ANKARA MEDICAL JOURNAL

Research Article

Ankara Med J, 2023;(4):378-388 // 10.5505/amj.2023.73588

IS THE RISK OF MALNUTRITION AMONG CARETAKERS RELATED TO CAREGIVER ANXIETY?

Ayşe Naciye Erbakan[1], Özge Telci Caklılı[2], Özlem Gönen[1]
Banu Mesçı[1], Aytekin Oguz[1]

[1]Department of Internal Medicine, Istanbul Medeniyet University, Prof Dr Suleyman Yalcin City Hospital, Istanbul, Turkey
[2]Department of Endocrinology and Metabolism, Kocaeli City Hospital, Kocaeli, Turkey

Correspondence:
Ayşe Naciye Erbakan (e-mail: erbakan553@hotmail.com)

Submitted: 28.09.2023 // Accepted: 18.12.2023

Ankara Yıldırım Beyazıt University Faculty of Medicine
Department of Family Medicine

ANKARA MEDICAL JOURNAL

Abstract

Objectives: This study aims to investigate the association between caregiver anxiety and the risk of malnutrition among caretakers.

Materials and Methods: A total of 200 caregivers whose patients were hospitalized in internal medicine clinics were included in a cross-sectional study. Patients were screened with the Nutritional Risk Screening (NRS) 2002 and divided into two groups: Patients with scores <3 (patients without nutritional support) and with scores ≥3 (patients with nutritional support). Caregiver distress was assessed using the State-Trait Anxiety Inventory (STAI).

Results: Anxiety scores were high for all caregivers (mean state anxiety score 42.4 (min=20, max=70, median=42) and median trait anxiety score 41 (min=25, max=64, mean=41.4). However, the anxiety scores of caregivers of patients with malnutrition did not differ from those of caregivers of patients without malnutrition(for NRS score < 3 versus ≥3, state anxiety score 41.4±10.1 versus 42.7±10.1, p=0.428, and trait anxiety score 40±12 versus 41±13, p=0.494, respectively). Caring for patients for more than one year without support or with minimal support was significantly associated with higher anxiety scores compared to caring for more than one year with support or caring for less than six months without support (for state and trait anxiety, 50.4±9.1 vs 41.0± 9.7, p < 0.001 and 49±10 vs 40±12, p < 0.001, respectively).

Conclusion: The absence of a support system and the duration of caregiving were found to be associated with an increased risk of caregiver anxiety, especially when both factors were present. However, no effect was observed on malnutrition status based on levels of anxiety among caregivers.

Keywords: Caregivers, malnutrition, anxiety, caregiver burden.

Introduction

Caregivers are essential in providing the emotional and physical needs of people who require additional care and support, and they are also referred to as caretakers. Caregivers may be involved in decision-making about the patient's progress in addition to their general responsibilities. These tasks may be of short duration or lifelong and have psychological implications. Torres et al. reported depression in 32% of elderly caregivers.[1] Hahn et al. also reported increased depressive signs in caregivers providing care for longer than two years. [2] In their study, Lai et al. found a significant prevalence of depression and anxiety in individuals affected by rare bone disease and their caregivers. The research revealed that up to 50% of caregivers suffered from anxiety symptoms.[3] Previous studies have shown that female gender, advanced age, and partner dissatisfaction are factors associated with increased risk for psychological distress among caregivers.[4-6] This underscores the importance of recognizing and addressing caregivers' psychological distress to promote their well-being.

Several scales exist to assess mood disorders in caregivers. The Hospital Anxiety and Depression Scale, the Center for Epidemiologic Studies Depression Scale, and the Beck Depression Inventory are among these instruments for measuring depression in caregivers.[7,8] The State-Trait Anxiety Inventory (STAI) consists of two questionnaires and can be used to assess caregiver distress.[9] Malnutrition encompasses the inadequate or excessive intake of nutrients, as well as imbalances in essential nutrient distribution and impaired utilization. The dual challenge of malnutrition comprises both undernourishment and overweight/obesity, along with noncommunicable diseases linked to diet.[10] The impact of malnutrition on both the quality of life and morbidity rates is significant, with potentially fatal consequences. The prevalence of this issue differs depending on the specific context or setting. The literature reports 14.5% malnutrition in elderly patients living at home and 20-50% in hospitalized patients.[11,12] Assessment of factors contributing to malnutrition is crucial, as it is an important predictor of mortality.[13]

Because caretaker well-being often depends on the caregiver, we hypothesized that the malnutrition status of the caretaker may be affected by caregiver anxiety. The purpose of this study is to investigate an association between caregiver anxiety and the risk of malnutrition among caretakers. Furthermore, we aimed to assess the factors contributing to caregiver anxiety.

Materials and Methods

This prospective cross-sectional study was conducted with patients hospitalized in internal medicine clinics between January 1, 2018, and June 31, 2018. The study protocol was approved by the hospital ethics committee and conducted in accordance with the Declaration of Helsinki. All participants gave their informed consent.

Subjects

The nutritional status of patients admitted to the internal medicine clinics was assessed using the Nutritional Risk Screening (NRS) 2002 by the same nutrition nurse, and two groups were formed: Patients with a score <3 (patients not requiring nutritional support) and with a score ≥3 (patients requiring nutritional support).

Caregivers were eligible to participate in the study if they were at least 18 years old, lived with patients in the same home, and had supervised or directly cared for them for at least 4 hours per day in the three months before participating in the study. Caregivers were excluded if they had cognitive impairment or an active psychiatric illness.

The State-Trait Anxiety Inventory (STAI), a widely used psychological inventory, was designed to assess and measure the level of anxiety in individuals. It consists of 20 items assessing state anxiety (STAI 1), which measures the current feelings of anxiety that an individual is experiencing, and 20 items measuring trait anxiety (STAI 2), which assesses the enduring trait of anxiety that individuals experience over the course of their lives. The State-Trait Anxiety Inventory, developed by Spielberger et al., is a reliable and valid instrument for assessing anxiety in both clinical and research settings.[9] The Turkish version is also available and was used in our study.[14] STAI scores are often categorized as indicating "absence or minimal anxiety" (20-37 points), "moderate levels of anxiety" (38-44 points), and "high levels of anxiety" (more than 44 points).[15] Caregivers of both groups were assessed using STAI 1 and STAI 2. STAI 1 was presented on the first day of hospitalization, and STAI 2 was presented on the second day. They also completed a questionnaire to obtain background information.

Caregiver anxiety scores were compared using two categories: Scores below three and scores equal to or above 3. Furthermore, caregiver characteristics were examined to identify groups at high and low risk for anxiety based on their relation with anxiety scores.

Statistical Analysis

Statistical analysis was performed using SPSS version 16 software. The normality of variables was tested using visual (histogram) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk's test) to determine whether they were normally distributed. Data was analyzed by calculating the mean and standard deviation (SD) for normally distributed variables and the median and interquartile range (IQR) for non-normally distributed variables. Comparisons between normal distributions were made using the Student's t-test, while the Mann-Whitney U-test was used to compare non-normal continuous variables. Pearson and Spearman were used to test correlations between variables.

The correlation between the NRS score and the situational anxiety and trait anxiety scores was analyzed using Spearman correlation analysis, and the correlation coefficient (rho) was calculated. If the value of Rho is less than 0.2, it is considered to have a very weak correlation; between 0.2-0.4 indicates a weak correlation, between 0.4-0.6 suggests a moderate correlation, and above 0.6 represents a high correlation in academic studies. If the correlation coefficient was negative, it indicated that there was an inverse relationship between the variables - if one increased, the other decreased (or vice versa). On the other hand, if the coefficient was positive, it indicated a direct relationship - if one variable increased, so did the other (or if one variable decreased, the other also decreased). An overall 5% type-I error level was used to infer statistical significance.

Results

A total of 200 caregivers were included. The mean age of the participants was 53.40±12.60 years. There were 181 female caregivers (90.50%), and 48 of them were housewives (n=96).

A significant proportion (n=73) had completed middle school education as their highest level attained, accounting for approximately 36.50 % of the group. Out of the participants, 73% (n=146) were unemployed. Chronic illness was reported by 40% (n=80) of participants, while 11.50 % (n=23) had a history of psychiatric illness. The majority of caregivers had no prior training in caregiving, accounting for 90% (n=180). First-degree relatives made up most of the caregivers at 63% (n=126). A significant percentage, 72%, had been caring for patients for more than one year. Caregivers included non-native speakers, some of whom had language communication problems (approximately 5.55 %). Of the total patient population, a significant proportion (73.50%, n=147) required nutritional support. Of those who received this support, 57.1% relied on oral feeding, while the remaining 42.9% used tube feeding (Table 1).

STAI scores

The mean state anxiety level of participants was 42.40 (min=20, max=70, median=42), with 72 participants (36%) reporting little or no anxiety, 41 participants (20.50%) displaying moderate levels of anxiety, and 87 participants (43.50%) showing a high level of anxiety. The trait anxiety score was 41 (min=25, max=64, mean=41.40).

No significant difference was found between the anxiety levels among caregivers whose patients had NRS scores of 3 or higher and those whose NRS scores were below 3. Additionally, there was no correlation between NRS scores and the state and trait anxiety scores (p=0.986 and p=0.346, respectively) (Table 2).

ANKARA MEDICAL JOURNAL

Table 1. The baseline characteristics of caregivers and their anxiety scores

Variables	Data (n=200)
Age, median (IQR)	54 (17)
Gender, (n/%)	
Female	181 / 90.50
Male	19 / 9.50
Nationality, (n/%)	
Native	164 / 82.00
Nonnative	36 / 18.00
Marital status, (n/%)	
Single	56 / 28.00
Couple	144 / 72.00
Occupation, (n/%)	
Housewife	97 / 48.50
Retired	19 / 9.50
Caregiver/nurse	23 / 11.50
Others	61 / 30.50
Education status, (n/%)	
Illiterate	16 / 8.00
Elementary school	52 / 26.00
High school	73 / 36.50
University	59 / 29.50
Working, (n/%)	
Yes	54 / 27.00
No	146 / 73.00
Chronic illness, (n/%)	80 / 40.00
Active psychiatric illness, (n/%)	23 / 11.50
Alcohol and/or cigarette use (n/%)	45 / 22.50
Received training for care?, (n/%)	
Yes	20 / 10.00
No	180 / 90.00
Degree of kinship with the patient, (n/%)	
1. degree	126 / 63.00
Relative	23 / 11.50
Other	51 / 25.50
Duration of caring? , (n/%)	
Three months	31 / 15.50
4-6 months	25 / 12.50
Longer than a year	144 / 72.00
Time for caring?, (n/%)	
All day	119 / 59.50
Not all-day	81 / 40.50
Support status, (n/%)	
Little or no	45 / 22.50
Yes	155 / 77.50
Is there another person responsible for care?	
Yes	50 / 25.00
No	150 / 75.00
Duration of sleep near the patient, (n/%)	
2-3 hours	73 / 36.50
4-5 hours	74 / 37.00
6-8 hours	16 / 8.00
Not staying at night	37 / 18.50
Nutritional support?	
Yes	147 / 73.50
No	53 / 26.50
Nutrional route*, (n/%)	
Oral	84 / 57.14
With tube	63 / 42.86
NRS score, median (IQR)	4 (3)
NRS score groups, (n/%)	
<3	54 / 27.00
≥3	146 / 73.00
State anxiety score, mean (SD)	42.40 (10.10)
State anxiety status, (n/%)	
Little or no	72 / 36.00
Moderate	41 / 20.50
High	87 / 43.50
Trait anxiety score, median (IQR)	41 (12)
Trait anxiety status, (n/%)	
Little or no	74 / 37.00
Moderate	56 / 28.00
High	70 / 35.00

*Calculations were made on 147 patients receiving nutritional support.
n; number, IQR; interquartile range, SD; standard deviation, NRS;

Table 2. The correlation between NRS and anxiety scores

Correlation	Correlation coefficient	p-value
NRS and state anxiety	0.001	0.986
NRS and trait anxiety	-0.067	0.346

NRS; Nutritional Risk Screening

Caregiver anxiety scores were assessed according to patients' nutritional and caregivers' social characteristics (Table 3). Although the differences were not statistically significant, the lack of adequate training for providing care led to an increase in both state and trait anxiety (p=0.379 and p=0.553, respectively). When the patients' care was provided by a first-degree family member rather than others, trait anxiety scores were similar (p=0.957). However, being a first-degree relative of the patient caused higher levels of anxiety than being a non-first-degree relative, and this difference was almost statistically significant (p=0.090). There was no difference in anxiety scores according to total time spent with the patient (all day vs. night or daytime, p=0.500). Caregivers of patients with nutritional support did not have higher anxiety scores than caregivers without nutritional support (p=0.500), and the route of nutritional support did not affect caregivers' anxiety scores (oral vs. tube, p=0.080).

There was a statistically significant difference between the trait anxiety score of caregivers who had been working for more than one year and caregivers who had been working for only 4-6 months (p=0.196), whereas no significant difference was observed for state anxiety (p=0.196). Participants who had been caring for their patients for less than six months had lower scores on both state anxiety and trait anxiety than participants who had been caring for their patients for over a year.

Results showed that the presence of support statistically significantly affected both state anxiety (p=0.002) and trait anxiety (p=0.003). Individuals who had little to no support had higher scores for both state anxiety and trait anxiety than those who had support in their lives. Based on the results of the comparisons, which can be seen in Table 3, participants were divided into a high-risk group and a low-risk group for anxiety. The high-risk group included individuals caring for patients for more than one year without support (n=29). In contrast, the low-risk group consisted of individuals who either received assistance or had been providing care for less than six months without any assistance (n=171). When comparing these two groups, participants in the high-risk group had significantly higher levels of both state anxiety and trait anxiety compared to those in the low-risk group ($p < 0.001$ for both).

Table 3. Comparison of anxiety scores among some demographic variables

Variable	n / %	State anxiety score (Mean / SD)	p-value	Trait anxiety score (Median / IQR)	p-value
Training received for care?					
Yes	20 / 10.00	40.50 / 10.89	0.379	40 /12	0.553
No	180 / 90.00	42.62 / 10.11		41 / 13	
Degree of kinship with the patient, (n/%)					
1. degree	126 / 63.00	43.33 / 10.74	*0.090*	41 / 14	0.957
Other	74 / 37.00	40.82 / 8.99		40 / 11	
Duration of care? , (n/%)					
Less than six months	56 / 38.00	40.91 / 9.850	0.196	38 / 8	**0.01**
More than one year	144 / 72.00	42.92 / 10.20		42 / 14	
Support status, (n/%)					
None or minimal	45 / 22.50	46.60 / 10.15	**0.002**	45 / 16	**0.003**
Yes	155 / 77.50	41.19 / 9.82		40 / 11	
Nutrition route*, (n/%)					
Oral	84 / 57.14	42.82 / 11.08	0.879	42 / 13	0.138
With tube	63 / 42.86	42.55 / 8.96		40 / 12	
Alcohol and/or cigarette use (n/%)					
Yes	45 / 22.50	43.27 / 10.64	0.542	41 / 10	0.337
No	155 / 77.50	42.17 / 10.06		41 / 13	
NRS score groups, (n/%)					
<3	54 / 27.00	41.46 / 10.16	0.428	40 / 12	0.494
≥3	146 / 73.00	42.75 / 10.19		41 / 13	
In terms of patient care and support, (n/%)α					
Caring for more than one year and having no or little support	29 / 14.50	50.41 / 9.17	**<0.001**	49 / 10	**<0.001**
"Caring for more than one year but have support" or "caring less than six months and have no support."	171 / 85.50	41.05 / 9.73		40 / 12	

* Calculations were made on 147 patients receiving nutritional support.
α Individuals participating in the study were divided into two distinct groups based on their susceptibility to anxiety. The high-risk group consisted of caregivers who had cared for their patients for more than one year without significant support. The low-risk group included participants who had cared for their patients with assistance for more than one year or those who had provided care without assistance for less than six months.
(P values in bold indicate statistical significance. The p-value in italics indicates a trend towards statistical significance.)
(n; number, IQR; interquartile range, SD; standard deviation, NRS; nutritional risk score)

Discussion

In this study, although there was no association between patients' malnutrition status and STAI scores, caregivers had high levels of anxiety. The risk of patient malnutrition did not affect caregiver anxiety scores, but duration of care, especially when there was no or minimal support, was associated with higher anxiety scores.

The relationship between caregiver stress and malnutrition is possibly bidirectional. Tana et al. have shown that poor patient nutritional status negatively affects caregiver stress.[16] Rullier et al. have shown that

malnutrition occurs in both caregivers and dementia patients.[17] These findings suggest that caregivers' distress includes somatic manifestations beyond psychological defects. Anxiety is a highly distressing condition that caregivers should take seriously in the context of caregiving.[18] Furthermore, it is important to recognize that anxiety can have a significant impact on both the well-being of caregivers and the quality of care they provide to their care recipients.

As life expectancy and the number of people needing care increases, family caregivers continue to be the primary providers of people in both developed and developing countries.[19] Often, family caregivers are family members, spouses, or children, also referred to as informal caregivers. Unlike professional caregivers, these informal caregivers often provide unpaid, continuous assistance with daily activities or tasks for people with chronic illnesses or disabilities.[20] A majority of caregivers assume responsibilities associated with medical tasks that are usually carried out by medical professionals such as nurses and therapists.[21] The results of our study suggest that the lack of proper training in caregiving contributes to an increase in both state and trait anxiety, although these differences were not statistically significant. In the study conducted by Pars et al., caregivers who were trained in the use of gastrostomy tubes were more proficient in providing home care. This resulted in a reduction in stress, anxiety, and challenges associated with home care.[22] Both of these results suggest that adequate education and training of caregivers may enhance their ability and confidence in caring for patients effectively.

Hahn et al. also reported an increase in depressive signs in caregivers over a 2-year period.[2] This finding underscores the fact that continuous assessment of caregiver distress is needed. Geriatric facilities often assess patients in less than three months. Caregiver distress screening can be integrated into these assessments to prevent or detect the problem earlier.

Identifying the factors that contribute to increased levels of anxiety in informal caregivers is critical for early detection and prevention of these symptoms, as they can significantly impact the daily lives of caregivers and ultimately affect the well-being of both the caregiver and the care recipient.[23] Understanding the factors that contribute to increased levels of anxiety in informal carers in order to early identification and prevention of these symptoms.

Research suggests that caregiver burden is associated with a range of adverse reactions while performing the primary caregiving task. In the study by Liu et al., they found that caregiver burden can stem from inadequate financial resources, competing responsibilities, and a lack of social activities.[24] In our study, the trait anxiety scores of caregivers working for a longer period of time were higher than those of caregivers with shorter care durations. In addition, individuals who did not have sufficient support exhibited higher scores on both state anxiety and trait anxiety compared with individuals who had a support system. Furthermore, caring for

patients for an extended period of time combined with inadequate or no support emerged as the highest risk factor for anxiety. These results likely indicate the cumulative effect of various risk factors while also pointing to two important factors that may be modifiable. These findings suggest that social and familial support plays a critical role in the management of anxiety and depression in people caring for the chronically ill.

The study has several limitations, starting with its cross-sectional design, which prevents the establishment of a definitive causal relationship between the parameters. Secondly, it was conducted in a hospital where medical assistance can be provided at any time. This may have lowered the state anxiety scores of the caregivers.

In conclusion, in our study, caregiving elicited anxiety regardless of the patient's nutritional status. The factors associated with increased caregiver anxiety were the duration of care and the presence of a support system.

Ethical Considerations: The study protocol was approved by the Istanbul Medeniyet University, Istanbul Goztepe Training and Research Hospital Ethics Committee (2018/0413-09/01/2028)

Conflict of Interest: The authors declare no conflict of interest.

References

1. Torres SJ, McCabe M, Nowson C. Depression, nutritional risk and eating behavior in older caregivers. *The journal of nutrition, health & aging.* 2010;14:442-8.
2. Hahn EA, Kim G, Chiriboga DA. Acculturation and depressive symptoms among Mexican American elders new to the caregiving role: Results from the Hispanic-EPESE. *Journal of Aging and Health.* 2011;23(3):417-32.
3. Lai X, Jiang Y, Sun Y, Zhang Z, Wang S. Prevalence of depression and anxiety, and their relationship to social support among patients and family caregivers of rare bone diseases. *Orphanet Journal of Rare Diseases.* 2023;18(1):1-8.
4. Kim Y, Baker F, Spillers RL. Cancer caregivers' quality of life: effects of gender, relationship, and appraisal. *Journal of pain and symptom management.* 2007;34(3):294-304.
5. Li Q, Zhang H, Zhang M, et al. Mental health multimorbidity among caregivers of older adults during the COVID-19 epidemic. *The American Journal of Geriatric Psychiatry.* 2021;29(7):687-97.
6. Sun H, Saeedi P, Karuranga S, et al. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes research and clinical practice.* 2022;183:109119.
7. Aben I, Verhey F, Lousberg R, Lodder J, Honig A. Validity of the Beck depression inventory, hospital anxiety and depression scale, SCL-90, and Hamilton depression rating scale as screening instruments for depression in stroke patients. *Psychosomatics.* 2002;43(5):386-93.
8. Roberts RE, Vernon SW. The Center for Epidemiologic Studies Depression Scale: its use in a community sample. *The American Journal of Psychiatry.* 1983;140(1):41-6.
9. Spielberger CD, Gorsuch RL, Lushene RE, Vagg PR, Jacobs GA. Manual for 22 the State-Trait Anxiety Inventory (STAI) Form Y. Palo Alto, CA Consulting 23 Psychologists Press.1983.
10. World Health Organization. *Malnutrition* [Internet]. 2023; https://www.who.int/health-topics/malnutrition#tab=tab_1. (Accessed: 15.09.2023).
11. Johansson Y, Bachrach-Lindström M, Carstensen J, Ek AC. Malnutrition in a home-living older population: prevalence, incidence and risk factors. A prospective study. *Journal of Clinical Nursing.* 2009;18(9):1354-64.
12. Barker LA, Gout BS, Crowe TC. Hospital malnutrition: prevalence, identification and impact on patients and the healthcare system. *International journal of environmental research and public health.* 2011;8(2):514-27.
13. Lim SL, Ong KCB, Chan YH, Loke WC, Ferguson M, Daniels L. Malnutrition and its impact on the cost of hospitalization, length of stay, readmission and 3-year mortality. *Clinical nutrition.* 2012;31(3):345-50.

14. Necla Ö, Le Compte A. Durumluk ve Sürekli Kaygı Envanteri El Kitabı. *İstanbul: Boğaziçi Üniversitesi Yayınları*, 1983
15. Kayikcioglu O, Bilgin S, Seymenoglu G, Deveci A. State and trait anxiety scores of patients receiving intravitreal injections. *Biomedicine hub.* 2017;2(2):1-5.
16. Tana C, Lauretani F, Ticinesi A, et al. Impact of nutritional status on caregiver burden of elderly outpatients. A cross-sectional study. *Nutrients.* 2019;11(2):281.
17. Rullier L, Lagarde A, Bouisson J, Bergua V, Barberger-Gateau P. Nutritional status of community-dwelling older people with dementia: associations with individual and family caregivers' characteristics. *International journal of geriatric psychiatry.* 2013;28(6):580-8.
18. Geng H-m, Chuang D-m, Yang F, et al. Prevalence and determinants of depression in caregivers of cancer patients: A systematic review and meta-analysis. *Medicine.* 2018;97(39).
19. Indicators O, Hagvísar O. *Health at a glance 2019: OECD indicators.* Paris: OECD Publishing; 2019.
20. Roth DL, Fredman L, Haley WE. Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist.* 2015;55(2):309-19.
21. Reinhard S. Home alone revisited: Family caregivers providing complex care. *Innovation in aging.* 2019;3(Suppl 1):S747.
22. Pars H, Soyer T. Home gastrostomy feeding education program: Effects on the caregiving burden, knowledge, and anxiety level of mothers. *Journal of Parenteral and Enteral Nutrition.* 2020;44(6):1029-37.
23. del-Pino-Casado R, Priego-Cubero E, López-Martínez C, Orgeta V. Subjective caregiver burden and anxiety in informal caregivers: A systematic review and meta-analysis. *PloS one.* 2021;16(3):e0247143.
24. Liu Z, Heffernan C, Tan J. Caregiver burden: A concept analysis. *International journal of nursing sciences.* 2020;7(4):438-45.