

## RESEARCH ARTICLE

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# The Role of Perceived Social Support on Stress, Anxiety, Depression and Care Burden Levels of Caregivers of Cancer Patients: A Turkish Republic of Northern Cyprus (TRNC) Example

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### Abstract

**Objective:** The current study investigated the role of perceived social support in the relationship between stress, depression, anxiety, and caregiving burden on caregivers of cancer patients. The research was conducted in the Turkish Republic of Northern Cyprus. In this sense, the situation in a region that is not often subject to research is reflected in the literature. **Methods:** In the current study, data from 93 caregivers were examined. 61.6% of the participants are women and the mean age of the participants is 40.82. Sociodemographic Information Form, Zarit Caregiver Burden Scale, Multidimensional Scale of Perceived Social Support, Depression Anxiety Stress Scale were used as measurement tools. **Results:** Caregivers' depression and anxiety levels were found to be normal, and their stress levels were found to be mild. Caregiving burden, depression, anxiety, stress, and perceived social support were found to be interrelated variables. Six models of the role of perceived social support were tested. The analysis results showed that perceived social support had a mediating role, but not a moderating role, in the relationships between stress and caregiving burden, depression and anxiety. **Conclusion:** This finding, which is not frequently encountered in the related literature, was discussed with the related literature and suggestions for future studies were presented in the light of the findings.

**Keywords:** Caregiver- care- psychological health- Cyprus- cancer

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### Introduction

It is stated that cancer is one of the leading causes of death in the world, causing approximately 10 million deaths in 2020, which explains approximately one in six deaths [1]. Studies showed that this prevalence will increase in the coming years. For example, a study stated that the cancer burden is expected to increase by 47% in 2040 compared to 2020, which means there will be 28.4 million cases [2]. It is stated that the most common types of cancer are breast, lung, colon, rectum and prostate [1]. When evaluated in terms of TRNC, a current study conducted in 2017 was found. In this study, it is stated that the prevalence of cancer also increases on the basis of TRNC. Skin and prostate cancer are more common in men; It has been reported that breast and thyroid cancer are more common in women [3]. In addition to the prevalence of cancer by type, there are four stages of cancer depending on how large the tumor associated with the cancer is and how far it has spread [4].

It is seen that cancer has effects on individuals' lives

starting from the time of cancer diagnosis [5, 6, 7, 8]. In addition to diagnosis, individuals' lives are affected by this process during the treatment process [9] and after the treatment process [10, 11]. It is inevitable that individuals are affected physically and psychologically by this process, and their immediate surroundings are also affected. Studies show that cancer affects not only the individual but also his/her social environment [12, 13, 14].

Caregiving is defined as the activity and experience that involves helping and supporting relatives with services, they cannot provide themselves [15]. Caregivers (e.g., adult children, spouses, parents, friends, and neighbors) devote significant time and energy to the caregiving process over months or years, provide this care generally at home, do not receive any remuneration in return. It is stated that it may be physically, emotionally, socially, and economically challenging. This care given by family members, relatives or neighbors is called informal caregiving [16]. These difficulties cause caregivers to experience care burden [17]. Younger caregiver [18], and caregiver more impairment in the functionality of

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the cancer patient they care for [19] reported higher levels of depressive mood and have more difficulties with caregiving responsibilities. It was concluded that caregivers who were married, unemployed, and whose cancer patient they cared for had not undergone surgery [20] experienced greater care burden. It is stated that care burden is also associated with depression, anxiety, stress and fatigue [21].

One of the symptoms that is associated with care burden and frequently reported by caregivers of cancer patients is stress [22]. Caregiving stress is defined as the level of caregiver feeling overwhelmed by their responsibilities in caring for a disabled or chronically ill individual [23]. It is stated that the stress reported by caregivers of cancer patients is related to many physical and psychological conditions. For example, while it is stated that stress is related to immune functions [24], it has been concluded that caregivers who experience stress are more likely to experience physical discomfort afterwards [23]. On the other hand, it is stated that stress is associated with cancer caregivers' adaptation processes to the disease [25], depression and anxiety [26].

One of the factors thought to be related to this period, which is stressful for caregivers, is social support. Social support is included as an element in the models developed for caregivers of cancer patients [27] and the Cancer Family Caregiver Experience Model [28]. Social support is defined by Cobb as "information that enables a person to believe that he is liked and loved, that he is respected and valued, and that he is a member of a social environment in which there are mutual responsibilities" [29]. While social support is divided into two as received and perceived [30], it has been concluded that perceived social support is a better predictor [31]. It is stated that social support affects psychological outcomes in three ways: direct effect, mediating effect, and moderating effect [32]. When examined in terms of direct effect; studies conducted with caregivers of cancer patients have shown that perceived social support is related to care burden [33, 34, 35, 36], depression [36] and anxiety [37]. When studies on perceived social support from different sources were examined, it was concluded that perceived social support from family predicted depression, while perceived social support from significant others predicted anxiety [38]. Other studies also stated that perceived social support from the family is related to care burden [39]. The mediating effect explains the relationship between the predictor and the outcome variable [40]. In a study conducted with caregivers of cancer patients, perceived social support was found to have a mediating role in the relationship between resilience and care burden [41]. In another study, it was concluded that perceived social support and care burden played a mediating role in the relationship between the positive aspects of caregiving and psychological distress [42]. Finally, in the moderating effect, social support is expected to interact with the predictive variable and create a change on the outcome variable. In other words, the moderating effect is defined as the variable that reduces or increases the relationship between the predictor variable and the outcome variable [40]. This situation is parallel to the stress buffer hypothesis. According to the

stress buffer hypothesis, social support acts as a buffer when the individual encounters a stressful situation, reducing or eliminating the effects that the individual will experience [43]. The moderator role of perceived social support has also been examined in studies conducted with caregivers of cancer patients. For example, it was concluded that perceived social support has a moderating role in the relationship between caregiver well-being and psychological symptoms. In other words, it was concluded that participants with high caregiver well-being reported low levels of psychological symptoms if their social support was also high [32]. However, there are also studies showing that perceived social support does not have a moderating role in the relationship between resilience and care burden [41].

As a result, studies have examined stress, anxiety, depression, care burden and perceived social support levels of caregivers of cancer patients. These studies belong to different cultures, but no study has been found in which these variables were investigated together in the TRNC sample. It is thought that examining these variables will be useful in reducing the effects of stress and developing interventions for them. On this basis, one aim of this study was to examine the relationships of stress, anxiety, depression, caregiving burden, and perceived social support. Another aim of the study is to examine the mediator/moderator role of perceived social support in the relationships between stress and anxiety, depression, and care burden. In this context, the conceptual model of mediator/moderator effect was used [40].

## Materials and Methods

### Participants

This research was conducted with individuals who provide care to people diagnosed with cancer and whose treatment is ongoing. The sample consists of patients receiving treatment in the Chemotherapy and Radiation Oncology departments within the Oncology Service of Dr Burhan Nalbantoğlu State Hospital affiliated with the TRNC Ministry of Health. Data from 93 outpatients were used in this study. The average ( $\pm$ Standard deviation) age of the patients is  $52.35^{+18.81}$  ( $Age_{Min.-Max.} = 8-92$ ). The average ( $\pm$ Standard deviation) age of the caregivers is  $40.88^{+17.13}$  ( $Age_{Min.-Max.} = 18-84$ ). 61.6% of the participants are female and 38.4% are male caregivers. The convenient sampling method was used to reach participants in the sample consisting of caregivers of cancer patients living in Northern Cyprus. After their consent was obtained, the participants were included in the study. The inclusion criteria for the participants to be included in the study were being over 18 years of age, residing in Northern Cyprus, caring for someone with cancer, and having the ability to read and write in Turkish. Detailed sociodemographic characteristics are presented in Table 1.

### Measurements

#### Sociodemographic Information Form

This form prepared by the researchers consists of two parts. The form included information about both the caregiver and the patient being cared for. Information

Table 1. Information on Socio-demographic Characteristics of the Patient Receiving Care and the Caregiver

Characteristics of the person receiving care		
	N	%
<b>Diagnosis</b>		
Lung cancer	9	9.6
Liver cancer	7	7.4
Breast cancer	32	34.0
Prostate cancer	10	10.6
Thyroid cancer	5	5.3
Colon cancer	7	7.4
Lymphoma	2	2.1
Gastric cancer	2	2.1
Other	22	21,5
<b>Cancer stage</b>		
Phase 1	12	12.8
Phase 2	30	31.9
Phase 3	16	17.0
Phase 4	35	37.2
<b>Characteristics of caregivers</b>		
<b>Gender</b>		
Female	56	59.6
Male	38	40.4
<b>Marital status</b>		
Married	54	57.4
Single	28	29.8
Engaged	9	9.6
Divorced	2	2.1
Widowed	1	1.1
<b>Educational background</b>		
Primary school	7	7.4
Secondary school	9	9.6
High school	29	30.9
Bachelor	44	46.8
Master/Doctorate	5	5.3
<b>Degree of closeness with the patient</b>		
Mom / Dad	8	8.5
Child	34	36.2
Siblings	7	7.4
Spouse	21	22.3
Grand child	4	4.3
Nephew	10	10.6
Other	16	10.7
<b>City of residence</b>		
City center	53	56.4
Town	15	16.0
Village	26	27.7

such as age, marital status, income level, duration of care, patient's diagnosis, and cancer stage were obtained through this form.

#### Zarit Caregiver Burden Scale

This scale, developed by Zarit, Reever and Bach-Peterson [44], is used to measure the burden experienced by people providing care to an individual or elderly person in need of care during this process. It, consisting of twenty-two questions, is evaluated with a 5-point Likert (range of 0 to 4 points; [45]). Within the scope of the validity and reliability studies of the original form of the Caregiving Burden Scale, the internal consistency coefficient of the scale was found to be between 0.87 and 0.94, and the test-retest reliability was found to be 0.71 [45]. The adaptation, validity, and reliability study of the Turkish form of the scale was conducted by İnci and Erdem [46]. It was concluded that the internal consistency coefficient of the Turkish Form was .95 and the test-retest invariance coefficient was .90 [46]. Within the scope of the study, the internal consistency coefficient was calculated as .87.

#### Multidimensional Scale of Perceived Social Support (MSPSS)

It is a scale that shows the level of social support perceived by individuals and from which source they perceive it. The scores obtained indicate perceived social support in the dimensions of family, friends, and special people [47]. The scale consists of 12 items and is evaluated with a 7-point Likert scale. The internal consistency of the original scale is 0.91. The Turkish adaptation of the scale was made by Eker and Arkar [48]; Subsequently, the revised version of the scale was published. It is stated that the internal consistency coefficients of the scale vary between 0.80 and 0.95 for the total score and subscales [49]. In the scope of the current study, the internal consistency coefficient was calculated as 0.87 for the total perceived social support score of the scale, while it was 0.82 for the perceived social support subscale from family, 0.87 for the social support received from friend's subscale and .87 for the social support received from special people subscale. The internal consistency coefficient is 0.89.

#### Depression Anxiety Stress Scale (DASS-21)

This scale, designed to measure depression, anxiety and stress levels, consists of 21 questions [50]. The short form is a scale with 3 sub-dimensions and 7 items in each sub-dimension, and participants evaluate the items with a 4-point Likert scale. Evaluation is made according to the total scores for Depression, Stress and Anxiety, and a minimum of 0 and a maximum of 21 points can be obtained in each dimension. Turkish validity and reliability studies of the Depression, Anxiety and Stress Scale Short Form (DASS-21) were conducted by Yılmaz et al. [51] and it was determined that the form had a valid and reliable structure. The fact that the reliability coefficients of the scale vary between 0.77 and 0.85 (0.81 for the "depression" sub-dimension, 0.80 for the "anxiety" sub-dimension and 0.75 for the "stress" sub-dimension) proves this [51]. Within the scope of the current study, it was found that the internal consistency coefficients of the scale varied between 0.77 and 0.80 (0.77 for the depression subscale, .80 for the anxiety subscale and 0.80 for the stress subscale).

Procedure

To conduct the research, the Ethics Committee of Cyprus International University (Number: -100-5988 and Date: 28/07/2021) and the Ethics Committee of Nicosia Dr Burhan Nalbantoğlu State Hospital affiliated with the TRNC Ministry of Health (Project Approval Code: 56/21, Date: 08/11/2021) necessary permits have been obtained. This is the only hospital in TRNC with an oncology polyclinic, so this is where the data received from. The participants who took part in the study gave their informed consent, and their participation was guaranteed. In the current study, a cross-sectional research design and convenient sampling method were used. The “50+8k” formula [52] was used to determine the number of participants and it was understood that at least 90 people were needed for the study. The data of the research was collected face to face and online between November 2021 and April 2022 (data was collected face to face with 61 people; data was collected online with 33 people.) The surveys were presented to the participants by counterbalancing to prevent the order effect. It took participants approximately 20 minutes to complete the survey set.

Statistical Analyses

The obtained data was transferred to SPSS (21<sup>st</sup> Version). Data control and distribution parameters were examined first. No outliers or missing data were found in the data set. To examine the distribution situation, the mean, standard deviation, skewness and kurtosis values of the measurements of the dependent and independent variables were examined. (See Table 2). The distribution of skewness and kurtosis values between -1.5 and +1.5 [53] indicated that the data showed a normal distribution. In order to test the hypotheses of the study, parametric tests such as one-way ANOVA, Pearson Correlation and Regression (PROCESS Macro - Model 1 and 4) analyzes were used [54]. The linearity, covariance, collinearity, normality of residual values and effective observation assumptions of the regression analysis were checked, and it was decided that it was appropriate to perform the regression analysis.

Results

While examining the findings of the current study, descriptive analyzes were first conducted (See Table 2). Depression (6.94 ±4.27), anxiety (5.52 ±3.94) and stress (7.36 ±4.42) levels of the participants were examined. Accordingly, it is understood that the participants’ depression and anxiety levels are “mild” and their stress levels are “normal” [51].

Significant findings were obtained in the correlation analysis and the findings are given in Table 2. In the current study, it was examined whether there were differences in terms of caregiving burden, depression, anxiety and stress variables depending on the cancer stage of the patient to whom the caregiver cared and the number of years the caregiver cared for the patient. Analysis results showed that there was no difference in terms of the variables mentioned. Additionally, data was collected from study

Table 2. Descriptive and Correlational Findings Regarding Caregiver Burden, Psychological Symptoms and Perceived Social Support Variables.

Variables	1	2	3	4	5	6	7	8	M±SD <sup>a</sup>	Min. - Max <sup>b</sup>	Skewness	Kurtosis
1.Caregiver burden	1								31.73± 12.20	3-61	0.10	-0.31
2.Depression	0.65**	1							6.94± 4.27	0-19	0.38	-0.42
3.Anxiety	0.55**	0.73**	1						5.52± 3.94	0-15	0.19	-1.09
4.Stress	0.52**	0.71**	0.66**	1					7.36± 4.42	0-18	0.23	-0.63
5.MSPSS <sup>c</sup> - Total	-0.18	-0.27**	-0.20	-0.18	1				61.29±11.89	35-84	-0.12	-0.78
6.MSPSS- Family	-0.14	-0.29**	-0.25*	-0.17	0.90**	1			19.20± 4.98	2-28	-0.32	-0.55
7.MSPSS- Friend	0.49**	0.59**	0.49**	0.52**	0.17	-0.16	1		10.10±2.81	2-15	0.51	-0.47
8.MSPSS- Significant others	-0.22*	-0.14	-0.05	-0.13	0.80**	0.55**	-0.09	1	22.01±3.71	14-28	-0.23	-0.62

<sup>a</sup>, mean ± standart deviation; <sup>b</sup>, Minimum and maximum values; <sup>c</sup>, Multidimensional Scale of Perceived Social Support; \* p<.05; \*\*p<.01

Table 3. Comparison of Study Variables in Terms of Duration of Care, Cancer Stage of the Patient being Cared for, Type of Study Participation

Variables	Duration of care			F(2, 91)	
	Less than 1 year M± SD	1-2 years M± SD	More than 3 years M± SD		
Caregiver Burden	29.07± 15.29	31.35± 10.99	34.41± 10.39	1.39 <sup>ns</sup>	
Depression	6.42± 5.21	7.40± 4.07	6.83± 3.68	0.41 <sup>ns</sup>	
Anxiety	5.42± 4.40	5.91± 3.78	5.12± 3.80	0.34 <sup>ns</sup>	
Stress	6.23± 4.78	9.13± 4.30	6.19± 3.60	1.36 <sup>ns</sup>	
Variables	Cancer stage of the patient being cared for				F(3,89 )
	Phase 1 M± SD <sup>a</sup>	Phase 2 M± SD	Phase 3 M± SD	Phase 4 M± SD	
Caregiver Burden	29.33± 13.11	30.30± 9.77	28.93± 9.55	35.62± 13.97	1.83 <sup>ns</sup>
Depression	8.41± 5.69	7.03± 3.52	5.37± 3.48	7.28± 4.48	1.29 <sup>ns</sup>
Anxiety	6.75± 4.49	5.80± 3.82	3.62± 3.11	5.88± 3.98	1.83 <sup>ns</sup>
Stress	8.08± 5.10	8.36± 3.86	7.12± 4.27	6.57±4.57	1.02 <sup>ns</sup>
Variables	Type of study participation		t(92 )		
	Face to face M± SD	Online M± SD			
Caregiver Burden	29.65± 13.04	35.57± 9.50	-2.26*		
Depression	6.44± 4.56	7.87± 3.56	-1.56 <sup>ns</sup>		
Anxiety	5.21± 3.83	6.09± 4.12	-1.03 <sup>ns</sup>		
Stress	6.91± 4.57	8.18± 4.07	-1.32 <sup>ns</sup>		
MSPSS <sup>b</sup> -Total	62.67± 11.54	58.75± 12.28	1.53 <sup>ns</sup>		
MSPSS-Family	20.01± 4.68	17.69± 5.24	2.19*		
MSPSS-Friend	3.85± 2.84	4.57± 2.73	-1.19 <sup>ns</sup>		
MSPSS-significant others	22.06± 3.77	21.87± 3.61	0.23 <sup>ns</sup>		

<sup>a</sup>, mean ± standart deviation; <sup>b</sup>, Multidimensional Scale of Perceived Social Support; <sup>ns</sup>, non-significant

participants face-to-face and online. To check whether there was a difference related to this situation, the type of participation was entered as a categorical variable and an Independent Samples t-Test was conducted. While the analysis results differentiate the type of participation in terms of caregiving burden and MSPSS-family variables; It was understood that there was no differentiation for other

variables. One-way ANOVA and Independent Samples t-Test results are presented in Table 3.

To determine the moderating role of MSPSS (in the relationship between stress and caregiving burden, in the relationship between MSPSS in stress and depression, and in the relationship between MSPSS in stress and anxiety), moderated regression analysis was performed

Table 4. The Moderator Role of Perceived Social Support in the Relationship between Stress and Caregiver Burden, Stress and Depression, and Stress and Anxiety

	Effect	se <sup>a</sup>	t	p	LLCI <sup>b</sup>	ULCI <sup>c</sup>
Caregiver burden						
Stress	-0.24	1.36	-0.17	0.85	-2.95	2.46
MSPSS <sup>d</sup>	-0.29	0.19	-1.54	0.12	-.68	0.08
Interaction	0.02	0.02	1.22	0.22	-0.06	0.07
Depression						
Stress	-0.01	0.38	-0.04	0.96	-0.77	0.73
MSPSS	-0.13	0.05	-2.59	0.01	-0.24	-0.03
Interaction	0.01	0.00	1.83	0.06	-0.00	0.02
Anxiety						
Stress	0.03	0.38	0.08	0.93	-0.73	0.79
MSPSS	-0.09	0.05	-1.77	0.07	-0.20	0.01
Interaction	0.00	0.00	1.44	0.15	-0.00	0.02

<sup>a</sup>, standart error; <sup>b</sup>, lower limit of confidence interval; <sup>c</sup>, upper limit of confidence interval; <sup>d</sup>, Multidimensional Scale of Perceived Social Support; Values for quantitative moderators are (± 1) standard deviation of the mean.

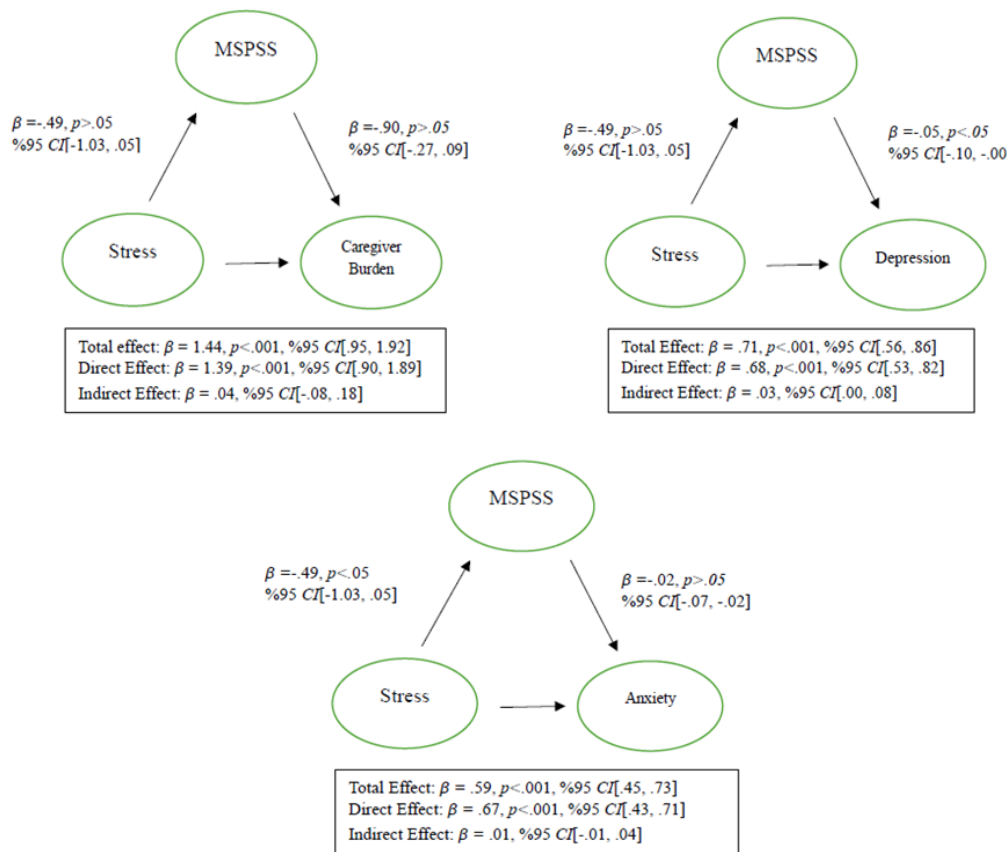


Figure 1. The Mediator Role of Perceived Social Support in the Relationship between Stress and Caregiver Burden, Stress and Depression, and Stress and Anxiety.

with PROCESS Macro [54]. Model 1 for the desired analysis [Dependent variables are caregiving burden, depression, anxiety (Y); independent variable stress (X); Three separate moderation analyses were conducted with the moderating variable MSPSS (W)]. Analysis results showed that MSPSS ( $\beta = 0.02$ , CI [-0.02, 0.06],  $F(3,90) = 36.59$ ,  $R^2 = 0.53$ ,  $p < 0.001$ ) in the relationship between stress and caregiving; MSPSS ( $\beta = .02$ , CI [-.03, .03],  $F(3,90) = 12.61$ ,  $R^2 = 0.28$ ,  $p < 0.001$ ) in the relationship between stress and depression; MSPSS ( $\beta = 0.00$ , CI [-0.00, 0.02],  $F(3,90) = 25.68$ ,  $R^2 = 0.46$ ,  $p < 0.001$ ) in the relationship between stress and anxiety has been shown that it has no moderator role (See Table 4).

Another goal of the research is to examine the mediating effect of MSPSS (in the relationship between stress and caregiving burden; in the relationship between stress and depression and in the relationship between stress and anxiety). In this context, Model 4 was used for mediation analysis using the PROCESS Macro plug-in [Dependent variables are caregiving burden, depression, anxiety (Y); independent variable stress (X); Three separate mediation analyzes were conducted with the mediator variable MSPSS (M)]. According to the results, MSPSS was found to have a mediating role only in the relationship between stress and depression ( $\beta = 0.03$ , CI [0.00, 0.08],  $F(1,92) = 95.60$ ,  $R^2 = 0.49$ ,  $p < 0.001$ ). Baron and Kenny [40] defined the situation in which the relationship between the dependent variable and the independent variable loses significance when the mediator

variable is included in the model as ‘full mediation’. He called the situation where the significance between the dependent and independent variables continues but there is a decrease in significance with the inclusion of the mediator variable, as ‘partial mediation’. When the findings were examined, it was concluded that the perceived social support variable showed a ‘partial mediation’ effect on the relationship between caregiving burden and depressive symptom level.

MSPSS does not mediate the relationship between stress and caregiving burden ( $\beta = 0.04$ , CI [-0.08, 0.18],  $F(1,92) = 34.62$ ,  $R^2 = 0.27$ ,  $p < .001$ ) and the relationship between stress and anxiety ( $\beta = 0.01$ , CI [-0.07, 0.04],  $F(1,92) = 72.88$ ,  $R^2 = 0.44$ ,  $p < 0.001$ ) (See Figure 1).

## Discussion

One of the investigations conducted within the scope of this study is to examine the relationships between care burden, depression, anxiety, stress and perceived social support. First, participants’ depression, anxiety and stress levels were discussed. It was concluded that the participants’ depression and anxiety levels were mild, and their stress levels were normal [51]. In studies conducted with caregivers of cancer patients, it is stated that caregivers report high levels of depression and anxiety [55], and anxiety and depression are observed in screening tests [56]. In addition to depression and anxiety, studies conducted with caregivers of cancer patients also show

that cancer patients report stress [22]. Studies show that caregivers report more symptoms in cases where the individual with cancer experiences more symptoms and mobility is affected [57]. Perhaps the cancer patients examined in this study may have fewer symptoms or their immobility may not be limited. This may result in fewer symptoms. In addition to the need for care, caregivers' experiences during the caregiving process may also differ depending on the stage of the patients [58, 59]. Although caregivers of cancer patients at different stages were included in this study, more participants from stages where caregivers may report fewer symptoms may have been included in this study.

It would also be useful to examine perceptions about caregiving in a cultural context. There may be differences in terms of symptoms between societies that perceive caregiving as a responsibility and loyalty to their relatives and caregivers who see caregiving as an obligation [60]. In addition to examining, it in a cultural context, it is stated that the emotional distress experienced by patients and their unmet needs also vary between countries, and the more emotional distress they report affects the emotional well-being of caregivers [61]. When these two findings are evaluated based on a collectivist society like the TRNC [62], caregivers may consider caregiving as a natural flow of life and an expected situation. Additionally, patients may experience less emotional distress or have their needs better met, or they may be hiding their existing condition to less impact their caregivers. All of these may cause caregivers to report fewer symptoms.

When the relationships between care burden, depression, anxiety and stress levels are evaluated, it is seen that there are positive relationships between the variables. These findings are compatible with existing studies in the literature [63]. Additionally, studies have concluded that caregivers with symptoms of depression and anxiety are three times more likely to report care burden [64]. When the relevant literature is examined, it is also stated that depression and anxiety are frequently seen as comorbidities [65].

When evaluated in terms of perceived social support, care burden appears to have negative relationships with perceived social support from significant others. When the content of perceived social support from significant others is examined, it is seen that dating, fiancée, relative, neighbor and doctor are considered in this context [49]. It is thought that caregivers perceiving support from the doctor and being informed about the disease may have an impact on the care burden. Since the sample of the current study is patients who do not receive inpatient treatment in the hospital but continue oncology treatment, they frequently establish contact with the doctor. In this sense, it is possible that this finding of the study can be explained within the context of healthcare professionals. In parallel, a study concluded that meeting the needs of caregivers by healthcare professionals also increases psychological morbidity [66]. Another study states that receiving health care and the need for information are important for caregivers of cancer patients and that these are related to caregivers' anxiety [67]. Additionally, perceived support from family appears to have negative relationships with

depression and anxiety. Perceiving support from family is very important for individuals in a challenging experience such as caring for an individual with cancer [68] and can help individuals overcome this process more easily [69]. In this study, in line with the literature [38, 70], it was concluded that as the perceived social support from the family increased, the depression and anxiety levels of the participants decreased.

When the literature is examined, it is seen that the general trend in the studies is that perceived social support has negative relationships with caregivers' symptoms [33, 37, 40]. However, contrary to the literature, perceived social support from friends appears to have positive relationships with care burden, depression, anxiety and stress. In other words, it was concluded that when perceived social support from friends increases, caregivers' care burden, depression, anxiety and stress levels also increase. The fact that perceived social support from friends has such effects makes us think about the content and quality of perceived social support from friends. That is, participants may think that they have friends who support them in difficult situations or with whom they share things, but the quality of the support might not be positive for the participants. Their friends may be with them, but when caregivers share a problem, they may make unsupportive statements and behaviors that they think they support. In this context, it is thought that it would be useful to evaluate the content of the support. In addition, individuals may in some cases perceive support as an attack on their autonomy [71]. It is thought that support may have negative aspects if caregivers, whose life course has undergone a significant change during the disease process, perceive the support as a negative intervention.

Another situation related to social support is how willing caregivers are for this support or how suitable they are for this support relationship. In a study that included caregivers of cancer patients within the scope of the "The Cancer Family Caregiving Experience" model, it was stated that maintaining friendships, social relationships and social life was difficult for most of the participants. It is stated that at the beginning of the diagnosis period, some caregivers isolate themselves from their environment and avoid discussions about the disease. While some caregivers avoid this social environment themselves, some caregivers report that they were abandoned by others, and this creates a great distress for them [72]. Some caregivers also state that they need social support very much, but this support decreases over time [73]. Relatives who can provide support may not know how to provide support during this process. As stated in the previous research, caregivers' avoidance of social communication in the first place may be pushing people who can provide support away from these relationships. On the other hand, caregivers may not be able to convey their support needs adequately or may put their needs aside. It is thought that it may be important at this point that the TRNC, where the research was conducted, also has collectivist characteristics [62]. In collectivist cultures, the idea of having to repay the social support given and the idea of putting a burden on their social networks may

make individuals feel less need for social support [74, 75].

When evaluated in terms of its moderator role, the current study shows that perceived social support has no effect on protecting the effects of stress on caregivers. In other words, perceived social support does not affect the direction of the association between stress and depression, anxiety, and care burden [76]. Related literature shows that perceived social support has a protective role [43]. In fact, studies on this protective role were also examined in a sample of caregivers of cancer patients and it was concluded that perceived social support has a protective role [32]. One of the reasons why such a protective role could not be achieved within the scope of this study may be related to the participants' normal level of stress. Higher stress levels may be needed to achieve a protective role.

When the findings of the research on the mediator role of perceived social support were evaluated, it was concluded that perceived social support had a mediator role in the relationship between stress and depression but did not have such a mediator role in the relationship between stress and anxiety and stress and care burden. The strong relationship between stress and depression is emphasized in many studies [77]. When evaluated in terms of this study, it appears that stress and depression are related, but stress and care burden and anxiety are not. This may be one of the reasons why the mediator role between stress and depression cannot be achieved in terms of stress anxiety and stress care burden. On the other hand, depression's relationship with perceived social support may be stronger than anxiety. Studies show that while low social support is associated with an increase in depression two years later, it is not associated with anxiety [78]. In addition to these, studies have been conducted on whether social support is a cause or consequence of depression (e.g. [79]). According to the social causation model, it is stated that social support is a precursor of psychological distress [80]. Within the scope of this study, it was concluded that, in parallel with this model, stress has effects on perceived social support, and perceived social support has effects on depression.

Although the study is one of the limited number of studies examined with TRNC caregivers, it has some limitations. Although the number of participants in the study is above the required number according to analysis [52], it is limited. In this number, it is thought that collecting data from a limited region such as TRNC may be effective, and working with a sample of caregivers may be effective. It has been emphasized in many studies conducted with caregivers that it is difficult to reach the participants [81]. Since it was difficult to reach the participants, no specific distinctions could be made regarding the participants. For example, not working with more specific groups in terms of the stage of the patients or their cancer type constitutes another limitation of the study. However, analyses were conducted on the sociodemographic variables of the participants. No difference was found in terms of the sample considered. The only difference in this sense is in terms of groups whose data are collected in two different ways: face-to-face and online. It was concluded that the participants who completed the survey online had higher care burdens and lower perceived social support from

their families. It is thought that it may be more difficult for caregivers who have a greater care burden and perceive less support from their families to leave home and participate in such a study. For this reason, it is thought that they participate online. Another limitation of the study is that some of the data was collected face-to-face and some online. However, the pandemic during the period when the data was collected created this limitation in data collection. All necessary precautions were taken to ensure that caregivers do not transmit the disease to cancer patients who may be considered at risk, but interviews with some of the participants had to be held online.

While the effects of cancer start from the moment of diagnosis, many different situations are encountered during the disease. The effects of all these processes on cancer patients and caregivers may be different [58,59]. For this reason, it would be useful to use longitudinal studies instead of cross-sectional studies as in this study, to examine the conditions of patients and caregivers throughout the processes of this disease.

When evaluated in terms of future studies, it is thought that it would be more appropriate to conduct longitudinal studies and collect data through a single channel, face-to-face or online, to address the effects of cancer on caregivers throughout the process. Although it is difficult to reach the caregiver sample [81], it is anticipated that in future studies, examining caregivers according to their cancer types, cancer stages, and proximity to cancer patients will be more useful in terms of the generalizability of the research findings.

When the studies are examined, it is seen that patients' perspectives on the caregiver's care burden are also evaluated. It is stated that when the caregiver's care burden is evaluated as less by patients, caregivers report lower quality of life and higher levels of depression and anxiety [82]. It is thought that it would be useful to consider patients' evaluations of the caregiver's burden in future studies and to reach a consensus on evaluations in this context. It is thought that this consensus may also strengthen the communication between the caregiver and the care recipient. On the other hand, communication is also a situation that needs to be addressed. Studies have concluded that caregivers' hostile communication also predicts high levels of care burden [83].

In this study, it seems that the negative aspects of caregiving are discussed. In recent years, developments in positive psychology [84] are also evident in studies conducted with caregivers of cancer patients [85, 86]. In this context, perceived social support, which is a positive concept, was also discussed. It is thought that it would be useful to address the positive aspects of caregiving in future studies. For example, since cancer disease is a traumatic experience for both patients and caregivers [87, 88], it is thought that it may be useful to consider the concept of post-traumatic growth in future studies (e.g. [89]).

As a clinical implication, intervention studies regarding perceived social support may also provide benefit. Studies also report that support interventions are effective on care burden [90] and distress [86]. In addition to the development of support interventions for caregivers,



it is thought that psychoeducation on the content of social support may also be beneficial. For caregivers, in this study, positive relationships were achieved with perceived social support from friends, while other studies showed negative but weak relationships [91], suggesting that there may be differences in the content of social support. It is envisaged that it would be beneficial for those around them who can provide support to caregivers to be informed about what support they provide in this regard.

### Author Contribution Statement

All authors contributed equally to this work. All authors contributed to the introduction, method, findings and discussion sections. The first author collected the data of the study.

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### Ethical Declaration

The Ethics Committee of Cyprus International University (Number: -100-5988 and Date: 28/07/2021) and the Ethics Committee of Nicosia Dr Burhan Nalbantoğlu State Hospital affiliated with the TRNC Ministry of Health (Project Approval Code: 56/21, Date: 08/11/2021) necessary permits have been obtained.

### Availability of data

The data that support the findings of this study are available from the corresponding author, [UÇ], upon reasonable request.

### Conflict of Interest

The authors declare that there are no conflicts of interest concerning the content of the present study.

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