

Awareness of the European Code against Cancer of Family and Community Medicine residents and Medicine and Nursing students in Spain

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Abstract

- Background and objective: Health professionals and students in training are key for early diagnosis of cancer. The objective of this study was to evaluate the degree of awareness of Family and Community Medicine (FCM) residents and Medicine and Nursing undergraduate students in Spain regarding the European Code against Cancer (ECAC).

- Methods: Observational, descriptive, multicentric study. Location: Teaching Units of FCM of Cordoba and Ceuta, Schools of Medicine and Nursing of the Universities of Cordoba and Francisco de Vitoria of Madrid (Spain). Participants: Residents of FCM and Medicine and Nursing undergraduate Spanish students. Intervention: self-administered questionnaire to assess the awareness about the ECAC.

Results: A total of 651 subjects participated (52.4% [95% CI: 48.5-56.2] Nursing students, 34% [95% CI: 30.3-37.6] Medicine students and 13.6% [95% CI: 11.0-16.3] FCM residents). 74.8% were women. Mean age: 22.34 years (Standard Deviation: 4.68; range: 18-52; 95% CI: 21.98-22.70) 76.8% (95% CI: 73.5-80.1) declared to be unaware of the ECAC. Those referring to be aware of the ECAC, mainly knew it through degree subjects (7.5% [95% CI: 5.5-9.6]). Residents of FCM ($p < 0.001$), older participants ($p < 0.001$) and those belonging to the Teaching Units ($p = 0.002$) showed a better awareness of the ECAC.

- Conclusions: The findings reveal the unawareness on the ECAC in three out of four participants. The access to the advice described in the ECAC through the Medicine and Nursing Schools and FCM Teaching Units is poor. The awareness of the ECAC of postgraduate residents is higher than that the awareness of the undergraduate students.

Keywords:

European Code against Cancer, Cancer Prevention, Primary Care, Healthcare Professionals, Undergraduate Students

Introduction

Cancer constitutes one of the main causes of morbidity, being responsible for 14 million new cases in the world (World Health Organization, WHO)¹. The annual estimations indicate that the number of cancer patients will increase by 70% in the next decades, reaching 24 million cases by 2035.

At the present time, cancer represents the second cause of death in the world. The global incidence of cancer in Europe was 23.4% in 2018 (GLOBOCAN)². Approximately a third of these deaths is related to five behavioral and dietary risk factors: high body mass index, low intake of fruits and vegetables, lack of physical activity, tobacco smoking and alcohol intake.

The Europe Against Cancer action plan, created and launched by the WHO from 1987³, establishes the main recommendations for the prevention and early diagnosis of cancer through the European Code Against Cancer (ECAC)⁴. This Code consists of 12 recommendations, accessible to all the population, whose objective is to promote healthy lifestyles and to reduce the risk of developing cancer, regardless of the level of risk exposed to. Between 30% and 50% of cancers are estimated to be preventable¹. Therefore, it is necessary to influence the modifiable external factors that boost cancer development and to implement prevention strategies to reduce cancer prevalence⁵.

Health professionals are key for the promotion of health, primary prevention and early diagnosis of cancer⁶. At the moment, the Program of Prevention and Health Promotion Activities (PAPPS⁷) includes in its prevention recommendations the guidance provided by the ECAC, aiming at promoting health education. The awareness of the ECAC recommendations and the promotion of a healthy lifestyle boosted by the PAPPS constitute decisive elements in the prevention of cancer⁸. In this sense, various research studies have identified a positive association between a greater awareness of the risk factors for cancer and the adoption of a healthy lifestyle in the general population⁹.

At the Spanish level, we can find previous studies published in the literature in this regard, such as the study performed by Lopez *et al.*¹⁰ (1994), who evaluated the awareness of the advices described in the ECAC in a sample of 695 high school students. Another study published in 2015¹¹ has addressed the general Spanish population. Recently, a study analyzing the awareness of the ECAC recommendations of the Primary Care (PC) professionals has been published¹². These three studies show the widespread unawareness of the ECAC among health professionals, high school students and the general Spanish population.

Regarding the ECAC, no information on the situation of other groups deserving attention, such as postgraduate or undergraduate students, is available. The awareness of the recommendations of the ECAC in these groups can be very useful¹³, because the characteristics of these subjects differ from those identified in the population of health professionals who had worked longer in PC, being of interest to determine the impact of this awareness on clinical settings in further studies.

Our objective was to assess the degree of awareness of the ECAC among the residents of FCM and among Medicine and Nursing students in Spain. In addition, we aim to identify the existing relation between the sociodemographic variables of these groups and the awareness of the ECAC.

Materials and Methods

An observational, descriptive, cross-sectional, multicenter study was conducted. The study population consisted of, on one hand, FCM resident physicians of the Teaching Units of Cordoba (n=94) and Ceuta (n=12), and on the other hand, the second year (n=120) and fifth year (n=140) Medicine students and the first year (n=134), second year (n=123) and fourth year (n=108) Nursing students of the School of Medicine and Nursing of the University of Cordoba, and fourth year students (n=95) of the Medicine School of Francisco de Vitoria University of Madrid (Spain). An informed consent was provided by the study subjects prior to their participation in the study.

Sample size was estimated considering an 5% alpha error, a 50% expected proportion of professionals aware of the ECAC, and a 5% accuracy. At least 377 participants should be included.

The study population was recruited using two procedures:

- 1) Sending electronic mails to the FCM resident physicians of the Teaching Units of FCM of Cordoba and Ceuta. For this purpose, an on-line message was sent to all the residents, in which the objective of the study was explained, requesting an informed consent and encouraging them to complete the questionnaire, available on Google Forms of Drive.
- 2) Delivery of the questionnaire in person to the students of the School of Medicine and Nursing of the University of Cordoba and the School of Medicine of Francisco de Vitoria University of Madrid, taking advantage of some face-to-face lectures delivered by the researchers participating in the present study at these universities.

The questionnaire was created by members of the work groups of the PAPPS-SemFYC¹⁸, experts in the performance of other surveys on prevention actions. This questionnaire underwent a face and content

validity process by consensus¹⁴; and it was conceived to be anonymously self-administered by each participant.

The variables collected in the questionnaire were: sociodemographic (age and gender), academic (center and year of training), and awareness of the ECAC. Moreover, participants were surveyed about their awareness of the PAPPS, a reference program in Spain, in which the recommendations in relation to this type of activities are stated¹⁵, and that entails the ECAC recommendations.

The fieldwork was conducted between January 2016 and April 2017. This study was approved by the Committee of Ethics and Clinical Research of the Reina Sofia University Hospital (Cordoba).

Statistical analysis

A descriptive analysis of the variables was performed. A 95 % confidence interval (95% CI) for the main estimators was considered. A bivariate analysis (Chi-square and the Mann-Whitney U tests) was performed to assess the relation between sociodemographic variables and awareness of the ECAC, and between awareness of the ECAC and participants' implementation of the postulated recommendations. Two-way contrast and a $p \leq 0.05$ was considered. Finally, a multiple logistic regression analysis was performed, where the dependent variable was the awareness of the ECAC, whereas the independent variables were age, gender, and the academic profile of the participants (the latter was considered a dummy variable). The goodness of fit for the logistic regression model was determined with the Hosmer-Lemeshow test.

Results

A total of 651 participants completed the questionnaire, 74.8% of them were women (95% CI: 71.5-78.1). The mean age of the subjects was 22.34 years (Standard deviation: 4.68; range: 18-52; 95% CI: 21.98-22.70), finding two maximum peaks of participation, at 19 and at 21 years old. The 52.4% (95% CI: 48.5-56.2) of participants were Nursing students, 34% (95% CI: 30.3-37.6) were Medicine students, and 13.6% (95% CI: 10.9-12.4) were resident physicians of FCM. The 75.6% of participants are enrolled in the School of Medicine and Nursing of Cordoba, 10.8% in Francisco de Vitoria University, 11.8% are enrolled in the Teaching Unit of FCM of Cordoba and the 1.8% in the Teaching Unit of Ceuta.

The global rate of participation was 78.8%; considering the training profile of participants, the participation was the following: Nursing students: 93.4%, Medicine students at the University of Cordoba: 58.7%, students at Francisco de Vitoria University: 73.7%, and resident physicians: 84.0%.

The 76.8% of participants stated being unaware of the ECAC (Table 1). Those that declared to be aware of it, indicated that the more usual access way to the ECAC was through the subjects of the degree (7.5%).

Table 1 Awareness of the European Code against Cancer (ECAC) and ways to access this Code

	n (%)	95% CI
Awareness of the ECAC		
Yes, I am well aware of it	23 (3.5)	2.1-5.0
I have heard about it	128 (19.7)	16.6-22.7
I am not aware of it	500 (76.8)	73.5-80.1
Ways to access the ECAC		
Scientific documents	10 (1.5)	0.6-2.5
Mass media	21 (3.2)	1.9-4.6
Other colleagues	28 (4.3)	2.7-5.9
Subjects of the degree	49 (7.5)	5.5-9.6
Internet	26 (4.0)	2.5-5.5
Training provided by the FCMTU ^a	15 (2.3)	1.2-3.5
Hospital	2 (0.4)	0.1-0.7

^a FCMEU: Family and Community Medicine Teaching Unit

95% CI: 95% Confidence interval

Table 2 shows the association between the awareness of the recommendations of the ECAC and the sociodemographic variables of the participants. An association with the age ($p < 0.001$), the kind of profession ($p < 0.001$) and the location ($p = 0.002$) was found. A greater awareness of the ECAC was found in the residents of FCM, in the older participants, and in those of the FCM Teaching Unit of Ceuta.

Table 2 Awareness of the recommendations of the European Code against Cancer (ECAC), based on sociodemographic and work variables

Sociodemographic and work variables	Awareness of the ECAC		p
	Yes	No	

Age (years) ^a	23.81 ±5.18	21.90 ±4.42	<0.001
Gender	n %	n %	0.663
Men	36 (22.0)	128 (78.0)	
Women	115 (23.6)	372 (76.4)	
Academic profile			<0.001
Nursing students	67 (19.6)	274 (80.4)	
Medicine students	51 (23.1)	170 (76.9)	
Residents of FCM ^b	33 (37.1)	56 (62.9)	
Training/Studying location			0.002
School of Medicine Francisco de Vitoria	9 (12.9)	61 (87.1)	
School of Medicine and Nursing of Cordoba	107 (21.7)	385 (78.3)	
Teaching Unit of FCM ^b of Ceuta	5 (41.7)	7 (58.3)	
Teaching Unit of FCM ^b of Cordoba	30 (39.0)	47 (61.0)	

^a Variable expressed as mean and standard deviation

^b FCM: Family and Community medicine

Table 3 show the results of the multivariate analysis. Although statistical significance in relation to the gender was not found, an association between the awareness of the ECAC and the age of the participant (OR=1.07) was found. In addition, significant difference in awareness of ECAC was found when comparing between the residents of FCM and the Nursing students, being residents more aware (OR=1.74).

Table 3 Variables associated to the awareness of the European Code against Cancer (ECAC) by means of multivariate analysis

VARIABLES	Beta Coefficient	p	OR	95% CI	
				Lower limit	Upper limit
Age	0.066	0.001	1.07	1.03	1.11
Gender (men <i>versus</i> women)	0.231	0.307	1.26	0.81	1.96
Academic profile (reference category: Nursing students)	-	0.097	-	-	-
Medicine student	0.052	0.156	1.36	0.89	2.08
Family and Community Medicine resident	0.078	0.049	1.74	1.00	3.03

Dependent variable: awareness of the ECAC (Yes/No); Hosmer-Lemeshow test=3.691; p=0.884.

OR: Odds Ratio; 95% CI: 95% Confidence interval of OR

Regarding the programs of health promotion and prevention, such as the PAPPS, 30.1% (95% CI 26.6-33.6) of the participants in our study stated being aware of it. Residents of FCM (53.9%; 95% CI 22.3-31.7) and Nursing students (27%; 95% CI 22.3-31.7) were those stating a greater awareness of the existence of the PAPPS. In addition, a statistically significant relation ($p < 0.001$) was found between the awareness of the ECAC and the awareness of the PAPPS.

Discussion

This is the first study analyzing the degree of awareness of the ECAC among Nursing and Medicine university students and residents of FCM on training in Spain. Despite the relevance of early detection of cancer in our environment, the present study reveals that approximately 75% of students and future specialists of FCM are not aware of the Code. Therefore, the implementation and increase in training activities focused to health promotion and cancer prevention in the graduate and postgraduate curricula is needed.

Previous studies have addressed the awareness of the ECAC of the general population^{11,16,17}, such as the study conducted by our group in a sample of 2058 PC patients¹¹. We showed in that study that 86.7% (95% CI: 85.2-88.2) of patients were not aware of the ECAC and we highlighted the need for development of awareness campaigns on this issue. Another study conducted in 124 patients¹⁶ showed that the family physician constitutes the professional of choice when there is a concern or suspicion of alarm signs or symptoms of having cancer; nevertheless, the main source of information on this disease was the audiovisual communication media, mainly the television.

With regard to healthcare settings, only one study, which was also conducted by our group, is available. This study assessed the awareness of the ECAC in a sample of 1734 PC health professionals¹². Similarly, the present study underline the great unawareness of Medicine and Nursing students and FCM residents about the ECAC, in consistency with the results obtained on awareness of prevention and health promotion programs, such as the PAPPS. These findings can be relevant from the clinical point of view because of the significant association found between the awareness of the ECAC and the implementation of the prevention advice in the PC services¹².

Currently, there are evidences endorsing the concern to incorporate more training focused on the promotion of healthy habits and cancer prevention in undergraduate and postgraduate curricula¹⁸. At international level, studies aiming to increase the awareness of Medicine¹⁹ and Nursing²⁰ school students

in the area of cancer prevention have been conducted. As described by the results of the present study regarding the ways to know the recommendations of the ECAC, only a small percentage of students and residents acquire notions of cancer prevention and health promotion at the Schools or postgraduate Training Units. Therefore, and considering the importance and large cancer burden as a health problem, it is essential to encourage and give priority to the training in this matter. Similarly, it is necessary to foment the professional development of the healthcare staff with the purpose of promoting healthy lifestyles and increasing awareness and diffusion of the ECAC recommendations among the population in general.

In relation to the type of profession, our study shows a larger percentage of FCM residents referring being aware of the ECAC than Medicine and Nursing students. Despite no previous studies have specifically addressed the awareness of the ECAC of Medicine and Nursing students, some published studies have addressed the awareness that they have regarding the prevention of certain cancers, such as prostate, breast, cervix or colorectal cancer^{21,22}.

It is worth noting the high percentage of women who complimented the questionnaire, representing more than 75% of participants. This data is consistent with the feminization that is progressively occurring in the health degrees, especially in medicine, which is being clearly reflected in the last years in the profile of the population working in the Spanish National Health System²³. This situation starts to being perceived at both university entrance exams and examinations to enter specialty training. In the study conducted in May of 2018 on the physicians participating in the national examination of medical specialty (medical internal resident, MIR) for the course 2017-2018, 64.1% were women, a lower percentage than the obtained in our study. Although no objective data are available, it is possible that the percentage of women choosing the specialty of FCM is still higher than the percentage of men choosing it.

One of the limitations of the study is the possibility of a selection bias (volunteer bias) because the people more interested in the subject of study are keener to participate, which could overestimate the percentage of subjects with awareness of the ECAC. However, given the high rate of obtained answer, we think that this bias is not very relevant, although we admit that we cannot know if the answers of those students who did not attend class the day when the survey was conducted would have been different. Another limitation that should be highlighted is that the selection of only some years (instead of all the degree years) of Medicine and Nursing of the Schools of Cordoba and Francisco de Vitoria to participate in the

project. This selection was performed in this way due to operative reasons, because the researchers involved in the present study teach only in some years.

We compared our data according to age and gender with those published by the Spanish Medical Colleges Organization²⁵ in 2015 to analyze the representativeness of the sample compared to the study population. Thus, the proportion of female family physicians in Spain was 54.2%, whereas in our study the proportion of participant women is 74.8%, which confirms the above-mentioned female overrepresentation. Because the degree of awareness of the ECAC found in women is similar to the degree found in men, we could conclude that this is similar in both genders. Regarding age, we found a greater awareness among the oldest participants, and considering that a larger proportion of Nursing students participated in the study, suspicions about an underestimation of the prevalence of awareness of the ECAC could be raised.

Conclusions

This study shows the high number of Medicine and Nursing students and FCM Residents who are unaware of the ECAC. Furthermore, this study demonstrates the poor access to the awareness of the ECAC through Medicine and Nursing Schools and Teaching Units of FCM. For such reason, the implementation of training programs oriented to cancer prevention, based on the ECAC recommendations, should become a priority for the decision-makers in health schools, organizations with expertise in cancer prevention and related scientific societies. It would be interesting to elucidate if those who are aware of the ECAC show better health habits than those who are unaware of these recommendations, and to investigate their attitudes towards the prevention actions related to cancer.

Conflicts of interest

The authors declare no conflict of interest.

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