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ORGINAL ARTICLE / ORJİNAL MAKALE

Examination of the stress level perceived by gynecological oncology patient's and their caregivers, the social support perceived by the patients and the caregiving stress level of the caregivers: A cross-sectional study

Jinekolojik onkoloji hastası ve yakınlarının algıladıkları stres düzeyinin, hastaların algıladıkları sosyal desteğin ve hasta yakınlarının bakım verme stres düzeylerinin incelenmesi

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ABSTRACT

Objective: Gynecologic oncology patients and their caregivers often experience high levels of stress during the treatment process. This cross-sectional study aimed to measure the perceived stress levels of patients and caregivers and identify factors related to perceived social support.

Materials and Methods: A survey was conducted with 100 gynecologic oncology patients and 62 caregivers at Baskent University Ankara Hospital. The survey included the Turkish translated versions of the Perceived Stress Scale (PSS), the Multidimensional Scale of Perceived Social Support (MSPSS), and the Caregiver Strain Index (CSI), along with a sociodemographic form.

Results: The majority of patients had their spouses or daughters as their caregivers (63%). The study found a strong correlation between stress levels and the perceived social support scores of caregivers (r=0.747; p<0.001), indicating that caregivers experience higher levels of stress. Female caregivers reported higher stress and caregiver strain than male caregivers (p=0.021, p=0.009, respectively). Married patients reported less stress and discomfort than unmarried patients (p=0.005). The family sub-scale scores of the MPSSS were higher in married women (p=0.027) indicating greater perceived support from family. The total PSS scores were found to differ by the number of children (p=0.043) with the greatest difference between patients who had no children and those who had three (p=0.032).

Conclusion: The results of the study emphasize the need for a multidisciplinary approach in the care of gynecologic oncology patients. It is crucial for future research to concentrate on devising effective interventions that can reduce stress and improve the quality of life of both patients and their caregivers.

Keywords: Caregiver, Gynecological Neoplasm, Patient Care, Psychosocial Support System, Women Health Services

ÖZ

Amaç: Jinekolojik onkoloji hastaları ve bakım verenleri tedavi sürecinde sıklıkla yüksek düzeyde stres yaşarlar. Tarafların stres düzeylerinin, hastaların destek algılarının belirlenmesi amaçlanmıştır.

Gereç ve Yöntem: Başkent Üniversitesi Ankara Hastanesi'nde 100 jinekolojik onkoloji hastası ve onlara bakım veren 62 yakını görüşüldü. Görüşmede verilerini toplamada Algılanan Stres Ölçeği (ASÖ), Çok Boyutlu Algılanan Sosyal Destek Ölçeği (ÇBASDÖ) ve Bakım Verenin Stres İndeksi (BVSİ) ve sosyodemografik form kullanıldı.

Bulgular: Bakım verenlerin çoğunluğu hastanın eşi veya kızıydı (%63). Bakım verenlerin stres düzeyleri ile algılanan sosyal destek puanları arasında güçlü bir ilişki bulundu (r=0,747; p<0,001). Bu durum bakım verenlerin daha yüksek düzeyde stres yaşadıklarını göstermektedir. Kadın bakım verenler, erkek bakım verenlere göre daha fazla stres ve zorlanma bildirdiler (sırasıyla p=0,021, p=0,009). Evli hastalar, evli olmayan hastalara göre daha az stres ve rahatsızlık bildirdi (p=0,005).

ÇBASDÖ'nin aile alt boyutu puanları evli kadınlarda daha yüksekti (p=0,027), bu da aileden algılanan desteğin daha fazla olduğunu gösteriyordu. Toplam ASÖ puanlarının çocuk sayısına göre farklılık gösterdiği (p=0,043), en fazla farkın çocuğu olmayan ve üç çocuğu olan hastalar arasında olduğu (p=0,032) belirlendi.

Sonuç: Çalışmanın sonuçları jinekolojik onkoloji hastalarının bakımında multidisipliner bir yaklaşımın gerekliliğini vurgulamaktadır. Gelecekteki hasta hizmetleri için, hem hastaların hem de bakım verenlerin stresini azaltabilecek ve yaşam kalitesini iyileştirebilecek etkili önlemlere ihtiyaç vardır.

Anahtar Kelimeler: Bakıcı, Hasta Bakımı, Jinekolojik Neoplazm, Kadın Sağlığı Hizmetleri, Psikososyal Destek Sistemi

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INTRODUCTION

It is well known that cancer has psycohologic trauma effects on patients and their caregivers. It is possible that the stress level of both parties affects how patients perceive the support they receive. Therefore, it is necessary to measure and know the stress levels of both parties (1).

Patients are often in need of a caregiver and this role is usually taken on by a relative. However, caregivers frequently require assistance themselves and while researchers are actively trying to address this issue, there is still no standard recommendation (2,3).

The perspectives of gynecologic oncology patients and their caregivers may differ on care, and their perceptions have to be investigated in order for optimal care with improved outcomes to be achieved with all parties involved.

MATERIAL AND METHODS

A cross-sectional survey was conducted at Başkent University Ankara Hospital between July 5, 2022, and October 5, 2022, involving 100 gynecologic oncology patients and their respective caregivers (n=62). The study utilized surveys as the primary data collection method. Participants in the study were randomly selected during their outpatient clinic visits and approached in-person. Gynecologic oncology patients and their accompanying caregivers were eligible to participate, and consent was obtained from those who agreed to take part in the interviews.

The study was approved by the Baskent University Institutional Review Board and Ethics Committee (Project no: KA22/291, July 5, 2022). The survey used Turkish-translated versions (1,4,5) of the Perceived Stress Scale (PSS) (6), Multidimensional Scale of Perceived Social Support (MSPSS) (7), and Caregiver Strain Index (CSI) (8) along with a sociodemographic form. Patients and caregivers were interviewed to complete the PSS scale, while the MSPSS was administered exclusively to patients and the CSI to caregivers. The authors conducted a pilot study with ten patients and their caregivers undergoing treatment in the gynecologic oncology inpatient ward to assess the questionnaire's understandability and answerability. Based on the results, the questionnaire forms were deemed appropriate, leading to the development of the main study.

The minimum sample size was determined as 44 patients and 44 caregivers of patients at 90% power and 95% confidence levels using G-Power 3.1 with α=0.05 and d=0.50. The Shapiro-Wilk test was used to assess the normality of numerical variables. Since scale scores were non-normally distributed, descriptive statistics were reported as median values.

The Mann-Whitney U test and the Kruskal-Wallis test were used to analyze group differences in scale scores. A Dunn-Bonferroni post hoc test was performed for the groups found significant as a result of the Kruskal-Wallis test. Significant groups were assessed using the Dunn-Bonferroni post hoc test. Spearman's correlation coefficient was used to examine scale-score relationships. In all hypothesis tests, the type I error probability was set at α=0.05, and the SPSS v25.0 package program was used for statistical evaluations.

Perceived Stress Scale (PSS): The 5-point Likert scale measures stress levels, with higher scores reflecting higher stress levels. It was developed by Cohen et al. (6) and the Turkish translation and its validity and reliability studies were conducted by Eskin M. et al., (known as: 'Algılanan Stres Ölçeği'). The factor structures are detailed as: Factor 1(Items 4, 5, 6, 8, 9, 10. and 13): Perception of inadequate self-efficacy; and Factor 2 (Items 1, 2, 3, 7, 11, 12, and 14): Perception of stress-discomfort. 1

Multidimensional Scale of Perceived Social Support (MSPSS): The scale is a 7-point Likert developed by Zimet et al. (7) and the Turkish translation and its validity and reliability studies were conducted by Eker D. et al. (known as: 'Çok Boyutlu Algılanan Sosyal Destek Ölçeği') (5). It has 3 sub-scales of 4 items, each reflecting from

whom the social support comes (family, friends and significant other). Higher scores implies high perceived social support.

Caregiver Strain Index (CSI): It was developed by Robinson, B. (8) and the Turkish translation and its validity and reliability studies were conducted by Uğur Ö. (known as: 'Bakım Verenin Stres Ölçeği') (4). The 13-item scale assesses caregivers' work, financial, physical, social, and time situations, with seven or more positive responses indicating higher stress levels.

RESULTS

The mean age of the patients was 55.69 years (±12.26) and the median age was 69 (17-86).

The mean age of the caregivers was 46.13 (±14.53) and the median was 47 (17-76).

The scale and sub-scale scores did not significantly differ by the patients' age group, occupation, income, simultaneous survey administration to the caregiver, or the presence of a healthcare worker in the family (p>0.05). The distribution of scale scores based on the sociodemographic characteristics of the patient and scores according to disease-related variables are detailed in Table 1 and Table 2 respectively (see Table 1, Table 2).

Table 1. Distribution of Scale Scores Based on the Sociodemographic Characteristics of the Patient

Sociodemographic information	PSS Total	PSS Factor 1	PSS Factor 2	MSPSS Total	MSPSS Family	MSPSS Significant other	MSPSS Friend
Age group							
<35	23 (0-31)	6 (0-14)	12.5 (0-24)	83.5 (78-84)	28 (22-28)	28 (24-28)	28 (26-28)
36-55	22 (2-52)	4 (0-24)	14 (2-28)	82 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
>55	14 (4-43)	2 (0-21)	12 (4-23)	83 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.062	0.220	0.114	0.702	0.677	0.392	0.510
City of residence							
Ankara	14 (2-52)	2 (0-24)	10 (2-28)	84 (54-84)	28 (26-28)	28 (17-28)	28 (4-28)
Outside of Ankara (Turkey)	19 (0-43)	4 (0-24)	14 (0-25)	81 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Abroad[a]	4 (4-4)	0 (0-0)	4 (4-4)	82 (82-82)	26 (26-26)	28 (28-28)	28 (28-28)
p	**0.048**	0.140	0.113	0.054	**0.017**	0.162	0.093
Civil status							
Married	15 (0-52)	2 (0-24)	12 (0-28)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Single	27.5 (3-43)	6 (0-21)	20 (3-24)	79.5 (48-84)	26.5 (22-28)	28 (17-28)	28 (4-28)
p	**0.008**	0.062	**0.005**	0.538	**0.027**	0.690	0.831
Number of children							
None	22 (3-43)	4 (0-21)	17 (3-25)	80 (48-84)	28 (14-28)	28 (16-28)	28 (4-28)
1 child	22 (8-52)	3 (0-24)	14 (5-28)	84 (24-84)	28 (11-28)	28 (9-28)	28 (4-28)
2 children	18 (0-32)	3 (0-13)	12 (0-24)	83 (43-84)	28 (15-28)	28 (15-28)	28 (6-28)
3 children	12.5 (4-18)	0 (0-5)	11 (4-17)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
More than 3 children	15 (4-40)	7 (0-24)	12 (4-24)	78 (18-84)	28 (8-28)	26 (6-28)	28 (4-28)
p	**0.043**	**0.026**	0.248	0.629	0.270	0.638	0.784
Education level							
Illiterate	17 (10-43)	4 (0-21)	14 (7-24)	75 (18-84)	28 (8-28)	24 (6-28)	25 (4-28)
Primary school graduate	14 (4-40)	2 (0-24)	12 (4-24)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Secondary school graduate	11.5 (4-27)	1.5 (0-10)	9.5 (4-24)	80 (24-84)	27.5 (11-28)	26 (9-28)	27 (4-28)

High school graduate	18 (0-52)	3 (0-24)	14 (0-28)	84 (54-84)	28 (14-28)	28 (22-28)	28 (4-28)
2-year university graduate	16 (9-28)	2 (0-6)	14 (7-24)	84 (70-84)	28 (24-28)	28 (22-28)	28 (24-28)
4-year university graduate	18 (3-32)	2.5 (0-14)	13 (3-24)	82.5 (48-84)	28 (15-28)	28 (17-28)	28 (4-28)
Master's/PhD graduate	22 (22-22)	4 (4-4)	18 (18-18)	84 (84-84)	28 (28-28)	28 (28-28)	28 (28-28)
p	0.846	0.778	0.838	0.207	0.276	0.164	**0.041**
Occupation							
Civil servant	18.5 (11-31)	4.5 (2-12)	14.5 (8-19)	82 (65-84)	28 (15-28)	27 (22-28)	28 (21-28)
Housewife	15 (0-52)	2 (0-24)	12 (0-28)	83 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Other	18.5 (3-40)	4 (0-16)	12.5 (3-24)	83.5 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
p	0.702	0.438	0.966	0.908	0.667	0.713	0.409
Income status							
Income less than expenses	20.5 (0-52)	4 (0-24)	14 (0-28)	82.5 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Income equals expenses	14 (2-40)	2 (0-24)	12 (2-25)	84 (43-84)	28 (14-28)	28 (15-28)	28 (4-28)
Income exceeds expenses	14.5 (4-22)	1.5 (0-10)	10 (4-19)	82 (80-84)	28 (26-28)	28 (24-28)	28 (28-28)
p	0.064	0.164	0.107	0.888	0.464	0.821	0.208
The patient is a healthcare worker							
Yes	9 (0-20)	0 (0-14)	5 (0-14)	83.5 (82-84)	28 (27-28)	28 (26-28)	28 (28-28)
No.	17.5 (2-52)	3 (0-24)	13 (2-28)	82.5 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.094	0.300	**0.022**	0.418	0.767	0.408	0.246
Presence of a healthcare worker in the family							
There is	14 (3-29)	2 (0-13)	12 (3-24)	84 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
No	20 (0-52)	3 (0-24)	14 (0-28)	82 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.126	0.257	0.150	0.164	0.661	0.349	0.114

a: only 1 person was included in this group and therefore was not evaluated.

Table 2. Distribution of Scale Scores According to Disease-Related Variables

	PSS Total	PSS Factor 1	PSS Factor 2	MSPSS Total	MSPSS Family	MSPSS Significant other	MSPSS Friend
Diagnosis time							
In the last 6 months	17 (0-43)	3 (0-24)	12.5 (0-23)	83.5 (54-84)	28 (24-28)	28 (22-28)	28 (4-28)
More than 6 months ago	17 (2-52)	3 (0-24)	12.5 (2-28)	82.5 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.707	0.636	0.334	0.201	0.965	0.055	0.090
Cancer type							
Cervical	19 (3-38)	4 (0-14)	16 (3-25)	80 (56-84)	28 (14-28)	28 (17-28)	28 (12-28)
Ovarian	14 (2-40)	2 (0-24)	12 (2-24)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Endometrial	18 (0-52)	3 (0-24)	12 (0-28)	84 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
Vulvar	4 (4-4)	0 (0-0)	4 (4-4)	48 (48-48)	28 (28-28)	16 (16-16)	4 (4-4)
p	0.622	0.442	0.462	0.746	0.902	0.648	0.397
Metastasis status							
Yes	22.5 (2-40)	5.5 (0-24)	15 (2-24)	79 (24-84)	28 (8-28)	25.5 (8-28)	28 (4-28)
No	15 (0-52)	2 (0-24)	12 (0-28)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	**0.023**	0.130	0.057	0.177	0.637	0.144	0.189

Presence of other cancer diagnosis							
No	17 (0-52)	3 (0-24)	12 (0-28)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Breast	29 (13-37)	4 (0-23)	14 (13-25)	70 (51-84)	28 (14-28)	28 (19-28)	28 (4-28)
Thyroid	7.5 (5-10)	1 (1-1)	6.5 (4-9)	77.5 (71-84)	28 (28-28)	26 (24-28)	23.5 (19-28)
Other	17.5 (14-22)	2 (0-7)	16.5 (8-19)	79.5 (75-84)	27 (24-28)	26.5 (25-28)	28 (22-28)
p	0.216	0.807	0.239	0.836	0.623	0.998	0.928
Presence of other chronic illnesses							
Yes	14.5 (3-37)	2 (0-15)	12 (3-24)	82 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
No.	21 (0-52)	5 (0-24)	13 (0-28)	84 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
p	0.023	0.014	0.243	0.679	0.722	0.975	0.761
Family history of cancer							
Yes	17 (2-52)	2 (0-24)	14 (2-28)	84 (38-84)	28 (14-28)	28 (11-28)	28 (4-28)
No	18 (0-43)	4 (0-24)	12 (0-25)	80 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.888	0.392	0.689	0.258	0.507	0.117	0.134
Treatment							
Surgery							
No	20.5 (9-38)	3 (0-14)	18 (8-25)	82 (56-84)	28 (14-28)	28 (17-28)	28 (12-28)
Yes	16.5 (0-52)	3 (0-24)	12 (0-28)	83 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
p	0.274	0.888	0.085	0.971	0.384	0.507	0.586
Chemotherapy							
No	18 (0-43)	3 (0-21)	13.5 (0-25)	82.5 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Yes	16 (2-52)	3 (0-24)	12 (2-28)	83.5 (18-84)	28 (8-28)	28 (6-28)	28 (4-28)
p	0.896	0.969	0.746	0.686	**0.009**	0.937	0.632
Radiotherapy							
No	15 (0-52)	2 (0-24)	13 (0-28)	84 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Yes	20 (4-38)	5 (0-23)	12 (4-24)	68 (38-84)	28 (14-28)	24 (11-28)	16 (4-28)
p	0.244	0.094	0.761	**0.033**	0.457	**0.008**	**0.005**
Monoclonal Antibody Therapy							
No	16.5 (0-52)	3 (0-24)	12 (0-28)	82.5 (17-84)	28 (7-28)	28 (6-28)	28 (4-28)
Yes	19 (2-38)	3.5 (0-14)	13.5 (2-24)	84 (48-84)	28 (26-28)	28 (16-28)	28 (4-28)
p	0.917	0.686	0.581	0.653	0.158	0.768	0.706

The presence of metastasis in the patient was positively correlated with the total scores on the PSS (p=0.023). In patients with metastasis, perceived stress was increased. The total perceived stress scores differed according to the city of residence (p=0.048).

The total PSS scores were lower for those living in Ankara. Similarly, the scores of the family sub-scale of the MSPSS differed according to the city of residence and were higher in those living in Ankara (p=0.017).

The total PSS scores were found to differ by marital status and were higher in singles (p=0.008). PSS factor 2 scores also differed according to marital status, with married patients reporting less stress and discomfort (p=0.005). The family sub-scale scores of the MSPSS were higher in married women (p=0.027) indicating greater perceived support from family. The total PSS scores were found to differ by the number of children (p=0.043) with the greatest difference between patients who had no children and those who had three (p=0.032). Similarly, PSS factor 1 scores differed significantly based on the number of children (p=0.026).

PSS factor 2 scores differed according to whether the patient was a healthcare worker (p=0.022) and patients who were healthcare workers reported less stress and discomfort.

According to the gender of the patients' caregivers, a relationship was found between

the PSS factor 2 scores and CSI total scores (p=0.021, p=0.009, respectively). These scores were found to be higher in women. The distribution of scale scores according to sociodemographic characteristics of the caregivers are given in Table 3 (see Table 3). PSS factor 2 scores and CSI scores of the caregivers significantly differed by gender, with female caregivers reporting higher stress and caregiver strain. (p=0.021, p=0.009, respectively). There was a significant correlation between the caregivers' occupational status as healthcare workers and total PSS scores, with them reporting higher levels of stress (p=0.044).

Table 3. Distribution of Scale Scores According to Sociodemographic Characteristics of the Caregivers

			ASO total	ASO factor1	ASO factor2	Caregiver stress_total
Age group	<35		19 (2-35)	6 (0-15)	11.5 (0-20)	20 (16-26)
	35-55		25 (3-39)	11.5 (0-18)	13 (2-24)	18.5 (13-25)
	>55		18.5 (5-33)	9 (1-19)	9.5 (2-21)	20 (14-24)
		p	0.131	0.169	0.309	0.079
Gender	Male		19.5 (3-33)	10 (0-19)	10 (2-17)	21 (15-25)
	Woman		22.5 (2-39)	9.5 (0-18)	14 (0-24)	18.5 (13-26)
		p	0.325	0.652	**0.021**	**0.009**
Relationship to the patient	Spouse, child, mother, father, sibling		21 (2-39)	9.5 (0-19)	13 (0-24)	19 (13-26)
	Uncle, aunt, niece, nephew grandfather, grandmother		12 (10-26)	0 (0-14)	12 (10-12)	20 (19-24)
	Cousins		23 (23-23)	13 (13-13)	10 (10-10)	25 (25-25)
	Non-blood related		24.5 (15-30)	14 (6-15)	10 (9-16)	21.5 (19-24)
		p	0.706	0.293	0.925	0.172
City of residence	Ankara		23.5 (4-36)	10 (0-17)	14.5 (4-24)	18.5 (13-25)
	Outside of Ankara (Turkey)		20.5 (2-39)	9.5 (0-19)	11.5 (0-24)	20 (13-26)
		p	0.227	0.572	0.183	0.190
Civil status	Married		22 (3-36)	10 (0-19)	11.5 (2-24)	20 (13-25)
	Single		20 (2-39)	7 (2-15)	15 (0-24)	19 (16-26)
		p	0.901	0.781	0.300	0.870
Number of children	None		24 (2-39)	10 (2-16)	16 (0-24)	18 (13-26)
	1 child		18 (4-36)	5.5 (0-14)	11.5 (4-24)	19 (13-24)
	2 children		22 (3-34)	12 (1-19)	10 (2-20)	21 (15-24)
	3 children		22 (3-33)	10 (0-17)	13.5 (2-16)	19 (16-25)
	More than 3 children		16.5 (15-18)	7.5 (6-9)	9 (9-9)	21 (20-22)
		p	0.620	0.206	0.380	0.518
Education level	Illiterate		14 (14-14)	4 (4-4)	10 (10-10)	19 (19-19)
	Primary school graduate		21 (15-33)	11.5 (0-17)	13 (6-16)	20 (16-25)
	Secondary school graduate		21.5 (2-29)	8 (2-16)	12.5 (0-19)	17.5 (13-24)
	High school graduate		23 (10-33)	12 (0-19)	12.5 (6-19)	19 (16-23)
	2-year university graduate		20.5 (18-23)	5.5 (2-9)	15 (9-21)	20.5 (17-24)
	4-year university graduate		17 (3-39)	7 (0-15)	10 (2-24)	21 (13-26)
	Master's/PhD graduate		29 (22-32)	15 (11-17)	13 (11-17)	18.5 (15-21)
		p	0.438	0.142	0.945	0.754
Occupation	Civil servant		21 (4-39)	10.5 (0-15)	13 (4-24)	18 (13-26)
	Freelance		18.5 (5-28)	7.5 (1-15)	13.5 (4-17)	18.5 (16-23)
	Housewife		23 (2-33)	10 (0-16)	13 (0-19)	19 (13-25)
	Other		23 (3-35)	11 (0-19)	11 (2-21)	20 (15-25)
		p	0.719	0.568	0.894	0.268

Income status	Income less than expenses		23 (17-33)	12 (5-19)	12 (6-16)	19 (14-25)
	Income equals expenses		21 (2-39)	9 (0-17)	14 (0-24)	19 (13-24)
	Income exceeds expenses		15.5 (3-30)	8.5 (1-17)	8 (2-17)	22.5 (16-26)
		p	0.280	0.168	0.147	0.071
The caregiver is a healthcare worker	Yes		28.5 (26-32)	12.5 (10-17)	16.5 (13-17)	19.5 (16-21)
	No		21 (2-39)	9 (0-19)	11.5 (0-24)	20 (13-26)
		p	0.044	0.129	0.073	0.709
Presence of a healthcare worker in the family	Yes		25.5 (3-39)	12 (0-19)	12.5 (2-24)	21 (13-25)
	No		21 (2-36)	8 (0-18)	12.5 (0-24)	19 (13-26)
		p	0.213	0.129	0.808	0.068
Presence of chronic diseases in the caregiver	Yes		22 (4-39)	9 (0-19)	11 (2-24)	18 (13-25)
	No		21 (2-36)	10 (0-17)	13 (0-24)	20 (13-26)
		p	0.921	0.772	0.827	0.053
Previous experience in cancer patient care	Yes		22 (5-33)	9 (0-18)	14 (4-21)	20 (13-24)
	No		21.5 (2-39)	10.5 (0-19)	11 (0-24)	19 (13-26)
		p	0.614	0.509	0.093	0.864
Other family members' support in caring for the patient	Yes		22 (2-39)	10 (0-19)	13 (0-24)	20 (13-26)
	No		21 (17-33)	9 (6-17)	10 (6-16)	19 (14-22)
		p	0.897	0.352	0.689	0.340
Presence of family history of cancer	Yes		22 (3-36)	9 (0-18)	14 (2-24)	19 (13-26)
	No		20 (2-39)	11 (0-19)	11 (0-24)	20 (14-25)
		p	0.783	0.258	0.170	0.080

Table 4 shows the analysis of the relationships between scale scores administered to patients. For the patients, there was no significant correlation between PSS total scores and MSPSS total scores (p=0.080) or PSS factor 2 scores and MSPSS total socrs (p=0.293). However, a significant negative correlation was found between PSS factor 1 scores and MSPSS total scores (r=-0.204; p=0.042) indicating a lower perception of inadequate self-efficacy with higher perceived social support (see Table 4).

Table 4. Analysis of the Relationships between Scale Scores Administered to Patients

		PSS Total	PSS Factor 1	PSS Factor 2	MSPSS Total	MSPSS Family	MSPSS Significant other	MSPSS Friend
PSS Factor 1	**r**	0.811						
	p	**<0.001**						
PSS Factor 2	**r**	0.881	0.469	1.000				
	p	**<0.001**	**<0.001**					
MSPSS Total	**r**	-0.176	-0.204	-0.106	1.000			
	p	0.080	0.042	0.293				
MSPSS Family	**r**	-0.180	-0.148	-0.150	0.595	1.000		
	p	0.074	0.142	0.136	**<0.001**			
MSPSS Significant other	**r**	-0.157	-0.216	-0.073	0.915	0.383	1.000	
	p	0.118	0.031	0.470	**<0.001**	**<0.001**		
MSPSS Friend	**r**	-0.117	-0.115	-0.086	0.872	0.320	0.879	1.000
	p	0.246	0.255	0.393	**<0.001**	0.001	**<0.001**	

Table 5 shows the analysis of the relationships between scale scores administered to caregivers. A statistically significant relationship was found between the PSS scale and PSS factor 1 (r=0.822) and PSS factor 2 (r=0.837) (p<0.001). Additionally, a significant positive linear relationship was found between PSS scale scores and CSI scores (r=0.501; p<0.001) indicating higher perceived stress levels with higher caregiver burden (see Table 5).

Table 5. Analysis of the Relationships between Scale Scores Administered to Caregivers

		PSS Total	PSS Factor 1	PSS Factor 2	CSI Total
PSS Factor 1	**r**	0.822	1		
	p	**<0.001**			
PSS Factor 2	**r**	0.837	0.377	1	
	p	**<0.001**	**0.003**		
CSI Total	**r**	0.501	-0.219	0.605	1
	p	**<0.001**	0.087	**<0.001**	

The majority of the patients had their spouses or daughters as their caregivers (63%), when they were matched (n=54) to take the survey simultaneously with the patient.

Caregivers who were friends and cousins of the patients' accounted for 3% of all caregivers.

Table 6 shows the distribution of caregivers accompanying the patient by their relationships with the patient (see Table 6).

Table 6. Distribution of Caregivers Accompanying the Patient by Their Relationships to the Patient

Relationship to the Patient	n	%
Wife	17	31.5
Daughter	17	31.5
Sister	7	13.0
Son	5	9.3
Mother	2	3.7
Daughter-in-law	2	3.7
Brother	2	3.7
Friend	1	1.9
Cousin	1	1.9

There was no statistically significant correlation between patients and caregivers' PSS scores ($p>0.05$). Table 7 shows the distribution of PSS scores between patients and their caregivers (see Table 7).

Table 7. Distribution of Perceived StressScale Scores Between Patients and Their Caregivers[b]

Patients' PSS Scores / Caregiver PSS Total		Caregivers' PSS Scores		
		Caregiver PSS Factor 1	Caregiver PSS Factor 2	
Patient PSS Total	**r**	0.093	0.065	0.087
	p	0.501	0.642	0.532
Patient PSS Factor 1	**r**	0.190	0.125	0.185
	p	0.170	0.366	0.180
Patient PSS Factor 2	**r**	0.008	0.017	-0.011
	p	0.952	0.901	0.938

b: comparison of scores when the patients are matched to their own caregivers

The total PSS scores of the patients and their caregivers were merged and a variable called 'stress total' was obtained. A Spearman correlation analysis was performed to determine the linear relationship between the stress total and the PSS scores of the patient and their caregivers. A significant relationship was found between the stress total and the PSS scores of the patient ($r=0.687$, $p<0.001$). Similarly, the stress total and PSS scores of the caregivers were also found to be correlated ($r=0.747$, $p<0.001$).

The descriptive statistics of the scales are given in Table 8 (see Table 8).

The descriptive statistics of scale scores when the patients were matched with their own caregivers are given in Table 9 (see Table 9).

Table 8. Descriptive Statistics of the Scales ($n_{patient}$ =100. $n_{caregiver=54}$)

	Scales and sub-scales/factor scores	Mean±SD	Median (min-max)
Patient	PSS Total	18.37±10.22	17 (0-52)
	PSS Factor 1	4.82±5.8	3 (0-24)
	PSS Factor 2	13.55±6.27	12.5 (0-28)
	MSPSS Total	74.49±15.83	83 (17-84)
	MSPSS Family	26.23±4.5	28 (7-28)
	MSPSS Significant other	24.99±5.2	28 (6-28)
	MSPSS Friend	23.27±8.17	28 (4-28)
Caregiver	PSS total	20.94±9.05	21.5 (2-39)
	PSS Factor 1	9.11±5.34	10 (0-19)
	PSS Factor 2	11.82±5.56	12.5 (0-24)
	CSI Total	19.68±3.18	20 (13-26)

Table 9. Descriptive Statistics of Scale Scores in Matched Data (n=54)[c]

	Scales and sub-scales/factor scores	Mean±SD	Median (min-max)
Patient	**PSS Total**	17.56±8.62	15.5 (4-40)
	PSS Factor 1	3.91±5.25	2 (0-24)
	PSS Factor 2	13.65±5.41	14 (4-24)
Caregiver	**PSS total**	21.52±9.38	22 (2-39)
	PSS Factor 1	9.63±5.11	10 (0-19)
	PSS Factor 2	11.89±5.91	13 (0-24)

c: scale scores when the patients are matched to their oew caregivers, one caregiver was chosen for those with multiple caregivers

Further analysis revealed that the stress total was strongly correlated with the PSS scores of the caregiver, indicating that stress is heavily concentrated on the caregiver during the treatment process. When the PSS of the patient and their caregivers were compared and evaluated on the basis of who was more stressed, it was found that 52.7% (n=29) of the caregivers were more stressed and 14.5% (n=8) shared the stress. Additionally, the PSS scores of the caregivers were found to be higher compared to those of the patient. The comparison of PSS scores between patients and their caregivers is given in Figure 1 (see Figure 1).

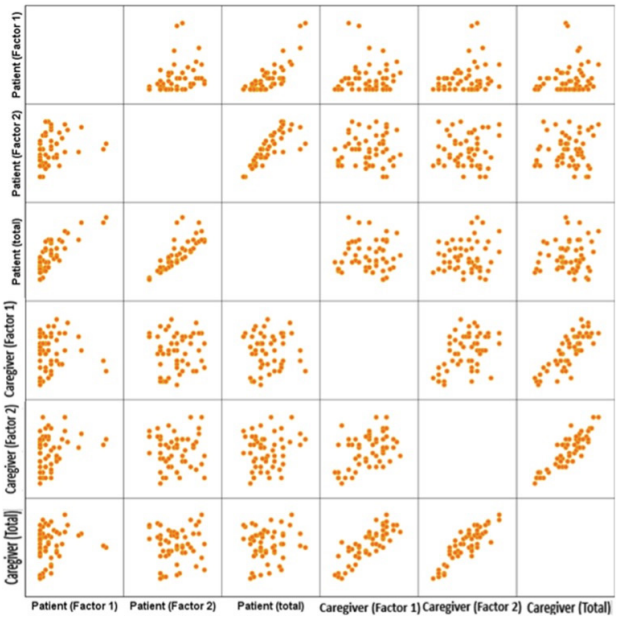

Figure 1. Comparison of Perceived Stress Scale Scores Between Patients and Their Caregivers

DISCUSSION

Our study included both gynecologic oncology patients and their caregivers, and we found that certain independent variables were significantly associated with the patients' perceived stress levels. Specifically, the patients' marital status, number of children, city of residence, and metastasis status emerged as statistically significant factors.

When these factors are considered individually, the present study found that patients with a higher number of children perceived less stress (p=0.032), which raises the topic of gynecologic cancer patients' fertility. This suggests a multidisciplinary approach encorporating reproductive endocrinology, infertility, and perinatal clinics in the stages of diagnosis and treatment, chemotherapy, radiotherapy, surgical intervention, maintenance medicalization, rehabilitation, and, if planned, delivery. The disease history and future plans should be interpreted jointly, and necessary measures should be taken, such as prioritizing fertility-sparing options.

In the study of Chen et al. a positive relationship was found between spousal support and family resilience among gynecologic cancer survivors. 9 In the present study, most of the caregivers were found to be first-degree relatives of the patient n=54 (87.1%). The level of perceived stress (PSS total scores) was higher in singles, and the level of perceived stress/discomfort (PSS factor 2 scores) was lower in married patients. Married patients also reported higher family-based perceived social support (MSPSS family sub-scale scores).

We hypothesized that the gender of the caregiver and their caregiver strain could be associated, and we predicted that higher stress levels and a higher caregiver strain would be observed in female caregivers. Accordingly, PSS factor 2 scores and CSI total scores were found to be higher in women. We believe this could be due to their ability to anticipate physical complaints and show more empathy.

In the study, we did not find a statistically significant relationship between the scale scores and the type of gynecologic cancer, which differs from the literature. In Mamguem Kamga et al.'s study of long-term gynecologic cancer survivors, the highest depression scores were seen especially in cervical cancer, and this group also had less social support (10). In a 2022 study by Di Mattei et al. on the chemotherapy-related quality of life of gynecologic oncology patients, high levels of perceived social support, low anxiety, and being in a relationship (with a male partner/spouse) were found to play a protective role on the patients' quality of life (11).

We also investigated whether the patients being healthcare workers could affect their stress levels and expected that the stress levels among patients who were healthcare workers would be lower as it could be explained by both their clinical knowledge and their experiences influencing their mental states. We found that the PSS factor 2 scores of healthcare workers were lower supporting this (p=0.022). On the contrary, caregivers who were healthcare workers reported higher levels of stress (p=0.044). There is limited data in the literature on perceived stress among healthcare workers with cancer, and there is a need for further investigation for a better understanding.

The stress levels of caregivers and their physical and mental health are known to be negatively affected during disease progression. With the family environment known as a determinant of the emotional well-being of both the patient

and their caregiver, the issue of meeting the differing needs of both parties has to be addressed (12–14). Caregivers play the role of an anchor by helping physicians during the process of obtaining information about the patient and facilitating the exchange of information between the physician and the patient (15). With this stance, the caregiver burden could result in a reduced capacity for coordination during care, less understanding of instructions, and a lack of support for the patient (16). In our study, we found that the higher stress levels related to the care of the same patient originated with the caregiver.

Psychosocial support should be provided to cancer patients by professionals especially those who are familiar with strategies to cope with the stress caused by cancer. Interventions that focus on the patient and caregiver, such as stress reduction strategies, should be developed to improve the quality of life and stress management skills of patients and caregivers. The direct costs of caregiving should be identified, and financial support for caregivers should be provided.

Considering the implications of gynecologic cancer, the issue of relatives as caregivers should be taken into account. Screening programs should be planned for 'high-risk' caregivers who care for gynecologic oncology patients diagnosed with a known genetic background (17). The diagnosis of invasive epithelial ovarian, fallopian tube, primary peritoneal, or endometrial cancer requires the use of genetic services, including hereditary cancer risk assessment, genetic counseling, and germline genetic testing. Current guidelines recommend that at-risk relatives be informed and consider genetic counseling and testing (18).

One limitation of our study is that the sample comprised participants who may have had relatively higher socioeconomic status and better access to healthcare services, potentially limiting the generalizability of our findings. Future studies should aim to include a more diverse sample of patients and caregivers from multiple locations to overcome this limitation.

The results of this study highlight the concentrated stress levels of caregivers during the treatment process. However, it should be noted that patients who were married and had children reported less stress, indicating the protective factor of their support systems. Healthcare workers should focus on the complex relationship between the caregiver and the patient and address the needs of both parties. Future research should also integrate gender issues to provide a better understanding of stress among gynecologic oncology patients and their caregivers.

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Conflict of Interest

The authors reports no conflict of interest.

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Ethical Declaration

The study was approved by the Baskent University Institutional Review Board and Ethics Committee (Project no: KA22/291, July 5, 2022).

Author Contributions

The research subject was collectively decided by the authors ÇF, ÇNÜ, ÖÇŞ, EG, RA, AA. The literature review, table, and figure designs (Table 1, Table 2, Table 3, Table 4, Table 5, Table 6, Table 7, Table 8, Table 9, Figure 1) were carried out by the authors. The material was evaluated from the perspectives of gynecologic

oncology, and public health before being adapted to an article format. Disagreements, discrepancies, and uncertainties were resolved through discussion.

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