

Survey on Knowledge and Attitudes Related to the Relationship between Smoking, Alcohol, Radiation, Cosmetics Use and Risk of Breast Cancer in the Northern Saudi Arabia

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Abstract Background: Breast cancer is one of the leading causes of deaths in females worldwide. Increased Knowledge about breast cancer associated risk factors will prevent a number of people from getting the disease. Therefore, the aim of this study was to evaluate knowledge and attitudes related to the relationship between smoking, alcohol, radiation, cosmetics use and risk of breast cancer in the Northern Saudi Arabia. **Methodology:** This is a descriptive cross sectional study conducted in Northern Saudi Arabia. Essential identification data about smoking, alcohol, radiation, cosmetics use as risk for breast cancer were taken from 555 Saudi volunteers living in the city of Hail, Saudi Arabia. **Results:** When asking the participants the question “Do you think tobacco smoking can increase the risk of breast cancer?” Out of 549 respondents, 23.7% stated yes and the remaining 76.3% stated that smoking doesn’t increase the risk of breast cancer. When the participants were asked “Do you think exposure to radiation increase the risk of breast cancer?” Out of 549 respondents, only 15.5% stated yes and the remaining 84.5% stated that radiation exposure doesn’t increase the risk of breast cancer. When the participants were asked “Do you think exposure to some cosmetics usage increase the risk of breast cancer?” Out of 547 respondents, about 62.7% stated yes and the remaining 37.3% stated that cosmetic use doesn’t increase the risk of breast cancer. **Conclusion:** Although, the great majority of study population were females, the knowledge level of breast cancer risk related to cigarette smoking, alcohol consumption and radiation exposure is very low.

Keywords: breast cancer, Saudi Arabia, cigarette smoking, alcohol consumption, cosmetic use

Cite This Article: Fayez Saud Alreshidi, Ibrahim A. Bin ahmed, Saleh Hadi Alharbi, Sami Awejan Alrashedi, Ali Ghannam Alrashidi, Kalaf Jaze Kalaf Alshammeri, and Hussain Gadelkarim Ahmed, “Survey on Knowledge and Attitudes Related to the Relationship between Smoking, Alcohol, Radiation, Cosmetics Use and Risk of Breast Cancer in the Northern Saudi Arabia.” *American Journal of Public Health Research*, vol. 5, no. 5 (2017): 147-153. doi: 10.12691/ajphr-5-5-2.

1. Introduction

Breast cancer is the most common female’s cancer in the western world where a woman’s lifetime risk of developing the disease is more than 10% [1]. Whereas, the incidence in developing countries is lower than in developed countries, the mortality is much higher. Of the estimated 1 600 000 new cases of breast cancer worldwide in 2012, 794 000 were in the more developed world compared to 883 000 in the less developed world; conversely, there were 198 000 deaths in the more developed world compared to 324 000 in the less developed world (data from GLOBOCAN 2012, IARC) [2].

Active smoking and passive smoking have been associated with amplified risk of breast cancer [3]. In a 2014 report on the health effects of cigarette smoking, the

US Surgeon General concludes that there is inadequate evidence to suggest a causal relationship between active smoking and breast cancer risk [4]. Epidemiologic studies have more frequently suggested a positive relationship [5,6], consistent with tissue culture and animal experiments showing that cigarette smoke constituents disrupt cell-cycle regulation, cause DNA damage, and are associated with malignant transformation [7,8].

Alcohol is an established risk factor for breast cancer, with studies showing higher risk in those with the highest levels of intake [9,10,11]. Initial experimental studies of alcohol exposure claimed that alcohol may be a co-carcinogen, increasing risk only among individuals exposed to other carcinogens. However, this hypothesis was dispersed by extended exposures, wherein lifetime exposure to alcohol produced carcinogenic effects in animals independent of other carcinogenic exposures [12]. Drinking more than seven alcoholic beverages per week increased invasive

breast cancer risk among white and African American women, with significant increases only among African American women. Genetic or environmental factors that differ by race may mediate the alcohol-breast cancer risk association [13].

The risk of breast cancer is high in women treated for a childhood cancer with chest irradiation. Among women treated for childhood cancer with chest radiation therapy, those treated with whole-lung irradiation have a greater risk of breast cancer than previously recognized, demonstrating the importance of radiation volume. Importantly, mortality associated with breast cancer after childhood cancer is substantial [14,15].

Over the last decade, the possible association between underarm deodorants/antiperspirants use and breast cancer risk has raised important interest in the scientific community [16]. Role of hair dyes in the etiology of breast cancer has occasionally raised concern but previous research has concluded with mixed results [17].

However, the evaluation of knowledge and attitudes related to cigarette smoking, alcohol consumption, radiation exposure and cosmetic use (e.g hair dye use) and occurrence of breast cancer in a population-based series is very important in order to deliver a successful preventive strategy. The main objective of this study was to evaluate knowledge and attitudes related to the relationship between cigarette smoking, alcohol consumption, radiation exposure, cosmetics use and risk of breast cancer in the Northern Saudi Arabia.

2. Materials and Methods

This is a descriptive cross sectional study conducted in Northern Saudi Arabia. Essential identification data about breast cancer were taken from 555 Saudi volunteers living in the city of Hail, Saudi Arabia. Participants were randomly selected by simple random regardless to age, gender and education.

Purposeful questionnaire was designed and used for obtaining of the necessary data. The following information were obtained from each participant: age, sex, knowledge about breast cancer, cosmetics increase the risk of breast cancer, radiation exposure increases the risk of breast

cancer, cigarette smoking increases the risk of breast cancer.

3. Data Analysis

Statistical Package for Social Sciences (version 16) was used for analysis and to perform Pearson Chi-square test for statistical significance (P value). The 95% confidence level and confidence intervals were used. P value less than 0.05 was considered statistically significant.

4. Ethical Consent

Each participant was asked to sign a written ethical consent during the questionnaire's interview. The informed ethical consent form was designed and approved by the ethical committee of the College of Medicine (University of Hail, Saudi Arabia) Research Board.

5. Results

This study investigated 555 participants, their ages ranging from 16 to 52 years with a mean age of 26.4 years. Out of the 555 participants, 162 (29.2%) were males and 393 (70.8%) were females, giving males' females' ratio of 1.00 to 2.42.

Table 1. Distribution of the study population by demographical characteristics

Variable	Category	Males	Females	Total
Age	<20 years	27	62	89
	21-25yrs	117	159	276
	26-30yrs	6	40	46
	31-36yrs	4	54	58
	36+yrs	8	78	86
	Total	162	393	555
Education	Basic	4	102	106
	Secondary	7	35	42
	university	151	256	407
	Total	162	393	555

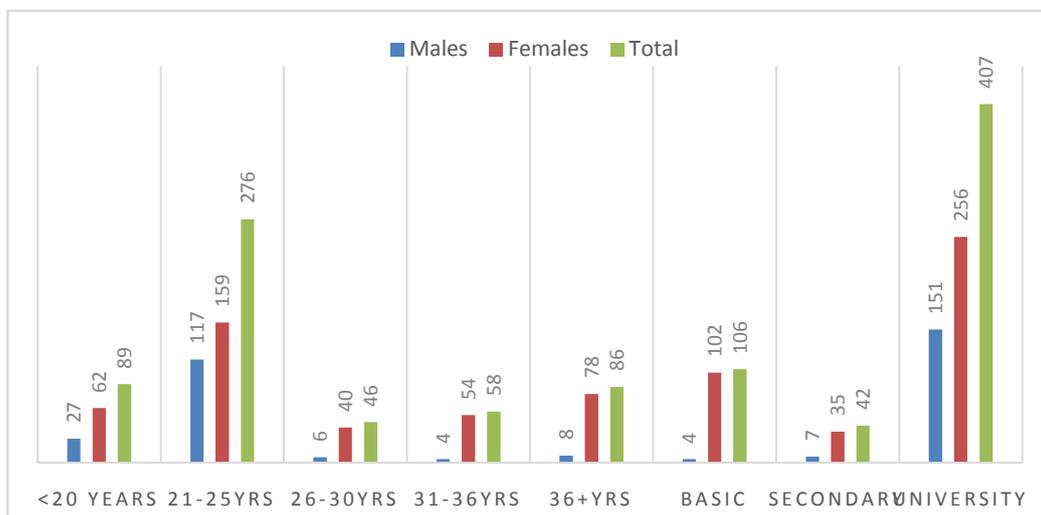


Figure 1. Description of the study population by age, sex and education

The distribution of the study population showed that most of the respondents were at age group 21-25 years followed by <20, representing 276/555(49.7%) and 89/555(16%) respectively. For males, the majority of participants were found in age range 21-25 years by <20, 36+ and 26-30 years constituting 117/162(72.2%), 27/162(16.7%), 8/162(4.9%) and 6/162(3.7%), respectively. For females, the majority of participants were found in age range 21-25 years followed by 36+, < 20, and 31-36 years, constituting 159/393(40.5%), 78/393(19.8%), 62/393(15.8%), and 54/393(13.7%) respectively, as indicated in Table 1, Figure 1.

With regard to education level, the majority of the study subjects were with university level of education followed by basic and secondary education levels, representing 407/555(73.3%), 106/555(19%) and 42/555(7.5%) respectively. For males, out of 162, 151/162 (93.2%) were at university level, 7/162 (4.3%) were at secondary level and 4/162(2.4%) were at basic level. For females, 256/393 (65%) were at university level, 102/393(26%) were at basic level and 35/393(8.9%) were at secondary level, as indicated in Table 1, Figure 1.

With regard to the rating of the study subjects by knowledge about breast cancer, most of the participants were found with average knowledge followed by little knowledge, good and complete ignorance constituting 204/552(37%), 191/552(34.6%), 88/552(15.9%) and 69/552(12.5%) respectively. For males, most of the participants were found with little knowledge followed by average, good and complete ignorance constituting 69/162(42.6%), 54/162(33.3%), 24/162(14.8%) and 15/162(9.3%) respectively. For females, most of the participants were found with average knowledge followed by little, good and complete ignorance constituting 150/390(38.5%), 122/390(31.3%), 64/390(16.4%) and 54/390(13.8%) respectively, as indicated in Table 2, Figure 2.

When asking the participants the question “Do you care to know about breast cancer?” Out of the 547 respondents,

only 69/547(12.6%) indicated yes and the remaining 478/547(87.4%) indicated no. Out of 69 indicated yes, 29/161(18%) were males and 40/389(10.3%) were females, as described in Table 2.

When asking the participants the question “Is the breast cancer the commonest cancer in Saudi Arabia?” Out of the 549 respondents, about 477/549(86.9%) indicated yes the commonest, 42/549(7.6%) stated as not the commonest, and 30/549(5.5%) stated as rare. Out of 477 indicated yes the commonest, 141/160(88%) were males and 336/389(86.4%) were females, as described in Table 2.

When asking the participants the question “Do you think tobacco smoking can increase the risk of breast cancer?” Out of 549 respondents, 130/549(23.7%) stated yes and the remaining 419/549(76.3%) stated that smoking doesn’t increase the risk of breast cancer. Out of the 130 positively stated 21/160(13%) were males and 109/389(28%) were females as indicated in Table 3, Figure 3.

Table 2. Distribution of the study population by knowledge about breast cancer

Variable	Category	Males	Females	Total
Rate your knowledge about breast cancer				
	Nothing	15	54	69
	Little	69	122	191
	Average	54	150	204
	Good	24	64	88
	Total	162	390	552
Do you care to know about breast cancer				
	Yes	29	40	69
	No	132	346	478
	Total	161	386	547
Is the breast cancer the commonest cancer in Saudi Arabia?				
	Yes the commonest	141	336	477
	Not the commonest	11	31	42
	Rare	8	22	30
	Total	160	389	549

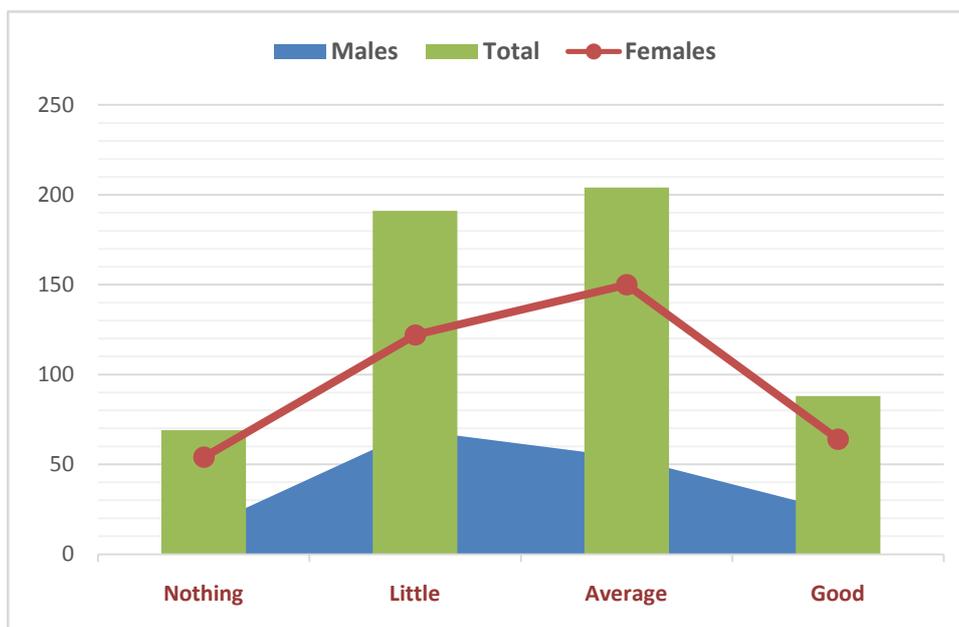


Figure 2. Description of the study population by rate of knowledge about breast cancer

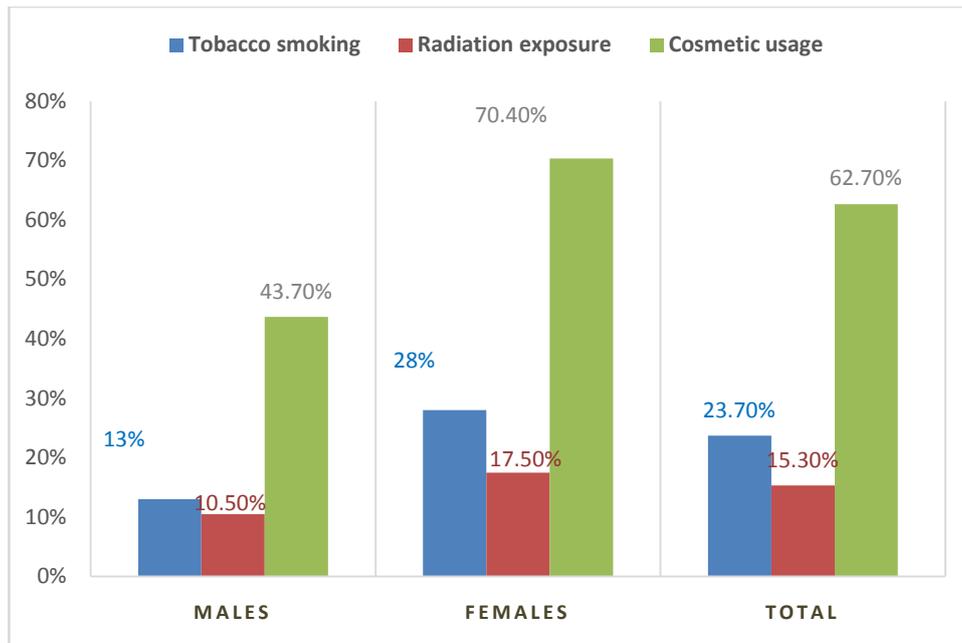


Figure 3. Description of the study population by exposure to smoking, radiation and cosmetics

With regard to alcohol only 5% believed that alcohol consumption can increase the risk of breast cancer.

When asking the participants the question “Do you think exposure to radiation increase the risk of breast cancer?” Out of 549 respondents, 85/549(15.5%) stated yes and the remaining 464/549(84.5%) stated that radiation exposure doesn’t increase the risk of breast cancer. Out of the 130 positively stated 17/161(10.5%) were males and 68/389(17.5%) were females, as indicated in Table 3, Figure 3.

When asking the participants the question “Do you think exposure to some cosmetics usage increase the risk of breast cancer?” Out of 547 respondents, 343/547(62.7%) stated yes and the remaining 204/547(37.3%) stated that cosmetic use doesn’t increase the risk of breast cancer. Out of the 343 positively stated 69/158(43.7%) were males and 274/389(70.4%) were females, as indicated in Table 3, Figure 3.

The distribution of the study subjects by age in relation to the tobacco smoking, radiation exposure cosmetic usage was summarized in Table 4. Due to the clustering of age in age range 20-25 years, there was no apparent differences,

but when the percentage of the study subjects was calculated within each group, there were variable percentages in association with the correct answers towards these risk factors, as shown in Figure 4.

Table 3. Distribution of the study population by exposure to smoking, radiation and cosmetics

Variable	Category	Males	Females	Total
Do you think tobacco smoking can increase the risk of breast cancer				
	Yes	21	109	130
	No	139	280	419
	Total	160	389	549
Do you think exposure to radiation increase the risk of breast cancer				
	Yes	17	68	85
	No	177	320	464
	Total	161	388	549
Do you think exposure to some cosmetics increase the risk of breast cancer				
	Yes	69	274	343
	No	89	115	204
	Total	158	389	547

Table 4. Distribution of the study population age by exposure to smoking, radiation and cosmetic usage

Variable	Category	<20 years	21-25	26-30	31-35	36+	Total
Do you think tobacco smoking can increase the risk of breast cancer							
	Yes	28	41	20	14	27	130
	No	60	233	25	44	57	419
	Total	88	274	45	58	84	549
Do you think exposure to radiation increase the risk of breast cancer							
	Yes	22	36	9	4	14	85
	No	66	238	37	53	70	464
	Total	88	274	46	57	84	549
Do you think exposure to some cosmetics increase the risk of breast cancer							
	Yes	61	161	27	39	55	343
	No	27	114	18	18	28	204
	Total	88	275	45	57	83	549

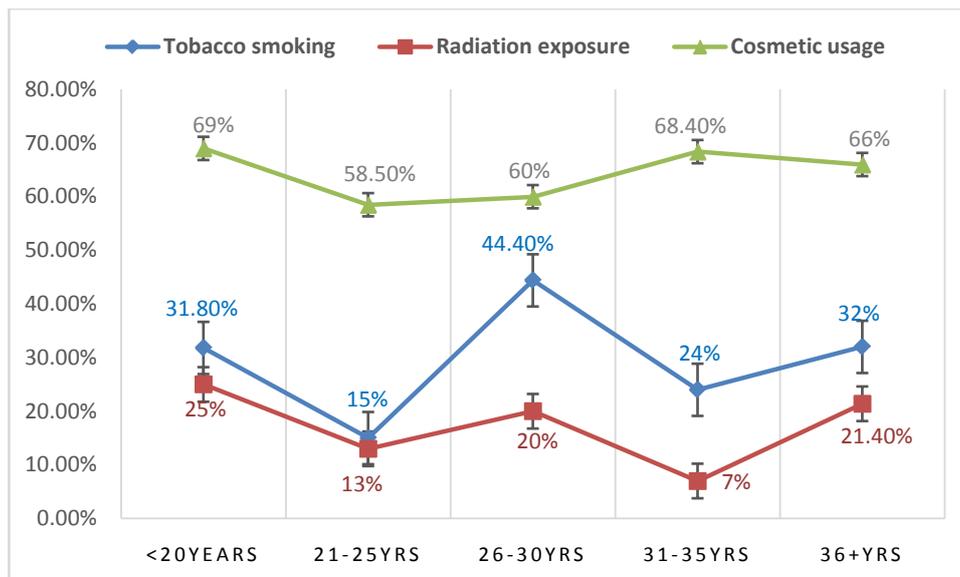


Figure 4. Description of the study population by exposure to smoking, radiation and cosmetics within entire age group

6. Discussion

In the present study, the knowledge and attitudes related to cigarette smoking, alcohol consumption, radiation exposure and cosmetic use as risk factors for breast cancer were evaluated through a survey comprising a series of people representative for northern Saudi Arabia population. The majority of the study subjects were educated and relatively at younger age. Although, the majority of the study population were females, most of them knew less than the average about breast cancer, not only this, but they have no willing to know more about the disease.

Cigarette smoking is a major public health issue in Saudi Arabia in recent years, particularly among adolescents [18]. Overall prevalence of current smoking was 12.2 % and males were more likely to smoke than females (21.5% vs. 1.1 %). Mean age of smoking initiation was 19.1 years (± 6.5 years) with 8.9 % of ever smokers starting before the age of 15 years [19]. However, the majority of females are passive smokers, since tobacco use is considered as social stigma.

When asking the participants the question “Do you think tobacco smoking can increase the risk of breast cancer?” Out of 549 respondents, 23.7% stated yes and the remaining 76.3% stated that smoking doesn’t increase the risk of breast cancer. Although, epidemiological evidence on the role of active cigarette smoking in breast cancer risk has been inconsistent, recent literature supports a modest association between smoking and breast cancer [20]. Knowledge of tobacco as a risk factor for breast cancer can itself elevate individual’s keenness towards undertaking some preventive measures. It was expected that most females in Northern Saudi Arabia might be affected by passive smoke from a relative male who is smoker. Several studies from Saudi Arabia have reported high prevalence rates of second hand smoke both inside and outside the home among children and adolescents [21,22,23]. Therefore, knowledge and beliefs about second hand smoke exposure are the main preventable attitude.

In the present study, only 5% believed that alcohol consumption can increase the risk of breast cancer. Still alcohol consumption is almost ignored in most part of

Saudi Arabia, as it is social stigmatized both for males and females and also prohibited by law. However, that exact burden of alcohol consumption might be obscure in Saudi Arabia.

When the participants were asked “Do you think exposure to radiation increase the risk of breast cancer?” Out of 549 respondents, only 15.5% stated yes and the remaining 84.5% stated that radiation exposure doesn’t increase the risk of breast cancer. This also indicating the poorest knowledge toward this fact, which results in attitude of high frequencies of exposure to radiation for simple reasons in conditions, exposure to radiation can be avoided. It was reported that that germline mutations in BRCA1, BRCA2, ATM or CHEK2 may double the risk of radiation-induced contralateral breast cancer following radiotherapy for a first breast cancer. This is suggesting that carriers of pathogenic alleles in DNA repair and damage recognition genes may have an increased risk of breast cancer following exposure to ionizing radiation, even at low doses. For the protection of breast cancer patients and their close relatives, mutation carriers may wish to consider alternatives to X-ray for diagnostic purposes [24]. In a large European study among carriers of BRCA1/2 mutations, exposure to diagnostic radiation before age 30 was associated with an increased risk of breast cancer at dose levels considerably lower than those at which increases have been found in other cohorts exposed to radiation. This supports the use of non-ionizing radiation imaging techniques (such as magnetic resonance imaging) as the main tool for surveillance in young women with BRCA1/2 mutations [25]. Therefore, there is hard need to deliver educational program considering the effects of radiation in order to protect a large section of females in Northern Saudi Arabia.

When the participants were asked “Do you think exposure to some cosmetics usage increases the risk of breast cancer?” Out of 547 respondents, about 62.7% stated yes and the remaining 37.3% stated that cosmetic use doesn’t increase the risk of breast cancer. This is relatively higher percentage of knowledge, through there is lack of information regarding osmatic components and its harmful effects in the study area. Parabens are

preservatives used in a variety of personal care, cosmetic, pharmaceutical and food products. Parabens have been detected in human tissues and bodily fluids, but it is the discovery of these chemical compounds in the breast tissue of patients with breast cancer that has raised public concern over their use. It is hypothesized that the estrogenic properties of parabens may play a role in breast cancer development [26]. Lifestyle factor used near the breast is the application of antiperspirants/deodorants accompanied by axillary shaving. Underarm shaving with antiperspirant/deodorant use may play a role in breast cancer. It is not clear which of these components are involved [27]. Hairdressers and allied occupations represent a large and fast growing group of professionals. The fact that these professionals are chronically exposed to a large number of chemicals present in their work environment, including potential carcinogens contained in hair dyes, makes it necessary to carry out a systematic evaluation of the risk of cancer in this group. Therefore, hairdressers have a higher risk of cancer than the general population. Improvement of the ventilation system in the hairdresser salons and implementation of hygiene measures aimed at mitigating exposure to potential carcinogens at work may reduce the risk.

Previous studies have proved that risk factor awareness increases with educational status, yet even in a university student population, in which the majority of females would have been offered educational program, risk factor awareness for cancers is low.

7. Conclusion

Although, the great majority of study population were females, the knowledge level of breast cancer risk related to cigarette smoking, alcohol consumption and radiation exposure is very low. More health education is needed particularly around the breast cancer risk factors associated with cigarette smoking, alcohol consumption and radiation exposure.

Acknowledgments

The authors would like to express their special appreciation and thanks to every one offered his efforts and time to participate in this study, in particular the volunteers.

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