacco (chewing/smoking)			
	iii. drugs			
10.	Causes for cancer:			
	i. hereditary			
	ii. witchcraft			
	iii. stress			
	iv. hormonal imbalance			
	v. fast food			
	vi. radiations			
	vii. occupational hazards			
11.	Symptoms:			
	i. Lump			
	ii. Persistent localized pain			
	iii. Bleeding			
	iv. Cough/hoarseness			
	v. Breathlessness			
	vi. Di□culty in swallowing			
	vii. Big mole			
	viii. Sore			
	ix. Undue weight loss			
	x. Tiredness/fatigue			
	xi. Persistent headache			
	xii. General unwellness			
	xiii. Blurred vision			
	xiv. Blood in urine			
	xv. Indigestion			
	xvi. Heart burn			
	xvii. Breast changes			

	xviii. Blood in stools			
	xix. Persistent looser stools.			
	xx. Abdominal distension			
	xxi. Excessive menstrual bleeding			
12.	Risk factors:			
	i. Obesity			
	ii. Pollution			
	iii. Smoking			
	iv. Passive smoking			
	v. Low fruit / veg intake			
	vi. Eating red and processed meat			
	vii. Getting sunburnt			
	viii. Advanced age			
	ix. Family history			
	x. HPV infection			
	xi. Sedentary lifestyle			
	xii. Having close relative with cancer.			
13.	Do you practice any preventive acts?			
	i. Exercise			
	ii. Screening test			
	iii. Self-examination			
	iv. Avoid too much sunlight			
	v. Maintain healthy weight			
	vi. Vaccine			
	vii. Quit tobacco			
	viii. Quit alcohol			
14.	Can cancer be prevented by including these in diet?			
	i. Turmeric			
	ii. Ginger			
	iii. Garlic			
	iv. Tulasi			
	v. Antioxidant fruits and vegetables			
15.	Does early detection of cancer reduce further complications?			

Around 81.0% (n= 179) agree with the fact that awareness about cancer increases the survival of patient curable cancer. 4.98% (n=11) responded not sure, and 14.03% (n=31) responded no. The significance of cancer awareness has been emphasized to ensure a behavior that facilitates early detection, whereas its absence can be a detriment to this end. Cancer patients in low- and middle-income countries usually have a poor prognosis compared to patients in high-income countries, which is linked to lack of awareness, late diagnosis and unbalanced access to affordable curative services.[25,30]

Encircling that 22.62% (n= 50) agree with the fact that cancer is a result of karma/destiny. 14.48% (n=32) responded not sure and 62.9% (n=139) responded no. A lack of awareness fuels many myths and misconceptions about cancer and maintains the stigma associated with it.[31,32-34] People also tend to have debatable thoughts that not all substance abusers suffer from cancer. Thus, they ascribe cancer to fate or karma, with the origin of the disease being a curse from the patient's gods, and the patients consulted religious counsellors or occultists. [35,36] Although many people believe that cancer is not a curse.[37]

About 65.6% (n=145) of the study population believes that cancer is not considered a contagious disease. Cancer can spread from person to person in case of tissue or organ transplant, with a low incidence of about 2 cases of cancer per 10,000 attributed to human papillomavirus and *Helicobacter pylori* infection.[38]

For a long time, cancer has been the most feared disease amongst the population; it is widely considered to be synonymous with death[39-43]; this is in concur by 33% (n=73). 54.3% (n=120) of the study population still consider that not all cancers lead to death; it all depends on the severity, type of cancer and stage of cancer. Cancer, if diagnosed at an early stage, can be treated.[44-46]

Cancer affects psychological, emotional, and also substantially changes their social life, such as family life, relationships with people around them, work, income, leisure activities, and relationships with health care providers.[47-52] This is yet agreed by 30.3% (n=67) of the study population. The need for support for their social problems, as well as the mental care of patients, has been increasingly recognized.[52]

Caregivers also request the doctors to refrain from informing the patients about their diagnosis, due to the fear of not being able to handle it emotionally[53]; this is well supported in this study, wherein 66.9% (n=148) affirm that the diagnosis of cancer has to be kept confidential. A support system can help ease the emotional and physical burdens during diagnosis and treatment. Some may feel that sharing their experience publicly empowers them and provides an opportunity to help others on similar journeys (Table 2).[54]

Around 54% (n= 120) of the study population denied this. The reality of cancer patients is often more physically and emotionally complex. The diagnosis puts the patient in turmoil of emotions.[55] India is observing rapid changes in dietary and lifestyle changes due to westernization and urbanization. It's been seen that consumption of alcohol and preserved food with low intake of fibre is gradually rising. Tobacco-related cancer has also reached a new peak.[56-60] Increased risk of several cancers, including cancer of the colon, rectum, female breast, oral cavity, pharynx, larynx, liver, and oesophagus, is linked to heavy intake of alcohol.[61] Habitual use of tobacco products or being around environmental tobacco smoke have a greater risk of cancer as it contains chemicals that have a destructive effect on the DNA of a cell (Table 3).[62,63]

As per the 2014 estimation, 31.7% of cancer survivors are fat, indicating that obesity has developed rapidly in cancer survivors compared to the general adult population in recent years.[64] Tobacco (chewing/smoking) was rated highest as causative factor of cancer by 87.3% (n=193) of the study population, followed by alcohol consumption 69.2% (n=153) and drugs 67.8% (n=150).

The undue weight loss and fatigue were graded the commonest symptom of cancer by 68.7% (n=152) of the study population; followed by difficulty in swallowing 67.4% (n=149) and lump by 62.4% (n = 138). Abdominal pain is a common symptom of colorectal, ovarian, and renal cancer.[66] Extremely rare primary malignant fibrous histiocytoma (MFH) localised in the large intestine is associated with blood in stools (Table 4).[67]

A patient presented with dysphagia and weight loss with an impression of gastrointestinal stromal tumor (GIST), which was later diagnosed as a rare case of malignant glomus tumor of the esophagus. [68] Symptoms such as exertional shortness of breath, orthopnea and non-productive cough are observed in lung cancers.[69]

Both active and passive smoking are considered major risk factors for cancer development by 81.9% (n=181) and 69.68% (n=154), respectively. About 75% (n= 33.9%) of the study population believes that family history accounts for cancer development. About 5 to 10% of cancers inherited from an individual's family are due to mutations. Women who have a family history of breast cancer and Hodgkin's lymphoma are at higher risk of developing breast cancer.[70] Obesity is linked to an increased risk of recurrence in aggressive prostate cancer.[71] Some families with an inherited cancer mutation will have multiple family members developing the same type of cancer; these are denoted as familial or hereditary cancers (Table 5).[72]

About 73.7% (n= 163) of the study population consent that exercise would be an effective lifestyle modification tool in the prevention of cancer. According to a report, regular Physical activity reduces the incidence of cancer and tumor growth.[73] Epidemiological studies have demonstrated the role of physical activity in cancer, leisure-time physical exercise reduces the risk of at least 13 different cancer types[74] and furthermore, exercise reduces the risk of recurrence for breast, colon, and prostate cancer. [75-77] The mortality and morbidity rates of cancer are reducing due to cancer screening tests.[78,79] Only 49.3% (n=109) of the study population knew about self-examination as a cancer preventive tool. Around the world, the prevalence of cancer is increasing. Some simple secondary preventions like self-breast examination can help prevent the rising of this epidemic.[80] Breast cancers can be diagnosed and successfully treated by breast self-examination or by clinical examination (Table 6).[81]

Framing 77.3% (n=171) believe that maintaining a healthy weight is an effective cancer preventive tool. Weight loss could prevent a major portion of common cancers. Body fat is one of the major risk factors for cancer. There is sufficient evidence to prove the association of body fat and numerous types of cancers, like colorectal, pancreatic, esophageal, postmenopausal breast, kidney, and endometrial cancers. Cancer burden could be reduced if an individual realizes the importance of weight loss and a nutritious diet (Table 7).[77]

Cancer and non-communicable diseases could be prevented by maintaining a healthy weight and being physically active, with intake of a plant-based diet along with limited amounts of fast foods, red meat, alcohol, and sugar-sweetened drinks consumption, as both diseases have common risk factors.[82,83] However, prevention is the most cost-effective, long-term strategy to control the incidence of cancer.[84]

Encompassing 48.4% (n=107) of the population agreed upon the fact that vaccination is one of the preventive measures. Therapeutic cancer vaccines against human papilloma[65] virus and hepatitis B virus for cervical cancer and hepatocellular carcinoma, respectively, are highly effective at clearing pre-malignant lesions but have not shown any effectiveness in advanced disease.[85,86]

About 81.9% (n=181) of the study population agrees with the fact that quitting alcohol would be an effective preventive measure against cancer. Epidemiologic research shows that people who use both alcohol and tobacco have much greater risks of developing cancers

of the oral cavity, pharynx, larynx, and esophagus than people who use either alcohol or tobacco alone.[87,88] Stopping consumption of alcohol eventually decreases the risk for cancer, although it may take many years for it to return to the risks of never drinkers.[89] The latest world statistics from 2002 estimate that around 3.6% of all cancers, or 389100 cases, are related to alcohol consumption.[90,91] Consuming three alcoholic beverages per day was associated with a moderate increase in liver cancer risk, while consuming about seven drinks per day was associated with an increased risk of up to 66%.[92]

Round about 82.8% (n=183) of the study population agreed that quitting tobacco would be an effective preventive measure in cancer prevention. Smoking cessation is important to reduce tobacco use and help reduce the burden of cancer and other diseases. Quitting tobacco is beneficial for the health of an individual by preventing problems like lung and other cancers, cardio and cerebrovascular diseases.[93] Recent researches have shown that smokers who quit the use of tobacco before the age of 40 reduce the risk of smoking-related mortality by 90%.[93,94]

More than half of the study population, around 66.06% (n=146), believe that using turmeric in routine food preparation prevents cancer. Some studies suggest the active ingredient curcumin in turmeric has cancer fighting property, in addition to other health benefits. Some lab studies have found it might fight against lung, breast, prostate, and colon cancers (Table 7).[94-99]

Around 68.33% (n=151) of study participants agreed upon the fact that Ginger usage in the diet prevents cancer. Experimental studies showed that 6-gingerol and 6-shogaol, the active components of ginger, have anti-cancerous properties against gastrointestinal cancer.[100-103]

The fact that garlic not only works as an antibiotic but also prevents cancer is supported by 65% (n=144). Eating garlic lowers the risk of colorectal cancers, according to a review of the global research, AICR's (American Institute for Cancer Research) reports. Lab studies suggest that garlic compounds repress the cancer cells' growth, help repair DNA and are anti-inflammatory.[104-106]

Tulasi has been used religiously for decades by the Indian population and is used in various traditional medicines. This usage would prevent cancer, has been believed by 72.8% (n=161). Preclinical studies have also shown that Tulasi and some of its phytochemicals prevented chemical-induced skin, liver, oral, and lung cancers by increasing the antioxidant activity, altering the gene expressions, inducing apoptosis, and inhibiting angiogenesis and metastasis.[107-109]

Around 72.4% (n=160) believe that antioxidant properties in fruits and vegetables prevent cancer. Many fruits and vegetables contain antioxidants such as vitamin C, lycopene, and beta-carotene. According to a review of many clinical studies, having meals rich in fruits and vegetables lowers the risk of developing lung cancer and could prevent cancers of the mouth, throat, larynx, esophagus, stomach, pancreas, and prostate (Table 7).

Around 78% (n=179) believe that early detection improves the prognosis of the disease. Later-stage diagnosis contributes to poor cancer outcomes. The community has some knowledge of cancer illness, has some experience with cancer, but is fully unaware of identifying early symptoms of this illness and what to do, how to go about it if such an illness occurs.[110-112] In our study, we identified

Table 1: Demographic profile of participants

Profile	*Frequency*	*Percentage (%)*
Age groups		
18–20 years	16	7.24
21–30 years	70	31.67
31–40 years	64	28.96
41–50 years	40	18.10
>=51 years	31	14.03
Gender		
Male	128	57.92
Female	93	42.08
Occupations		
Students	41	18.55
Business	14	6.33
Housewife	36	16.29
Labour	26	11.76
Government servant	10	4.52
Farmer	31	14.03
Skilled workers	63	28.51
Education		
Illiterates	9	4.07
Primary	8	3.62
Secondary	47	21.27
PUC	38	17.19
Graduates	103	46.61
PG	16	7.24
Marital status		
Married	146	66.06
Single	75	33.94
Family		
Joint	123	55.66
Nuclear	98	44.34
SES		
Low	16	7.24
Low middle	149	67.42
Upper middle	53	23.98
Upper	3	1.36
Location		
Rural	111	50.23
Urban	110	49.77
Experience of cancer		
Some experience	62	28.05
No experience	145	65.61

Primary Health Centres, Community Health Centres and Secondary Care Centres, sampled the healthy individuals who visit these centres and conducted face-to-face interviews. Most of our participants

Table 2: Question-wise responses of participants

Questions	*Yes*	%	*Not sure*	%	*No*	%
Do you feel is cancer curable?	162	73.30	29	13.12	30	13.57
Do you think cancer awareness help saving lives?	179	81.00	11	4.98	31	14.03
Do you think cancer is result of karma/destiny?	50	22.62	32	14.48	139	62.90
Is cancer communicable?	43	19.46	33	14.93	145	65.61
Does cancer mean death?	73	33.03	28	12.67	120	54.30
Having cancer can lose social relation/ communication with people?	67	30.32	21	9.50	133	60.18
Should cancer be kept confidential?	56	25.34	17	7.69	148	66.97
Does life return to normal after getting treated for cancer?	153	69.23	30	13.57	38	17.19

Table 3: Is Substance abuse a risk factor for cancer?

Substance abuses a risk factor	*Yes*	%	*Not sure*	%	*No*	%
i. Alcohol	153	69.23	32	14.48	36	16.29
ii. Tobacco (chewing/smoking)	193	87.33	13	5.88	15	6.79
iii. Drugs	150	67.87	47	21.27	24	10.86
iv. Hereditary	77	34.84	61	27.60	83	37.56
v. Witchcraft	13	5.88	51	23.08	157	71.04
vi. Stress	62	28.05	57	25.79	102	46.15
vii. Hormonal imbalance	97	43.89	67	30.32	57	25.79
viii. Fast food	104	47.06	56	25.34	61	27.60
ix. Radiations	97	43.89	59	26.70	65	29.41
x. Occupational hazards	97	43.89	66	29.86	58	26.24

Table 4: Signs/Symptoms

Signs/Symptoms	*Yes*	%	*Not sure*	%	*No*	%
Lump	138	62.44	56	25.34	27	12.22
Persistent localized pain	131	59.28	56	25.34	34	15.38
Bleeding	129	58.37	52	23.53	40	18.10
Cough/hoarseness	132	59.73	51	23.08	38	17.19
Breathlessness	121	54.75	50	22.62	50	22.62
Difficulty in swallowing	149	67.42	42	19.00	30	13.57
Big mole	71	32.13	85	38.46	65	29.41
Sore	89	40.27	83	37.56	49	22.17
Undue weight loss	152	68.78	44	19.91	25	11.31
Tiredness/fatigue	152	68.78	38	17.19	31	14.03
Persistent headache	111	50.23	63	28.51	47	21.27
General wellness	125	56.56	61	27.60	35	15.84
Blurred vision	93	42.08	78	35.29	50	22.62
Blood in urine	105	47.51	73	33.03	43	19.46
Indigestion	111	50.23	67	30.32	43	19.46
Heart burn	112	50.68	59	26.70	50	22.62
Breast changes	132	59.73	58	26.24	31	14.03
Blood in stools	101	45.70	72	32.58	48	21.72
Persistent looser stools.	79	35.75	91	41.18	51	23.08
Abdominal distension	108	48.87	67	30.32	46	20.81
Excessive menstrual bleeding	99	44.80	80	36.20	42	19.00

Table 5: Risk factors

Risk factors	*Yes*	%	*Not sure*	%	*No*	%
Obesity	94	42.53	60	27.15	67	30.32
Pollution	128	57.92	44	19.91	49	22.17
Smoking	181	81.90	13	5.88	27	12.22
Passive smoking	154	69.68	27	12.22	40	18.10
Low fruit / veg intake	92	41.63	51	23.08	78	35.29
Eating red and processed meat	86	38.91	69	31.22	66	29.86
Getting sunburnt	73	33.03	71	32.13	77	34.84
Advanced age	77	34.84	65	29.41	79	35.75
Family history	75	33.94	62	28.05	84	38.01
HPV infection	68	30.77	101	45.70	52	23.53
Sedentary lifestyle	75	33.94	83	37.56	63	28.51
Having close relative with cancer.	54	24.43	51	23.08	116	52.49

Table 6: Do you practice any preventive acts?

Practice any preventive acts	*Yes*	%	*Not sure*	%	*No*	%
Exercise	163	73.76	19	8.60	39	17.65
Screening test	98	44.34	33	14.93	90	40.72
Self-examination	109	49.32	39	17.65	73	33.03
Avoid too much sunlight	79	35.75	38	17.19	104	47.06
Maintain healthy weight	171	77.38	23	10.41	27	12.22
Vaccine	107	48.42	34	15.38	80	36.20
Quit tobacco	183	82.81	14	6.33	24	10.86
Quit alcohol	181	81.90	14	6.33	26	11.76

Table 7: Can cancer be prevented by including these in diet?

Prevented by including these in diet	*Yes*	*%*	*Not sure*	*%*	*No*	*%*
Turmeric	146	66.06	54	24.43	21	9.50
Ginger	151	68.33	49	22.17	21	9.50
Garlic	144	65.16	53	23.98	24	10.86
Tulasi	161	72.85	42	19.00	18	8.14
Antioxidant fruits and vegetables	160	72.40	44	19.91	17	7.69

Table 8: Does early detection of cancer reduce further complications?

	Yes	%	Not sure	%	No	%
Does early detection of cancer reduce further complications?	174	78.73	20	9.05	27	12.22

Table 9: Levels of awareness

Levels of awareness	*Frequency*	*Percentage (%)*
Low awareness (<Mean-SD)	33	14.93
Moderate awareness (>Mean-SD, <Mean+SD)	153	69.23
High awareness (>=Mean+SD)	35	15.84
Total	221	100.00

Table 10: Association between levels of awareness with demographic profile

Profile	*Low*	%	*Mode rate*	%	*High*	%	*Total*	%	*Chi- square*	*p-value*
Age groups										
18-20yrs	1	6.25	12	75.00	3	18.75	16	7.24	15.5570	0.0490*
21-30yrs	9	12.86	54	77.14	7	10.00	70	31.67		
31-40yrs	13	20.31	34	53.13	17	26.56	64	28.96		
41-50yrs	5	12.50	28	70.00	7	17.50	40	18.10		
>=51yrs	5	16.13	25	80.65	1	3.23	31	14.03		
Gender										
Male	19	14.84	90	70.31	19	14.84	128	57.92	0.2430	0.8860
Female	14	15.05	63	67.74	16	17.20	93	42.08		
Occupations										
Students	2	4.88	34	82.93	5	12.20	41	18.55	24.5270	0.0170*
Business	6	42.86	5	35.71	3	21.43	14	6.33		
Housewife	8	22.22	26	72.22	2	5.56	36	16.29		
Labor	4	15.38	18	69.23	4	15.38	26	11.76		
Government servant	0	0.00	6	60.00	4	40.00	10	4.52		
Farmer	5	16.13	22	70.97	4	12.90	31	14.03		
Skilled workers	8	12.70	42	66.67	13	20.63	63	28.51		
Education										
Illiterates	3	33.33	6	66.67	0	0.00	9	4.07	18.6340	0.0450*
Primary	2	25.00	6	75.00	0	0.00	8	3.62		
Secondary	11	23.40	32	68.09	4	8.51	47	21.27		
PUC	7	18.42	27	71.05	4	10.53	38	17.19		
Graduates	8	7.77	70	67.96	25	24.27	103	46.61		
PG	2	12.50	12	75.00	2	12.50	16	7.24		
Marital status										
Married	24	16.44	100	68.49	22	15.07	146	66.06	0.8480	0.6540
Single	9	12.00	53	70.67	13	17.33	75	33.94		
Family										
Joint	23	18.70	81	65.85	19	15.45	123	55.66	3.1200	0.2100
Nuclear	10	10.20	72	73.47	16	16.33	98	44.34		
SES										
Low	2	12.50	11	68.75	3	18.75	16	7.24	19.7260	0.0030*
Low middle	23	15.44	112	75.17	14	9.40	149	67.42		
Upper middle	8	15.09	27	50.94	18	33.96	53	23.98		
Upper	0	0.00	3	100.0	0	0.00	3	1.36		
Location										
Rural	19	17.12	79	71.17	13	11.71	111	50.23	3.2310	0.1990
Urban	14	12.73	74	67.27	22	20.00	110	49.77		
Experience of cancer										
Some experience	17	27.42	37	59.68	8	12.90	62	28.05	17.3420	0.0020*
No experience	13	8.97	110	75.86	22	15.17	145	65.61		
Not to say	3	21.43	6	42.86	5	35.71	14	6.33		
Total	33	14.93	153	69.23	35	15.84	221	100.0		

*p<0.05

Table 11: Multiple logistic regression analysis

	OR	*95% C.I. for OR*		*p-value*
		Lower	*Upper*	
Age groups				
18-20yrs	2.48	0.16	39.50	0.5210
21-30yrs	0.59	0.09	4.01	0.5880
31-40yrs	3.07	0.58	16.21	0.1850
41-50yrs	2.18	0.39	12.20	0.3760
>=51yrs	Ref. (OR=1)			
Gender				
Male	Ref. (OR=1)			
Female	2.52	0.90	7.04	0.0780
Occupations				
Students	0.69	0.11	4.41	0.6970
Business	2.19	0.38	12.77	0.3830
Housewife	0.42	0.07	2.72	0.3650
Labour	5.76	0.87	38.13	0.0690
Government servant	2.26	0.36	14.19	0.3840
Farmer	3.56	0.55	23.01	0.1830
Skilled workers	Ref. (OR=1)			
Education				
Illiterates	-	-	-	-
Primary	-	-	-	-
Secondary	0.25	0.03	1.97	0.1870
PUC	0.25	0.03	2.22	0.2150
Graduates	1.28	0.33	4.96	0.7180
PG	Ref. (OR=1)			
Marital status				
Married	Ref. (OR=1)			
Single	1.79	0.48	6.65	0.3830
Family				
Joint	Ref. (OR=1)			
Nuclear	1.00	0.42	2.42	0.9970
SES				
Low	0.24	0.02	3.21	0.2780
Low middle	0.05	0.01	0.34	0.0020*
Upper middle	0.15	0.02	0.97	0.0460*
Upper	Ref. (OR=1)			
Location				
Rural	0.67	0.25	1.80	0.4260
Urban	Ref. (OR=1)			
Experience of cancer				
Some experience	Ref. (OR=1)			
No experience	0.92	0.34	2.47	0.8680
Not to say	4.63	0.80	26.86	0.0880

*p<0.05

Table 12: Substance abuse

Substance abuse a risk factor	*Yes*	%	*Not sure*	%	*No*	%
I. Alcohol	153	69.23	32	14.48	36	16.29
Ii. Tobacco (chewing/smoking)	193	87.33	13	5.88	15	6.79
Iii. Drugs	150	67.87	47	21.27	24	10.86
I. Hereditary	77	34.84	61	27.60	83	37.56
Ii. Witchcraft	13	5.88	51	23.08	157	71.04
Iii. Stress	62	28.05	57	25.79	102	46.15
Iv. Hormonal imbalance	97	43.89	67	30.32	57	25.79
V. Fast food	104	47.06	56	25.34	61	27.60
Vi. Radiations	97	43.89	59	26.70	65	29.41
Vii. Occupational hazards	97	43.89	66	29.86	58	26.24

Table 13: Signs and symptoms of cancer

Risk factors	*Yes*	%	*Not sure*	%	*No*	%
Obesity	94	42.53	60	27.15	67	30.32
Pollution	128	57.92	44	19.91	49	22.17
Smoking	181	81.90	13	5.88	27	12.22
Passive smoking	154	69.68	27	12.22	40	18.10
Low fruit / veg intake	92	41.63	51	23.08	78	35.29
Eating red and processed meat	86	38.91	69	31.22	66	29.86
Getting sunburnt	73	33.03	71	32.13	77	34.84
Advanced age	77	34.84	65	29.41	79	35.75
Family history	75	33.94	62	28.05	84	38.01
HPV infection	68	30.77	101	45.70	52	23.53
Sedentary lifestyle	75	33.94	83	37.56	63	28.51
Having close relative with cancer.	54	24.43	51	23.08	116	52.49

Table 14: Practicing preventive acts

Practice any preventive acts	Yes	%	Not sure	%	No	%
Exercise	163	73.76	19	8.60	39	17.65
Screening test	98	44.34	33	14.93	90	40.72
Self-examination	109	49.32	39	17.65	73	33.03
Avoid too much sunlight	79	35.75	38	17.19	104	47.06
Maintain healthy weight	171	77.38	23	10.41	27	12.22
Vaccine	107	48.42	34	15.38	80	36.20
Quit tobacco	183	82.81	14	6.33	24	10.86
Quit alcohol	181	81.90	14	6.33	26	11.76

Table 15: Prevention of cancer including these in diet

Prevented by including these in diet	*Yes*	%	*Not sure*	%	*No*	%
Turmeric	146	66.06	54	24.43	21	9.50
Ginger	151	68.33	49	22.17	21	9.50
Garlic	144	65.16	53	23.98	24	10.86
Tulasi	161	72.85	42	19.00	18	8.14
Antioxidant fruits and vegetables	160	72.40	44	19.91	17	7.69

Table 16: Does early detection of cancer reduce further complications?

	Yes	%	Not sure	%	No	%
Does early detection of cancer reduce further complications?	174	78.73	20	9.05	27	12.22

Table 17: Levels of awareness

Levels of awareness	*Frequency*	*Percentage (%)*
Low awareness (<Mean-SD)	33	14.93
Moderate awareness (>Mean-SD, <Mean+SD)	153	69.23
High awareness (≥Mean+SD)	35	15.84
Total	221	100.00

Table 18: Multiple logistic regression analysis

	OR	*95% C.I. for OR*		*p-value*
		Lower	*Upper*	
Age groups				
18–20yrs	2.48	0.16	39.50	0.5210
21–30yrs	0.59	0.09	4.01	0.5880
31–40yrs	3.07	0.58	16.21	0.1850
41–50yrs	2.18	0.39	12.20	0.3760
>=51yrs	Ref. (OR=1)			
Gender				
Male	Ref. (OR=1)			
Female	2.52	0.90	7.04	0.0780
Occupations				
Students	0.69	0.11	4.41	0.6970
Business	2.19	0.38	12.77	0.3830
Housewife	0.42	0.07	2.72	0.3650
Labor	5.76	0.87	38.13	0.0690
Government servant	2.26	0.36	14.19	0.3840
Farmer	3.56	0.55	23.01	0.1830
Skilled workers	Ref. (OR=1)			
Education				
Illiterates	-	-	-	-
Primary	-	-	-	-
Secondary	0.25	0.03	1.97	0.1870
PUC	0.25	0.03	2.22	0.2150
Graduates	1.28	0.33	4.96	0.7180
PG	Ref. (OR=1)			
Marital status				
Married	Ref. (OR=1)			
Single	1.79	0.48	6.65	0.3830
Family				
Joint	Ref. (OR=1)			

still feel cancer means incurable, certain death. Only 24 to 81% of participants were aware of risk factors (Table 8).

In our present study, we find that 69% of study participants have moderate awareness of cancer (Table 7). The students, youth, illiterate, middle class, and persons who have some experience of cancer have significantly better awareness. The middle-class group persons have significantly low awareness of cancer. The awareness regarding danger signals of cancer varies from 32% to 68% among different strata of the population. Only 24 to 81% of participants are aware of risk factors for cancer. However, 79% of study participants feel early detection helps in recovery (Table 9).

Among the participants, 65 to 72% believe use of ginger, turmeric, garlic, tulasi, fruits and vegetables helps in the prevention of cancer. In general, 35 to 82% of participants practice preventive measures like: weight reduction, quitting tobacco, quitting alcohol, attending screening tests, and take vaccine. The middle-class persons have significantly low awareness of cancer. (Table 10)

There are around 15 studies on cancer awareness among the community. These studies, conducted in Chennai, Kerala, and Mumbai, have sampled cancer sufferers, family members of cancer patients, students, and caregivers. All these studies have one common finding: the community still has no complete awareness of cancer, does not fully use existing cancer screening, and there is a lack of cancer awareness.[111,112] Low, moderate, and high awareness were categorized based on scores. The study population had 69.23% moderate awareness in the majority (Tables 11-18).

CONCLUSION

The Cancer Awareness Measure (CAM) is a validated, face-to-face questionnaire designed to measure the public's awareness of the symptoms and signs, risk factors, preventive acts and practices of cancer, as well as the barriers to seeking help. The myths related to cancer have been elucidated. Many believe in the benefits of early detection, yet having ignorant attitude towards cancer, specifically regarding substance abuse. The community is aware of cancer illness,

but unaware of dangerous signs, and hence does not participate in screening programs. Lifestyle modifications could prevent almost one-third to one-half of all cancer cases. The awareness of cancer risk factors could motivate people to make such changes in their behaviors and lifestyles.

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