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# HOW MUCH FEAR EXPLAIN CANCER EARLY DETECTION BEHAVIORS AMONG COLLEGE STUDENTS

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**Abstract**

Cancer is the second and third leading cause of death in industrial and developing countries respectively. The aim of this study was determining determinants of cancer early detection symptoms among college students based on protection motivation theory. This cross-sectional study was conducted among 400 college students in Javanrood city, in the Kermanshah County, west of Iran. Participants were randomly selected to participate voluntarily in the study and filled out a self-report questionnaire. Data were analyzed by SPSS version 21 using t-test, ANOVA, correlation, and linear regression statistical tests at 95% significant level. The mean age of respondents was 25.58 years [95% CI: 25.23, 25.93], ranged from 19 to 30 years. There were significant relationship between knowing someone with cancer and undergoing early detection of cancer (t=2.759 & p=0.006). PMT variables accounted for 48% of the variation in cancer early detection behaviors. Based on findings, response efficacy toward perform a cancer early detection behaviors, severity toward side effect of cancer, and response efficacy, and self-efficacy toward perform a cancer early detection behaviors were the best predictors for cancer early detection behaviors. Therefore suggest for planning preventive programs to increase cognition about of cancer early detection, focusing on self-efficacy and response efficacy about benefit of undergoing cancer early detection are the best strategy.

**Keywords**: Cancer, Health Behavior, Protection Motivation Theory, Student.

**Introduction:** Cancer is the second and third leading cause of death in industrial and developing countries respectively (Vecchia, et al., 2015). According to the statistics published by the World Health Organization (WHO) over 12.3 million

individuals had cancer and over 7.6 million individuals died of cancer in 2007 and it is estimated that by 2030 the prevalence of cancer reach 75 million individuals and 27 million individuals get cancer annually and about 60% of the new cases will be in less-developed countries (Omar, et al., 2007). Currently 70000 new cases of cancer occur annually and over 35000 individuals die due to cancer annually (Balducci, & Aapro, 2005). Breast cancer incidence rate in Iran is 22 cases per 100000 individuals, its prevalence is 120 cases in 100000 individuals and the resulted deaths are 1200 deaths annually (Kadivar, et al., 2012). The highest percentages of cancer incidence (standardized by age) include skin cancer (16.33%), stomach cancer (12.73%), bladder cancer (9.91), prostate cancer (8.33%) and colorectal cancer (7.48%) for men and breast cancer (24.82%), skin cancer (12.65%), colorectal cancer (7.56%), stomach cancer (6.1%6) and esophageal cancer (5.39%) for women. Also, the highest prevalence of cancer in Iran generally includes skin cancer (14.6%), stomach cancer (10.7%), breast cancer (10.4), colorectal cancer (7.5%) and bladder cancer (6.7%) (Balducci, & Aapro, 2005). Lack of enough physical activity, obesity and increasing adoption of poor nutrition in addition to the environmental factors that harm health such as environmental pollutions in the air and on the ground pave the way for the increase of cancer incidence (Young, & Wilson, 2002). However, the thing that should be paid attention to is the reality that cancer is a disease that different causes and factors are involved in its emergence. The impacts of these factors are often modifiable, reducible and even eliminable in a way that at least one-third of different types of cancer are preventable (Nourizadeh, et al., 2011). Cancer screening and timely diagnosis is effective ways for reducing mortality rate and reduction of costs (Kadivar, et al., 2012). Timely diagnosis strategy includes the knowledge of early signs and symptoms, screening with clinical examination by a physician and etc. (Maree, & Wright, 2010). Therefore, educating the public is necessary for early detection of cancer (Brunswick, et al., 2001). Internationally, different studies have done estimations of the cancer mortality that are attributed to different risk factors but overall, studies on the level of public knowledge on warning signs of cancer are rare at national and international levels (San Turgay, et al,. 2005; Grunfeld, et al., 2002). Considering the lack of formulated regular cancer screening and prevention programs for controlling cancer in Iran and the lack of knowledge on its risk factors and signs and symptoms, the existence of advantages for implementing screening programs and the role of the performance of cancer-related health clinics in the Iranian society is verified (Ghorbani, et al., 2009). As human behavior is a reflection of different factors and plays a significant role in prevention, control, treatment and rehabilitation of a significant portion of health-related problems, health promotion planners

recommend the use of theories derived from social psychology for knowing health-related issues for exploring the existing conditions of health issues and they consider the selection of a good theory as the first step in the process of planning health promotion programs (Kok, 2014). And as Kurt Lewin has pointed out, there is nothing as practical as a good theory (Eldredge, et al., 2016) and applying behavioral analysis theories can be useful in identifying the factors impacting the problem under the study. In this regard, protection motivation theory was introduced by Rogers in 1975 and since then it has been used extensively as framework for prediction of an intervention in health-related behaviors. Protection motivation theory bas basically developed for describing the effects of creating fear on health attitudes and behaviors. Communication due to the creation of fear has s significant impact on selection of behaviors. Threat appraisal evaluates maladaptive response. Threat appraisal process includes internal and external rewards and perception of threat (vulnerability and threat). Coping appraisal process evaluates the ability to cope and counter the threating risk or adaptive responses. Coping appraisal process factors include response efficacy, self-efficacy and response costs (Milne, et al., 2000). Different studies have verified the effectiveness of this theory in predicting different behaviors, especially health related behaviors (Floyd, et al., 2000; Milne, et al., 2000). On the other hand, many studies have pointed out that educational programs should be focused on appropriate target groups. In this regard, students are one of the vulnerable groups of the society due to different reasons such as stress (MirzaeiAlavijeh, et al., 2011). Therefore, the present study was conducted with the aim of determining the factors predicting early detection of cancer symptoms among college students in the city of Javanrood in western Iran and protection motivation theory was used as the theoretical framework of the study.

**Materials and Methods**

This cross-sectional study was conducted among 400 college students in Javanrood city, in the Kermanshah County, west of Iran. Of the population of 400, 326 (81.5%) signed the consent form and voluntarily agreed to participate in the study, which has been approved from Kermanshah university of medical sciences' institutional review board, and informed consent was obtained from participants (KUMS.REC.1395.276).

Data collection conducted after receiving approval from the relevant university ethics committee, this project was carried out, and the volunteers were given the self-questionnaire. The variables assessed in this study included three sections. Prior to conducting the main project, a pilot study was carried out. Initially, the relevant questionnaires were

administered to 30 students who were similar to study population in order to estimate the duration of the study conduction and to evaluate the reliability of the questionnaire.

The data collection tool in the present study was self-report questionnaire which included three sections.

A: background variables

The first part of the questionnaire was dedicated to background information such as age (years), sex (male, female), having medical insurance (yes, no), marital status (yes, no), and knowing a person with cancer (yes, no).

B: cancer early detection behaviors

This part was evaluated by 9-item. Each item was measured on an ordinal 5-point Likert-type scaling (0= never, 4= always). Example of the items was: are you cheek blood in the urine or stool. The reliability coefficient for the social support scale in our study was 0.81, suggesting that the internal consistency was adequate.

C: PMT variables

PMT scale was researcher questioner designed based on a standard questionnaire (Helmes, 2002; Milne, et al., 2000) and included thirty-three items under six constructs including (a) susceptibility; (b) severity; (c) response costs; (d) response efficacy; (e) self-efficacy; and (f) motivation. Five items were designed to measure susceptibility toward of the threat of cancer (e.g. "anyone in any age, maybe diagnosis with cancer."). Six items were designed to measure severity toward side effect of cancer (e.g., "Cancer is a progressive disease with serious complications."). Five items were designed to measure response costs toward perform a cancer early detection behaviors (e.g., "I believe cancer early detection, is scary".). Five items were designed to evaluate response efficacy toward perform a cancer early detection behaviors (e.g., "If I now cancer early detection behaviors, I will take more care of my health".). Eight items were designed to measure self-efficacy toward perform a cancer early detection behaviors (e.g., "I believe that I can do cancer early detection behaviors".). Four items were designed to measure motivation toward perform a cancer early detection behaviors (e.g., "I intend had pay more attention to my body physical symptoms".). In order to facilitate participants' responses to the items, all items were standardized to a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Prior to conducting the main project, a pilot study was carried out. Initially the relevant questionnaires were administered to 30 women who were similar to study population in order to estimate the duration of the study conduction and to evaluate the reliability of the questionnaire. Estimated reliability using alpha Cronbach coefficient for each PMT constructs

questionnaire were as follows: susceptibility ($\alpha$=0.73); severity ($\alpha$=0.79); response costs ($\alpha$=0.74); response efficacy ($\alpha$=0.85); self-efficacy ($\alpha$=0.71); and motivation ($\alpha$=0.78).

Finally, the gathered data were entered into the SPSS software for Windows (ver. 21.0). The data were analyzed using the T-test, ANOVA, correlation, and linear regression analysis. The significance level was set at 0.05.

**Results**

The mean age of respondents was 25.58 years [95% CI: 25.23, 25.93], ranged from 19 to 30 years. About 54% (176/326) of participants were male and 46% (150/326) were female. 46.9% (153/326) of participants reported was single, 53.1% (173/326) married. Regarding the economic status: 6.7% (n=22) had reported weak, 67.8% (n=221) middle, 20.6% (n=67) were good and 4.9% (n=16) were very good. About 25.2% (82/326) respondents knew a person with cancer, whereas 244 subjects (74.8%) did not know.

Among the background factors, only knowing someone with cancer was significant relationship with undergoing early detection of cancer (t=2.759 & p=0.006).

Table 1 shows the Zero-order correlations. Significance levels at the 0.01 were the criteria for the analysis of protection motivation theory constructs.

**Table 1: Correlation between different components of protection motivation theory.**

| Component | Mean (SD) | X1 | X2 | X3 | X4 | X5 | X6 |
|---|---|---|---|---|---|---|---|
| X1. Susceptibility | 11.43 (2.96) | 1 | | | | | |
| X2. Severity | 16.07 (4.19) | 0.376[**] | 1 | | | | |
| X3. Response Costs | 15.38 (3.94) | -0.276[**] | -0.669[**] | 1 | | | |
| X4. Response Efficacy | 11.83 (3.67) | 0.378[**] | 0.714[**] | -0.447[**] | 1 | | |
| X5. Self-Efficacy | 22.11 (7.74) | 0.405[**] | 0.685[**] | -0.483[**] | 0.83[**] | 1 | |
| X6. Motivation | 11.86 (3.85) | 0.196[**] | 0.426[**] | -0.378[**] | 0.530[**] | 0.523[**] | 1 |
| X7. Behavior | 10.69 (2.28) | 0.276[**] | 0.647[**] | -0.399[**] | 0.614[**] | 0.611[**] | 0.336[**] |

** Correlation is significant at the 0.01 level (2-tailed).

Linear regression analysis was performed to explain the variation of cancer early detection behaviors. As shown in table 2, collectively, PMT variables accounted for 48% of the variation seen in cancer early detection behaviors.

**Table 2: PMT variable which were predictor of cancer early detection behaviors.**

| Variable | Unstandardized Coefficients | | Standardized Coefficients | t | Sig |
|---|---|---|---|---|---|
| | B | SE B | Beta | | |
| Self-Efficacy | 0.063 | 0.021 | 0.214 | 3.057 | 0.002 |
| Severity | 0.205 | 0.032 | 0.376 | 6.325 | < 0.001 |
| Response Efficacy | 0.108 | 0.045 | 0.174 | 2.383 | 0.018 |

*Final Model: Step 4; $R^2$=0.48; F=99.427; P <0.001*

**Discussion**

The present study was conducted with the aim of identifying the factors that predict cancer early detection behaviors among college students in western Iran by using protection motivation theory. In this regard, WHO emphasizes on this point that cancer early detection as the best way to cancer prevention (Maree, & Wright, 2010); Meanwhile Iran faces the lack of cancer screening programs like many other Asian countries and these results in late cancer detection (Nourizadeh, et al., 2011). On the other hand, cancer is responsible for 13 percent of the deaths worldwide and it will be an increasingly significant factor in global disease burden in the next decades (Yoo, 2010). In this regard it has been suggested that understanding cognitive, mental and social factors that predict cancer early detection behaviors is one of the ways for reduction of cancer consequences (McCaffery, et al., 2003). The findings of the present study indicated that, among the protection motivation theory constructs, perceived severity, perceived self-efficacy and perceived response efficacy were respectively stronger predictors for doing behaviors related to detection of early cancer symptoms. Overall, protection motivation theory constructs predicted 84 percent of the variance of cancer early detection behaviors. In this regard, it has been shown in different studies that the constructs perceived severity, perceived self-efficacy and perceived response efficacy have been appropriate predictors for the explored behaviors. For example, the findings of the study titled "Application of the Protection Motivation Theory to Genetic Testing for Breast Cancer Risk" by Almut on 330 women ages 18-64 in Washington DC indicated that women who perceived a higher level of cancer threat together with those who had a good knowledge of protective methods were more motivated to do protective measures and had higher levels of motivation (Helmes, 2002). In their study on 300 women visiting health clinics of Kermanshah, Mirzaei-

Alavijeh et al showed that perceived self-efficacy and perceived susceptibility were stronger predictors for breast self-examination as one of the breast cancer screening behaviors (Mirzaei-Alavijeh, et al., 2015). Also, Jalilian et al pointed out perceived severity as the main predictor of self-medication (Jalilian, et al., 2013). Understanding factors that predict behavior facilitates implementing educational interventions for changing behavior; considering the results of the present study and specifying the relationship between high self-efficacy, perception of the risk of cancer consequences and response efficacy of doing cancer symptoms detection behaviors, health planners in the society are recommended to design and implement appropriate and continuous education regarding familiarity with severe dangers of cancer (for creating fear and increasing society's perception of the dangers of cancer), to provide appropriate solutions for doing cancer early detection behaviors and cancer screening (for improving self-efficacy) and to show the usefulness of cancer early detection behaviors (for improving response efficacy) with emphasis on high-risk groups. Also, the mean score of doing cancer early detection behaviors was 10.69 out of a total score of 36 which shows that the participants have obtained only 29.6 percent of the maximum obtainable score for this section. These findings reveal the necessity of implementing educational interventions more. Finally, the findings of the present study indicated that, among the background factors, only familiarity with an individual with cancer and doing cancer early detection behaviors had a significant relationship. These results are consistent with similar studies (Mirzaei-Alavijeh, et al., 2015). It seems that individuals who have an individual with cancer in their family or among their friends and acquaintances probably have more perceived vulnerability and severity and pursue preventive behaviors more.

**Conclusion:** There was significant relationship between knowing someone with cancer and undergoing early detection of cancer. PMT variables accounted for 48% of the variation seen in cancer early detection behaviors. Based on our findings, response efficacy toward perform a cancer early detection behaviors, severity toward side effect of cancer, and response efficacy, and self-efficacy toward perform a cancer early detection behaviors were the best predictors for cancer early detection behaviors. Therefore suggest for planning preventive programs to increase cognition about of cancer early detection, focusing on self-efficacy and response efficacy about benefit of undergoing cancer early detection are the best strategy.

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