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ORIGINAL ARTICLE

Oncological genetic counseling (OGC) for high-risk hereditary cancer: what can hospital anxiety and depression scale (HADs) tell us?

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Summary

Purpose: *This study aimed to verify whether and how anxiety and depression symptoms are associated both to sociodemographic and clinical variables (age, civil status, type of cancer diagnosed, time elapsed between cancer diagnosis and Oncologic Genetic Counseling/OGC, number of relatives affected by cancer) and to psychological features (presence/absence of previous psychological suffering), subjective cancer risk perception, psychological attitude approaching/OGC) in a sample of Caucasian patients accessing OGC.*

Methods: *201 participants (193 female and 8 male) accessing OGC in the Istituto di Ricovero e Cura Carattere Scientifico (IRCCS) Giovanni Paolo II in Bari completed the Hospital Depression and Anxiety Scale (HADs) that was analyzed as global scoring, anxiety (HAD-A) and depression subscale (HAD-D).*

Results: *In our sample, higher HADs, HAD-A and HAD-D scorings were associated in different ways to both sociodemographic information (age: p value 0.019), clinical and medical features (personal history of cancer: HAD-D p value 0.02; months elapsed between diagnosis and OGC, HAD-A p value 0.004 and HADs p value 0.008) and psychological dimensions (approaching genetic counseling: anxiety p value 0.06; fear p value 0.02; duty p value 0.04).*

Conclusion: *This study showed that during the process of oncological genetic counseling the importance of taking into consideration not only medical variables but also cognitive and emotional aspects from both the individual and family spheres, in order to assure adequate care of the patient.*

Key words: *oncology, genetic, counseling, anxiety, depression*

Introduction

An estimated 10-24% of cancers are caused by a mutation in a known cancer susceptibility gene.

The identification of genes associated with high risk of breast, ovarian, and colorectal cancer has advanced our understanding of cancer predisposition over the last decade [1]. In particular, BRCA1 and BRCA2 genes are associated with malignant tumors of breast and ovary and approximately 15% of women whose breast cancer is associated with a hereditary predisposition have this mutation.

The study of these mutations in populations at risk should be accompanied by Oncological Genetic Counseling (OGC), which includes an evaluation process directed by experts in a multidisciplinary team [2]. Genetic counseling is defined by the National Society of Genetic Counselors (NSGC) as a

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process of helping people understand and adapt to the medical, psychological and familial implications of genetic contributions to disease [3]. It affords individuals at increased risk of cancer the opportunity to make an informed decision regarding genetic testing and risk management and it is considered essential for individuals undergoing genetic testing as it doesn't cause long-term psychological distress [4].

Anxiety and depression are the most studied psychological factors in participants of OGC [5] and approximately 25% of participants who attend OGC experience clinically significant levels of anxiety. It has been reported that low social support and personal/familial history of cancer are risk factors for anxiety [6], but little studies investigated how relevant the presence of other parental cancer diagnosis is in causing anxious or depressive symptoms.

In addition to this, in a setting of OGG, it is important to consider that the concept of genetic risk, as a predisposing condition, takes on a dual significance: objective significance on the one hand (i.e., quantification of the chances of developing the disease), and subjective significance on the other (i.e., a purely individual perception of one's own level of vulnerability). Risk perception seems to be influenced by cognitive, social and cultural factors [7] and it is theoretically and empirically relevant in motivating cancer screening and risk reduction behaviors [8]: individuals who underestimate their risk of developing cancer may be less likely to engage in health protective behaviors, whereas those who overestimate their risk may worry excessively, exhibiting behavior dependent on the health care system [9].

The primary aim of this study was to understand whether and how OGC is associated to anxious and depressive symptoms (evaluated with the Hospital Anxiety and Depression Scale, HADs) in connection to the feelings patients experienced before OGC and their subjective cancer risk perception.

This is the first Italian study approaching Oncological Genetic Counseling in a global way in order to consider all the potential socio-demographic, psychological and clinical variables related to anxiety and depression symptoms. In fact, HADs scores (anxiety subscale, depression subscale and global scale) have been analyzed in relation not only to socio-demographic information (i.e. age, civil status) and psychological dimensions, but also in relation to the familial and clinical history of the patient. In fact, according to previous experiences [10], we evaluated either the number of relatives affected both among collaterals (brothers and children), in the maternal and paternal pedigree separately and overall.

Methods

This study included 201 participants who underwent OGC for breast, ovarian, colorectal or other type of cancers at the Heredo-Familial tumors of IRCCS Istituto Tumori "Giovanni Paolo II", Bari, Italy. Data was consecutively collected from February 2017 to January 2019. All participants had a cancer diagnosis. Additional criteria for participation included age 18-75 years, having an adequate level of understanding of Italian language and the absence of psychiatric disorders that could prevent participants from understanding the goals of the research and survey questions (i.e., intellectual disabilities, severe psychotic symptoms).

The assessment was carried out by trained researchers; all participants were informed about the study purposes, and they signed both an informed consent before the assessment and a second consent to be contacted by the Psycho-Oncology Unit of the Institute if their HADS scores would exceed the cut-off. The self-report administration was conducted on the healthcare premises to guarantee confidentiality; it occurred prior to delivering the results of genetic testing (pre-test).

Socio-demographic form was specially constituted for use during counseling, being useful both to collect socio-demographic data and to understand genetic counseling information. The variables assessed were: age, gender, place of birth, civil status, type of cancer diagnosed, time elapsed from cancer diagnosis to OGC, number of relatives affected by cancer both among brothers and children (collaterals), in the paternal and maternal pedigree separately and overall. The normalization of the total number of relatives affected by cancer was carried out on the basis of the total number of relatives present in the family tree.

As reported by prior researches [11], a previous psychological suffering represents a factor of concern for developing anxious or depressive symptomatology after a cancer diagnosis. One self-report item was taken to investigate its presence: participants were asked to declare if they had ever suffered from anxious or depressive symptoms in their lives.

To investigate Cancer Risk Perception (CRP), one self-report item was taken from prior researches [12] to evaluate perceptions of the possible risk of the individual developing cancer: "How much did you feel at risk of developing a cancer if compared to general population?". Participants could answer choosing one of the following responses: "1. More", "2. The same", or "3. Less than the general population".

Regarding the psychological approach to OGC, as there is no available standardized psychological tool to asses this feature, one self-report item was taken from clinical psycho-oncological experience to investigate qualitatively the feelings participants showed before undergoing OGC: "How do you feel about the Genetic Counseling you are undergoing?". Possible answers were: "1. I'm scared about the results", "2. I feel anxious", "3. I feel obliged to my children", "4. I live it as an opportunity", "5. I live it normally".

HADS is a well-known emotional distress self-report measure and it is one of the most frequently used in

oncological settings as well as in other somatic diseases [13]. HADS excludes somatic symptoms of emotional distress (e.g. headache, weight loss, insomnia) that could be caused by the illness itself rather than being emotional distress expressions. It is a Likert scale composed of 14 items to which patients respond through a 4-point scale (from 0 to 3) referring to overt symptoms within the last week. It is composed of two scales - HAD-A for anxiety (7 items) and HAD-D for depression (7 items). The two scores can be calculated separately with three cut-offs: normal (0-7), borderline (8-10), disturbance (>11). The global score of HADS can be calculated with two cut-offs: normal (<14) and disturbance (>14). In the present study, the HADS demonstrated a good internal consistency with a Cronbach's α value of 0.91 for HADS-A and 0.90 for HADS-D.

Statistics

Data processing was performed with SPSS 19.0. Descriptive statistics were calculated (mean, standard deviation, frequencies and percentages). Also, association between categorical variables were calculated using the Pearson's x^2 test [14]. A p value <0.05 was used to evaluate the significance of the obtained data. The reliability of each scale was assessed using Cronbach's index of internal consistency. To identify associations between HADs scorings (HAD-A, HAD-D and HAD-global scale) and continuous variables investigated (i.e. age) we performed one way analysis of variance (ANOVA) which produced F-statistic test [15].

Table 1. Socio-demographic characteristics of participants and cancer history (n=201)

Characteristics	*Cases, n (%)*
Age (years), mean ± SD	51.61 ± 10.217 (range 25-74)
Sex	
Female	193 (96)
Male	8 (4)
Civil status	
Single	35 (17.4)
Married/Cohabitants	141 (70.1)
Separated/Divorced	18 (9.0)
Widowed	7 (3.5)
Previous history of cancer	
Breast cancer (BC)	153 (76.1)
Ovarian cancer (OC)	10 (5)
Others	14 (7)
More than 1 cancer	24 (11.9)
Time from cancer diagnosis to OGC (months)	
0-6	68 (33.8)
6-12	35 (17.4)
13-60	47 (23.4)
>60	51 (25.4)
Collaterals (brothers and children) affected by cancer	
0	139 (69.2)
1-2	52 (25.9)
>3	10 (5)
Relatives affected by cancer: % of the total number of relatives in the family tree	
0	3 (1.5)
1-10	88 (43.8)
11-30	91 (45.3)
>30	19 (9.5)

Results

All participants were Caucasian. The mean age of the participants was 51.61±10.217 years (range 25-74). More than 17% of the individuals were single, while 70.1% were married or cohabitant (Table 1).

All participants had a cancer diagnosis: 76.1% (n=153) suffered of breast cancer (BC), 5% (n=10) of ovarian cancer (OC), 7% (n=14) had a different type of cancer (colorectal cancer, melanoma, prostate cancer) and 11.9% (n=24) had 2 or more cancer diagnoses (one of which was BC or OC). The descriptive analysis of the time elapsed between the oncological diagnosis and the OGC took into consideration the following time frames from the diagnosis: 0-6, 7-12, 13-60, >60 months. OGC occurred in 33.8% (n=68) of the participants within 6 months from cancer diagnosis, in 17.4% (n=35) within 12 months, in 23.4% (n=47) within 5 years and in 25.4% (n=51) of the sample more than 5 years after diagnosis (Table 1).

The number of family members affected by cancer on the total number of relatives present in the family tree was more than one third only in 9.5% of cases, between one tenth and one third in 45.8% and between zero (1.5%) and one tenth (43.8%) for the rest. It has also been specified if the family members suffering from cancer belonged to paternal pedigree (0 cancer diagnosis: 18.4%;

Table 2. Descriptive analysis of HAD-A, HAD-D and HADS scores

	Cases, n (%)
HAD-A	
Normal (0-7)	103 (51.2)
Borderline (8-10)	48 (23.9)
Disturbance (>11)	50 (24.9)
HAD-D	
Normal (0-7)	149 (74.1)
Borderline (8-10)	33 (16.4)
Disturbance (>11)	19 (9.5)
HADs	
Under cut-off (<14)	115 (57.2)
Over cut-off (>14)	86 (42.8)

1-2:44.3%; 3-4:19.9%; >4:17.4%), maternal pedigree (0 cancer diagnosis: 13.9%; 1-2:44.3%; 3-4:22.9%; >4:18.9%) or were among brothers and children (0 collaterals affected: 69.2%; 1-2:25.9%; >3:5%). (Table 1).

Participants were asked to declare if they suffered from anxious or depressive symptoms before the OGC, with 55.7% reporting negative psychological problem while 37.3% suffering from anxiety and 7% with previous depressive symptoms.

For what concerns Cancer Risk Perception (CRP), 56.2% of the participants felt to have the same risk as the general population of developing an oncological disease, 10.4% smaller risk and 33.3% (n=67) felt to have higher risk than the general population.

Moreover, regarding psychological approach to OGC, more than a half of the participants (55.7%) claimed to feel obliged to their families, 21.9% looked at OGC as an opportunity to gain control

Table 3. Association between HADs scores (HAD-A, HAD-D and HADS) and previous cancer history of patients having access to OGC

HADs vs previous cancer history				
	Breast cancer (n=153) n (%)	*Ovarian cancer (n=10)* n (%)	*Other cancer (n=14)* n (%)	*More than 1 cancer (n=24)* n (%)
Anxiety				
HAD-A normal	79 (51.6)	3 (30)	8 (57.1)	13 (54.2)
HAD-A borderline	37 (24.2)	3 (30)	3 (21.4)	5 (20.8)
HAD-A disturbance	37 (24.2)	4 (40)	3 (21.4)	6 (25)
p value	Ns*	Ns	Ns	Ns
Depression				
HAD-D normal	116 (75.8)	6 (60)	12 (85.7)	15 (62.5)
HAD-D borderline	23 (15.0)	2 (20)	0 (0)	8 (33.3)
HAD-D disturbance	14 (9.2)	2 (20)	2 (14.3)	1 (4.2)
p value	Ns	Ns	Ns	0.04**
Global score				
HAD-s under cut-off	90 (58.8)	3 (30)	11 (78.6)	11 (45.8)
HADs over cut-off	63 (41.2)	7 (70)	3 (21.4)	13 (54.2)
p value	Ns	0.07	Ns	Ns

*Ns: not significant; **chi square p value calculated for patients with a specific type of cancer vs all the others

Table 4. Association between HADs (HAD-A, HAD-D and HADs) scorings and the time elapsed from cancer diagnosis to OGC (months)

	0-6 months (n=68) n (%)	*7-12 months (n=35)* n (%)	*13-60 months (n=47)* n (%)	*>60 months (n=51)* n (%)
Anxiety				
HAD-A normal	39 (37.9)	10 (9.7)	24 (23.3)	30 (29.1)
HAD-A borderline	11 (22.9)	15 (31.2)	12 (25.0)	10 (20.8)
HAD-A disturbance	18 (36.0)	10 (20.0)	11 (22.0)	11 (22.0)
p value	Ns*	0.004**	Ns	Ns
Depression				
HAD-D normal	49 (32.9)	26 (17.4)	37 (24.8)	37 (24.8)
HAD-D borderline	12 (36.4)	6 (18.2)	7 (21.2)	8 (24.2)
HAD-D disturbance	7 (36.8)	3 (15.8)	3 (15.8)	6 (31.6)
p value	Ns	Ns	Ns	Ns
Global Score				
HADs under cut-off	44 (38.3)	13 (11.3)	28 (24.3)	30 (26.1)
HADs over cut-off	24 (27.9)	22 (25.6)	19 (22.1)	21 (24.4)
p value	Ns	0.008	Ns	Ns

*Ns: not significant, **chi square p value calculated for patients in a specific time range vs all the others

on their health, 15.4% stated to feel anxious, 4.5% were afraid of the results and 2.5% reported to feel "normally".

All participants completed HADS. Both scores in the sub-scales HAD-A, HAD-D and in the global score HADS have been analyzed: both HAD-A, HAD-D and HADs scorings were normal in more than the half of the sample (51.2, 74.1 and 57.2%, respectively), borderline scores were higher in HAD-A subscale (23.9%) than in HAD-D subscale (16.4%), while only 42% exceeded the cut off for HADs global scorings.

The association between on one hand HADs scores (HAD-A, HAD-D and HADs) and on the other hand all the other variables (age, type of cancer, months elapsed from its diagnosis to OGC, number of relatives affected, previous psychological suffering, subjective cancer risk perception, psychological approach to OGC) were analyzed. In order not to make the reading of the present paper too burdening, only significant results will be shown in the Tables.

The average age of patients with a low HADs score was 50.16 ± 9.98 and was significantly lower than the average age of patients with high scores, ie 53.56 ± 10.26 (t-test p value <0.05).

More than 70% (74%) of the participants whose scorings revealed the presence of anxious

Table 5. Association between HADs scores and the number of relatives affected by cancer diagnosis

	Relatives affected by cancer: paternal pedigree			
	0 (n=37) *n (%)*	*1-2 (n=89)* *n (%)*	*3-4 (n=40)* *n (%)*	*>4 (n=35)* *n (%)*
Anxiety				
HAD-A normal	21 (56.8)	49 (55.1)	17 (42.5)	16 (45.7)
HAD-A borderline	7 (18.9)	20 (22.5)	11 (27.5)	10 (28.6)
HAD-A disturbance	9 (24.3)	20 (22.5)	12 (30)	9 (25.7)
p value	Ns*	Ns	Ns	Ns
Depression				
HAD-D normal	30 (81.1)	71 (79.8)	24 (60)	24 (68.6)
HAD-D borderline	6 (16.2)	12 (13.5)	9 (22.5)	6 (17.1)
HAD-D disturbance	1 (2.7)	6 (6.7)	7 (17.5)	5 (14.3)
p value	Ns	Ns	0.023**	Ns
Global Score				
HAD-s under cut-off	24 (64.9)	56 (62.9)	17 (42.5)	18 (51.4)
HADs over cut-off	13 (35.1)	33 (37.1)	23 (57.5)	17 (48.6)
p value	Ns	Ns	0.03	Ns
	Relatives affected by cancer: maternal pedigree			
	0 (n=37 *n (%)*	*1-2 (n=89)* *n (%)*	*3-4 (n=40)* *n (%)*	*>4 (n=35)* *n (%)*
Anxiety				
HAD-A normal	13 (46.4)	49 (55.1)	25 (54.3)	16 (42.1)
HAD-A borderline	11 (39.3)	18 (20.2)	9 (19.6)	10 (26.3)
HAD-A disturbance	4 (14.3)	22 (24.7)	12 (26.1)	12 (31.6)
p value	Ns	Ns	Ns	0.04
Depression				
HAD-D normal	21 (75.0)	70 (78.7)	33 (71.7)	25 (65.8)
HAD-D borderline	5 (17.9)	12 (13.5)	6 (13.0)	10 (26.3)
HAD-D disturbance	2 (7.1)	7 (7.9)	7 (15.2)	3 (7.9)
p value	Ns	Ns	Ns	Ns
Global score				
HAD-s under cut-off	15 (13.0)	53 (59.6)	30 (65.2)	17 (44.79
HADs over cut-off	28 813.9)	36 (40.4)	16 (34.8)	21 (55.3)
p value	Ns	Ns	Ns	Ns

*Ns: not significant; **chi square p value calculated for patients with a specific number of relatives affected vs all the others

symptoms (HAD-A >11) were affected by breast cancer. In 12% of the cases participants had more than one personal cancer diagnosis, 8% had ovarian cancer and only 6% had other types of cancer (Table 3). HAD-D scores showed a significant association with more than one personal cancer vs all the others (p value 0.04). HADs global score showed a trend of association to ovarian cancer (p value 0.07).

As shown in Table 4, 62.9% of the patients who underwent OGC between the 7th and the 12th month after cancer diagnosis had high HADs. A significative association has emerged between HADs scorings and this specific time range vs. all the others (p value 0.008). Moreover, during this time range HAD-A scorings the results were normal only in the 28.6% of the cases, revealing a significant association (p value 0.004). Conversely, no association emerged between HAD-D scorings and the time elapsed from diagnosis to OGC (p value 0.97) (Table 4).

The possible association between HADs scores (HAD-A, HAD-D and HADS) has been investigated and the number of affected relatives both among collaterals (brothers and children), in the two parental arms (both paternal and maternal) separately and overall were evaluated. The total number of relatives with a cancer diagnosis have been normalized comparing it to the total number of relatives present in the family tree. More than a half (60%) of the patients who had 3-4 sick paternal relatives had normal HAD-D scorings, while 57.5% had high HADs scores (Table 5). The relationship between these indicators (HAD-D and HADs scores) and this range of paternal relatives affected by cancer vs all the others was significant (p value 0.02 and 0.03 respectively). Furthermore 57.9% of the participants with more than 4 maternal relatives affected by cancer had a HAD-A scoring over the borderline cut-off. The association between HAD-A scorings and this specific range of maternal relatives affected vs all the others showed statistical significance (p value 0.04).

Despite our expectations, HADs (HAD-A, HAD-D, HADs) scorings were not significantly associated to the presence of previous depression or anxiety story (p values 0.767; 0.919; 0.788 respectively).

This study also investigated whether HADs scorings (HAD-A, HAD-D and HADS) were related to the subjective cancer risk perception of the participants. No association emerged with HAD-A (p value 0.165), HAD-D (p value 0.219) or HADs scores (p value 0.142).

The association between HADS scores and psychological approach to OGC was investigated (Table 6). HAD-D scores were not significantly associated to different feelings in approaching OGC. Despite this, 55.6% of the subjects claiming to be afraid had HAD-A higher scorings than the cut-off. This association between HAD-A scorings a specific feeling vs all the others showed a trend of significance (p value 0.07).

Finally, 36.6% of the patients feeling obliged to their families had HADs scorings above the cut-off, while 77.8% of the participants feeling afraid of OGC had high HADs scorings. The association between HADs scorings and a specific psychological approach to OGC vs all the others was significant

Table 6. Association between HADs scores (HAD-A, HAD-D and HADS) and GC approach

	Anxiety (n=31) *n(%)*	*Fear (n=9)* *n(%)*	*Opportunity (n=44)* *n(%)*	*Duty (n=112)* *n(%)*	*Normality (n=5)* *n(%)*
Anxiety					
HAD-A normal	13 (41.9)	2 (22.2)	25 (56.8)	60 (53.6)	3 (60)
HAD-A borderline	6 (19.4)	2 (22.2)	10 (22.7)	29 (25.9)	1 (20)
HAD-A disturbance	12 (38.7)	5 (55.6)	9 (20.5)	23 (20.5)	1 (20)
p value	Ns*	0.07**	Ns	Ns	Ns
Depression					
HAD-D normal	21 (67.7)	4 (44.4)	32 (72.8)	88 (79.5)	4 (80)
HAD-D borderline	8 (25.8)	2 (22.2)	6 (13.6)	16 (14.3)	1 (20)
HAD-D disturbance	2 (6.5)	3 (33.3)	6 (13.6)	8 (7.1)	0 (0)
p value	Ns	Ns	Ns	Ns	Ns
Global score					
HADS under cut-off	13 (41.9)	2 (22.2)	26 (59.1)	71 (63.4)	3 (60)
HADS over cut-off	18 (58.1)	7 (77.8)	18 (40.9)	41 (36.6)	2 (40)
p value	0.06	0.02	Ns	0.04	Ns

*Ns: not significant, **chi square p value calculated for patients with a specific psychological approach to OGC vs all the others

(p values 0.04 and 0.02, respectively). In addition, 58.1% of the participants feeling anxious in relation to OGC had high HADs scorings. The association between HADs scorings and this specific feeling in approaching OGC vs all the others showed a trend of significance (p value 0.06).

Discussion

This study aimed to verify whether and how Hospital Anxiety and Depression Scale (HADs) scorings are associated to socio-demographic, psychological and clinical variables in a sample of Caucasian patients accessing Oncological Genetic Counseling.

This is the first Italian study approaching Oncological Genetic Counseling in a global way, in order to take into consideration all the potential clinical variables related to anxiety and depression symptoms. Both medical and psychological characteristics reported by the participants were considered to be possible predictive and/or moderating factors in the onset of psychological symptomatology, such as anxiety and depression.

Anxiety and depression have been identified as aspects of psychological impact linked to the risk and susceptibility for genetic tumors [16-18]. Despite this, and not consistent with prior researches [19-22], more than half (56.9% HADS scores) of our sample showed no anxious or depressive symptoms. Nevertheless, it was possible to highlight significant associations with psychological variables already investigated in the literature [12,23]. Regarding the socio-demographic information considered, only HAD-D scorings were significantly associated to older age. At this purpose it's important to say that our sample was collected in a continuous way, so that the groups analyzed were not homogeneous neither for sex (96% female, 4% man) nor for civil status (17.3% single, 70.3% married, 8.9% separated/divorced, 3.5% widowed).

Thus, as regards the clinical dimensions, both the type of cancer diagnosed, the time elapsed between diagnosis and OGC and the number of relatives affected in paternal and maternal pedigree were associated to HADs scorings. In particular, although the groups in our sample were not homogeneous as numerosity, patients with more than one personal cancer diagnosis seemed to have higher scores in the depression subscale, while patients with ovarian cancer were associated to higher global scores (HADs). An association emerged between HAD-A and HADs scorings and the range time of 7-12 months elapsed between diagnosis and OGC. Considering that after 6 months from cancer diagnosis most patients completed adjuvant therapies and began their psychological adaptation to the disease, we can hypothesize that this time span (7-12 months) is at high risk of developing anxious or depressive symptoms. Further studies are needed to better investigate this association.

Moreover, a significant association emerged between, on one hand the number of paternal relatives affected and HADs and HAD-D scorings, and on the other hand between HAD-A scoring and having more than 4 maternal relatives affected. It is conceivable that a wide number of relatives affected both in paternal or maternal pedigree can have an impact on anxiety and depression symptoms.

With regard to the psychological dimension, our research aimed to understand whether the subjective risk perception can be associated to anxiety and depression levels [19,22]. No association emerged between higher subjective cancer risk perception and higher HADs scoring, but it is to underline that the use of a single-item tool to investigate this dimension limits the validity of this result. Thus, analyzing the psychological approach to OGC, a significant trend of association was found, on one hand between the feeling of fear and the presence of an anxious symptomatology, and on the other hand between the feeling of anxiety and higher scores in the global scale HADs. HADs result to be associated significantly either to the feelings of fear and of being obliged to one's own relatives. No association emerged between HAD-A, HAD-D and HADs scorings and the presence of a previous psychological suffering.

Although these findings cannot be extended to the general population, this study showed the importance of taking into consideration during the OGC, not only medical variables but also cognitive and emotional aspects from both the individual and family sphere. In line with the scientific evidence, HADs represent an excellent tool to screen oncological population to detect *a priori* the patients needing psychological support. Future research should implement the analysis of clinical and psychological dimensions associated to OGC. Thus, to better examine whether and how psychological distress is associated to clinical and medical characteristics of patients undertaking a OGC, the adoption of new tools is to be valued in further studies.

Conflict of interests

The authors declare no conflict of interests.

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