

# The level of cancer-related concerns and affecting factors in Turkish cancer survivors: A cross-sectional study

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## Abstract

**Aim:** To examine and compare the level of cancer-related concerns and affecting factors between cancer survivors who completed their treatment and those still receiving treatment.

**Design:** The study has a cross-sectional comparative design.

**Methods:** Convenience sampling was used and the study included 350 Turkish cancer survivors. Data were collected between March and June 2022 online with a descriptive characteristics form and the Assessment of Survivor Concerns. Obtained data were analysed with numbers, percentages, mean values, *t*-test and multiple linear regression analysis.

**Results:** The cancer survivors who completed their treatment had a significantly higher level of concerns than those who were still on treatment. Female cancer survivors, cancer survivors with less than 5-year time elapsing after diagnosis and gynaecological cancer survivors with completed cancer treatment can also have a higher level of cancer-related concerns.

**Conclusion:** Cancer survivors who have completed their treatment have a higher level of concerns than those who still receive treatment. Gender, time elapsing after diagnosis and type of cancer affect the level of concerns.

**Implications for the Profession and/or Patient Care:** Nurses should evaluate psychosocial care and needs of cancer survivors in addition to their physical care. Raising awareness about the concerns of the cancer survivors with completed treatment in addition to those still receiving treatment and providing holistic care to them can reduce their concerns.

**Impact:** It is of great importance to be aware of the factors likely to increase cancer-related concerns during and after cancer treatment. This study identifies cancer-related concerns in cancer survivors who completed or were still receiving treatment and provides a comparison with other studies in the literature.

**Reporting Method:** We have adhered to STROBE statement using STROBE checklist for cross-sectional studies.

**Patient or Public Contribution:** There was no patient or public involvement.

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## KEYWORDS

cancer, cancer survivor, cancer treatment, cancer-related concern, nurse–patient interaction, nursing

## 1 | INTRODUCTION

The number of people diagnosed with cancer is increasing. About 19.2 million people were diagnosed with cancer and 10 million people died of cancer worldwide in 2020 (Globocan, 2020). In Turkey, 180,288 people were diagnosed with cancer in 2021 (Republic of Turkey Ministry of Health, 2021). Despite the increasing number of people experiencing cancer, survival rates have risen (Roser & Ritchie, 2019). This means that a higher number of people must struggle against cancer for a longer time (Yeh et al., 2020). Patients experience both physical and psychological problems during their struggle against cancer (Pozzar et al., 2022; Tsai et al., 2017). One of the most frequent psychological problems experienced by cancer survivors is their cancer-related concerns (Bresner et al., 2015; Butow et al., 2018). There have been many studies in the literature dealing with general anxiety in cancer survivors (Faye-Schjøll & Schou-Bredal, 2019; Götze et al., 2020; Hinz et al., 2019; Inhestern et al., 2017; Yan et al., 2019; Zeynalova et al., 2019). However, there has been a limited number of studies evaluating cancer-related concerns (Bresner et al., 2015; Kypriotakis et al., 2016). They have not compared cancer survivors who completed their treatment and those who still receive treatment. Nevertheless, these two groups of cancer survivors may differ in terms of cancer-related concerns and anxiety levels (Butow et al., 2018; Herschbach & Dinkel, 2014; Lebel et al., 2016, 2017). It is known that while patients still receiving cancer treatment experience concerns about disease progression or metastases to other organs (Herschbach & Dinkel, 2014), those with completed cancer treatment have concerns about cancer recurrences (Koch et al., 2013; Sharpe et al., 2018). Therefore, the present study was directed towards examining how cancer-related concerns and affecting factors changed depending on whether cancer treatment continued.

### 1.1 | Background

Cancer survivors experience the feeling of guilt, anger, helplessness, the feeling of being punished, fear of death and concerns after they are diagnosed with cancer (Brandão et al., 2017; Bresner et al., 2015). Concerns about cancer recurrences or metastases usually start at the time of diagnosis and can persist for years even if cancer treatment is completed (Koch et al., 2013). Therefore, cancer-related concerns are worth considering in all stages of a cancer journey. Temporary or mild cancer-related concerns can keep cancer survivors alert to new or recurring cancers, which can encourage them to display positive health behaviour (Simard et al., 2013; Thewes et al., 2012). However, constant and excessive concerns can result in anxiety disorders and

cause difficulties in social life and role functioning in some cancer survivors (Koch et al., 2014; Lebel et al., 2017; Sharpe et al., 2018).

It has been shown in the literature that the level of general concerns varies between cancer survivors (Aminisani et al., 2017; Annunziata et al., 2020; Chambers et al., 2012; Johansson et al., 2011; Tsaras et al., 2018). Aminisani et al. (2017) revealed a high level of general anxiety in 31.8% of cancer survivors. Chambers showed that 3.4% of colon cancer survivors had a high level of general anxiety 5 years after their cancer diagnosis (Chambers et al., 2012). Johansson et al. (2011) demonstrated that 43% of prostate cancer survivors followed for longer than 10 years had a high level of general anxiety. Various factors like age, education, income, type of cancer, disease stage, symptom severity, time elapsing after diagnosis and ongoing treatment affect the level of anxiety in cancer survivors (Götze et al., 2020; Institute of Medicine and National Research Council, 2006; Tsaras et al., 2018). It has also been reported that cancer survivors experience concerns about abnormal results of medical tests and examinations, treatment failure, prolonged side effects and death (Chirico et al., 2022; Deimling et al., 2017; Papaleontiou et al., 2019; Vandraas et al., 2021).

The term cancer survivor, referring to a person who has overcome cancer or is struggling against cancer, is frequently used to emphasize cancer patients' strong efforts to cope with the disease (Wronski, 2015). However, there is no agreement on its definition. According to the National Cancer Institute, a person who has had cancer is considered a survivor from the time of diagnosis and throughout all his/her life (National Cancer Institute, 2018). According to another definition, a survivor is a person who has completed primary cancer treatment (Reuben, 2004). A survivor is also defined as an individual who has been diagnosed with cancer, completed his/her primary treatment and survived disease free for the last 5 years (Reuben, 2004). According to the American Cancer Society, being diagnosed with cancer is a personal experience and a person can consider himself/herself as a survivor after cancer diagnosis, completion of cancer treatment or a few years of survival (American Cancer Society, 2018). In the present study, cancer survivors refer to individuals diagnosed with cancer.

When different definitions of cancer survivors are considered, it is worth noting that few studies have focused on an evaluation of both individuals continuing to receive cancer treatment and those completing their treatment. These studies have dealt with inflammation, fatigue and heart failure in cancer survivors (de Raaf, de Klerk, et al., 2012; de Raaf, Sleijfer, et al., 2012; Finet, 2017). A limited number of studies have been directed towards determining both cancer survivors still receiving treatment and those completing treatment together and comparing the level of anxiety between them (Eichler et al., 2018; Liao et al., 2011). They have dealt with general anxiety of the survivors. It is important to take into account ongoing cancer treatment, completion of cancer treatment and factors affecting

concerns in studies on cancer-related concerns to determine person-specific healthcare.

## 2 | THE STUDY

### 2.1 | Aims

The aim of the present study was to examine and compare the level of cancer-related concerns and affecting factors between cancer survivors continuing to receive cancer treatment and those completing the treatment.

### 2.2 | Research questions

- Is there a difference in the levels of cancer-related concerns between survivors with completed cancer treatment and those still receiving cancer treatment?
- What factors affect the levels of cancer-related concerns in survivors with completed cancer treatment and those with ongoing cancer treatment?

## 3 | METHODS

### 3.1 | Design

This was a cross-sectional comparative study.

### 3.2 | Participants

The study was performed with cancer survivors following social networking sites of a cancer association. Convenience sampling was used. Inclusion criteria: People aged over 18 years, having at least primary education, completing or still receiving their cancer treatment and not diagnosed with a psychiatric disease. Exclusion criteria: The survivors not having access to a smartphone and the Internet and those diagnosed with a psychiatric disease.

### 3.3 | Sample size calculation

The sample size was based on a sample without a non-finite population (Charan & Biswas, 2013). Data from a prior study on the level of concerns in cancer patients were utilized (Annunziata et al., 2020) and the sample size was found to be 295 ( $t=1.96$ ,  $p=.26$ ,  $q=0.74$ ,  $d=0.05$ ). Taking account of dropouts, the sample size was increased and the study included 350 cancer survivors. The following formula was utilized to calculate the sample size:

$$n = \frac{t^2 \times (p \times q)}{d^2}$$

where  $n$  is the sample size,  $p$  is the frequency of incidence of the event under consideration (expected prevalence),  $q$  is the frequency of absence of the event under consideration (expected non-prevalence),  $t$  is the standard normal distribution (usually set at 1.96, which corresponds to the 95% confidence level),  $d$  is the relative desired precision

$$\frac{(1.96)^2 \times (0.26 \times 0.74)}{(0.05)^2} = 295$$

### 3.4 | Data collection

Data were collected online with a descriptive characteristics form and the Assessment of Survivor Concerns (ASC) from cancer survivors following social media sites of a cancer association in Turkey (Kanserle Dans Derneği) between March and June, 2022.

### 3.5 | Data collection tools

*Descriptive characteristics form:* A descriptive characteristics form was prepared by the researchers. The form is composed of 10 questions about age, gender, education, employment status, marital status, type of cancer diagnosed, time elapsing after diagnosis, treatments given and continuing/completed cancer treatment.

*The assessment of survivor concerns:* The ASC was developed by Gotay and Pagano in 2007 to determine cancer-related concerns (Gotay & Pagano, 2007). It is a five-item, 4-point Likert scale. It has two subscales, that is, cancer worry and general health worry. The lowest and highest scores on the scale are 5 and 20 respectively. The validity and reliability of the ASC for the Turkish population were tested by Serçekuş et al. (2020) and Cronbach's alpha for the scale was reported to be 0.86. In the present study, Cronbach's alpha for the ASC was found to be 0.85.

### 3.6 | Ethical considerations

Ethical approval for the study was obtained from the ethical board for non-interventional research of Pamukkale University (approval date: 22 February, 2022; approval number: E-60116787-020-175433). On the first page of the online data collection tools, the participants were informed that participation in the study had a voluntary basis and that personal information was not requested. Below this explanation was a box accompanied by the sentence 'I accept to participate in the study'. The participants checking this box could fill in the data collection tools.

### 3.7 | Data analysis

Data were analysed with the Statistical Package Program for Social Sciences 22.0. Sociodemographic features of the participants were evaluated by using numbers and percentages. Normality of the data was tested with skewness and kurtosis. Since skewness and kurtosis

varied between +1.5 and -1.5, the data were considered as evenly distributed (Tabachnick & Fidell, 2013). The difference in the level of concerns between the cancer survivors who completed their treatment and those who were still receiving their treatment was determined with t-test. A multiple linear regression analysis was made to examine the effects of independent variables on the level of concerns. Normally distributed data about the independent variables were included in the regression model. Independent variables with more than two categories were integrated into the analysis through dummy coding.

## 4 | RESULTS

### 4.1 | Characteristics of the sample

Sociodemographic characteristics of the cancer survivors are presented in Table 1. The mean age of the survivors was  $45.71 \pm 11.19$  years. Of all the survivors, 69.7% were female, 71.1% were high school or university graduates, 79.1% were married, 66% were unemployed and 61.4% had an income equal to or higher than their expenses.

Cancer-related features of the survivors are shown in Table 2. Of all the survivors, 50.6% had a diagnosis of breast cancer, 79.1% had their diagnosis of cancer shorter than 5 years before initiation of the study and 37.4% received chemotherapy. Out of the survivors receiving chemotherapy, 57.2% completed their treatment.

The comparison of cancer-related concerns between the survivors still receiving treatment and those completing their treatment is given in Table 3. The survivors had a mean score of  $13.19 \pm 4.35$  on

TABLE 1 Sociodemographic characteristics of the cancer survivors ( $n = 350$ ).

Sociodemographic characteristics	Number (%)
Age (mean $\pm$ standard deviation)	$45.71 \pm 11.19$
Gender	
Female	244 (69.7)
Male	106 (30.3)
Education	
Primary education	101 (28.9)
High school or university	249 (71.1)
Marital status	
Married	277 (79.1)
Single	73 (20.9)
Employment status	
Employed	119 (34.0)
Unemployed	231 (66.0)
Income	
Lower than expenses	135 (38.6)
Equal to or higher than expenses	215 (61.4)
Total	350 (100.0)

the ASC, a mean score of  $8.19 \pm 2.76$  on its subscale concerns about cancer and a mean score of  $5.12 \pm 1.89$  on its subscale concerns about general health. There was a significant difference in the mean scores on the ASC ( $t = 10.365$ ,  $p < .001$ ), cancer worry ( $t = 11.745$ ,  $p < .001$ ) and general health worry ( $t = 10.365$ ,  $p < .001$ ) subscales between the survivors still receiving treatment and those completing treatment. The latter group had a higher level of concerns about cancer and general health (Table 3).

A multiple linear regression analysis was performed to determine the factors affecting concerns of the cancer survivors and its results are shown in Table 4. The data were examined in terms of the multicollinearity problem. To this end, coefficients for correlations between the independent variables, variance inflation factor and tolerance values were examined. No multicollinearity problem was found between the independent variables and the dataset was considered appropriate for multiple linear regression analysis. Since the type of cancer had more than two categorical variables, dummy coding was performed and four groups (k-1 group) appeared.

Gender, time elapsing after diagnosis and type of cancer had an effect on the level of cancer-related concerns. Whether their cancer treatment was ongoing or completed, the female survivors had a higher level of cancer-related concerns than the male survivors ( $\beta = .272$ ,  $p = .001$  and  $\beta = .285$ ,  $p = .041$  respectively) and the survivors with shorter than 5-year time elapsing after diagnosis had a higher level of cancer-related concerns than those with longer than 5-year time after diagnosis ( $\beta = .201$ ,  $p = .003$  and  $\beta = .179$ ,  $p = .019$

TABLE 2 Cancer-related features of the cancer survivors ( $n = 350$ ).

Cancer-related features	Numbers (%)
Type of cancer	
Breast cancer	177 (50.6)
Other types of cancer <sup>a</sup>	69 (19.7)
Lung cancer	43 (12.3)
Colon cancer	36 (10.3)
Gynaecological cancers <sup>b</sup>	25 (7.1)
Time from cancer diagnosis	
Shorter than 5 years	277 (79.1)
Five years and longer	73 (20.9)
Treatment status	
Completed	200 (57.2)
Ongoing	150 (42.8)
Treatments used <sup>c</sup>	
Chemotherapy	333 (37.4)
Surgery	280 (31.5)
Radiotherapy	205 (23.0)
Hormone	72 (8.1)

<sup>a</sup>Prostate, stomach, pancreas, liver, skin, bladder, thyroid, oesophagus, lymphatic system, larynx.

<sup>b</sup>Endometrium, cervix, ovaries, vagina, vulva, tuba uterine.

<sup>c</sup>Multiple responses were given to this question.

**TABLE 3** The comparison of cancer-related concerns between cancer survivors with completed treatment and those with ongoing treatment.

	Cancer survivors with completed treatment (n=200)	Cancer survivors with ongoing treatment (n=150)	Statistics
Cancer worry	9.47 ± 2.33	6.50 ± 2.35	t = 11.745 p < .001
General health worry	5.72 ± 1.77	4.33 ± 1.74	t = 7.310 p < .001
Total score on the ASC	15.02 ± 3.96	10.76 ± 3.59	t = 10.365 p < .001

**TABLE 4** The multiple linear regression model for the factors of cancer-related concerns in the cancer survivors.

Variables	The assessment of survivor concerns							
	Cancer survivors with completed treatment				Cancer survivors with ongoing treatment			
	B	SE	β	p	B	SE	β	p
Constant	15.710	1.515		<.001	13.657	1.684		<.001
Age	-0.008	0.029	-0.022	0.775	-0.012	0.031	-0.037	.708
Gender								
Female			Ref	.001			Ref	.041
Male	-2.897	0.880	-0.272		-2.041	0.988	-0.285	
Education								
Primary education			Ref	.100			Ref	.082
High school and university	1.132	0.685	0.110		-1.288	0.734	-0.178	
Marital status								
Married			Ref	.898			Ref	.492
Single	-0.077	0.605	-0.009		-0.622	0.903	-0.058	
Employment status								
Employed			Ref	.663			Ref	.964
Unemployed	-0.245	0.562	-0.031		-0.033	0.738	-0.004	
Income								
Lower than expenses			Ref	.679			Ref	.731
Equal to or higher than expenses	-0.218	0.527	-0.027		0.238	0.690	0.030	
Time from diagnosis								
Shorter than 5 years			Ref	.003			Ref	.019
Five years or longer	-1.838	0.616	-0.201		-1.782	0.753	-0.179	
Type of cancer <sup>a</sup>								
Breast			Ref				Ref	
Colon	-0.797	1.373	-0.042	.563	-0.590	1.142	-0.063	.606
Lung	-1.825	1.469	-0.090	.216	-0.703	1.177	-0.083	.552
Gynaecological cancers	2.458	0.959	-0.169	.011	1.249	1.216	0.083	.306
Other types of cancer <sup>b</sup>	-0.549	0.775	-0.058	.480	-1.403	1.081	-0.141	.196

Note: Survivors with completed treatment:  $R=0.479$ ,  $R^2=0.229$ ,  $F=5.085$ ,  $p<.001$ . Survivors with ongoing treatment:  $R=0.477$ ,  $R^2=0.228$ ,  $F=3.698$ ,  $p<.001$ .

Abbreviations: β, beta; SE, standard error.

<sup>a</sup>Dummy coding was performed.

<sup>b</sup>Prostate, stomach, pancreas, liver, skin, bladder, thyroid, oesophagus, lymphatic system and larynx cancer.

respectively). Besides, the survivors with gynaecological cancers and the survivors completing their treatment had a higher level of concerns about cancer ( $\beta = .169$ ,  $p = .011$ ) (Table 4).

## 5 | DISCUSSION

Cancer-related concerns involve negative feelings starting at the time of diagnosis in cancer survivors (Butow et al., 2018). The present study revealed important results regarding the comparison of cancer-related concerns and the factors affecting concerns between the cancer survivors with completed treatment and those with ongoing treatment. The cancer survivors had a high score on the ASC. Bresner et al. (2015) also revealed a high level of concerns in cancer survivors by using the same scale. In a systematic review and a meta-analysis, 41.9% of the cancer survivors were found to have a high level of worry (Hashemi et al., 2020). Association of cancer with death, intense fear and uncertainty and accompanying many negative conditions can cause individuals diagnosed with cancer to experience concerns (Gemalmaz & Aşşar, 2015; Uslu-Sahan et al., 2019).

In the current study, the survivors completing their treatment had a significantly higher score on the ASC and its subscales concerns about cancer and general health than those still receiving treatment. Few studies have focused on a comparison between cancer survivors with completed cancer treatment and those with ongoing cancer treatment (Eichler et al., 2018; Liao et al., 2011). Eichler et al. (2018) reported that cancer survivors still receiving cancer treatment experienced less severe general anxiety than those completing their cancer treatment. However, Liao et al. (2011) showed no difference in the level of general anxiety between cancer survivors with completed treatment and those with ongoing treatment. Patients can have stronger coping strategies and higher motivation while they are struggling against cancer and difficulties caused by ongoing treatment. Therefore, they can have a lower level of concerns during cancer treatment. However, they can have a higher level of concerns after treatment due to the fear of recurrences and new cancer foci in other organs. Besides, cancer survivors whose active treatment stage is over can consider the time elapsing after treatment as a passive stage, which can increase their psychological burden (Raphael et al., 2019). For these reasons, cancer survivors completing their treatment may feel more anxious than those continuing to receive treatment.

In the present study, gender, time elapsing after cancer diagnosis and type of cancer were found to affect the level of cancer-related concerns. Both the female cancer survivors still receiving treatment and those completing treatment had a higher level of concerns than their male counterparts. Consistent with this finding, female cancer survivors with completed treatment (Götze et al., 2020; Yan et al., 2019) and those with ongoing treatment (Hinz et al., 2019) were shown to have higher levels of concerns in the literature. This is attributed to the fact that male survivors use active and problem-based coping strategies, but that female survivors think about the sources of stress more (McLean & Anderson, 2009).

Although several studies have shown no difference in the level of concerns in terms of the time elapsing after the diagnosis of cancer (Inhestern et al., 2017; Zeynalova et al., 2019), one study has demonstrated that anxiety decreases over time after the diagnosis of cancer (Faye-Schjøll & Schou-Bredal, 2019). In the present study, regardless of treatment status, all the cancer survivors with shorter than 5-year time elapsing after their diagnosis were found to have a low level of cancer-related concerns. Individuals feel shocked, sad, afraid and anxious when they are diagnosed with cancer (Matthews et al., 2019). They can have fewer negative feelings over time as they struggle to recover and adapt to treatment (Brandão et al., 2017). The reason for decreasing concerns over time can be explained by adaptation to the disease and its treatment.

In this study, the type of cancer was also shown to be a factor affecting the level of cancer-related concerns. The survivors diagnosed with gynaecological cancers and completing their treatment had a higher level of concerns than the survivors diagnosed with other types of cancer. Yan et al. (2019) noted that individuals with cancer of the uterus (42.9%), cervix (40%) and ovaries (32.4%) had a higher level of general anxiety than those with other types of cancer (Yan et al., 2019). Diagnosis of gynaecological cancers and their treatments have a negative effect on female gender roles, sexual life, reproduction and body image of women and make coping difficult (Tsai et al., 2017). Gynaecological cancer survivors completing their treatment might experience losses of their reproductive organs and reproductive abilities. They can also have problems with their sexual life and decreased self-confidence (Sekse et al., 2013). All these factors might have caused a higher level of cancer-related concerns in the gynaecological cancer survivors completing their treatment in the present study.

### 5.1 | Strengths and limitations of the study

One strength of this study is that cancer-related concerns and affecting factors were compared with respect to the treatment status of cancer survivors, that is, completed or ongoing cancer treatment. Another strength of the study is that it examined and compared cancer-related concerns of the survivors, not their general anxiety levels. However, the study has two limitations. One limitation of the study is that data were collected through self-report questionnaires. The other limitation is that data were gathered online.

## 6 | CONCLUSION AND IMPLICATIONS FOR PRACTICE

Cancer survivors who have completed their cancer treatment have a higher level of cancer-related concerns than those who continue to receive their treatment. Gender, time from the diagnosis of cancer and type of cancer play a role in the level of cancer-related concerns. Female cancer survivors, cancer survivors with less than 5-year time elapsing after diagnosis and gynaecological cancer survivors with completed cancer treatment can also have a higher level of cancer-related concerns.

Nurses should evaluate psychosocial care and needs of cancer survivors in addition to their physical care. As a consequence, cancer-related concerns of the survivors can be reduced through nursing interventions. Being aware of the concerns of cancer survivors with completed treatment in addition to those with ongoing cancer treatment and offering holistic care can be effective in reduction of their concerns. The survivors found to have a high level of cancer-related concerns could be encouraged to join social support groups and receive professional support when necessary. This is the first study to examine and compare cancer-related concerns between Turkish cancer survivors with completed treatment and those with ongoing treatment. Its results can be generalized to all Turkish cancer survivors. Further similar studies should be conducted in different cultures.

#### AUTHOR CONTRIBUTIONS

**Okan Vardar:** Conceptualization, Formal analysis, Investigation, Methodology, Resources, Project administration, Writing—review and editing. **Pinar Serçekuş:** Conceptualization, Formal analysis, Investigation, Methodology, Resources, Project administration, Writing—original draft, Writing—review and editing, Supervision. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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#### CONFLICT OF INTEREST STATEMENT

The authors have no relevant financial or non-financial interests to disclose.

#### PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.16132>.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

#### ETHICS STATEMENT

This study was performed in line with the principles of the Declaration of Helsinki. Ethical approval for the study was obtained from the ethical board for non-interventional research of Pamukkale

University (approval date: 22 February, 2022; approval number: E-60116787-020-175433).

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