Correlates of Fear of Cancer Progression during COVID-19 in Romania

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Abstract

Objectives. Fear of cancer progression (FoP) is one of patients' greatest concerns and one of the most reported unmet needs. Higher levels of FoP can negatively impact a patient's quality of life, impairing physical, emotional, social and functional well-being. The Romanian health-care system has difficulties in offering qualitative psychosocial assistance for cancer outpatients. Due to their specific implications, the COVID-19 pandemic restrictions might further affect FoP, therefore our objective was to investigate correlates of FoP in cancer outpatients during the COVID-19 pandemic in Romania.

Material and methods. The study investigated correlates of FoP in 330 Romanian cancer outpatients assessed during 2021. T-tests, Multivariate General Linear Models and Hierarchical Regression Models were conducted in order to assess the relationship between variables.

Outcomes. Results showed differences in the assessed variables depending on gender (women had scores significantly higher than men regarding FoP and illness intrusiveness) and marital status. Moreover, using a hierarchical regression model, we identified three statistically significant predictors of FoP: gender, illness intrusiveness regarding relationships and anxiety, together explaining 38.2% of the variance in global FoP scores. Anxiety was the most important predictor of FoP, explaining 21.3% of the variance in the FoP scores, 5 times more than gender and almost 2 times more than illness intrusiveness in interpersonal relationships.

Conclusions. Cancer is a complex experience, impacted by both socio-demographic variables such as gender and marital status, as well as psychological variables such as anxiety and fear of disease progression. Individualized psychosocial-care should be recognized as essential, and personalized interventions should be integrated into the patient's treatment plan.

Keywords: fear of cancer progression, Romania, COVID-19, anxiety, illness intrusiveness

INTRODUCTION

Fear of cancer progression

Fear of cancer progression (FoP) is defined as "fear, worry or concern relating to the possibility that cancer will come back or progress" (1,2). FoP is patients' greatest concern and one of the most reported unmet need (3). The incidence of FoP ranges between 22% and 99% (4). In literature, fear of progression/recurrence is associated with both socio-demographic variables and psychological variables. In several samples with patients with different types of cancer, fear or progression/recurrence levels are significantly higher among unmarried or widowed patients, among patients that do not have children (5,6) and are younger (7). Moreover, FoP is negatively associated with income and educational level (2,6,8), physical and mental health, and social support (6). Conversely, fear or progression/recurrence is

positively associated with pain, anxiety, depression and adverse social interactions (6).

In a study using a multicenter randomized trial approach, periodic follow-ups have been associated with lower levels of fear of cancer recurrence in women diagnosed with early-stage endometrial cancer (9). Other studies investigating breast cancer patients also showed that hospital-based follow-up is associated with reduced FoP (10,11). Therefore, the COVID-19 pandemic restrictions imposed and limited access to regular check-ups and medical services (11) can further negatively affect the patients' FoP experience.

The COVID-19 pandemic and FoP

Romanian official statistics show that hospitalization rates have dropped at an alarming rate during the COVID-19 pandemic (12). In 2020, Romania was among the top EU countries with the highest mortality rate with regard to most types of cancer (13), in our country 98 886 new cases of cancer were diagnosed and in 54 486 cases, cancer was the cause of death. The COVID-19 pandemic has significantly hindered cancer patients' access to treatment, therefore being a factor contributing to this negative statistics.

During COVID-19 pandemic, fear or progression/recurrence was negative correlated with communication satisfaction, perceived risk, impaired sleep quality and quality of life (14) and elevated levels of anxiety and depression (8,15,16,17). Also, studies identified gender differences, women being more likely to report a higher FoP (2) and fear and anxiety associated with cancer (18).

Moreover, in Romania, the psychosocial care of cancer patients is not a common practice, the national health system having difficulties in offering qualitative psychosocial care for cancer patients. Medical staff acknowledges the psycho-oncological distress felt by cancer patients, however psychosocial care activities are considered neutral or understated in the workplace and a vast majority do not use tools or standardized psychosocial assessment protocols.

FoP and quality of life

Quality of life is usually conceptualized as a multi-dimensional construct, including physical, social, functional, and emotional well-being (19). WHO defines quality of life as the "*individual's perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*" (20,21).

Because FoP is associated with many negative outcomes and correlates as explained earlier, FoP can affect patient's quality of life. Longitudinal studies (6,7,22) showed that greater FoP predicted lower physical,

emotional and functional well-being and was negatively correlated with health-related quality of life, anxiety, mood and poor emotional functioning. These results are also highlighted in cross-sectional studies. On a sample of ovarian cancer patients, FoP was negatively correlated with all four dimensions of quality of life: physical, social, emotional and functional well-being (20). Moreover, emotional well-being was negatively associated with worry about breast cancer recurrence in a multi-ethnic population (19). Further, when taking into account spiritual well-being and resilience, the former partially mediates the relationship between psychological resilience and FoP in breast cancer survivors (11), meaning that a higher spiritual well-being can help alleviate the patients' anxiety regarding cancer experience.

Illness Intrusiveness

Another construct that can affect patient's quality of life is illness intrusiveness. The concept of illness intrusiveness was first introduced in chronic life-threatening diseases domain in 1994 by Gerald Devins, who defined it as "*illness-induced disruptions to lifestyles, activities, and interests that can compromise psychosocial well-being and contribute to emotional distress in chronic disease*" (23).

The concept was recently introduced in the domain of psycho-oncology, studies assessing the extent to which a cancer diagnosis disrupts important life domains (24) and interferes with patient's abilities to engage in valued activities (25). Growing body of literature shows that illness intrusiveness negatively affects quality of life, being positively associated with reduced subjective well-being and emotional distress (23,25,26). Furthermore, subjective well-being is negatively affected by illness intrusiveness, cancer patients reporting ongoing challenges in work-related domain, social life, family and other relationships and sex life (25).

On a mixed cancer-type sample, illness intrusiveness negatively affected subjective well-being, regardless of the type of the cancer diagnosis. Moreover, the study identified gender differences, women reporting higher scores of illness intrusiveness on the Instrumental subscale (25). Also, in a longitudinal study, women who were married or engaged in a relationship were less likely to report low illness intrusiveness for the intimacy domain. Another important study indicated that participants who report elevated levels of illness intrusiveness in at least one domain were more likely to have anxiety disorders (24).

Research objectives

Given the negative impact that COVID-19 pandemic can have on patients' physical and mental health, there

is an urgent need to understand the complex relationship between FoP and illness intrusiveness, taking into account the extent to which their interaction differs from one level to another. Therefore, using a multilevel approach, the present study investigates correlates of FoP in cancer outpatients during COVID-19 in Romania.

MATERIAL AND METHODS

The present study included a Romanian nationwide sample of 330 cancer outpatients participants (236 female-75.4%, and 77 male-24.6%) from 34 counties and the city of Bucharest. Data collection was carried out through the pandemic COVID-19 context, during 2021 (May 2021 to September 2021), which imposed a number of difficulties, such as restricted access to institutions, vaccine-based access or lack of independent vaccine access or difficulty in contacting institutions to conclude collaborations. Given the pandemic situation, we needed to use several strategic approaches to reach possible participants, such as collaboration agreements with 6 state and private medical institutions and collaboration agreements with NGOs and oncology psychologists from major regions of the country. We also had a third approach, through the Internet, where posts were made in different groups from all regions of the country with active participants with oncological diagnosis.

Regarding the collaborations, they advanced in two ways: either the collaborating institution allowed the field team to access the clinic's outpatients to discuss directly with potential participants, or the collaborating institution delegated an internal person to take over these activities. The implementation of these strategic partnerships ensured the establishment of a sample at national level, which also included the proportions related to gender and ethnicity.

In the design and methodology of quantitative research we complied with all the requirements of medical and research ethics. At the institutional level, prior to the implementation of the research, we obtained the approval of the Ethics Councils of each of the institutions involved. In addition, all collaborators who participated in the evaluation of patients diagnosed with cancer signed a confidentiality consent, in which they undertook to maintain anonymity on the information obtained in relation to the institutions and persons involved in the project and to maintain ethical conduct regarding the participants to this research.

Thus, only patients who: were at least 18 years old at the time of the survey, expressed agreement to participate in the study, had adequate mental and physical health in order to be able to complete the questionnaire and were capable to answer to the questionnaire-based interview were included in the study. In the process of data collection, evaluation and processing, we adhered to all the measures necessary to maintain participants' identity confidential. Each participant completed the questionnaire based on a unique 6-digit and letter participant code, which allows anonymization of responses both at the time of collection and at the time of completing the database, regardless of questionnaire completion method (paper or application).

Participants who agreed to be part of the research received the necessary information from the research team and had the opportunity to choose how to complete the questionnaire (either accessing the provided application with the unique access code received, or where this was not possible, receiving by mail the questionnaire in pencil paper format together with the necessary to send it back).

INSTRUMENTS

FoP was measured with Fear of Cancer Progression Questionnaire (FOPQ) (27), which is a validated self-report instrument that measures the fear that an illness will progress. The questionnaire has 5 subscales: affective reactions, partnership/family, occupation, loss of autonomy and coping with anxiety and the participant can answer to each item using a scale from 1 (never) to 5 (very often).

Illness intrusiveness was measured with Illness intrusiveness Ratings Scale (IIRS) (28), which is a validated self-report instrument that measures the illness-induced interference within three life domains central to quality of life: Instrumental (health, work, financial situation, active recreation), Intimacy (relationship with partner and sex life) and Relationships and Personal Development (family and other social relations, self and religious expression, community/civic involvements and passive recreation). The participant is asked to think about how much the illness and/or treatment interferes with different aspects of his/her life and can answer to each item using a scale from 1 – not very much to 7 – very much.

Participants also completed measures of socio-demographic variables, such as gender, marital status, age, socioeconomic status.

Regarding statistical analyses used, descriptive and correlational analyses, t-tests, Multivariate General Linear and Hierarchical Regression Models were conducted in order to assess the relationships between variables as it follows.

OUTCOMES

Data were analyzed with IBM SPSS Statistics 20. Firstly, we present the descriptive characteristics of our data (see Table 1).

TABLE 1. *Descriptive statistics (means, standard deviations, score ranges) for the assessed variables*

		N	Min	Max	Mean	SD
1	FOPQ_TOTAL	251	46	190	106.65	26.30
2	FOPQ_affective_reactions	279	13	65	32.16	10.98
3	FOPQ_Partnership_Family	284	7	34	15.27	5.30
4	FOPQ_Occupation	287	7	35	14.78	6.88
5	FOPQ_Coping	287	9	43	30.10	6.09
6	FOPQ_Loss_Independence	303	7	35	15.29	6.14
7	Illness_Intrusiveness_Total	254	13	91	47.18	16.97
8	Illness_Intrusiveness_Relationships	271	1	7	3.26	2.22
9	Illness_Intrusiveness_Intimacy	266	6	42	19.09	9.66
10	Illness_Intrusiveness_Instrumental	272	2	14	6.18	4.13
11	Depression_Total	273	4	28	17.84	5.77
12	Anxiety_Total	296	0	27	8.95	6.30
13	FOPQ_TOTAL	302	0	21	6.89	5.88

TABLE 2. *Differences in the assessed variables depending on gender*

	Gender	N	Mean	SD	t	Sign.	Cohen's d
Fear of Progression Total	M	61	98.36	28.40	**-2.87**	**.004**	**0.40**
	F	190	109.32	25.09			
Fear of Progression Affective_ Reactions	M	65	28.55	10.94	**-3.06**	**.002**	**0.71**
	F	214	33.25	10.78			
FOPQ_partnership_family	M	68	14.52	5.27	-1.33	.183	
	F	216	15.51	5.30			
FOPQ_occupation	M	65	13.95	7.08	-1.11	.268	
	F	222	15.03	6.82			
FOPQ_coping	M	67	26.94	5.82	**-5.05**	**.000**	**0.70**
	F	220	31.06	5.85			
FOPQ_loss_independence	M	69	14.65	6.37	-.98	.327	
	F	234	15.47	6.07			
Illness Intrusiveness Ratings Scale total	M	66	43.77	16.73	-1.90	.058	
	F	188	48.37	16.94			
IIRS Relationships	M	67	16.94	9.32	**-2.11**	**.035**	**0.30**
	F	199	19.81	9.69			
IIRS Intimacy	M	69	6.18	3.73	.00	.998	
	F	203	6.18	4.27			
IIRS Intrumental	M	69	16.44	5.56	**-2.34**	**.020**	**0.32**
	F	204	18.32	5.78			
Depression total	M	71	7.94	5.51	-1.55	.122	
	F	225	9.27	6.51			
Anxiety total	M	70	5.58	5.32	**-2.14**	**.033**	**0.30**
	F	232	7.29	5.99			

Next, we continued our analysis by comparing the assessed variables depending on the two gender groups (male and female). Results are presented in Table 2.

As our results indicate, there are significant differences in the assessed variables in the following aspects: the total scores of FoP are significantly higher in the case of the female than male participants [$t_{(249)}$= -2.87, p=.004,], with a medium (0.40) size effect; affective reactions in female participants are significantly higher than in male participants [$t_{(277)}$= -3.06, p=.002], with a medium to large (0.71) size effect. Furthermore, re-

garding unhelpful, maladaptive coping mechanisms included in the FOPQ, female participants attain significantly higher scores than male participants [$t_{(285)}$= -5.05, p=.000], with a medium to large (0.70) size effect. Regarding illness intrusiveness, our results indicate two significant differences in two dimensions of this variable between male and female participants: on the relationship component, female cancer patients attain significantly higher levels than their male counterparts [$t_{(264)}$= -2.11, p=.035], with a small (0.30) size effect, and on the received instrumental support, female partici-

pants also report significantly higher levels than males [$t_{(271)}$= -2.34, p=.020] with a small (0.32) size effect. Finally, from the assessed emotional reactions, female participants also reported significantly higher levels of anxiety than male participants [$t_{(300)}$= -2.14, p=.033], with a small (0.30) effect size.

In order to investigate possible differences in the assessed variables depending on marital status, we performed a Multivariate general linear model, and applied post-hoc Hochberg GT2. Results are presented in Table 3.

Our results indicate that there are significant differences depending on the marital status of the assessed participants only on the sub-scores of FOPQ related to family relationships, with single participants attaining significantly higher scores than divorced and widowed participants [$F_{(3,198)}$=3.073, p=.029], with a medium size effect (partial η^2=.04). Regarding illness intrusiveness, all sub-scale scores presented significant differences in marital status. Thus, in the case of global scores, single participants presented significantly higher levels of illness intrusiveness than their married, divorced, and widowed counterparts [$F_{(3,198)}$= 6.460, p=.001] with a medium to large (.089) size effect. Specifically for each subscale, our results indicate that there are significant differences in IIRS relationships between single and divorced, and married and widowed participants [$F_{(3,198)}$= 2.851, p=.039] with a small to medium (.041) size effect. Regarding IIRS intimacy, single and married participants attained significantly higher levels than divorced and widowed participants [$F_{(3,198)}$= 12.681, p=.001] with a large (.161) size effect. What concerns the instrumental aspect of IIRS, widowed participants attained significantly lower levels compared to single, married and divorced participants [$F_{(3,198)}$= 3.553, p=.015] with a small to medium (.051) size effect. Of the two major emotional life markers, significant differences were produced only in levels of depression [$F_{(3,198)}$= 3.399, p=.019] with a small to medium (.049) effect size, widowed, married and divorced participants attaining significantly higher scores than single participants.

In order to establish the association pattern between the assessed psychological variables, we continued our investigation by conducting a zero order correlation. Results are presented in Table 4.

Our results indicate that there are significant association patterns between total scores of FoP and all the sub-components of illness intrusiveness, as well as depression and anxiety.

Finally, we conducted two hierarchical multiple regression (HMR) analyses in order to investigate the degree to which illness intrusiveness, depressive symptoms and anxiety symptoms are predicted by the assessed variables, controlling for the demographic variables (gender and marital status). In the first step of the HMR we introduced gender and marital status. In the second step we introduced all the subscales of illness intrusiveness, in the third model we introduced depressive symptoms, and finally, anxiety symptoms were introduced. After running the regression analyses, we selected those variables that significantly predicted global scores of FoP. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Results are presented in Tabel 5.

Model one with Gender as predictor of FoP proved to be statistically significant [$F_{(1,208)}$=8.40.51, *p<.01*], predicting 3.9% of the variance in FOCP. Next we introduced IIRS Relationships, which also proved statistically significant [$F_{(2,207)}$=20.98, *p<.001*], explaining an additional 13% of the variance in FOP scores. In the third, final step we anxiety as predictor of FOPQ global scores. This final model was also statistically significant [$F_{(3,206)}$=40.06, *p<.001*], explaining an additional 21.3% of the variance in global FOPQ scores. The three variables together (gender, IIRS_Relationships, and generalized anxiety) explain 38.2% of the variance in global FOPQ scores (Figure 1).

DISCUSSIONS

Our results indicate gender differences regarding FoP and illness intrusiveness, women experiencing significantly higher levels than men. Also, affective reactions in female participants were significantly higher than in male participants. Our results are in line with previous studies that highlighted gender differences, women reporting higher anxiety levels about the possible progression of cancer (2,25). Moreover, female participants had significantly higher scores than male participants regarding unhelpful, maladaptive coping mechanisms included in the FOPQ. Regarding illness intrusiveness, female cancer patients reported significantly higher levels than their male counterparts on the
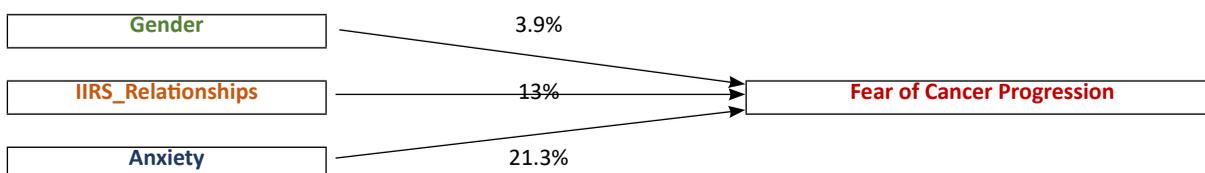

FIGURE 1. *Fear of Cancer Progression Predictors*

TABLE 3. *Differences in the assessed variables depending on gender marital status*

		N	Mean	Std. Deviation	F	Sig	Partial eta square
Fear of Progression Total	Single	24	109.66	21.86	2.063	.106	.030
	Married	176	108.12	27.90			
	Divorced	20	98.40	27.49			
	Widowed	29	102.79	16.30			
Fear of Progression_Affective_reactions	Single	24	31.87	7.46	1.471	.224	.022
	Married	195	32.35	11.41			
	Divorced	27	30.37	12.21			
	Widowed	30	33.50	9.11			
FOPQ_partnership_family	Single	26	16.30	4.97	**3.073**	**.029**	**.044**
	Married	199	15.70	5.44			
	Divorced	22	13.81	4.66			
	Widowed	34	13.17	4.58			
FOPQ_occupation	Single	24	15.37	6.74	2.444	.065	.036
	Married	197	15.22	7.17			
	Divorced	28	14.64	7.57			
	Widowed	35	12.40	4.08			
FOPQ_coping	Single	25	31.96	6.01	1.656	.178	.024
	Married	199	30.04	5.93			
	Divorced	26	28.61	6.56			
	Widowed	35	30.02	6.69			
FOPQ_loss_independence	Single	26	14.88	5.24	.140	.936	.002
	Married	206	15.14	6.26			
	Divorced	29	16.00	6.03			
	Widowed	38	15.63	6.13			
Illness Intrusiveness Ratings Scale total	Single	26	56.11	18.04	**6.460**	**.000**	**.089**
	Married	177	47.92	17.00			
	Divorced	21	43.04	10.72			
	Widowed	28	38.53	15.36			
IIRS Relationships	Single	27	22.11	10.49	**2.851**	**.039**	**.041**
	Married	181	19.10	9.63			
	Divorced	25	20.00	8.40			
	Widowed	30	16.70	9.54			
IIRS Intimacy	Single	26	8.88	4.83	**12.681**	**.000**	**.161**
	Married	190	6.5	4.02			
	Divorced	22	4.90	3.33			
	Widowed	30	2.56	1.50			
IIRS Intrumental	Single	26	20.03	6.14	**3.553**	**.015**	**.051**
	Married	184	17.96	5.70			
	Divorced	27	17.11	5.98			
	Widowed	32	15.59	5.29			
Depression total	Single	27	5.14	4.34	**3.399**	**.019**	**.049**
	Married	204	9.19	6.25			
	Divorced	27	8.40	6.00			
	Widowed	35	11.05	6.81			
Anxiety total	Single	28	4.60	3.31	1.367	.254	.020
	Married	208	7.11	5.91			
	Divorced	27	5.40	5.87			
	Widowed	36	8.52	6.35			

IIRS relationships scale. Moreover, female participants reported significantly higher levels than males on the IIRS instrumental support scale. This result was highlighted in another study (25), where women reported higher scores on the Instrumental subscale. In our study, female participants also reported significantly higher levels of anxiety than male participants on the IIRS emotional reactions scale. Similar results were ob-

TABLE 4. *Zero-order correlations for all study measures*

		1	2	3	4	5	6	7	8	9	10	11	12
1	FOPQ_TOTAL	1											
2	FOPQ_affective_reactions	.88**	1										
3	FOPQ_Partnership_Family	.82**	.63**	1									
4	FOPQ_Occupation	.81**	.61**	.63**	1								
5	FOPQ_Coping	.32**	.05	.21**	.12*	1							
6	FOPQ_Loss_Independence	.81**	.72**	.66**	.63**	.02	1						
7	Illness_Intrusiveness_Total	.37**	.34**	.36**	.31**	.13*	.29**	1					
8	Illness_Intrusiveness_Relationships	.36**	.35**	.31**	.29**	.06	.30**	.90**	1				
9	Illness_Intrusiveness_Intimacy	.17**	.16*	.27**	.21**	-.01	.11	.71**	.54**	1			
10	Illness_Intrusiveness_Instrumental	.28**	.19**	.23**	.24**	.18**	,20**	.75**	.47**	.36**	1		
11	Depression_Total	.44**	.60**	.36**	.28**	-.16**	.52**	.28**	.29**	.09	.18**	1	
12	Anxiety_Total	.53**	.68**	.41**	.35**	-.08	.51**	.25**	.27**	.07	.19**	.82**	1

*$p < 0.05$, **$p < 0.01$.

TABLE 5. *Hierarchical Regression Model of fear of cancer progression, with demographic variables (gender, marital status), illness intrusiveness, depression, and anxiety*

	R	R²	R² Change	B	SE	ß	t
Step 1	.197	.039	.034				
Gender				11.85	4.08	.197	2.899(**)
Step 2	.411	.169	.161				
Gender				8.63	3.85	.14	2.24(*)
IIRS_Relationships				1.03	.18	.364	5.684(***)
Step 3	.618	.382	.213				
Gender				6.95	3.33	.11	2.08(*)
IIRS_Relationships				.68	.16	.24	4.20(***)
Anxiety				2.30	.27	.48	8.428(***)

tained on a sample of Polish cancer patients, women reporting higher levels of fear and anxiety associated with cancer than their male counterparts (18). In another multi-ethnic sample (19), almost half of the women who reported an increased worry about recurrence also reported impaired emotional well-being, thus emphasizing that fear or cancer progression/recurrence negatively affects patients' subjective well-being and functionality.

We also identified marital status differences regarding FoP and illness intrusiveness. Thus, regarding FoP, single participants attained significantly higher scores than divorced and widowed participants on the subscores of FOPQ related to family relationships. Another study (3) also identified differences in psychosocial concerns based on marital status, partnered women having greater concern regarding sexuality and relationship than single women. Regarding illness intrusiveness, we identified four marital status differences, as it follows. Single participants presented significantly higher levels of illness intrusiveness than their married, divorced, and widowed counterparts on the IIRS global scores. Also, single and married participants attained significantly higher levels than divorced and widowed participants on the IIRS intimacy scale. Another study found

that married or partnered women were less likely to report low levels of illness intrusiveness (24). Furthermore, widowed participants attained significantly lower levels compared to single, married and divorced participants IIRS instrumental scale. Moreover, widowed, married and divorced participants reported higher levels of depression than single participants on the IIRS major emotional life markers scale.

Further, using Hierarchical Regression Models, we identified three statistically significant predictors of FoP: gender, IIRS relationships scale and anxiety. Each one of them explained a significant proportion of the variance in FoP, gender predicting 3.9%, IIRS relationship scale predicting 13%, meanwhile anxiety predicting 21.3% of the variance in global FOPQ scores. Thus, these three predictors explained 38.2% of the variance in global FOPQ scores, with anxiety being the most important predictor of them all. Another study also found difficulties with anxiety as a predictor for clinical levels of fear of cancer recurrence (7). Anxiety being the most important predictor of FoP in our sample can be a good sign, because we can intervene on the anxiety felt by the patient, and its level of intrusiveness in everyday life. Moreover, our result that illness intrusiveness in relationships is a significant predictor of FoP is in line with

another study (6) which highlighted that social support and detrimental interactions were predictors for fear of cancer recurrence.

Our study has several limitations. This study analyzed FoP and its correlates in a mixed cancer patient sample, but because of limited sample sizes for most cancer types, the results could not be analyzed according to the cancer-type categories, which could be useful and important in order to understand the extent to which FoP varies depending on the type of cancer diagnosis. Future studies should allot concentrated efforts to investigate this matter. Moreover, because of the methodological aspects, these results cannot be interpreted in terms of causal relationships. Nevertheless, our study has methodological strengths as well, having a mixed cancer patient sample, using a variety of validated measures and conducting Multivariate General Linear and Hierarchical Regression Models in order to assess the relationship between variables.

Summarizing, based on a multilevel approach, our study highlighted that the oncological experience is impacted by both socio-demographic variables such as gender and marital status, as well as psychological variables such as anxiety and fear of disease progression.

CONCLUSIONS

Regarding theoretical implications, we had a multilevel approach, analyzing the relationship between FoP and illness intrusiveness, taking into account the relationship between them and the extent to which their interaction differs from one level to another.

Our results confirm once again that cancer is a complex experience, which is impacted by both socio-demographic variables such as gender and marital status, as well as psychological variables such as anxiety and fear of disease progression.

The current study identified anxiety as the most important predictor of FoP, explaining 21.3% of the variance in the FOPQ score, 5 times more than gender and almost 2 times more than interpersonal relationships. However, anxiety and level of intrusiveness can be targeted in interventions.

Regarding practical implications, we identified the need for personalized interventions based on gender, marital status and patient needs, interventions that can support skills development necessary for optimal FoP management.

Conflict of interest statement

Authors certify that they do not have any financial or personal relationships that might bias the content of this work, therefore reporting no conflict of interest.

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