Assessing Awareness Level about Warning Signs of Cancer and its Determinants in an Iranian General Population

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ABSTRACT

The present study was aimed at investigating the awareness level about warning signs of cancer and its determinants in an Iranian general population. This cross-sectional interview-based survey investigated 2,500 people aged 18 years and over, as a representative sample of Tehran population. Latent class regression was applied for analyzing data. A small (18.8%) proportion of the respondents had high level of knowledge, and 54.5% had moderate awareness, and 26.7% had low level of awareness. Most effective predictors for awareness were educational attainment, sex, and marital status. The findings suggest that the overall level of knowledge about warning signs of cancer among the public is low, particularly about some specific signs. Accordingly, educational and intervention programmes, with special attention placed on particular at-risk populations, to increase awareness about the disease leading to its early diagnosis are needed.

Key words: Awareness; Cancer; Cross-sectional studies; Health education; Neoplasms; Public education; Signs and symptoms; Iran

INTRODUCTION

Cancer is the third cause of mortality in developing countries (1). In 2007, more than 12.3 million people were affected by different kinds of cancers; more than 7.6 million died of the disease (around 13% worldwide), in which more than 70% of all deaths due to cancer occurred in developing countries; and 84 million people will die in the next 10 years, if action is not taken (1). The estimated number of new cases may rise from 12.3 million in 2007 to 16 million in 2020, and approximately 60% of all these new cases may occur in low- and middle-income countries (2).

In Iran, cancer is the third major cause of death (11.8%), and it is estimated to increase to 13.4% by 2030 (2-3). Annually, 30,000 Iranians die of cancer (3). It is estimated that more than 70,000 new cases of cancer may be detected in the country, and the incidence of cancer in the next decade will rise due to an increase in the number of the elderly people of the country (3).

Awareness of public about warning signs of cancer in relation to early detection and prevention has been surveyed in a few countries only, and results showed poor knowledge among them (4-8). Other studies focusing on specific cancers are limited in terms of sample-size or composition, and most of these studies were conducted in purposive samples or clinical settings, e.g. restricted age, sex, or patient groups (9-12).

In Iran, there is virtually no information on early detection and prevention knowledge of cancer among the general population. We decided to explore the level of knowledge about warning signs of cancer and its determinants among the general population, aged 18 years and over, in Tehran, Iran.

To the best of our knowledge, this study is not only the first large-scale population-based study in a developing country but it also can be considered one of few studies in the world, which seeks public awareness of warning signs of cancer. Our research, compared to most other studies in this area, is not a pure descriptive study, it rather uses a comprehensive statistical modelling framework.
MATERIALS AND METHODS
This exploratory and correlational cross-sectional study was conducted among the general population living in Tehran, Iran. Sample selection was performed with a probabilistic multi-stage stratified cluster sampling. In total, 2,500 people aged 18 years and over were interviewed. All the participants were informed about the study and signed a written consent form.

In the present study, knowledge of nine possible warning signs of cancer that were reported either in the European Code Against Cancer or by the major cancer organizations was assessed. These warning signs include: (a) changes in bowel or bladder habits; (b) a sore that does not heal; (c) unusual bleeding or discharge; (d) thickening or lump in the breast or elsewhere; (e) obvious change in a wart or mole; (f) nagging cough or hoarseness; (g) unexplained loss of weight; (h) difficulty in swallowing, and (i) indigestion.

The aggregate level of knowledge about all warning signs of cancer was considered a latent construct and was evaluated based on the dichotomous variables through latent class regression analysis (13). This model also provides the possibility for evaluating the effects of correlated determinants of knowledge level.

All descriptive and analytical statistical methods in the study were performed using the R free software (version 2.11.1).

RESULTS
The most important descriptive findings regarding the demographic characteristics of the respondents (n=2,508) were as follows: 52.9% were women; 37.2% were single; 42.3% had high school education; 30.8% had university attainments; 17.7% had a family history of cancer; 26.6% were smokers; and 10.4% were alcohol drinkers. More details about the demographic characteristics of the study respondents were reported elsewhere (14).

Table 1 presents the prevalence of correct knowledge on warning signs of cancer, with 95% confidence intervals for all the study participants—men and women. The table shows that, on a sign-by-sign basis, women were more aware than men (on average, 49.66% vs 41.76%).

Table 2 shows the percentages of the correct answers to the questions on specific warning signs of cancer in each constructed classes. Class 1 included the individuals with higher knowledge level (class size: 18.8%), Class 3 included the individuals with poor awareness level (26.7%), and Class 2 included the individuals with mixed situation in terms of the awareness level (54.5%). The constructed classes (latent classes) play the role of categories of the dependent variable. Therefore, similar to multinomial logistic regression, Class 1 (high knowledge) was selected as a reference class.

Table 3 contains the class-specific estimates of regression coefficients. The significant effective predictors of awareness level about warning signs, in order of importance, were level of education, gender, and marital status. Although other studied factors, such as age, family history, and lifestyle behaviours (smoking and alcohol drinking) were significant, they had a weak discriminative role.

DISCUSSION
The results revealed that, in general, the level of knowledge about warning signs of cancer among the studied sample was low. Our findings are consistent with those of a few studies in developing countries (6-7). However, the level of awareness in a developed country is slightly higher (4,5,8). Such a difference, in general, can be attributed to the social inequalities between....
Assessment of the effective factors on the knowledge level about warning signs of cancer indicated that the strongest predictor was the level of education. Our findings are consistent with findings of other studies (4-6,9,14-17). It is possible to infer that people having high levels of educational attainment are in a better position to be able to attend to the health protective issues.

The results of our research showed that men were significantly less likely than women to be aware of the early warning signs of cancer. These findings are consistent with those of other studies evaluating the effect of gender on knowledge of cancer (7,8,14-17). A possible explanation for this difference may lie with women’s greater familiarity and use of primary healthcare services through, for example, participation in mass health programmes and their responsibility for their children’s healthcare and interest in health within families (18).

The results showed that the married people, particularly women, were more concerned about their health because of their responsibilities to the families. Hence, they had a higher level of awareness compared to the single ones. Our findings are consistent with those of Brunswick et al. and Evans et al. (5,18).

Previous studies on adult population in developed and developed countries (7).

Table 2. Class-specific level of awareness about warning signs of cancer and the size of classes

| Warning sign                              | Class 1 | Class 2 | Class 3 |
|-------------------------------------------|---------|---------|---------|
|                                            | Yes (%) | No (%)  | Yes (%) | No (%)  | Yes (%) | No (%)  |
| Change in bowel or bladder habits         | 85.83   | 14.17   | 28.06   | 71.94   | 4.73    | 95.27   |
| A sore that does not heal                  | 95.48   | 4.52    | 44.84   | 55.16   | 2.82    | 97.18   |
| Unusual bleeding or discharge             | 98.22   | 1.78    | 52.18   | 47.82   | 1.95    | 98.05   |
| Thickening or lump in breast and other organs | 99.86   | 0.14    | 81.74   | 18.26   | 15.36   | 84.64   |
| Difficulty in swallowing                  | 95.00   | 5.00    | 28.35   | 71.65   | 0.86    | 99.14   |
| Indigestion                               | 94.49   | 5.51    | 34.79   | 65.21   | 3.96    | 96.04   |
| Change in a wart or mole                  | 98.20   | 1.80    | 56.09   | 43.91   | 2.98    | 97.02   |
| Nagging cough or hoarseness               | 93.00   | 7.00    | 44.08   | 55.92   | 3.27    | 96.73   |
| Unexplained weight loss                    | 94.66   | 5.34    | 70.69   | 29.31   | 10.61   | 89.39   |
| Class size (%)                            | 18.82   | 54.49   | 26.69   |

Table 3. Estimated class-specific covariates coefficients and related z-statistics and p values

| Variable                   | Coefficients | z value (p value) | Odds ratio | 95% CL |
|----------------------------|--------------|-------------------|------------|--------|
| Class 2 (ref=Class 1)      |              |                   |            |        |
| Age                       | -0.02        | -2.79 (0.005)     | 0.97       | 0.96-0.98 |
| Sex (ref=women)           | 0.31         | 4.67 (0.025)      | 1.36       | 1.04-0.77 |
| Marital status (ref=unmarried) | -0.62       | -3.73 (0.00)     | 0.54       | 0.39-0.75 |
| Level of education         | -0.76        | -8.56 (0.00)      | 0.47       | 0.39-0.55 |
| Family history (ref=without) | -0.28       | -1.70 (0.089)    | 0.76       | 0.55-1.04 |
| Smoking (ref=non-smoker)   | 0.16         | 0.98 (0.33)       | 1.18       | 0.85-1.63 |
| Alcohol drinking (Ref=non-drinker) | 0.21        | 1.97 (0.048)    | 1.23       | 1.03-1.53 |
| Class 3 (ref=Class 1)      |              |                   |            |        |
| Age                       | -0.002       | -0.18 (0.85)      | 0.98       | 0.99-1.00 |
| Sex (ref=women)           | 0.91         | -5.71 (0.00)      | 2.47       | 1.81-3.37 |
| Marital status (ref=unmarried) | -0.69       | -3.43 (0.001)    | 0.50       | 0.34-0.75 |
| Level of education         | -1.21        | -11.62 (0.00)     | 0.30       | 0.24-0.37 |
| Family history (ref=without) | -0.35       | -1.49 (0.091)    | 0.70       | 0.44-1.12 |
| Smoking (ref=non-smoker)   | -0.57        | -4.83 (0.00)      | 0.57       | 0.39-0.82 |
| Alcohol drinking (ref=non-drinker) | 0.29        | 2.69 (0.007)    | 1.33       | 1.11-1.55 |

CI=Confidence interval; ref=Reference category
countries have shown that the middle-aged people recognized more signs than those who were younger or older (5, 19). However, in our study this factor provided weak discriminative effect (see the OR values).

It was expected that those with a family history of cancer (they may be more motivated to adopt preventive behaviours) were particularly likely to acknowledge the potential warning signs of cancer (20). However, the findings of our study indicated that the family history had little influence on increasing the level of awareness.

Conclusions

These data may be considered the first step in the development of an intervention based on empirical findings that will identify areas for public education and intervention efforts as an important component of prevention of the disease. Such educational and intervention programmes should be culture-sensitive and accessible to all individuals, with special attention placed on reaching the populations of the highest risk to increase awareness about the disease leading to its early diagnosis. As a national cancer strategy, public education combined with the use of cancer-screening technology, focused on high-risk populations, is a cost-effective approach.

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REFERENCES

1. World Health Organization. Cancer control: knowledge into action: WHO guide for effective programmes. Module 2. Geneva: World Health Organization, 2007:iii. (www.who.int/cancer/modules/Prevention%20Module.pdf, 2007, accessed on July 2010).
2. Omar S, Alieldin NH, Khatib OM. Cancer magnitude, challenges and control in the Eastern Mediterranean region. East Mediterr Health J 2007;13:1486-96.
3. Sadjadi A, Nouraie M, Mohagheghi MA, Mousavi-Jarrah A, Malekezadeh R, Parkin DM. Cancer occurrence in Iran in 2002: an international perspective. Asian Pac J Cancer Prev 2005;6:359-63.
4. Bostick RM, Sprafka JM, Vimig BA, Potter JD. Knowledge, attitudes and personal practices regarding prevention and early detection of cancer. Prev Med 1993;22:65-85.
5. Brunswick N, Wardle J, Jarvis MJ. Public awareness of warning signs for cancer in Britain. Cancer Causes Control 2001;12:33-7.
6. Ali NS, Khalil HZ. Cancer prevention and early detection among Egyptians. Cancer Nurs 1996;19:104-11.
7. San Turgay A, Sari D, Turkistani EC. Knowledge, attitudes, risk factors, and early detection of cancer relevant to the schoolteachers in Izmir, Turkey. Prev Med 2005;40:636-41.
8. Lee HP. A survey of opinions and attitudes on cancer among some secondary school children in Singapore. Singapore Med J 1978;19:37-42.
9. Janda M, Youl PH, Lowe JB, Elwood M, Ring IT, Aitken JF. Attitudes and intentions in relation to skin checks for early signs of skin cancer. Prev Med 2004;39:11-8.
10. Eftekhar Z, Mohaghegh MA, Yarandi F, Eghtesad-Araghi P, Moosavi-Jarahi A, Giliani MM et al. Knowledge and attitudes of physicians in Iran with regard to chronic cancer pain. Asian Pac J Cancer Prev 2007;8:383-6.
11. Montazeri A, Vahdaninia M, Harirchi I, Harirchi AM, Sajadian A, Khaleghi F et al. Breast cancer in Iran: need for greater women awareness of warning signs and effective screening methods. Asia Pac Fam Med 2008;7:6.
12. Mazloomy Mahmoodabad S, Noorbala M, Rahaei Z, Mohammadi M. Knowledge, attitude and performance study of secondary school teachers of Yazd city regarding skin cancer. J Eur Acad Dermatol Venereol 2009;24:424-8.
13. Collins LM, Lanza ST. Latent class and latent transition analysis with application in social, behavioral and health sciences. New York, NY: Wiley, 2010:149-77.
14. Feizi A, Kazemnejad A, Babaee G, Parsayekta Z, Monjamed Z. Public awareness of risk factors for cancer and its determinants in an Iranian population. Asia Pac J Public Health 2010;22:76-88.
15. Ma GX, Fleisher L. Awareness of cancer information among Asian Americans. J Community Health 2003; 28:115-30.
16. Lykins EL, Graue LO, Brechting EH, Roach AR, Gochett CG, Andrykowski MA. Beliefs about cancer causation and prevention as a function of personal and family history of cancer: a national, population-based study. Psychooncology 2008;17:967-74.
17. Beier ME, Ackerman PL. Determinants of health knowledge: an investigation of age, gender, abilities, personality, and interests. J Pers Soc Psychol 2003; 84:439-48.
18. Evans R, Brotherstone H, Miles A, Wardle J. Gender differences in early detection of cancer. J Mens Health Gender 2005;2:209-17.
19. Breslow RA, Sorkin JD, Frey CM, Kessler LG. Americans’ knowledge of cancer risk and survival. Prev Med 1997;26:170-7.
20. Ryan EL, Skinner CS. Risk beliefs and interest in counseling: focus group interviews among first-degree relatives of breast cancer patients. J Cancer Educ 1999;4:99-103.