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The role of lifestyle in cancer prevention: opinions of Romanian cancer patients' relatives
Rolul stilului de viață în prevenirea cancerului: opiniile rudelor pacienților români cu diagnostic de cancer

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Abstract

Background. Different studies have underlined the importance of avoiding active and passive smoking, alcohol abuse, overweight, unhealthy alimentary habits and inappropriate physical activity as important components of health promotion and cancer prevention

Aims. This study aims to investigate opinions regarding the role of lifestyle in cancer prevention among Romanian adults having relatives with cancer.

Methods. A cross-sectional study was conducted in the “Ion Chiricuță” state oncological institute from Cluj-Napoca, Romania. It included 320 adults (160 men and 160 women) who had relatives with cancer. The participants filled in an anonymous questionnaire.

Results. The results of the study show that the majority of Romanian cancer patients' relatives from our study know the relationship between active and passive smoking, alcohol use and cancer. Two thirds of participants are aware about the link between physical activity and cancer prevention, but less than half know about the risk posed by being overweight. The percentages of the participants aware about the role of diet in cancer prevention varied from one third knowing the role of foods rich in dietary fibers to 50% recognizing the risk of consuming high quantities of red meat and to 74% being aware about the protective effect of fruits and vegetables. Several age, educational and residence (urban-rural) differences were identified for several opinions.

Conclusions. These data call for information and education actions, which help Romanian adults who have relatives with cancer to be aware of the lifestyle related risks, as a first step in the process of adopting healthy behaviors which protect against several types of cancer.

Key words: cancer prevention, lifestyle, Romania, adults having relatives with cancer.

Rezumat

Premize. Diferite studii au subliniat importanța evitării fumatului activ și pasiv, a consumului excesiv de alcool, a unei greutate corporale crescute, a obiceiurilor alimentare nesănătoase și a sedentarismului, ca și componente importante ale promovării sănătății și prevenirii cancerului.

Obiective. Obiectivul acestui studiu este reprezentat de evaluarea opiniilor privind rolul stilului de viață în prevenirea cancerului în rândul adulților din România, care au rude cu diagnostic de cancer.

Metode. A fost realizat un studiu transversal în Institutul oncologic „Ion Chiricuță” din Cluj-Napoca, România. Studiul a inclus 320 de adulți (160 femei, 160 bărbați), care au rude cu diagnostic de cancer. Subiecții au fost rugați să completeze un chestionar anonim.

Rezultate. Rezultatele studiului arată faptul că majoritatea rudelor pacienților cu diagnostic de cancer, care au fost incluse în studiu cunosc relația dintre fumatul activ, fumatul pasiv, consumul de alcool și cancer. Două treimi dintre participanți sunt conștienți de legătura dintre activitatea fizică și prevenirea cancerului, dar mai puțin de jumătate cunosc riscul pe care îl implică o greutate corporală crescută. Procentul persoanelor care recunosc rolul alimentației în prevenirea cancerului variază, o treime dintre participanți cunoscând rolul alimentelor bogate în fibre, jumătate fiind de acord cu riscul consumului crescut de carne roșie și 74% fiind conștienți de rolul protector al fructelor și legumelor. Au fost observate diferite diferențe în funcție de vârstă, educație și mediul de rezidență (urban-rural) cu privire la opiniile exprimate de participanți.

Concluzii. Aceste date arată faptul că este nevoie de acțiuni de informare și educare, care să îi ajute pe adulții din România, care au rude cu diagnostic de cancer, să cunoască riscurile relaționate cu stilul de viață, ca un prim pas în procesul de adoptare a unor comportamente sănătoase care protejează împotriva a diferite tipuri de cancer.

Cuvinte cheie: prevenirea cancerului, stil de viață, România, adulți care au rude cu diagnostic de cancer.

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Introduction

According to the World Health Organization, cancers figure among the leading causes of morbidity and mortality worldwide, with approximately 14 million new cases and 8.2 million cancer related deaths in 2012 (**a, 2015). Among men, the 5 most common sites of cancer diagnosed in 2012 worldwide were the lung, prostate, colorectum, stomach, and liver. Among women, the 5 most common sites diagnosed in the world were the breast, colorectum, lung, cervix, and stomach (**a, 2015; Stewart & Wild, 2014).

Different studies underline the relationship existing between lifestyle and cancer development and progression (**a, 2015; **, 2014; **, 2007). The World Health Organization emphasizes that around one third of cancer deaths are due to the 5 leading behavioral and dietary risks: tobacco use, alcohol use, high body mass index, low fruit and vegetable intake, lack of physical activity (**a, 2015).

Tobacco use is the most important risk factor for cancer, causing around 20% of global cancer deaths and around 70% of global lung cancer deaths (**a, 2015). Tobacco use is the main cause of lung cancer, but it is also linked to cancers with other localizations such as the head and neck, breast, cervix, urinary bladder and kidneys, pancreas and colon (**a, 2015; **, 2014). Passive smoking is also a risk factor for lung cancer, but some research also suggests that secondhand smoke may increase the risk of breast cancer, nasal sinus cavity cancer, and nasopharyngeal cancer in adults, as well as the risk of leukemia, lymphoma, and brain tumors in children (**, 2013).

The international report on “Food, Nutrition, Physical Activity and the Prevention of Cancer: A Global Perspective” (**, 2007) shows that the evidence is that alcoholic drinks are a cause of cancers of the mouth, pharynx, and larynx; the oesophagus; the colorectum in men, and the breast; and probably of liver cancer and colorectal cancer in women. Hence, the recommendations are, if alcoholic drinks are consumed, to limit consumption to no more than two drinks a day for men and one drink a day for women (one ‘drink’ contains about 10-15 grams of ethanol) (**, 2007).

The same report underlines that the strongest evidence, corresponding to judgments of ‘convincing’ and ‘probable’, shows that greater body fatness and greater abdominal fatness are causes of cancer of the colorectum; that greater body fatness is additionally a cause of cancers of the oesophagus (adenocarcinoma), pancreas, breast (postmenopause), endometrium, and kidney; and (probably) gallbladder. It also shows that greater abdominal fatness is probably a cause of cancers of the pancreas, breast (postmenopause), and endometrium; but that greater body fatness probably protects against premenopausal breast cancer. Hence, the report concludes with the recommendation to maintain body weight within the normal range (as issued by national governments or the World Health Organization) (**, 2007).

The report also presents the role of different food products in cancer prevention. According to the data presented in the report, foods containing dietary fiber probably protect against colorectal cancer; and there

is limited evidence suggesting that such foods protect against oesophageal cancer. Dietary fiber is found in plant foods: vegetables, fruits, and pulses (legumes), as well as in cereals, roots, tubers, and plantains. All these foods are highest in dietary fiber when in whole or minimally processed form. Foods high in dietary fiber may have a protective effect because of being bulky and relatively low in energy (**, 2007). Moreover, non-starchy vegetables probably protect against cancers of the mouth, pharynx, and larynx, and those of the oesophagus and stomach. There is limited evidence suggesting that they also protect against cancers of the nasopharynx, lung, colorectum, ovary, and endometrium. Allium vegetables probably protect against stomach cancer. Garlic (an allium vegetable, commonly classed as a herb) probably protects against colorectal cancer. At the same time, fruits in general probably protect against cancers of the mouth, pharynx, and larynx, and of the oesophagus, lung, and stomach. There is limited evidence suggesting that fruits also protect against cancers of the nasopharynx, pancreas, liver, and colorectum. Pulses (legumes), including soy and soy products, protect against stomach and prostate cancers (**, 2007). The report concludes with the following recommendations (**, 2007):

a) Eat at least five portions/servings (at least 400 g or 14 oz) of a variety of non-starchy vegetables and of fruits every day (this is best made up from a range of various amounts of non-starchy vegetables and fruits of different colors including red, green, yellow, white, purple, and orange, including tomato-based products and allium vegetables such as garlic).

b) Eat relatively unprocessed cereals (grains) and/or pulses (legumes) with every meal (relatively unprocessed cereals (grains) and/or pulses (legumes) to contribute to an average of at least 25 g non-starch polysaccharide daily).

c) Limit refined starchy foods.

The report also shows the strongest evidence, corresponding to judgments of ‘convincing’ and ‘probable’, that red meat and processed meat are causes of colorectal cancer, and limited evidence suggesting that red meat and processed meat are causes of other cancers. Hence, the panel of experts conclude that people who eat red meat should consume less than 500 g (18 oz) a week, and very little if any should be processed (‘red meat’ refers to beef, pork, lamb, and goat from domesticated animals, including that contained in processed foods; ‘processed meat’ refers to meat preserved by smoking, curing or salting, or addition of chemical preservatives, including that contained in processed foods) (**, 2007).

The report shows that physical activity of all types protects against cancers of the colon, and also of the breast (postmenopause) and endometrium. Moreover, the panel of experts also agree that since physical activity protects against overweight, weight gain, and obesity, it also protects against cancers for which the risk is increased by these factors. Hence the recommendations are (**, 2007):

a) Be moderately physically active, equivalent to brisk walking, for at least 30 minutes every day.

b) As fitness improves, aim for 60 minutes or more of moderate, or for 30 minutes or more of vigorous, physical activity every day.

c) Limit sedentary habits such as watching television.

Studies from different countries underline the necessity of educating and helping different population groups to adopt healthy behaviors which contribute to cancer prevention (Wright et al., 2015; Sanz-Barber et al., 2015; Murphy et al., 2015; Lopez et al., 2007; Kruk et al., 2014; Carlos et al., 2014; Costa et al., 2015; Falzon et al., 2012).

Hypothesis

This article focuses on opinions regarding the role of lifestyle in cancer prevention among Romanian adults having relatives with cancer. The study has three objectives. First, it investigates if the participants recognize the link between several lifestyle components - active and passive smoking, alcohol use, body composition, different unhealthy alimentary habits, physical activity - and cancer. The second objective is to assess possible correlations between several opinions related to these issues. Finally, the study aims to identify socio-demographic factors which might influence the participants’ opinion regarding the role of different lifestyle components in cancer prevention.

Material and methods

Research protocol

a) Period and place of the research

A cross-sectional study was conducted between October 2010 - February 2011 in the "Ion Chiricuță" State Oncological Institute in Cluj-Napoca, a city with approximately 330,000 inhabitants from North-West Romania. It provides medical care to oncological patients from North-West Romania and, sometimes, also from other Romanian regions. Ethical approval for the study was obtained from the hospital directorate - the standard procedure in Romania at the moment when the study was performed (Lotrean et al., 2013).

b) Subjects and groups

The study involved first degree relatives (parents, siblings, and offspring) of patients diagnosed with various types of cancer, who came to different departments of the oncological hospital (Surgery, Radiotherapy, Chemotherapy, Oncological Pediatrics) for treatment or medical checks.

c) Tests applied

The study used an anonymous questionnaire, which was filled in by the participants. The questionnaire was based on literature data and included items related to demographics, as well as the opinion of the participants regarding the role of different lifestyle components for

cancer prevention (***, 2007; Bauman et al., 2009; Humpel et al., 2007).

The socio-demographic items assessed by the study were gender (0-female, 1-male), age, educational level (0-low, 1-medium, 3-high), residence (1-rural, 2-urban). Five questions investigated the opinion of the participants regarding the connection between cancer prevention and different lifestyle components: active smoking, passive smoking, alcohol use, excessive body weight, consumption of fruits and vegetables, consumption of foods rich in dietary fibers such as whole grains and pulses, involvement in physical activity. The possibilities of answers were: I totally agree (2), I agree (1), I do not know (0), I disagree (-1), I totally disagree (-2).

The study subjects were contacted for participation in the study during their presence in the oncological hospital for accompanying or visiting their cancer relatives. An informed oral consent for participation was obtained from all participants. The refusal rate was 8.5% among female subjects and 11.5% among male subjects (Lotrean et al., 2013).

d) Statistical processing

Bivariate correlations were used in order to estimate the association between different opinions, as well as between different socio-demographic characteristics and the participants’ opinions.

Data analysis was performed with the SPSS-20.0 statistics program. Significant results were reported at p < 0.05.

Results

The study sample consisted of 160 men and 160 women aged 18-70 years from both rural (93 participants) and urban areas (227 subjects) of Romania. The educational level of the participants was as follows: 16.2% with a low educational level (junior high school or less), 42.8% with a medium educational level (high school), and 41.0% with a high educational level (university studies).

Table I shows that almost all of the subjects recognized (they totally agreed or agreed) the role of active smoking in cancer development, and around 80% knew the risk for cancer caused by passive smoking. At the same time, around 76% were aware of the link between alcohol use and cancer.

On the other hand, less than half of the participants (45%) knew that overweight increased the risk for different types of cancer. With regard to the relationship between alimentary habits and cancer, many participants (74%)

Table I
Opinions of participants about the link between lifestyle and cancer.

Opinions	I totally agree %	I agree %	I do not know %	I partially disagree %	I disagree %
Active smoking could increase the risk of cancer	61.3	33.2	5.5	0	0
Passive smoking could increase the risk of cancer	43.1	36.2	17.1	3.3	.3
Alcohol consumption could increase the risk of cancer	38.1	38.2	20.1	3.3	.3
Increased body weight could increase the risk of cancer	21.5	23.5	45.0	7.7	2.3
Consumption of fruits and vegetables could contribute to cancer prevention	39.5	34.6	18.0	5.6	2.3
Consumption of foods rich in dietary fibers such as whole grains and pulses could contribute to cancer prevention	11.1	28.5	52.8	7.6	0
Consumption of red meat could increase the risk of cancer	17.6	31.9	42.7	7.8	0
Physical activity could contribute to cancer prevention	27.3	39.1	26.7	6.9	0

were aware of the protective role of fruit and vegetable consumption, but only one out of three was aware of the importance of consuming fiber-rich foods, and one out of two participants knew about the risk posed by high red meat consumption. Two thirds of the participants recognized the fact that physical activity could contribute to cancer prevention.

As presented in Table II, there were statistically significant positive correlations between all the favorable opinions regarding the role of each investigated lifestyle component and cancer prevention. The strongest correlation was between recognizing the role of active smoking, passive smoking and alcohol use. Recognizing the risk of overweight had the strongest association with being aware about the risk of red meat consumption. Agreeing with the fact that fruit and vegetable consumption helps cancer prevention had the strongest association with recognizing the role of consuming fiber-rich foods. Besides, stronger opinions about the role of fiber-rich foods had one of the strongest associations with awareness about the risk of red meat consumption. Stronger opinions about the role of physical activity had the strongest correlation with awareness of the link between cancer and consumption of fruits and vegetables, consumption of fiber-rich foods, respectively.

Table III shows that there were no gender differences, except for the fact that women had a stronger opinion about the role of fruit and vegetable consumption in cancer prevention. Small age related differences were also found, and they concerned the fact that younger participants were less convinced about the role of alcohol use and red meat consumption in cancer development. On the other hand, the educational level was associated with an increased awareness of the role played by passive smoking, alcohol use, overweight, consumption of fiber-rich foods and consumption of red meat, as well as physical activity. Living in urban or rural areas made no difference in opinions about the role of active and passive smoking and

alcohol use, but people from urban areas were more aware of the importance of body weight, fruit and vegetable consumption, red meat consumption and physical activity.

Discussion

This study presents data on the opinions of Romanian adults having relatives with cancer about the role of lifestyle related behaviors in cancer prevention. The results show that the relationship between active and passive smoking and cancer was recognized by the majority of the participants. Another Romanian study also underlines that this message is clear to many Romanian adults, as a result of several information and education activities (Irimia, 2012). No gender, age, educational or residence (rural-urban) related differences were found, except for the fact that people with a higher educational level were more convinced about the relationship between passive smoking and cancer.

The link between alcohol use and cancer was recognized by 76% of the participants. A recent study performed among the general adult population from USA shows that less than half of the Americans are aware of this link (**b, 2015). In our study, the percentage of people recognizing this link was higher and it was noted that older people and participants having a higher educational level better recognized this relationship.

The fact that overweight might increase the risk for several cancers was recognized by 45% of the participants, with people from urban areas being more aware of this. Two recent studies performed among the general adult population from USA and UK show that this risk factor was known to 52% of the Americans and nearly two thirds of Britons (with people from higher social classes and those born before 1981 being much more aware of this link) (**b, 2015; **c, 2015).

A percentage of 74% of our study participants recognized the protective effect of fruit and vegetable consumption against cancer, women and people from urban

Table II
Bivariate correlations between the participants' opinions.

Indicator	Passive smoking	Alcohol use	Body composition	Consumption of fruits and vegetables	Consumption of fiber-rich foods	Consumption of red meat	Physical activity
Active smoking	.723***	.583***	.236**	.278**	.301***	.186***	.423***
Passive smoking		.572**	.231**	.270**	.311***	.183***	.407***
Alcohol use			.205**	.331**	.342***	.309***	.431***
Body composition				.182**	.158**	.365***	.296***
Consumption of fruits and vegetables					.394***	.277***	.539***
Consumption of fiber-rich foods						.392***	.483***
Consumption of red meat							.323***

*- P<0.05, **- P<0.01, ***-P<0.001.

Table III
Bivariate correlations between socio-demographics and the participants' opinions.

Indicator	Gender	Age	Educational level	Residence
Active smoking	NS	NS	NS	NS
Passive smoking	NS	NS	.154**	NS
Alcohol use	NS	.117*	.180**	NS
Body composition	NS	NS	NS	.165**
Consumption of fruits and vegetables	-.121*	NS	NS	.238
Consumption of fiber-rich foods	NS	NS	.140*	NS
Consumption of red meat	NS	0.113*	.215**	.127*
Physical activity	NS	NS	.212*	.185***

*- P<0.05, **- P<0.01, ***-P<0.001, NS - non-significant.

areas having stronger opinions about this. The benefits of fiber-rich food consumption for cancer prevention were recognized by one third of the participants, those with a higher educational level being more convinced about these. Half of the participants knew the link between the consumption of red meat and cancer; older people, those with a higher educational level and those living in urban areas were more aware of it. The awareness of our study participants about the relationship between different alimentary habits and cancer prevention was higher than in the general American population; in the American study, only 42% of the participants recognized the link between fruit and vegetable consumption and cancer, while only 35% knew the risk related to red meat consumption (**b, 2015). The UK study only investigated the general opinion if there was a relationship between alimentary habits and cancer prevention, and the results showed that 58% of the general population thought that there was a link between a poor diet and increased cancer risk (with people from higher social classes being much more aware of this link) (**c, 2015).

The role of physical activity in cancer prevention was recognized by two thirds of our study sample, people from urban areas and those having a higher educational level being more aware of this. The percentage was higher than among the general US population, where the proportion was 42% (**c, 2015) and the general UK population where the percentage was 49% (again, with people from higher social classes being much more aware of this link) (**c, 2015).

Moreover, the results show significant positive correlations between the participants' opinions about lifestyle components and cancer prevention. These data suggest that there are people who are better informed and educated regarding the role of different lifestyle related behaviors in cancer prevention, which helps them develop stronger opinions about the role of smoking prevention, alcohol abuse prevention, healthy weight management, healthy alimentary habits and active lifestyle, not only about one isolated behavior. Future activities should focus on identifying ways to reach and educate cancer patients' relatives about comprehensive healthy lifestyle promotion and cancer prevention, as a first step in order to motivate them and help them avoid unhealthy behaviors and prevent several types of cancer.

This study is subject to limitations. Due to funding and logistical restrictions, the studies did not include a national representative sample, which limits the generalization of the findings of the present study beyond its sample. Secondly, another common limitation with most studies on this topic is the reliance on the participants' self-reports. Although some respondents may have not reported truthfully, the likelihood of honest responses was maximized in this survey by conducting it anonymously.

Conclusions

1. The results of the study show that the majority of the Romanian cancer patients' relatives from our study know the relationship between active and passive smoking, alcohol use and cancer.

2. Two thirds of the participants are aware of the link between physical activity and cancer prevention, but less than half know about the risk posed by overweight.

3. The percentages of the participants aware about the role of diet in cancer prevention vary from one third knowing the role of fiber-rich foods to half recognizing the risk of consuming high amounts of red meat, and to 74% being aware of the protective effect of fruits and vegetables.

4. These data call for information and education actions, which might help Romanian adults who have relatives with cancer to be aware of lifestyle related risks, as a first step in the process of adopting healthy behaviors which can protect against several types of cancer.

5. Several age, educational and residence (urban-rural) differences were identified for several opinions, underlying a stronger need of educational activities for people from rural areas and those having a lower educational level.

Conflicts of interests

The authors have no conflict of interest.

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