Original Article

Perception of selected risk factors for cancer and heart attack among visitors of a public hospital

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ABSTRACT

Background: To assess perception of selected risk factors for cancer and heart attack among visitors of a public hospital. **Materials and Methods:** Randomly 1651 ambulatory adults were contacted using predesigned, pretested, semi-structure interview schedule comprising selective 12 risk factors for cancer (increasing age, tobacco, obesity, alcohol, diet-rich in fat/oil, diet-poor in fruits and vegetables (F and V), physical in-activity, environmental pollution, multiple sexual partners, insecticides/pesticides/chemicals, micro-organism, family history) and 11 for heart attack (increasing age, tobacco, obesity, alcohol, diet-rich in fat/oil, diet-poor in F and V, physical in-activity, hypertension, diabetes mellitus, mental stress, family history). Correct response was awarded one mark and incorrect/do not know response as zero. **Results:** The study participants comprised of 56.2% attendants and 43.8% patients with mean age of 36.78 (±13.05) years; 71.2% were male, 65% resided in rural area and 32.3% subjects were smoker. A statistically ($P = 0.001$) higher odds for smoking was found among less educated (odds ratio [OR]: 1.30), rural (OR: 1.60), male (OR: 2.85), patients (OR: 1.41) of more than 30 years of age (OR: 1.67). Nearly, 64.5% and 82.0% subject responded that tobacco causes the heart attack and cancer while obesity was considered as a risk factor by 68.4% (heart attack) and 28.1% (cancer). Nearly, 70.7% and 32.0% reported diet rich in fat/oil and poor in F and V could lead to heart attack but only 23.5% and 25.8% mentioned respectively for cancer. Mean risk factors identified for heart attack were 6.64 ± 2.29 (range: 0–11) while for cancer it was 5.01 ± 2.33 (range: 0–12). Nearly, 670 (40.58%) and 620 (37.55%) subjects mentioned spontaneously at least one type/anatomical site-specific cancer of male and female respectively; 73.4% believed that cancer does not spread by social activity and 54.2% opined that cancer is treatable if detected early. **Conclusion:** Overall low to moderate level of awareness was noticed for selected risk factors of heart attack but still better than cancer with ample scope for capacity building of stakeholders.

Key words: Alcohol, awareness, fruits, knowledge, misconception, myth, noncommunicable disease, physical activity, program malignancy, tobacco

INTRODUCTION

Noncommunicable diseases (NCDs) are reaching epidemic proportions worldwide.[1-3] These diseases – which include cardiovascular conditions (mainly coronary heart disease and stroke), diabetes, chronic respiratory conditions and cancers affect people of all ages, nationalities and classes with implicit social, financial and political consequences. Of the 57 million global deaths in 2008, 36 (63%) million were due to NCDs.[4] In terms of attributable deaths, the leading NCD risk factor globally are raised blood pressure (to which 13% of global deaths are attributed), followed by tobacco use (9%), high blood glucose (6%), physical inactivity (6%), overweight/obesity (5%), low fruit and vegetable intake (4.9%).[5] Compared with all other countries, India suffered highest loss in potentially productive years of life, due to deaths from cardiovascular disease in people aged 35 to 64 years (9.2 million years lost in 2000) and by 2030, this loss is expected to rise to 17.9 million years – 940% greater than the corresponding loss in the USA.[6]

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The epidemiological studies in India have estimated prevalence of coronary heart disease among adults to be around 3–4% in rural and 8–10% in urban areas. About 30 million people were having coronary heart disease in India.[7] National Cancer Registry Program started in the year 1982 - in India estimate that annually there was a prevalence of 3 million cases, with detection of 1 million (male [47.1%]; female [52.8%]) new cancer cases and 0.5 million deaths during 2010, which is projected to rise to annual 1,150,000 new cases by 2020; incident new cases are estimated to be around 800/million population.[8,9] The common fatal cancer were oral cavity (22.9%), stomach (12.6%), lungs (11.4%) amongst males while cervical (17.1%), stomach (14.1%) and breast (10.2%) in females.[10]

Risk factors such as a person's background, lifestyle and environment are known to increase the likelihood of certain NCDs. However, up to 80% of premature deaths can be averted with known behavioral and pharmaceutical interventions. Promoting healthy lifestyle is therefore a clear public health priority and social cognition models of health behavior posit a range of factors that appear to influence behavior, including perceived threat (e.g., perceived severity of and susceptibility to disease), perceived response efficacy (e.g., confidence that engaging in a recommended behavior will reduce the threat of disease), and perceived self-efficacy (i.e., confidence in personal ability to carry out the recommended behavior.[11] A prerequisite for this cognition model is awareness of the association between the disease and the behavior. Although ensuring public awareness of the links between common disease and lifestyle is a necessary albeit not alone sufficient step toward helping people to understand the potential health consequences of their action or inaction.[12]

Under challenging circumstances of second largest population (1.24 billion) base (2.4% of world surface area accounting for 17.5% of population) with gross national income of $1410/capita (World Bank, 2011) and life expectancy of 66.8 years, living in difficult geographical location (69% rural) with variable literacy (national literacy level, 74.04%) and exposed to diverse languages, cultures, socioeconomic fallacies (30% living below national poverty line), dietary and lifestyle pattern, greater dependence on private sector with high out of pocket expenditure on health (<15% population having some form of health insurance), in-equitable distribution of health human resource (70% modern system based doctors reside in urban areas) and grossly limited facilities for screening, management and rehabilitation of NCDs in a developing country like India which is witnessing epidemiological, nutritional and demographical transition, cost-effective primary prevention would remain hallmark of disease control for times to come.

With this background, a study was undertaken to assess perception of selected risk factors for cancer and heart attack among visitors of a public hospital so as to assist policymakers and health administrator in reflecting the ground realities on this aspect of rising health threat. In this region, no study has directly compared awareness of risk factors for cancer and heart disease in a single sample and doing so could shed light not only on public perceptions but also provide useful information for developing health education materials and messages.

MATERIALS AND METHODS

General setting

Haryana is a landlocked state in Northern India and located between 27°39′ and 30°35′ N (latitude) and 74°28′ and 77°36′ E (longitude) with a population of 253.5 lakhs (71% rural) spread out in 21 administrative districts. General profile of state is as follows: Literacy rate (75.5%); life expectancy (male: 68.9 and female: 71.3 years); 879 females/1000 male; birth rate of 21.6 and death rate 6.4/1000. Hindu's (94%) are in the majority including Sikh followers. It is one of the wealthier states of the country with second highest (Rs. 119,158) per capita income in the country. It is one of the rich wheat and milk producing states of India. Haryana has articulated comprehensive state sports policy and produced some of the best Indian players in a variety of sports. Many national and international medals/laurels have been achieved by state-persons in traditional games like boxing, wrestling, kabbadi, kho-kho, judo, cricket, swimming, and volley-ball. In the 2010 Commonwealth games at Delhi, 22 (58%) out of 38 gold medals that India won came from Haryana.

Study setting

The study was carried out in a multi-specialty referral government medical college hospital of north India situated in Rohtak (state of Haryana). Rohtak is situated about 70 km/43 miles from New Delhi, the capital city of India. It is located in the district with 1 million agrarian based population, serving 4–5 adjoining districts and catering to an average daily out-patient department (OPD) attendance of 5000 patients of rural and urban background mainly lower/middle socioeconomic strata of the society; and supported by 1750 in-patient beds with more than 80,000 annual admissions. It is a teaching and training center for MBBS, dental, pharmacy, nursing, physiotherapy in addition to postgraduate courses and houses government of India recognized regional cancer center.

Study design, sampling and data collection

A cross-sectional descriptive study was carried out using predesigned, pretested, semi-structure interview schedule. A lower level of knowledge for cancer in comparison to heart attack was assumed as a criterion for selection of sample size.

Using the formula $n = z^2_{1-\alpha/2} P (1-P)/d^2$ with $P = 0.20$, $d = 0.02$ at a confidence level of 95%, the sample size was 1537.[13] However, we were randomly able to recruit 1690 ambulatory adult (>18 years) visitors coming to the hospital during Mar-June 2012 and who consented to participate in the study. They were contacted in various OPDs, wards, waiting area, cafeteria, telephone booth, garden and/or galleries of the hospital. Informed verbal consent was obtained from each participant while maintaining confidentiality and ensuring nonduplicity of subjects.

Data were collected through face-face to interview by one-hundred medical students under the direct supervision and physical presence of investigators after standardization training on health communication and exposure to the local dialect through group discussion and role play. All the listed risk factors/items were read out by students and findings recorded verbatim without prompting or aiding. Students were regularly sensitized not to reflect their knowledge while recording responses and scrutinize questionnaire for completeness and/or inadvertent anomaly on culmination of the interview. Women study subjects were contacted by female students.

Study instrument and variables

The interview schedule consisted of two broad parts:

- Part-1 (Background variables): Type of visitor (patient/attendant), name of visiting department, number of previous visits to this hospital; age, gender, religion, social cast, residence-rural/urban, marital status and current tobacco consumption
- Part-2 (Specific items related to cancer and heart attack): Consisted of questions such as have you heard the term cancer and heart attack; listing of selected risk factors for both disease condition including dummy item with possible response as "Yes," "No" or "Do Not Know;" could you please enumerate common type of cancers of males and females; is cancer treatable (yes [always]; yes [when detected early]; never) and does cancer transmission occurs by social activity like hand-shake or hugging?

The selected risk factors considered in this study for cancer were (tobacco, alcohol, obesity, diet-rich in fat/oil, diet-poor in fruits and vegetables [F and V], physical in-activity, environmental pollution, increasing age, multiple sexual partners, insecticides/pesticides/chemicals, micro-organism [e.g., hepatitis-B/human papillomavirus], family history) while for heart attack were (tobacco, alcohol, obesity, diet-rich in fat/oil, diet-poor in F and V, physical in-activity, increasing age, hypertension, diabetes mellitus, mental stress, family history). Comprehensively not much is known about mobile phone-use as a risk factor; however, it was included as an item to gauge risk perception in the community.

Data management and statistical analysis

Of 1690 filled questionnaire, 39 (2.3%) were found to be of poor quality-illegible/incomplete and were excluded from the analysis, thus a sample of 1651 were finally included in the study. Data were managed on Excel spreadsheet and all entries double-checked for any possible errors. Each risk factor was awarded a score of one for correct and zero for incorrect/do not know response, thus making a total score of 12 (range: 0–12) for cancer and 11 (range: 0–11) for heart attack. Analysis was carried out by computing descriptive statistics (mean ± standard deviation; proportion) and *t*-test, for comparison of means using SPSS software (version 16.5, Chicago, IL). Odds ratio (OR; 95% confidence interval [CI]) was calculated for tobacco consumers in relation to background variables. Knowledge score for identification of risk factors was dichotomized into good and poor knowledge at a cut-off point of the median value, and then binary logistic regression applied keeping background factors as independent variables. *P* value was considered significant at <0.05 level or else stated.

RESULTS

Background profile of study subjects

The study subjects ($n = 1651$) comprised of 56.2% attendants and 43.8% patients; mean age was 36.78 (±13.05) years with 58.1% respondents over 30 years of age; 28.2% were 1st time visitors while rest (71.8%) had at least one previous visit to this hospital; 71.2% were male; 64.9% resided in rural area; 99.0% were Hindu; 78.2% were married and 38.3% belonged to affirmative social group. With regard to education, 17.6% had never been to school, 16.6% were at least college graduate and rest had some level of schooling, that is, 82.4% had some formal education. Visiting department as mentioned by respondents were general medicine (16.0%), obstetrics and gynecology (10.1%), surgery (9.4%), orthopedics (8.5%), ophthalmology (7.8%), ear, nose and throat (7.3%) and miscellaneous (12.7%) while 28.2% could not mention the name of department. Nearly 32.4% respondents were current tobacco consumer (smoking). Table 1 depicts background profile of participants according to current smoking status. Statistically ($P = 0.001$) higher odds for smoking was found among less educated (OR: 1.30; 95% CI 1.13–1.49), rural (OR: 1.60; 95% CI 1.35–1.89), male (OR: 2.85; 95% CI 2.19–3.71), patients (OR: 1.41; 95% CI 1.14–1.73) of more than 30 years of age (OR: 1.67; 95% CI 1.34–2.07).

Level of perception regarding selected risk-factors for heart attack and cancer

All the study subjects had heard about the terms cancer and heart attack. Nearly, 64.5% and 82.0% responded in affirmative that tobacco consumption causes heart attack and cancer, respectively; while obesity was considered as

a risk factor by 68.4% (heart attack) and 28.1% (cancer). About 70.7% reported that diet rich in fat/oil could lead to heart attack but only 23.5% mentioned it for cancer while less than one-third could link to diet poor in F and V. Nearly one-fifth (21.4%) considered mobile phone as risk factor while majority (61.0%) reported their ignorance about any possible association. All the details are shown in Table 2.

Identification of risk factors (mean)

Table 3 depicts mean risk factors identified according to background variables. Mean risk factor identified for heart attack were 6.64 ± 2.29 (range: 0–11). It was found to be statistically significant and higher amongst urban (6.96) versus rural (6.46) respondent; 9th class/above (6.80) versus educated up to 8th class including illiterate (6.37); and nonsmoker (6.76) versus current smoker (6.37). In contrast, mean risk factor identified for cancer were 5.01 ± 2.33 (range, 0–12). It was found to be higher and statistically significant amongst urban (5.08) versus rural (4.97) residents; 9th class/above (5.09) versus educated up to 8th class including illiterate (4.87); at least one previous visit to this hospital (5.10) versus none (4.77); and nonsmoker (5.10) versus smoker (4.81). On binary logistic regression analysis, risk factor identified for heart attack

Table 1: Background profile of study participants according to tobacco consumption

Item	Tobacco consumer (%)			OR; 95% CI	*P*
	Yes (*n*=535)	No (*n*=1116)	Total (*n*=1651)		
Category of visitor					
Attendant	50.5	59.0	56.2	Reference	0.001
Patient	49.5	41.0	43.8	1.41; 1.14–1.73	
Gender					
Female	15.9	35.0	28.8	Reference	<0.001
Male	84.1	65.0	71.2	2.85; 2.19–3.71	
Residence					
Urban	25.2	39.8	35.1	Reference	<0.001
Rural	74.8	60.2	64.9	1.60; 1.35–1.89	
Age					
Up to 30 years	33.6	45.9	41.9	Reference	<0.001
More than 30 years	66.4	54.1	58.1	1.67; 1.34–2.07	
Level of education					
9th class/above	55.1	64.7	61.6	Reference	<0.001
Nil to 8th class	44.9	35.3	38.4	1.30; 1.13–1.49	
Marital status					
Married	80.4	77.2	78.2	Reference	0.13
Other	19.6	22.8	21.8	0.82; 0.63–1.06	
Previous hospital visit					
None	27.3	28.7	28.2	Reference	0.55
At least one	72.7	71.3	71.8	1.07; 0.85–1.34	
Social caste					
General	61.7	61.6	61.7	Reference	0.99
Affirmative group	38.3	38.4	38.3	0.99; 0.80–1.23	

OR: Odds ratio, CI: Confidence interval

Table 2: Level of perception regarding selected risk factors for heart attack and cancer amongst visitors of a teaching hospital from India

Risk factor/item	Heart attack (%)			Cancer (%)		
	Yes	No	DK	Yes	No	DK
Tobacco	64.5	21.8	13.7	82.0	8.2	9.8
Physical in-activity	74.3	15.7	10.0	72.9	11.5	15.6
Diet rich in fat/oil	70.7	15.6	13.7	23.5	43.1	33.4
Obesity	68.4	17.7	13.9	28.1	41.8	30.0
Hypertension	76.5	9.7	13.9	22.2	41.2	36.6
Mental stress	67.6	15.3	17.2	30.0	40.5	29.5
Diabetes mellitus	42.3	22.0	35.7	25.8	32.5	41.7
Environmental pollution	40.8	29.4	29.8	49.9	21.0	29.1
Family history	36.9	46.0	17.0	36.4	46.1	17.5
Increasing age	65.9	17.6	16.4	49.1	27.5	23.4
Alcohol	63.9	20.8	15.2	57.2	21.9	20.9
Insecticides/pesticides/chemicals	37.7	30.5	31.7	45.6	24.5	29.9
Diet poor in fruits/vegetables	32.0	42.9	25.0	25.8	43.5	30.7
Multiple sexual partners	15.1	42.1	42.7	20.8	37.2	42.0
Micro-organism	12.3	21.0	66.7	9.2	41.0	49.8
Mobile use	21.4	17.2	61.4	21.4	16.5	62.1
Tuberculosis	27.8	34.0	38.0	36.6	26.0	37.4

DK: Don't know

was significantly ($P < 0.05$) related to level of education (OR: 1.36; 95% CI: 1.10–1.69) only while for cancer, risk factor identified was significantly related to level of education (OR: 1.46; 95% CI: 1.17–1.83) and social cast (OR: 1.26; 95% CI: 1.02–1.55).

Knowledge and myth regarding common cancers

Of a total of 1651 study subjects, 670 (40.58%) and 620 (37.55%) spontaneously enumerated at least one type of cancer for male and female respectively. The responses ranged from site-specific cancer of eye, ear, oral cavity, tongue, bone, brain, skin, thyroid, chest/lung, throat, liver, kidney, genital, blood to cancer from "any-part" of the body. Table 4 depicts top five cancers enumerated by study subjects. For males, it was chest/lung (46.11%), throat (32.23%), oral cavity (28.05%), while for female it was breast (76.29%), genital (30.0%), throat (6.77%) etc., With regard to treatment of cancer, majority (54.2%) said that it is possible only when detected early, and 22.5% opined that it can never be treated. Nearly, 73.4% subjects believed that cancer does not spread by social activity. Until, a conclusive link between tuberculosis and cancer has not been established still high proportion perceived tuberculosis as a risk factor for cancer (36.6%) and heart attack (27.8%). On a parallel note, a nationally representative community-based survey in India revealed that nearly 52% population (38.3% in the state of Haryana) had misconceptions about tuberculosis transmission.[14]

Table 3: Identification of risk factors (mean±SD) according to background variables

Item	Heart attack (range: 0-11)	Cancer (range: 0-12)
Grand total# (95% CI)	6.64 (±2.29) (6.52-6.75)	5.01 (±2.33) (4.89-5.12)
Category of visitor		
Patient	6.59 (±2.26)	5.08 (±2.27)
Attendant	6.67 (±2.31)	4.95 (±2.38)
Gender		
Male	6.58 (±2.28)	5.16 (±2.51)
Female	6.77 (±2.29)	4.95 (±2.26)
Age		
Up to 30 years	6.70 (±2.18)	5.01 (±2.24)
More than 30 years	6.59 (±2.37)	5.00 (±2.40)
Resident		
Rural	6.46 (±2.28)	4.97 (±2.38)
Urban	6.96 (±2.26)*	5.08 (±2.26)*
Level of education		
Up to 8th class including illiterate	6.37 (±2.38)	4.87 (±2.41)
9th class/above	6.80 (±2.21)*	5.09 (±2.28)
Marital status		
Married	6.63 (±2.30)	5.41 (±2.53)
Others	6.67 (±2.25)	5.49 (±2.43)
Cast		
Affirmative group	6.51 (±2.36)	5.11 (±2.38)
General	6.71 (±2.25)	4.94 (±2.31)
Previous visit to this hospital		
None	6.48 (±2.28)	4.77 (±2.30)
At least-one	7.70 (±2.29)	5.10 (±2.34)*
Current smoker		
Yes	6.37 (±2.32)	4.81 (±2.22)
No	6.76 (±2.26)*	5.10 (±2.38)*

#,*P<0.05. SD: Standard deviation, CI: Confidence intervals

Table 4: Top five common cancer of male and female enumerated by respondent

Item	For males (%)	For females (%)
Respondent who mentioned at least one type of cancer	670 (40.58)	620 (37.55)
Top five cancers enumerated by respondent in present study*	Chest/lung (46.11) Throat (32.23) Oral cavity (28.05) Blood (18.80) Prostate (7.91)	Breast (76.29) Genital (30.0) Throat (6.77) Abdomen (6.29) Blood (5.0)

*Multiple response

DISCUSSION

Our study, conducted on a sample of 1651 persons, first of its kind in this region, covering both rural and urban subjects, although institutional based, reflects higher awareness of selected risk factors for heart attack in comparison to cancer. Within study limitations, this could be a reflection of associated quantum of communication in the community due to higher prevalence of cardiovascular disease in comparison to cancer. This is further substantiated by the fact that only 40% of the subjects could enumerate at least one type/site-specific cancer of male and/or female. However, on an encouraging note, more than half of the study subjects responded that cancer is treatable if detected early and 73.4% mentioned that it did not spread by social activities. It is suggestive of positive attitude for cancer management along with concomitant low stigma in the society.

The inter-heart case-control study showed that nine modifiable risk factors (apo-lipoprotein levels, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, dietary factors, physical exercise, and alcohol consumption) account for more than 90% of the population attributable risk for acute myocardial infarction globally, a finding which was consistent in all regions of the world.[15] In an open-ended questions based study carried out amongst South Asians in America on risk factor for coronary heart diseases, respondents were able to identify 2.8 (mean) risk factors only; stress (44%) was the most common followed by high-fat diet (29%), hypertension (22%), diabetes (12%) and smoking (11%).[16] Our study reflected higher identification of risk factors; however, cholesterol was not included because of its poor understanding in the rural community and difficulty in communicating the same in local language. This is in contrast to findings of an urban hospital-based study conducted at AIIMS, New Delhi, wherein 57% correctly identified high cholesterol as one of the risk factors for heart disease.[17]

Global adult tobacco survey conducted in 16 countries revealed 40.7% of men (21.6% in Brazil to 60.2% in Russia)

and 5.0% of women (0.5% in Egypt to 24.4% in Poland) smoked a tobacco product.[18] In India, more than one-third adults (35.0%) consume tobacco in some form.[19] In the present study, 32.3% were current smokers. Higher level of awareness was noticed amongst nonuser versus tobacco consumers for both disorders; heart attack (6.76 [±2.26] vs. 6.37 [±2.32]) and cancer (5.10 [±2.38] vs. 4.81 [±2.22]) respectively. This finding was consistent with other studies conducted in the US, Scotland, and Pakistan.[20-22] The knowledge difference among subjects could be due to the positive attitude, literacy, higher preventive practices and/or ignorance of tobacco users of the adverse consequences of their habit. On the other hand, it is also possible that tobacco users are less prepared to admit the negative health implications and/or lesser opportunity of access to anti-tobacco messages to elderly residing in rural areas.

A study from Chandigarh (India) conducted among 1350 urban subjects reported risk factor for cancer as 74.7% smoking, 60.0% alcohol, 30.8% environmental pollution and 22.7% diet and nearly 39.8% believed that cancer cannot be treated.[23] The corresponding figures for these risk factors in our study were 82%, 57.1%, 49.8% and 23.5% respectively, and 22.5% mentioned that cancer is nontreatable. While a spontaneous response based Saudi Arabia study ($n = 1407$) reported lower proportion of cancer risk factors identification-smoking (65.2%), unhealthy food (19.0%), family history (10%), and pollution (9.5%).[24] Globally surveys have shown tobacco consumption to be consistently identified by majority of respondents as a risk factor for cancer: 87% (Delhi), 66.0% (Kerala), 82.0% (Asian American), 76% (Great Britain), 43.0% (Japan).[25-29]

Similarly several surveys have also shown high public awareness of the link between smoking and developing lung cancer, but considerably lower awareness of the impact of other lifestyle-related factors, e.g., diet, physical inactivity etc., as a risk for cancer.[30,31] Thus, people may believe that there is nothing else they can do to reduce their chances of developing cancer other than not to smoke when there are basic survival issues and challenges. However, majority of risk factors are preventable if given early and adequate attention by individual, family and society. Despite decades of concern and publicity, majority of people, in developed nations, are consistently consuming less than the daily recommended intake (400 g/person/day) of F and V.[32] In a study from 52 low and middle-income countries 77.6% of men and 78.4% of women consumed less than the minimum recommended servings of F and V. Same study reported 74% low F and V consumption amongst adults in India.[33] It is pertinent to mention that respondents in our study were aware that F and V are good for overall health but were unable to directly link with the disease condition.

Taking cognizance of the rising threat, government of India has taken some commendable measures during last decade including anti-tobacco legislation, 2003; Integrated Disease Surveillance Project, 2004; development, piloting and initiation of Integrated National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke during 2006–2010, however to make an impact these measures are required to be implemented earnestly at ground level to circumvent the increasing gap between need, demand, and availability of scarce resources. With increase in longevity (average age 32 years (1947) to current, 66.8 years) and simultaneous exposure to smoke/tobacco and other risk factors for last 60 years sizeable population is now and will continue to manifest in large volumes at health facilities with cardiac, cancer, chest, and/or associated diseases.

Electromagnetic fields (EMF) emitting from domestic appliances, power lines, mobile phones and towers have been an area of intense public discussion, debate and concern in nearly all Western societies since last 30 years; however, they have been accepted over the years with initial hesitation. According to the health belief model, risk perception involves people's beliefs, attitudes, judgments, and feelings as well as wider cultural and social dispositions they adopt toward hazards, severity of risk and their benefits. The risk perceptions may be directly modulated by media coverage and media-triggered public concern.[34,35] In a study of 710 subjects from Austria, Poland, Switzerland, and Luxembourg, <8% cited that EMF from mobile phone considered threatening to them.[36] In our study, 21.4% were concerned regarding mobile phone as risk factor. WHO in 2011 categorized radiofrequency EMF from mobile phones as possibly carcinogenic (group 2B classification) and is keeping a close watch on this emerging international public health concern with user base of mobile phones surpassing 5 billion mark in the world.[37]

We acknowledge some of the limitations of the studies. Although open-ended questions provide better insight into the depth of knowledge, however, in this setting our experience with spontaneous awareness was found to be poor hence the methodology of providing options to subjects was adopted for risk factor perception. This could have resulted in overestimation and/or randomness. Further, it is often difficult to quantify perceived health hazard with in-built complex psycho-social construct.

CONCLUSION

Overall low to moderate awareness was noticed in the present study with ample scope of initiating educational measures to enhance knowledge and remove myths/misconceptions in the light of impending NCD epidemic.

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REFERENCES

1. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL, editors. In: Global Burden of Disease and Risk Factors. Washington DC: Oxford Univ Press and World Bank; 2006.
2. World Health Organization. Preventing Chronic Diseases: A Vital Investment. Geneva: World Health Organization; 2005.
3. Adeyi O, Smith O, Robles S. Public Policy and the Challenge of Chronic Non Communicable Diseases. Washington DC: World Bank; 2007.
4. World Health Organization. Deaths from NCDs. Available from: http://www.who.int/gho/ncd/mortality_morbidity/ncd_total/en/index.html. [Last accessed on 2011 May 05].
5. World Health Organization. Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. Geneva: World Health Organization; 2009.
6. Leeder S, Raymond S, Greenberg H, Liu H, Esson K. A Race Against Time. The Challenge of Cardiovascular Disease in Developing Economies. New York: Columbia University; 2004.
7. Ghaffar A, Reddy KS, Singhi M. Burden of non-communicable diseases in South Asia. BMJ 2004;328:807-10.
8. Ramnath T, Nandakumar A. Estimating the burden of cancer. Natl Med J India 2011;24:69-71.
9. Murthy NS, Chaudhry K, Rath GK. Burden of cancer and projections for 2016, Indian scenario: Gaps in the availability of radiotherapy treatment facilities. Asian Pac J Cancer Prev 2008;9:671-7.
10. Dikshit R, Gupta PC, Ramasundarahettige C, Gajalakshmi V, Aleksandrowicz L, Badwe R, *et al.* Cancer mortality in India: A nationally representative survey. Lancet 2012;379:1807-16.
11. Marteau TM, Weinman J. Self-regulation and the behavioural response to DNA risk information: A theoretical analysis and framework for future research. Soc Sci Med 2006;62:1360-8.
12. Hall S, Weinman J, Marteau TM. The motivating impact of informing women smokers of a link between smoking and cervical cancer: The role of coherence. Health Psychol 2004;23:419-24.
13. Lwanga SK, Lemeshaw S. Sample Size Determination in Health Studies. A Practical Manual. Geneva: World Health Organization; 1991.
14. National Family Health Survey (NFHS-3), 2005-06. India, Mumbai: International Institute for Population Sciences; 2007.
15. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, *et al.* Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): Case-control study. Lancet 2004;364:937-52.
16. Kandula NR, Tirodkar MA, Lauderdale DS, Khurana NR, Makoul G, Baker DW. Knowledge gaps and misconceptions about coronary heart disease among U.S. South Asians. Am J Prev Med 2010;38:439-42.
17. Saeed O, Gupta V, Dhawan N, Streja L, Shin JS, Ku M, *et al.* Knowledge of modifiable risk factors of Coronary Atherosclerotic Heart Disease (CASHD) among a sample in India. BMC Int Health Hum Rights 2009;9:2.
18. Giovino GA, Mirza SA, Samet JM, Gupta PC, Jarvis MJ, Bhala N, *et al.* Tobacco use in 3 billion individuals from 16 countries: an analysis of nationally representative cross-sectional household surveys. Lancet 2012;380:668-79.
19. Global Adult Tobacco Survey (GATS) in India. New Delhi: Ministry of Health and Family Welfare, Government of India; 2010.
20. Ford ES, Jones DH. Cardiovascular health knowledge in the United States: Findings from the National Health Interview Survey, 1985. Prev Med 1991;20:725-36.
21. Woodward M, Bolton-Smith C, Tunstall-Pedoe H. Deficient health knowledge, diet, and other lifestyles in smokers: Is a multifactorial approach required? Prev Med 1994;23:354-61.
22. Khan MS, Jafary FH, Jafar TH, Faruqui AM, Rasool SI, Hatcher J, *et al.* Knowledge of modifiable risk factors of heart disease among patients with acute myocardial infarction in Karachi, Pakistan: A cross sectional study. BMC Cardiovasc Disord 2006;6:18.
23. Puri S, Mangat C, Bhatia V, Kaur AP, Kohli DR. Knowledge of cancer and its risk factors in Chandigarh, India. Internet J Epidemiol 2010;8:1.
24. Ravichandran K, Al-Hamdan NA, Mohamed G. Knowledge, attitude, and behavior among Saudis toward cancer preventive practice. J Family Community Med 2011;18:135-42.
25. Seth T, Kotwal A, Thakur R, Singh P, Kochupillai V. Common cancers in India: Knowledge, attitudes and behaviours of urban slum dwellers in New Delhi. Public Health 2005;119:87-96.
26. Tiwari R, Deb P, Debbarma A, Chaudhuri R, Chakraborty A, Lepcha M, *et al.* Tobacco use and cardiovascular disease: A knowledge, attitude and practice study in rural Kerala. Indian J Med Sci 2006;60:271-6.
27. Ma GX, Tan Y, Feeley RM, Thomas P. Perceived risks of certain types of cancer and heart disease among Asian American smokers and non-smokers. J Community Health 2002;27:233-46.
28. Warnakulasuriya KA, Harris CK, Scarrott DM, Watt R, Gelbier S, Peters TJ, *et al.* An alarming lack of public awareness towards oral cancer. Br Dent J 1999;187:319-22.
29. Inoue M, Iwasaki M, Otani T, Sasazuki S, Tsugane S. Public awareness of risk factors for cancer among the Japanese general population: A population-based survey. BMC Public Health 2006;6:2.
30. Ackermann S, Renner SP, Fasching PA, Poehls U, Bender HG, Beckmann MW. Awareness of general and personal risk factors for uterine cancer among healthy women. Eur J Cancer Prev 2005;14:519-24.
31. Wardle J, Waller J, Brunswick N, Jarvis MJ. Awareness of risk factors for cancer among British adults. Public Health 2001;115:173-4.
32. Diet, Nutrition and the Prevention of Chronic Diseases. Report of a Joint FAO/WHO Expert Consultation; 2003.
33. Hall JN, Moore S, Harper SB, Lynch JW. Global variability in fruit and vegetable consumption. Am J Prev Med 2009;36:402-9.e5.
34. Pidgeon N, Hood C, Jones D, editors. In: Risk Analysis, Perception and Management. London: Royal Society Study Group; 1992.
35. EMF Risk communication: Dealing with Public Perception. Available from: http://www.who.int/peh-emf/publications/en/EMF_Risk_Chpt2.pdf. [Last accessed on 2012 Mar 01].
36. Wiedemann P, Schutz H, Thalmann A, Grutsch M. Mobile fears? Risk perception regarding RF EMF. Proceedings: JRC/EIS-EMF Workshop. Ispra; 2004. Available from: http://www.emf-risiko.de/pdf/preprints/wiedemann-mobile_fears2.pdf. [Last accessed on 2012 Jul 15].
37. IARC classifies radiofrequency electromagnetic fields as possibly carcinogenic to humans. WHO, Press Release; 2011. Available from: http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf. [Last accessed on 2012 Mar 31].

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