Original Article

Relationship of Cachexia with Self-Care Agency and Quality of Life in Cancer Patients: The Case of Turkey

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ABSTRACT

Objective: This study aims to determine the effects of cachexia, causing major problems in the world and Turkey, on self-care agency and quality of life in cancer patients. **Methods:** The population of this cross-sectional and relationship-seeking study consisted of cancer patients in Turkey from April 1 to April 20, 2021. Using the snowball sampling method, 174 patients were sampled. "Patient Information Form," "The European Organization for Research and Treatment of Cancer C30 Cancer Quality of Life Scale," and "Exercise of Self-Care Agency Scale" were used as data collection tools. **Results:** In the study, 52 patients (29.9%) were found to have cachexia. Function, general well-being, symptom (except insomnia), and self-care agency, which are subdimensions of the quality-of-life scale, were found to be significantly lower in patients with cachexia than patients without cachexia ($P < 0.001$). It was determined that there was a significant negative correlation between the cachexia status of the patients and the five basic functions in the functional scale (physical, role, emotional, cognitive, and social function), general well-being, and self-care agency, and there was a significant positive correlation between the cachexia status of the patients and the symptom scale ($P < 0.001$). According to the results of multiple linear regression analysis, it was found that the factor that significantly affected the cachexia status of the patients was their self-care agency ($P < 0.001$). **Conclusions:** It was determined that cachexia caused significantly lower self-care agency and quality of life in cancer patients. Furthermore, quality of life was related to self-care agency.

Key words: Cachexia, cancer, quality of life, self-care

Introduction

Cancer is an important health problem that affects the whole world with its increasing and widespread results.[1] As in many other countries of the world, it ranks second after cardiovascular diseases in Turkey.[2] According to the data of the Global Cancer Observatory (GLOBACON) 2020, it has been reported that 19.3 million new cancer cases were diagnosed in the world, and 10 million people died due to cancer.[3]

Cachexia is a multifactorial syndrome prevalent in patients with advanced cancer, leading to increased

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morbidity and mortality and progressive functional impairment.[4,5] It is stated that approximately 50% of cancer patients have cachexia, and more than 20% die due to cachexia.[6] In the literature, cachexia is defined as a metabolic syndrome associated with an underlying disease, characterized by muscle loss with or without loss of fat tissue, and does not fully recover through conventional nutritional therapy.[7,8]

Cachexia in a patient with cancer leads to a deterioration in the quality of life as it affects the treatment response negatively and leads to decreased survival.[9] The World Health Organization defines the quality of life as the perception of individuals' living conditions by their culture, norms, goals, expectations, standards, and interests.[10]

Self-care is activities initiated and performed by individuals to maintain life, health, and well-being. Self-care agency is the combination of action and agency elements that determine an individual's self-care performance in maintaining and improving health.[11-13]

Cachexia causes physiological, biological, psychological, and socioeconomic changes by affecting self-care and quality of life in patients with cancer.[14] Increasing the quality of life and self-care agency of patients is very important to facilitate their adaptation to the process and meeting their needs.[15] Considering the literature, it is thought that the study will add a new perspective to the literature due to the limited number of studies examining the effect of cachexia on self-care agency and quality of life in patients with cancer. Based on this information, this study aimed to determine the effects of cachexia, causing major problems in the world and Turkey, on self-care agency and quality of life in cancer patients on self-care agency and quality of life in patients with cancer.

Methods

Study design

This is a cross-sectional and relationship-seeking study. The data in the study were collected from the cancer patients in Turkey from April 1 to April 20, 2021. Due to the coronavirus disease 2019 (COVID-19) pandemic, the data were collected online through Google Form. ASTROBE checklist was used in writing the study.[16]

Study population and sample

The population of this cross-sectional and relationship-seeking study consisted of cancer patients in Turkey. In the COVID-19 pandemic situation, reaching cancer patients was hard and involved the risk of infection. Therefore, using the snowball sampling method, the data were gathered from cancer patients living in Turkey between 1st and 20th April and accepting participation in the study. Seven people who were diagnosed with cancer and attended the cancer awareness training held by the "Kelkit Community Health Center" on "February 4, 2018, World Cancer Day" formed the first ring of the snowball chain. These seven people were asked to send the questionnaire to their acquaintance cancer patients who met the study criteria and agreed to fill out it. All types of cancer were included in the study without making any distinction in cancer patients. Data collection continues until data saturation.[17] The study included the data of 174 patients (response rate: 88%) [Figure 1].

Inclusion criteria

- Being 18 years or older
- Agreeing to participate in the study voluntarily
- Owning a smartphone
- Being literate
- Being diagnosed with cancer
- Living in Turkey
- Having no impairment in mental and cognitive functions.

Data collection tools and data collection

The data were collected through "Patient Information Form," "European Organization for Research and Treatment of Cancer (EORTC) C30 Cancer Quality of Life Scale," and "Exercise of Self-Care Agency Scale." After obtaining the necessary permissions for the study, an online questionnaire was created and filled in the electronic environment. The questionnaire form was prepared with the Google Forms web application and sent to patients through the *WhatsApp* messaging program.

Patient introduction form

This form consisted of two parts: "*introductory information of the participants"* and "*information on the status of cachexia*."

Introductory information of the participants

In this section, there were eight questions to determine the sociodemographic characteristics of the patients

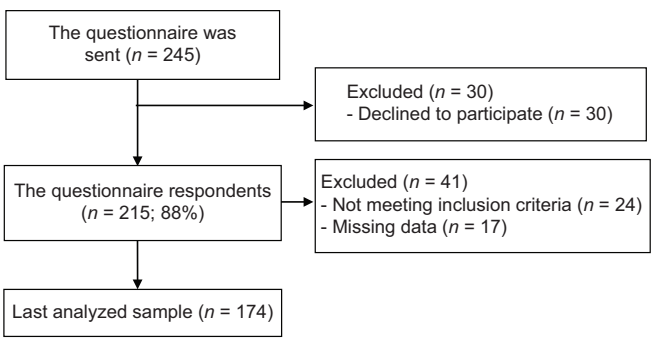

Figure 1: Flow diagram of patient recruitment and tracking process and analysis set

including age, gender, marital status, educational status, income level, and cancer type.

Information on cachexia status

In this section, there were six questions to determine cachexia status including height, weight, body mass index (BMI), weight loss status in the last 6 months, and percent body weight lost.

The European Organization for Research and Treatment of Cancer C30 Cancer Quality of Life Scale

The scale developed by Aaronson *et al*. consists of thirty questions. The validity and reliability of the EORTC C30 Cancer Quality of Life Scale for the Turkish population have been determined. The scale consists of three subdimensions: a general health score (general well-being), a functional scale, and a symptom scale, and it includes thirty questions for the past week. The functional scale involves physical, role, cognitive, emotional, and social functions. Symptom scale consists of such subtitles as weakness, pain, nausea-vomiting, dyspnea, insomnia, loss of appetite, constipation, diarrhea, and financial difficulty. The first 28 questions in the scale are four-point Likert-type scale, and the items are scored as *None: 1, A little: 2, Quite: 3,* and *Many: 4 points*. The 29th and 30th questions in the scale are questions regarding the field of general well-being. That the functional scale score and general health status scale score of the patients are high, and their symptom scale score is low indicates that the quality of life is high.[18]

Exercise of self-care agency scale

ESCA is developed by Kearney and Fleischer in 1979, the scale focused on individuals' self-assessment of their interest in self-care activities. The scale consists of 43 items. It was adapted as 35 items to Turkish society. The scale is a 5-point Likert-type. Each statement is scored from 1 to 4, and it is a 5-point Likert type scale. On the scale, eight expressions are evaluated as negative, and the scoring is reversed, and the minimum score is 35, and the maximum score is 140. The highest point refers to the highest self-care agency. As the score value increases, the self-care agency of the patients increases in direct proportion.[19]

Diagnosing cachexia

According to international consensus, cachexia in cancer patients is examined in three groups: non-cachexia, cachexia, and refractory cachexia.[5] In this study, the patients were divided into two groups as "cachexia and noncachexia" in terms of weight change, BMI, and sarcopenia in the past 6 months to reveal more clearly the relationship between cachexia and self-care and quality of life because the necessary conditions for detecting refractory cachexia and sarcopenia could not be met. Those with a weight loss of >5% in the last 6 months and a weight loss of >2%–5% and a BMI of <20kg/m^2 were considered "cachexia." Furthermore, those with a weight loss of 22% in the past 6 months and a weight loss of >2%–5% and a BMI of ≥20kg/m^2 were considered "noncachexia" [Figure 2].

Ethical approval

Necessary permission was obtained from the ethics committee of Gümüşhane University for the study (Approval No. E.95674917-108,99-21807; 2021/4). An online questionnaire was created and filled in electronically. Electronic informed consent was obtained from each participant before beginning the study. The participant could leave the survey at any time without any justification. The study was carried out in accordance with the Helsinki Declaration.

Statistical analysis

Microsoft Excel table of the data was created through Google Forms and transferred to the Statistical Package for the Social Sciences 22.0 for statistical analysis, software licensed by Karadeniz Technical University. For the data evaluation, such descriptive statistical methods as frequency, percentage, mean, and standard deviation, as well as the Kolmogorov–Smirnov distribution test were used to examine the normal distribution. We adopted the Chi-squared or Fisher's exact to compare differences in categorical variables. The Mann–Whitney U-test analysis was performed to determine the relationship between the scale scores of the patients and sociodemographic variables. The relationship between BMI, self-care power, and quality of life was evaluated with a Spearman correlation. Bınary logistic regression analysis was used to determine factors associated with cachexia. Statistical significance level was set at $P < 0.05$.

Results

The average age of the patients participating in the study was 53.61 ± 10.63 (range: 20-78), and 59.0% were women, 70.2% were married, and 68.0% were primary school graduates. It was determined that 38.2% of the participants had digestive system cancer, 33.0% had Stage 4, 56.7% had cancer surgery, 64.6% received chemotherapy, 61.2% did

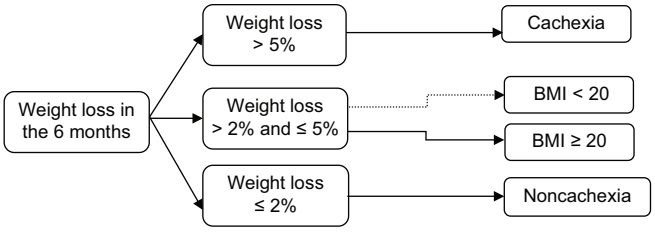

Figure 2: Flow chart showing the diagnosis of patients with and without cachexia. BMI: Body mass index.

not receive radiotherapy, and 69.7% received supportive treatment. It was observed that 68.5% of the patients lost more than 5 kg in the past 6 months, and 31.4% had a BMI <20kg/m^2.There was no difference between the groups in terms of age, marital status, education levels, cancer types, having chemotherapy, and radiotherapy. In the group without cachexia, on the other hand, there existed more patients who were males, had Stage 2, did not have surgery, and did not get supportive treatment [Table 1].

Five basic functions and general well-being in the functional scale of the patients with cachexia were significantly lower than the other. Furthermore, the patients in the cachexia group had significantly higher scores on the symptom scale except for insomnia. It was observed that the self-care agency of the patients in the cachexia group was considerably lower [Table 2].

It was observed that there was a significant negative correlation between the cachexia status of the patients and the five basic functions (physical, role, emotional, cognitive, and social function), general well-being, and self-care agency ($P < 0.001$). There was a significant positive correlation between the absence of cachexia and the symptom scale ($P < 0.001$). It was found that the incidence of cachexia increased as the stage of the tumor increased, and the incidence rate of cachexia decreased in those who did not have surgery and get supportive treatment ($P < 0.001$) [Table 3].

According to the results of logistic regression analysis, it was found that the factor that significantly affected the cachexia status of the patients was their self-care agency. These variables account for 45% of the total variance [Table 4].

Table 1: Sociodemographic and clinical characteristics of the patients according to the groups (*n*=174)

Variable	Cachexia (*n*=52)	Noncachexia (*n*=122)	*P*
Age (years), mean±SD	51.60±9.30	54.35±11.22	0.121
Gender			
Female	29 (55.8)	44 (36.1)	0.016
Male	23 (44.2)	78 (63.9)	
Marital status			
Married	38 (73.1)	85 (69.7)	0.652
Single	14 (26.9)	37 (30.3)	
Educational level			
Primary school	34 (65.4)	85 (69.7)	0.578
High school and above	18 (34.6)	37 (30.3)	
Types of cancer			
Lung	2 (3.8)	31 (25.4)	0.852
Digestive system	32 (61.5)	34 (27.9)	
Head-neck	0	13 (10.7)	
Lymphoma	8 (15.4)	16 (13.1)	
Breast	4 (7.7)	8 (6.6)	
Gynecological	3 (5.8)	8 (6.6)	
Soft tissue tumor	2 (3.8)	8 (6.6)	
Other	1 (1.9)	4 (3.3)	
Stages of tumor			
1	0	15 (12.3)	<0.001
2	0	48 (39.3)	
3	23 (44.2)	33 (27.0)	
4	29 (55.8)	26 (21.3)	
Having surgery			
Yes	39 (75.0)	36 (29.5)	<0.001
No	13 (25.0)	86 (56.9)	
Receiving chemotherapy			
Yes	29 (55.8)	83 (68.0)	0.122
No	23 (44.2)	39 (32.0)	
Receiving radiotherapy			
Yes	26 (50.0)	42 (34.4)	0.054
No	26 (50.0)	80 (65.6)	
Receiving supportive treatment			
Yes	25 (48.1)	25 (20.5)	<0.001
No	27 (51.9)	97 (79.5)	

SD: Standard deviation

Discussion

Cachexia in cancer patients can cause morbidity and mortality, especially in advanced stages of cancer.[20] In a study on cancer patients conducted by Liao *et al.*,[21] the incidence of cachexia was found to be 57.95%. Sun *et al.*[22] reported the rate of cachexia as 53.98% in their study. In our study, the rate of cachexia in the patients diagnosed with cancer was lower (29.9%) compared to the literature. It is estimated that this difference may be due to the lower average age of the patients with cachexia in this study.

Although there was no significant relationship between the types of cancer and having cachexia in our study, the fact that cachexia was seen mostly in digestive system cancers (61.5%) is similar to other studies examined.[22-24] The reason why cachexia is more common in digestive system cancers is thought to be due to loss of appetite, food intake, and weight loss[25] caused by digestive system disorders in such cancers.

In the literature, some studies show that the treatment applied to cancer patients directly affects[25] their appetite and weight loss, while others indicate that there is no relationship between them.[22,23] In our study, a significant correlation was found between having surgery and receiving supportive treatment and having cachexia.

In the literature, it has been reported that cachexia-related malnutrition, weight loss, and decreased muscle mass negatively affect the quality of life.[26-28] In our study, similar to the studies by Sun *et al.*,[22] we found that the function, general well-being, symptom (except insomnia), and general quality of life were significantly lower in the patients with cachexia than the patients without cachexia.[29-35]

Our study results, as in the studies examined, show that there was a negative direction between cachexia and the five

Table 2: Self-care agency and quality of life of cachexia and noncachexia patients (n=174) (Mean±SD)

Variable	Cachexia (n=52)	Noncachexia (n=122)	P
EORTC C30 cancer Quality of Life Scale			
Functional Scale	50.25±13.40	70.15±16.94	<0.001
Physical function	50.86±13.60	70.00±17.20	<0.001
Role function	48.79±17.19	70.79±18.71	<0.001
Emotional function	50.24±13.38	70.08±17.10	<0.001
Cognitive function	51.68±16.97	69.36±20.77	<0.001
Social function	48.79±17.19	70.79±18.71	<0.001
Global State of Health Scale (general well-being)	47.83±18.64	68.85±25.42	<0.001
Symptom Scale	58.33±5.08	44.02±19.61	<0.001
Weakness	86.05±7.14	63.72±16.52	<0.001
Nausea and vomiting	81.00±8.39	62.50±15.74	<0.001
Pain	86.29±11.93	67.62±43.91	<0.001
Dyspnea	96.15±9.10	66.18±27.25	<0.001
Insomnia	89.42±17.39	70.90±76.15	0.085
Loss of appetite	83.17±12.83	64.34±24.24	<0.001
Constipation	96.15±9.10	66.18±27.25	<0.001
Diarrhea	81.25±13.89	62.70±23.45	<0.001
Financial difficulty	83.17±12.83	64.34±24.24	<0.001
Self-care agency scale	23.55±12.78	76.71±41.66	<0.001

SD: Standard deviation; EORTC: European Organization for Research and Treatment of Cancer

Table 3: Relationship between some sociodemographic characteristics of the patients, self-care agency, quality of life and cachexia (n=174)

Characteristics	1	2	3	4	5	6	7	8	9	10	11	12
(1) Physical functions (*r, P*)	1											
(2) Role function (*r, P*)	0.822, <0.001	1										
(3) Emotional function (*r, P*)	0.998, <0.001	0.878, <0.001	1									
(4) Cognitive function (*r, P*)	0.860, <0.001	0.546, <0.001	0.880, <0.001	1								
(5) Social function (*r, P*)	0.896, <0.001	1.000, <0.001	0.878, <0.001	0.546, <0.001	1							
(6) General well-being (*r, P*)	0.710, <0.001	0.675, <0.001	0.704, <0.001	0.564, <0.001	0.675, <0.001	1						
(7) Symptom Scale (*r, PP*)	−0.633, <0.001	−0.562, <0.001	−0.637, <0.001	−0.558, <0.001	−0.562, <0.001	−0.560, <0.001	1					
(8) Self-care agency (*r, P*)	0.812, <0.001	0.721, <0.001	0.814, <0.001	0.710, <0.001	0.721, <0.001	0.741, <0.001	−0.761, <0.001	1				
(9) Stages of tumor (*r, P*)	−0.810, <0.001	−0.699, <0.001	−0.816, <0.001	−0.737, <0.001	−0.699, <0.001	−0.790, <0.001	0.747, <0.001	−0.889, <0.001	1			
(10) Having surgery* (0=yes, 1=no) (*r, P*)	0.653, <0.001	0.603, <0.001	0.669, <0.001	0.574, <0.001	0.603, <0.001	0.573, <0.001	−0.525, <0.001	0.693, <0.001	−0.639, <0.001	1		
(11) Receiving supportive treatment* (0=yes, 1=no) (*r, P*)	0.702, <0.001	0.665, <0.001	0.709, <0.001	0.582, <0.001	0.665, <0.001	0.722, <0.001	−0.520, <0.001	0.653, <0.001	−0.721, <0.001	0.534, <0.001	1	
(12) Cachexia* (0=cachexia, 1=noncachexia) (*r, P*)	0.598, <0.001	0.574, <0.001	0.611, <0.001	0.502, <0.001	0.574, <0.001	0.483, <0.001	−0.506, <0.001	0.666, <0.001	−0.554, <0.001	0.451, <0.001	0.364, <0.001	1

*A dummy variable is a variable that takes values of 0 and 1, where the values indicate the presence or absence of something

basic functions, which are sub-dimensions of the quality of life scale, (physical, role, emotional, cognitive, and social function) in the functional scale and general well-being, and we found out that there was a significant positive correlation between cachexia and symptom scale.

There is an increased risk of complications and death in cancer patients with postoperative low BMI. Therefore, supportive treatment should be planned in patients who have undergone surgery or have cachexia.[36,37] In our study, we found that the incidence of cachexia decreased in cancer patients who did not have surgery and did not receive supportive treatment, in contrast to a study[22] examined.

Weight loss and weakness are among symptoms of tumor spread.[38] Besides, inflammatory cytokines such

Table 4: Associations between cachexia with self-care agency and quality of life ($n=174$)

Model	*B*	SE	OR (95% CI)	*P*
Self-care agency	0.056	0.014	1.058 (1.030-1.086)	<0.001
Physical function	0.075	0.165	1.078 (0.780-1.489)	0.649
Role function	0.061	0.052	1.062 (0.959-1.177)	0.245
Social function	−0.115	0.214	0.892 (0.587-1.356)	0.592
Symptom scale	0.015	0.017	1.016 (0.982-1.050)	0.362
General well-being	−0.023	0.015	0.977 (0.949-1.006)	0.123

Dependent variable: Cachexia (0: Cachexia, 1: Noncachexia). Nagelkerke R^2=0.502 Hosmer-Lemeshow=0.253. *B*: Unstandardised coefficient, SE: Standard error; OR: Odds ratio; CI: Confidence interval

as C-reactive protein, interleukin-6, and tumor necrosis factor-alpha are also crucial factors in the development of cachexia.[39,40] In our study, we found that, as the stage of the tumor increased, the incidence of cachexia also increased.

The concept of self-care agency is one of the main concepts of the *"General Nursing Theory or Self-Care Failure Theory in Nursing"* and it is the combination of action and agency elements that determine an individual's self-care performance in maintaining and improving health.[41] Some studies reported that cancer patients had high self-care agency,[42,43] while others stated that they had moderate self-care agency.[44-46] In our study, the self-care agency of cancer patients with cachexia was significantly lower than cancer patients without cachexia. In the literature, the self-care agency of patients without cachexia was found to be moderate. It is similar to our study result. In our study the self-care level of cachexia patients was considerably lower than the studies reviewed. In our study, we estimated that the difference in self-care level is caused by the cachexia status of the sample group, having surgery, receiving supportive treatment, and the stage of the tumor.

Keeping the quality of life of cancer patients at the highest level and their taking responsibility for their treatment and care to lead their lives are of great importance. Therefore, it is highly essential to determine the quality of life and self-care agency of the patients.[47] A study drawing a comparison between self-care agency and quality of life reported a positive relationship between self-care agency and physical function, role function, and social function.[47] The study conducted by Bae *et al*. stated that self-care agency positively affected the quality of life in individuals with cancer.[42] In the literature, in studies conducted with patients with and without cancer, it is stated that self-care agency positively affects the quality of life.[48-50] Whether the self-care agency increases quality of life, or the increased quality of life affects the self-care agency positively should be taken into consideration. Regardless of the result, it is a remarkable finding that self-care agency and quality of life affect each other in parallel. As in the other studies, by comparing self-care agency and quality of life, we determined that there was a positive relationship between self-care agency and physical function, role function, emotional function, cognitive function, social function and general well-being, and a negative relationship between self-care agency and symptom scale. This result shows that, as self-care increases, the quality of life also increases.

In the snowball sampling method, the sampling process starts by reaching one of the participants in the study. After being interviewed, this initial participant is asked to suggest other potential participants, and following the interview, they recommend additional participants. Thus, the process continues with an increasing number of participants.[51] In our study, while choosing the first ring of the snowball sample among those who attended cancer awareness training, all seven people who were diagnosed with cancer were selected among 86 people who participated in the training session to reduce the selection bias.

Limitations

The limitations of this study are that it is a cross-sectional study, and cachexia was evaluated only once, and the sample size was small.

Conclusions

Approximately one-third of cancer patients had cachexia. We determined that cachexia caused significantly lower self-care agency and quality of life in cancer patients. The quality of life of patients with cachexia was associated with self-care agency. Besides, we found the factor significantly affecting the cachexia status of the patients was their self-care agency.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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