

Attitude to primary prevention advice of the European Code against cancer in relatives of cancer patients: Implications for the development of preventive programmes

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Achieving a preventive attitude is the first step in eliminating cancer risk behaviours. This cross-sectional study evaluated the attitude towards the European Code against Cancer, in 3,031 relatives of cancer patients. The study looked for keys to improve attitude by means of educational interventions. Attitude was evaluated using a questionnaire with 63 items and a Likert's scale. Measured from -2 to +2, the mean score was 0.905 [0.894 - 0.971]. Five per cent had a mean score under 0.38 and another 5% over 1.46. A multivariate analysis found that age, sex and level of education were significantly associated with attitude: young men with a low cultural level were those with the lowest preventive attitude. The family history of cancer was not associated with attitude. Educational interventions should modify the perceived advantages of smoking and drinking, and the disadvantages related to preventive diet and sun and workplace protection.

Actitud hacia los consejos de prevención primaria del Código Europeo contra el cáncer, en parientes de pacientes con cáncer: implicaciones para el desarrollo de programas preventivos. Conseguir una actitud preventiva es esencial para eliminar conductas de riesgo de cáncer. Se describe la actitud hacia el Código Europeo contra el Cáncer de 3.031 parientes de cancerosos. Se buscan claves para mejorar la actitud mediante intervenciones educativas. La actitud se evaluó con cuestionario de 63 ítems y escala de Likert: medida de -2 to +2, la puntuación media fue 0.905 [0.894 - 0.971]. Un 5% tuvo una media inferior a 0,38 y otro 5% superior a 1,46. En un análisis multivariante, edad, sexo y nivel de educación se asociaron significativamente con la actitud: los hombres jóvenes con bajo nivel cultural son los que tienen actitud preventiva menor. La historia familiar de cáncer no se asoció con la actitud. La clave de programas preventivos es modificar las ventajas percibidas por fumar y beber alcohol, y las desventajas de la prevención relacionada con la dieta, el sol y el trabajo.

Attitude, according to some psychosocial models that try to explain human behaviour, is a powerful determinant of it (Fishbein and Ajzen, 1980; McGuire, 1985). One of these models is the ASE model (De Vries, Mudde and Dijkstra 2000). It is based on the theories of Fishbein-Ajzen (1975) and Bandura (1986) and, in synthesis, establishes that behaviour is associated with 3 distal factors: Attitude, which is the result of considering the advantages and disadvantages of a behaviour, and their alternatives; social influence, in which the modelling experienced on observing the behaviour of others forms a part, and also the direct and indirect pressures received to adopt a type of behaviour; self-efficacy, which is the self-evaluation of one's ability to develop a specific behaviour. These 3 distal factors are associated with a proximal factor: the intention of developing the behaviour or not. If anyone

really intends to adopt a given type of behaviour, he will do so if he does not have to face insurmountable barriers and if he has the necessary skills for it. The ASE Model described has been used in studies related to risk behaviour and cancer prevention (Brug, Lechner and De Vries, 1995; Van Assema, Pieterse, Kok, Eriksen and De Vries, 1993).

Health Promotion, apart from other aims, tries to get health risk factors changed to preventive behaviour (Ottawa Charter, 1986). To do this, it is considered necessary to implement tailor-made educative interventions. These interventions should be adapted to the stage of the behavioural change process of the subject whose behaviour is to be modified (Kreuter, Bull, Clark and Oswald 1999).

The ASE Model mentioned above, establishes that attitude can be modified in the desired way, emphasizing the advantages of preventive behaviour, minimizing its disadvantages and, in any case, searching for alternatives to the said disadvantages, if they exist. This theory is applied, for example, when trying to convince the smoker that, by giving up smoking, he will improve his health and looks, save money, avoid situations of anxiety in the ever more numerous no-smoking areas and set a good example to the children around him, to quote only some of the most common advantages. These

theoretical bases are also being applied when trying to alleviate one of the most important disadvantages of giving up smoking —the nicotine withdrawal syndrome and its effects—, by means of some alternatives: substitution therapy, prescribing chewing gum or patches, and avoidance and relaxation techniques, for example.

Primary prevention of cancer is based on carrying out the preventive behaviour set out in the European Code against Cancer (ECC): A programme of activities and research, focussing on three major themes (prevention, screening and education and training) (Boyle et al, 2003). The ECC, since 1987, has tried to divulge among European citizens the importance of not smoking, increasing the consumption of fruit, vegetables and wholemeal cereals, decreasing the consumption of fat and alcoholic drinks, controlling weight by means of diet and regular exercise, and protecting yourself from the sun and from carcinogenic substances in the workplace. The first step to achieve this behaviour, and with it health promotion in this field, is for health educators to achieve a positive attitude towards compliance with the ECC.

Abundant research has been carried out with the aim of discovering and modifying attitude towards some of the preventive behaviour of the ECC, in an isolated way (Hailey, Carter and Burnett, 2000; Smith, Williamson, Womble, Johnson and Burke, 2000; Hornung et al, 2000; Howell, Nelson-Marten, Krebs, Kaszyk and World, 1998; Johnson, Davy, Boyett, Weathers and Roetzheim, 2001; Marcell, Halpern-Felsher, Coriell and Millstein, 2002), especially smoking (Etter, Humair, Bergman and Perneger, 2000; Wang, Fitzhugh, Eddy and Westerfield, 1996). Implicit and explicit attitudes and other psychosocial factors associated with cancer risk behaviour have also been investigated independently (Amigo, Fernández, Rodríguez and Rodríguez, 2005; Briñol, Horcajo, Becerra, Falces and Sierra, 2002; Ruiz, Berrocal, López and Rivas, 2003; Sánchez, Olivares and Rosa, 1998). But we have not found studies focussed on the attitude towards compliance with the ECC primary prevention advice, considered as a whole.

It has also been established that relatives of patients with cancer could have a more positive attitude towards the adoption of preventive behaviour, or an attitude easier to modify towards a healthy one (Audrain et al, 1999; Weston, 1999).

For this reason, the aim of this study was to evaluate the attitude of relatives of patients with cancer towards the primary prevention of this disease, study which factors are associated with a more preventive attitude, and find clues to design suitable educative interventions with a theoretical probability of success.

Methods

Participants

A sample of 3,031 individuals from patients who attended Primary Care centres for any health problem, was randomly selected in 3 regions in the North of Spain —Asturias, Cantabria and Galicia—, which have the highest cancer incidence and mortality rates in our country (FESEO, 2002). The inclusion criteria in the study were: 1) Age between 15-50; 2) One or more first or second degree relatives, dead or alive, affected by cancer; 3) Intellectually able to fill in a self-administered questionnaire.

The average age of the sample was 35,12 years [34.78 - 35.46]; 70.6% were women and 29.4% were men. 32% had primary studies, 42% secondary and 27.9% university. 94.6% of the people invited to take part in the study accepted.

Variables and instruments

Attitude towards advice on primary prevention of cancer was measured by means of a validated questionnaire (López et al, 2003) (table 1), including a test of 63 items and a 5-point Likert scale, from «entirely disagree» to «entirely agree» with a neutral position. An average attitude value was calculated, adding the scores obtained in each of the items and dividing by 63. The value -2 was given to the items in the scale that expressed risk opinions, to which the participants answered «Agree entirely». On the contrary, the value +2 was given to the items in the scale that expressed preventive opinions, to which the participants answered «Agree entirely». The average attitude value calculated in this way oscillates between -2 and +2, and the most positive value expresses the most favourable attitude towards compliance with the ECC.

Other variables measured were: age, gender, level of education, access to internet, application for professional help to understand some items in the questionnaire, region of residence and family history of cancer (number of sick relatives, survival of those affected, and date of the last death).

Procedure

A multicentric cross-sectional study was carried out. The questionnaire was self-administered in a quiet place in the Primary Care Centre, in the 2000-2003 period. Twenty-four trained doctor-nurse units from 14 primary care centres took part.

Data analysis

The normality of the attitude variable was studied with the Kolmogorov-Smirnoff test. To compare attitude among groups defined by qualitative variables (region, education, access to internet, etc.) the Mann-Withney and de Kruskal Wallis U tests were used. The relation between quantitative variables was studied by means of the Spearman correlation coefficient. Subsequently, a multivariate analysis was made by means of multiple regression. Attitude was considered as the dependent variable and the other variables were introduced in 2 steps, by means of the «enter» method. Family history of cancer was introduced in the first step and the other covariables were added in the second step.

Results

Mean scores for each item of attitude are shown in table 1. The mean score of attitude towards the ECC preventive advice was 0.905 [CI_{95%}= 0.894 - 0.917], SD 0.330, range [-0.11 to 1.86]. The attitude distribution (figure 1) does not fit the normal distribution (Kolmogorov Smirnoff Z= 2.105; p<0.001). Percentile values were P₂₅= 0.66, P₅₀= 0.88 and P₇₅= 1.14 (figure 2). Five percent of the sample had a mean score under 0.38, another 5% over 1.46.

The values of attitude were compared using the grouping variables shown in table 2. In the bivariate analysis no significant differences between regions (P= 0.406) were detected and women, people with a higher level of information —whether due to a higher level of education (figure 3) or their access to internet— and those with relatives affected by cancer, both dead and alive, were found to have a significantly more preventive attitude.

Table 1
Attitude items in the questionnaire and mean scores

Item	Mean and IC ₉₅	Item	Mean and IC ₉₅
Smoking raises the risk of getting lung cancer ^a	1.63 [1.61-1.65]	Food with a lot of fat is tastier ^b	0.41 [0.37-0.45]
Smoking gives me great pleasure ^b	0.58 [0.53-0.63]	Fatty diets raise the cholesterol in the blood ^a	1.31 [1.29-1.34]
Smoking relaxes me ^b	0.55 [0.50-0.60]	Meals with fat are more satisfying ^b	0.27 [0.32-0.31]
Smoking is a way to waste money ^a	1.31 [1.27-1.34]	Meals with a lot of fat are more difficult to digest ^a	1.18 [1.15-1.22]
Tobacco smoke annoys non-smokers ^a	1.43 [1.40-1.46]	Fat is one of the greatest gastronomic pleasures ^b	0.76 [0.73-0.80]
Thanks to tobacco I can bear stress ^b	0.85 [0.81-0.89]	A diet rich in fat raises the arterial blood pressure ^a	1.07 [1.04-1.10]
I would sleep badly without tobacco ^b	1.10 [0.60-1.13]	Thanks to a diet rich in fat it is possible to do work requiring great physical effort ^b	0.66 [0.62-0.69]
The smell that smokers have is unpleasant ^a	1.00 [0.96-1.05]	The best ending for a good meal is a high-fat dessert ^b	0.97 [0.93-1.00]
If I can't smoke I get into a bad mood ^b	0.63 [0.58-0.68]	Maintaining a suitable weight prevents a lot of illnesses ^a	1.30 [1.28-1.33]
Drinking alcohol in excess raises blood pressure ^a	1.06 [1.02-1.09]	The sacrifice necessary to watch weight is too great ^b	-0.08[-0.05-0.03]
Drinking alcohol helps me to mix with other people ^b	1.04 [1.01-1.08]	Having a suitable weight helps you to get certain jobs ^a	0.47 [0.44-0.51]
People who drink alcohol can harm their liver ^a	1.52 [1.50-1.56]	Worrying about not putting on weight can be more dangerous for your health than being overweight ^b	-0.12[-0.16-0.08]
Drinking alcohol gives me great pleasure ^b	1.00 [0.96-1.03]	Society accepts thin people more readily than fat ones ^a	0.88 [0.84-0.91]
If I don't drink when I go out with friends they don't like it ^b	1.36 [1.33-1.39]	The discipline necessary to be thin prevents you from being happy ^b	0.68 [0.64-0.71]
Drinkers have more family problems ^a	1.31 [1.28-1.35]	Thin people find clothes more easily ^a	1.05 [1.01-1.08]
When I drink alcohol I feel happier ^b	1.03 [1.00-1.07]	Thin people pick up partners more easily than fat people ^a	0.40 [0.36-0.43]
Alcohol is the main cause of traffic accidents ^a	1.33 [1.30-1.36]	Watching my weight so as not to get fat puts me in a bad mood ^b	0.46 [0.42-0.50]
Drinking alcohol relaxes me ^b	1.09 [1.06-1.13]	You are better- looking with your normal weight than when you are overweight ^a	1.04 [1.01-1.07]
Alcohol makes it difficult to control yourself ^a	1.25 [1.22-1.29]	The sun is the most important cause of skin cancer ^a	1.27 [1.24-1.30]
Thanks to alcohol I lose my inhibitions ^b	0.76 [0.72-0.80]	Products that protect you from the sun (creams, lotions, etc) are unpleasant ^b	0.86 [0.83-0.90]
Fresh vegetables have a lot of vitamins ^a	1.57 [1.54-1.59]	The sun helps to make wrinkles appear in the skin ^a	1.13 [1.10-1.16]
I find the taste of vegetables unpleasant ^b	0.81 [0.77-0.86]	Sun creams are expensive ^b	-0.24[-0.28-0.20]
Fresh fruit is a very healthy food ^a	1.64 [1.61-1.66]	The sun produces lots of blemishes on the skin ^a	1.17 [1.15-1.20]
Eating vegetables prevents you having a varied diet ^b	1.14 [1.11-1.18]	Using sun creams it is difficult to get a tan ^b	0.28 [0.24-0.31]
When I eat vegetables I still feel hungry ^b	0.56 [0.52-0.60]	Many cancers would be avoided if workers protected themselves against toxic substances ^a	1.29 [1.26-1.31]
Some of the people who live with me do not like vegetables ^b	-0.07[-0.02-0.08]	If all the workers at risk protected themselves, the country would save a lot of money ^a	0.99 [0.96-1.03]
Eating vegetables helps you not to put on weight ^a	0.98 [0.95-1.01]	When the worker uses protection he works worse ^b	0.78 [0.74-0.81]
It is difficult to cook vegetables in such a way as to make them appetizing ^b	0.70 [0.66-0.74]	You feel better about yourself when you work with protection ^a	1.12 [1.09-1.15]
Diets with vegetables are not very enjoyable ^b	0.42 [0.38-0.46]	Using protection at work wastes a lot of time ^b	0.65 [0.62-0.69]
Fruit is only pleasant in summer ^b	1.14 [1.10-1.17]	Protecting yourself at work is a way of showing your love for your loved ones ^a	1.10 [1.07-1.13]
A diet rich in vegetables helps to control cholesterol ^a	1.17 [1.14-1.20]	Protecting your hands with gloves is dangerous as it lowers the sensitivity of your sense of touch ^b	0.66 [0.62-0.70]
A diet rich in fat harms the health of the heart ^a	1.32 [1.29-1.35]		

^a 'Completely agree' = +2; 'I agree' = +1; 'I don't know/neutral' = 0; 'I disagree' = -1; 'I completely disagree' = -2

^b 'Completely agree' = -2; 'I agree' = -1; 'I don't know/neutral' = 0; 'I disagree' = +1; 'I completely disagree' = +2

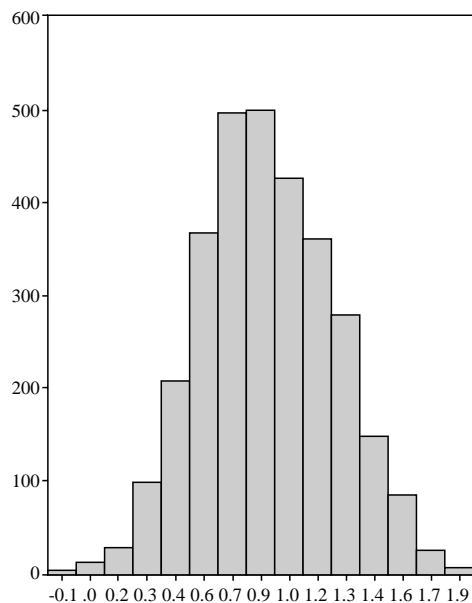


Figure 1. Average score distribution of cancer prevention attitude from -2 to +2 (optimum)

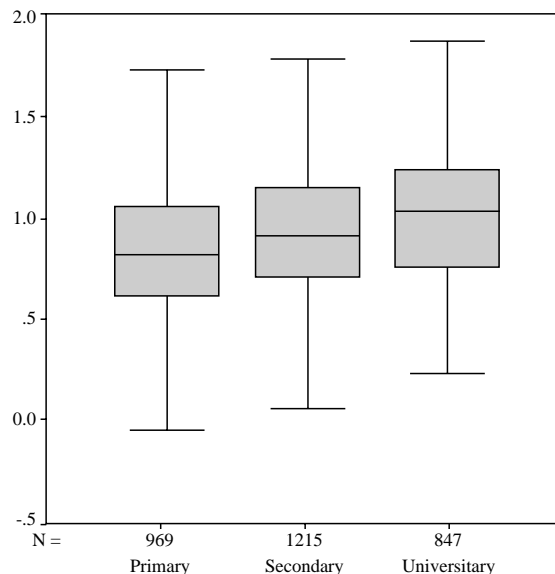


Figure 3. Attitude by level of education

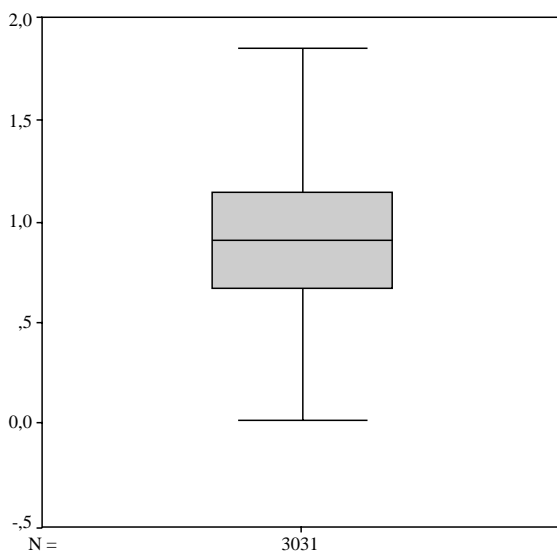


Figure 2. Median and boxplot of attitude

Of the quantitative variables only age showed a very low positive but statistically significant association with attitude (Spearman's $Rho = 0.068$; $p < 0.001$). In relation to the family history variables, no association with attitude was found either for the number of relatives with cancer ($P = 0.935$) or for the time since the last death ($P = 0.589$).

In the multivariate analysis (table 3), in the first stage (Model 1) only the variables related to family history of cancer were included as independent variables, but no statistically significant association with attitude was found. In the second stage (Model 2) all the variables were included, showing that age, sex, level of education, region and help in understanding some items in the questionnaire were associated at significant levels. However this regression model can only explain about 10% of the variability of the variable *attitude* ($R^2 = 10.4$).

Discussion

Most people obtained a mean score in attitude situated in the positive part of the measuring scale, but the mean of the mean scores obtained by the population under study is far from being the optimum score (+2). For this reason, the priority of any educative intervention, tailor-made for these patients, should: emphasize the advantages of adopting healthy behaviour and lifestyles that

Grouping variable	Attitude		
	Groups	Mean and 95% confidence interval	P
Region	Asturias	0.90[0.88-0.91]	0.406 ^a
	Cantabria	0.91[0.89-0.93]	
	Galicia	0.94[0.86-1.01]	
Help in understanding some items	Yes	0.81[0.79-0.84]	<0.001 ^b
	No	0.93[0.91-0.94]	
Gender	Male	0.82[0.79-0.84]	<0.0001 ^b
	Female	0.94[0.92-0.95]	
Level of education	Primary	0.82[0.80-0.84]	<0.001 ^a
	Secondary	0.90[0.89-0.92]	
	University	0.99[0.97-1.01]	
Internet user at home	Yes	0.93[0.90-0.95]	0.004 ^b
	No	0.89[0.88-0.90]	
Survival of relatives with cancer	All alive	0.90[0.87-0.93]	0.026 ^a
	Some dead	0.89[0.88-0.91]	
	Dead and alive	0.95[0.91-0.97]	

^a Kruskal Wallis test
^b Mann Whitney test

prevent cancer; and offer alternatives to the advantages the patients perceive in their risk behaviour.

In relation to this last point, the analysis of the answers given to the items in the scale showed that: tobacco is a source of pleasure and relaxation, and an effective element to manage stress; alcohol is used to lose inhibitions; vegetables are not considered very appetizing or satiating, contrary to food with lots of fat; weight control is considered very difficult and being overweight is not considered as having too many negative social repercussions related to their body image; protection from the sun is expensive and prevents them from getting the tan that the present aesthetic model demands; using protection in the workplace is considered uneconomic and, sometimes, even dangerous.

For all these reasons, health promotion activities for primary prevention of cancer should include: alternatives to the advantages obtained from tobacco and alcohol, including relaxation techniques; cooking classes that teach recipes made with vegetables and with little fat that, however, are appetizing and satiating; feasible and effective slimming methods; affordability of solar protection and a gradual change in the aesthetic model that has emphasized tans in the last decades; suitable workplace legislation, control of its compliance and scientific evidence —available to the workers— that protection in the workplace saves resources and health.

The most easily modifiable of the items with the lowest scores (<0), according to Samejima's analysis carried out on validating the scale (López et al, 2003) would be: *'The sacrifice necessary to watch weight is too great'* and *'Some of the people who live with me do not like vegetables'*. The most easily modifiable of the items with scores between 0 and 0.5, would be: *'Diets with vegetables are not very enjoyable'*, *'Having a suitable weight helps you to get certain jobs'* and *'Thin people pick up partners more easily than fat people'*. The most easily modifiable of the items with scores between 0.51 and 1, would be, in this order: *'If I can't smoke I get into a bad mood'*, *'Smoking relaxes me'*, *'Smoking gives me great pleasure'*, *'Thanks to tobacco I can bear stress'*; *'Thanks to*

alcohol I lose my inhibitions'; *'When I eat vegetables I still feel hungry'*, *'I find the taste of vegetables unpleasant'*, *'Society accepts thin people more readily than fat ones'*, *'The discipline necessary to be thin prevents you from being happy'*; *'Products that protect you from the sun (creams, lotions, etc.) are unpleasant'*; *'If all the workers at risk protected themselves, the country would save a lot of money'*, *'When the worker uses protection he works worse'*, *'Protecting your hands with gloves is dangerous as it lowers the sensitivity of your sense of touch'*. The intervals —whose limits are the indexes of difficulty/ease— are relatively small for these items in Samejima's analysis. For this reason, the educative interventions to modify the said items are expected to have the highest theoretical probability of success in changing attitude.

We have not been able to compare the scores obtained on measuring the attitude towards primary prevention of cancer with those of other authors, because we have not found comparable measurements. However, the associations between more preventive attitude and age, gender or cultural level, which we have found, have been corroborated by other authors: These variables are important predictors of attitude towards primary prevention (Garbe and Buettner, 2000; Vandelanotte and De Bourdeaudhuij, 2003) and towards secondary prevention (Blanchard et al, 2004; Brawarsky, Brooks and Mucci, 2003; Hewitt, Devesa and Breen, 2004; Seeff et al, 2004; Slattery, Kinney and Levin, 2004; Somkin et al, 2004).

There are also findings that disagree with our results, probably due to differences in the population under study. For example, cancer family history does not seem to influence the attitude in our sample, but the inclusion criteria used in our research does not allow us to compare this attitude with that of people with no cancer family history, and the latter may have an even more negative attitude. What our work does support is that, in a population with cancer family history, attitude is neither modified by the number of relatives affected, nor by their state of survival. But they may have a more preventive attitude than those without a cancer family history, as stated by many authors (Audrain et al., 1999; Weston, 1999). Neither did having a cancer family history influence the response to a mailed cancer family history questionnaire (Mancuso et al, 2004). Another study found modest support to indicate that relatives of cancer patients spontaneously change their own risk behaviours (Kristeller et al, 1996). Therefore more research is necessary to clarify if the family history of cancer really induces a more preventive attitude.

The association found between those who asked for professional help to better understand some of the items in the scale and a lower preventive attitude could be explained by the fact that help was probably required by people with a lower level of education and so would have more difficulty interpreting the items.

The multivariate analysis showed that the factors that best explain a preventive attitude towards cancer are level of education, gender, age and the region of origin. When most of the known covariables related to attitude were controlled, access to internet does not seem to influence as yet the attitude towards cancer prevention in our country, in spite of also being considered a powerful source of health information (Kalichman et al, 2003; Thomas, Stamler, Lafreniere, Out and Delahunt, 2002), although it has important limitations and can be improved (Berland et al, 2001). Most Spanish people may not yet have access to internet, and for this reason, our study has not found an association between

Table 3
Multiple regression models for cancer prevention attitude

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	S.E.	B		
1 (Constant)	0.902	0.017		52.588	<0.001
Number of relatives with cancer	0.000	0.006	-0.001	-0.054	0.957
Years since last death	0.002	0.002	0.028	1.258	0.209
Dead relatives (0= alive)	-0.020	0.022	-0.027	-0.906	0.365
Dead and alive (0= alive)	0.026	0.028	0.030	0.946	0.344
2 (Constant)	0.590	0.032		18.159	<0.001
Number of relatives with cancer	-0.009	0.005	-0.035	-1.759	0.079
Years since last death	0.001	0.002	0.007	0.317	0.752
Dead relatives (0= alive)	-0.008	0.021	-0.011	-0.366	0.715
Dead and alive (0= alive)	0.030	0.026	0.034	1.138	0.255
No help in understanding items	0.092	0.015	0.115	6.183	<0.001
Male gender	-0.121	0.013	-0.166	-9.516	<0.001
Age (years)	0.005	0.001	0.153	8.326	<0.001
Internet user	0.003	0.013	0.004	0.214	0.831
Region: Galicia (0= Asturias)	0.088	0.033	0.047	2.658	0.008
Region: Cantabria (0= Asturias)	0.038	0.013	0.053	2.980	0.003
Secondary (0= Primary)	0.099	0.014	0.147	6.948	<0.001
University (0= Primary)	0.183	0.016	0.249	11.270	<0.001

being an internet user and attitude towards cancer prevention. As the multivariate model obtained only explains a little more than 10% of the attitude variability, it is necessary to continue exploring other possible covariables, that will allow us to deepen our knowledge of attitude.

The results of our study have the limitations inherent in research done by survey. Nevertheless, the validation of the scale used (López et al., 2003) allows the reliability and validity of the data obtained to be accepted. The results cannot be generalized to the whole population, but only to the population that attend Primary Care centres for any reason and who are, on the other hand, the only ones who are exposed to possible educative interventions. Neither can differences with populations in other parts of Spain and Europe be ruled out, as the geographical factor was significantly associated with attitude in our study. For all these reasons, the variability of attitude towards cancer prevention in other geographical zones and the influence on attitude of

variables different from those used by us should be studied. Also, educative interventions capable of modifying attitude towards a more healthy one should be designed and evaluated.

In conclusion, young men with a low cultural level from the Asturian region were those with the lowest preventive attitude. They are the most preferable population for educative programmes designed to change attitude. The key of such programmes is to modify their perception of the advantages of tobacco and alcohol, and of the disadvantages they experience on following the ECC, related to preventive diet and sun and workplace protection.

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