

## Validity and Reliability of The Cancer Loneliness and The Cancer-Related Negative Social Expectations Scale

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**Abstract:** There is a need for cancer-specific tools to evaluate loneliness and cancer-related negative social expectations before developing interventions for cancer patients. The purpose of this study was to examine the reliability and validity of the Cancer Loneliness and the Cancer-related Negative Social Expectations Scale. Data were collected from 300 cancer patients registered to an oncology outpatient clinic of a University Hospital for this methodological study. In the data collection, Patient Information Form, Cancer Loneliness Scale and Cancer-related Negative Social Expectations Scale and the General Loneliness Scale were used. The Cronbach's Alpha coefficient of the Cancer Loneliness Scale was found to be .88, Spearman-Brown correlation value was found to be .81, CFI, .98, GFI, .96,  $X^2/SD$ , 2.99 and RMSEA .08. As for the Negative Social Expectations Scale, Cronbach alpha value was found as .82, Spearman-Brown correlation value .86, CFI 1.00, GFI 1.00,  $X^2/SD$  1.33 and RMSEA .02. The study revealed those both scales were highly reliable and indices of fit showed perfect fit. These scales are highly valid and reliable instruments for the Turkish society.

## 1. INTRODUCTION

Cancer is a significant reason for morbidity and mortality in all regions and countries. Globally, 18.1 million individuals were diagnosed with cancer and 9.6 million individuals lost their lives due to cancer. Although there are a number of proven interventions to prevent cancer, the promotion and implementation of preventive measures has an important place in this process (Bray et al., 2018).

The aim of cancer diagnosis and treatment programs is to prolong the life of patients and to enable the best possible lives for the survivors (WHO, 2019). Loneliness which is a well-known risk factor for mental and physical health is a negative concept for the health of cancer patients (Jaremka et al., 2013). Cancer patients face some symptoms that are both psychological and somatic. Those people also suffer from anxiety and social difficulties during and after their treatment. Moreover, such an experience makes patients feel lonely (Brintzenhofe-Szoc, Levin, Li, Kissane & Zabora, 2009; Kroenke, Johns, Theobald, Wu & Tu, 2013). In particular, loneliness which decreases immune function, and increases depression in cancer patients may

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increase fatigue, pain, sleep disturbance and cause mortality together with other factors (Jaremka et al., 2014a).

According to the loneliness theory, negative social expectations may cause much more negative relationships, increasing loneliness and the related negative social expectations (Decxk, Akker & Buntinx, 2014). Negative social expectations may specifically be associated with cancer experience. Families and friends of those individuals should provide support and sympathy after the diagnosis. If such behaviours are not seen, then the patients could feel disappointed. Loneliness theory and the relevant studies have shown loneliness can lead to negative expectations in cancer patients (Adams, 2016).

In the care of cancer patients, although loneliness is taken into consideration as a part of care, no effective techniques are found in order to identify and intervene for cancer-related loneliness. In defining cancer-related loneliness, healthcare professionals should trust the patients who express feelings of loneliness or use a variety of approaches to reveal loneliness. However, these approaches are not sufficient to evaluate cancer patients (Wells & Kelly, 2008; Macmillan Cancer Support, 2014).

Studies in the literature, on loneliness in cancer patients generally use UCLA loneliness scale. There have not been many studies related to this issue. Jaremka et al. (2014b) found that for breast cancer survivors, loneliness increases the risk of pain, depression and fatigue symptom cluster and also affects physical and mental health. Fanakidou et al. (2018) found a higher level of loneliness in young breast cancer individuals and in patients without breast reconstruction within one year after mastectomy. In another study it was noted that minimized social support was related to the elevated loneliness and hopelessness (Pehlivan, Ovayolu, Ovayolu, Sevinç, & Camcı, 2012). Dodds et al. (2015) found no difference between loneliness levels in experimental and control groups in breast cancer patients despite educational intervention; whereas in another study it was found that the loneliness level decreased in the experimental group (Tabrizi, Radfar & Taei, 2016). All these studies describe the loneliness of cancer patients in general.

There is a need for cancer-specific tools to evaluate loneliness before developing interventions for cancer patients (Adams, Mosher, Winger, Abonour & Kroenke, 2018). The study was carried out in order to evaluate the reliability and validity of the Cancer Loneliness Scale and the Cancer-related Negative Social Expectations Scale developed by Adams et al.

## **2. METHOD**

### **2.1. Study Design**

The research is a methodological one.

### **2.2. Setting and Sampling**

The population of the study was composed of adult cancer patients admitted to the Oncology Polyclinic of a University for treatment and control purposes. For factor analysis, 200 subjects were considered to be “moderate”, 300 subjects were considered “good”, 500 subjects were considered “very good”, and 1000 subjects were considered to be “excellent” (Streiner & Kottner 2014; Tavşancıl, 2014). In this context, study sample consisted of 300 cancer patients. Inclusion criteria were as follows: Patients diagnosed with cancer in 2016 and 2017 and enrolled in the oncology outpatient clinic, aged 18 years or older, without any communication problems, no brain cancer as primary diagnosis. The participants’ consents were obtained as well. Since it was determined that loneliness did not differ according to the type or stage of cancer (Decxk et al., 2014), all types and stages of cancer (except primary brain cancer) were included in the study. Data were obtained from breast, lung, colon, ovarian, prostate, cervical, kidney and pancreatic cancer patients by means of face-to-face interview method between April and August

2018. Six patients who were diagnosed with primary brain cancer were excluded because of impaired perception and comprehension (Adams, 2016).

### **2.3. Measurements**

The following tools were used for data collection.

#### **2.3.1. Patient Information Form**

It has totally 18 questions including the socio-demographic characteristics of the patients and diagnostic and therapeutic information about their diseases. The questions were formed by the researchers based on the literature (Jaremka et al., 2014a; Tabrizi et al., 2016; Adams et al., 2018).

#### **2.3.2. Cancer Loneliness Scale (CLS)**

Developed by Adams et al. (2017), the original scale included 15 items based on loneliness theory. The scale was later revised into a 7-item one-dimensional form after validity and reliability analyses. The scale is used in cancer patients to evaluate cancer associated loneliness (i.e., attributed loneliness cancer experience). Items are scored as follows: Never (1), rarely (2), sometimes (3), often (4), and always (5). When the score gets higher, it means there will be an increase in terms of cancer associated loneliness. The Cronbach's alpha coefficient of the scale was .94 (Adams et al., 2017; Adams et al., 2018).

#### **2.3.3. Cancer-Related Negative Social Expectations Scale (CRNSES)**

Developed by Adams et al. (2017), the original scale consisted of 14 items based on loneliness theory and previous studies. It was later revised into a 5-item one-dimensional form after validity and reliability analyses. The scale assesses the negative social cognition of the patients about their cancer experiences. The items are scored as follows: strongly disagree (1), partially disagree (2), slightly disagree (3), slightly agree (4), partially agree (5), and strongly agree (6). Cronbach's alpha coefficient was .90 (Adams et al., 2017).

#### **2.3.4. UCLA Loneliness Scale**

The scale which was developed by Russel, Peplau and Ferguson in 1978 was revised in 1980 by the same authors so that half of the items in the scale were positive and half were negative. The third version of the scale consists of 20 items with 11 negative and 9 positive statements. The reliability of the scale, which exhibits a one-dimensional factor structure, was determined to be between .89 and .94 in studies on different samples (students, nurses, teachers, elderly) (Russell, 1996). UCLA is commonly preferred in order to calculate general loneliness. It is a 4-point Likert type scale with responses between 1 (never) and 4 (always). The reliability and validity study of the Turkish scale was performed by Demir (1988) and alpha reliability coefficient found as .94 (Demir, 1988).

### **2.4. Cultural Adaptation of Scales**

In this study, the recommendations of the World Health Organization (WHO, 2017) and the International Testing Commission (ITC, 2018) reference guidelines, which define the steps to be followed in adaptation studies, were considered in the cultural adaptation of the scales. The guidance published by the International Test Commission is in line with WHO although there may be changes in steps in some cases. The first step is the adaptation of language and culture (WHO, 2017; ITC, 2018). First, permission to use the scales was obtained from the original author via e-mail, and language validity was performed. The scales were translated into Turkish by different health experts whose native language is Turkish and who speak fluent English. The translations were evaluated by the researchers together with a specialist working in the field. The Turkish version of the scales was created through selecting the most appropriate narratives for each item. In the second step, semantic expressions should be considered. The scale, which

was evaluated by an expert of Turkish Language and Literature, was finalized after necessary arrangements were made. The third step is the expert panel. In this step, concordance ratio between the opinions of 8 experts was calculated with the Content Validity Index (CVI). Davis method was preferred in CVI calculation. At least 3, at most 20 experts evaluate each item as follows; (a) “highly appropriate” (4 points), (b) “appropriate but minor change” (3 points), (c) “item needs to be revised” (2 points) and (d) “item not suitable” (1 point). In this technique, the number of experts selecting options (a) and (b) is divided by the total number of experts in order to obtain content validity index (CVI). Provided that the CGI index is greater than 0.80, the content validity of the item is considered sufficient (Davis, 1992; Erdoğan, Nahcivan & Esin, 2017). According to the content validity analysis of our study, the intelligibility levels of the items were found to be between .88 and 1.00. In the fourth step, the scales were translated back to English by a professional translator whose native language is English and compared with the original scale by the researchers. Pilot application and cognitive analysis were performed in the fifth step. The scales were administered to 30 cancer patients resembling the sample and all items were understood by the participants. After these steps, the final version of the scales was obtained and the scales were given serial numbers. In the last step, documentation was made and a report was created.

## **2.5. Ethical Considerations**

Permission was received from the Non-Interventional Clinical Ethics Committee of a University (dated 10.01.2018 and numbered 60116787-020/2485). In addition, verbal consent was obtained from the patients together with institutional permission.

## **2.6. Statistical Analysis**

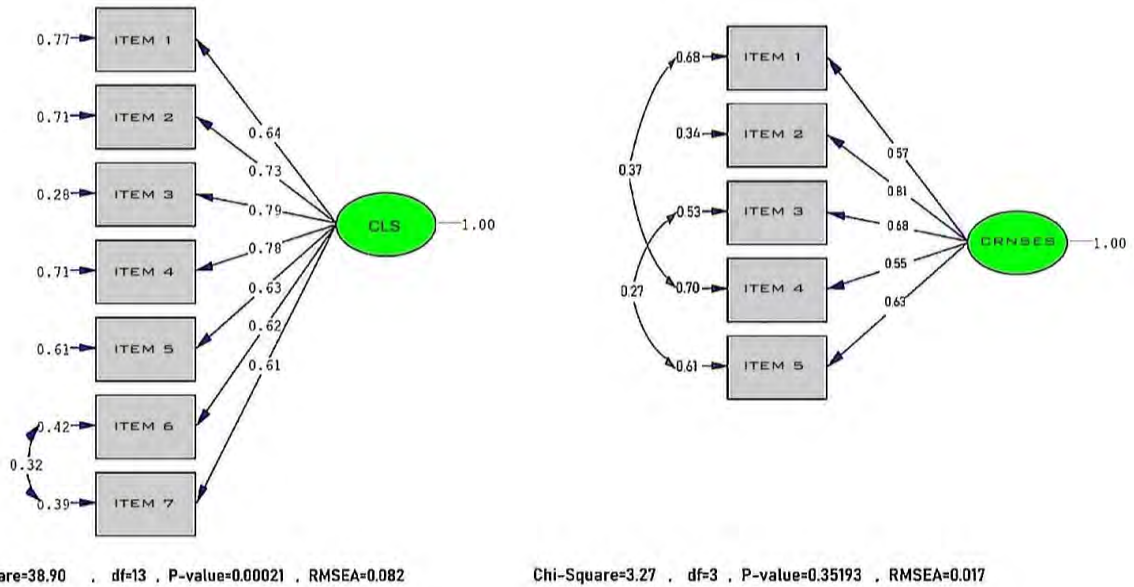
Data were analyzed by SPSS 24 (Statistical Package for the Social Sciences) and Lisrel 8.80 (Linear Structural Relations) statistical software programs. Significance level was taken as  $p < 0.05$  in all statistical evaluations. Descriptive statistics were presented as number and percentage. As part of validity analysis, CVI was calculated for content and scope validity. Confirmatory Factor Analysis (CFA) was used for the construct validity of the scales and Pearson Product-Moment Correlation was examined for concurrent validity. In the reliability analysis of the data; normal distribution of the scales was calculated with Skewness and Kurtosis Coefficients, and item analysis, internal consistency and Split-half reliability were evaluated by means of Item Total Score Correlation, Cronbach's Alpha Coefficient and Spearman-Brown Coefficient Value. In this study, since the data is normally distributed, the Maximum Likelihood method was used as the parameter estimation method in CFA.

## **3. RESULT / FINDINGS**

57.0% of the patients were found to be female while 43.0% were found to be male. The mean age was found to be  $57.03 \pm 11.32$  (min.19 - max.84). 27.0% of patients were breast cancer, 20.3% lung cancer, 8.3% colon cancer, 8.3% ovarian cancer, 4.3% prostate cancer.

### **3.1. Validity Results of Scales**

The goodness-of fit index values obtained from the confirmatory factor baseline analyses of both scales were not acceptable to confirm the factor structure. For this reason, in accordance with the modification suggestions of the analyses, items 6-7 of CLS and items 1-4 and 3-5 of CRNSES were modified (Figure 1).



**Figure 1.** CLS and CRNSES Modified PATH diagrams.

After the modifications, the factor loads of the CLS were found to be between 0.61-0.78 and those of CRNSES were between 0.55-0.81. Table 1 shows the fit indexes of the modified models and basic models.

**Table 1.** Model Fit Indexes of Basic Model and Post-Modification Scales (n=300)

Cancer Loneliness Scale							
	X <sup>2</sup> /df	CFI	GFI	IFI	AGFI	RMSEA	Result
Basic Model	18.2	0.88	0.80	0.88	0.61	0.240	No fit
Modified Model	2,99	0,98	0,96	0.98	0.92	0.08	Perfect fit
Cancer-related Negative Social Expectations Scale							
	X <sup>2</sup> /df	CFI	GFI	IFI	AGFI	RMSEA	Result
Basic Model	27.13	0.83	0.85	0.41	0.54	0.296	no fit
Modified Model	1.33	1.00	1.00	1.00	0.98	0.02	Perfect fit

CFI: Comparative Fit Index; GFI: Goodness of Fit Index; IFI: Incremental Fit Index; AGFI: Adjusted Goodness of Fit Index; RMSEA: Root Mean Square Error Of Approximation.

UCLA General Loneliness scale was used to evaluate concurrent validity. The correlation between the scales was evaluated (Table 2).

**Table 2.** Cancer Loneliness Scale, Cancer-related Negative Social Expectations Scale and UCLA Loneliness Scale Correlation

	CLS	CRNSES	UCLA
Cancer Loneliness Scale (CLS)	1		
Cancer-related Negative Social Expectations Scale (CRNSES)	r = 0.48 p = 0.000	1	
UCLA Loneliness Scale	r = 0.69 p = 0.000	r = 0.39 p = 0.000	1

While a high positive correlation was found between CLS and UCLA General Loneliness scale, a moderate correlation was found between CRNSES and UCLA General Loneliness scale ( $p < 0.001$ ). There was a statistically significant positive moderate correlation between CLS and CRNSES ( $p < 0.001$ ) (Table 2).

### 3.2. Reliability Results of Scales

Item analysis of CLS revealed that the general average of the items was 2.6. The mean variation analysis was 0.83 (min. 2.05 - max. 2.88) (Hotelling's T-Squared = 223.25,  $F = 36.58$ ,  $p = 0.000$ ). When the total correlations were examined, the scale a was assumed as moderate and there were strong values between 0.52 and 0.70. Item analysis of CRNSES revealed that the general average of the items was 3.9. The mean variation analysis was 2.03 (min. 2.89 - max. 4.92) (Hotelling's T-Squared = 447.9,  $F = 110.87$ ,  $p = 0.000$ ). When the total correlations of the scale were investigated, it was found that the scale had moderate values between .60 and .62 (Table 3). The normal distribution of the scores obtained from the scale was evaluated by Skewness and Kurtosis coefficients. The Skewness and Kurtosis coefficients of CLS were -1.71 and -1.82, and those of CRNSES were -1.78 and -1.67, respectively.

**Table 3.** Item analysis of Cancer Loneliness and Cancer-related Negative Social Expectations Scales

Items	Mean	Standart deviation	Item-Total Correlation	Cronbach's Alpha Value of the Scale
Cancer Loneliness Scale *				
Item 1	2.74	1.08	0.519	0.864
Item 2	2.51	1.11	0.598	0.854
Item 3	2.67	0.94	0.740	0.834
Item 4	2.57	1.14	0.612	0.852
Item 5	2.05	1.00	0.577	0.857
Item 6	2.88	0.89	0.706	0.837
Item 7	2.82	0.87	0.709	0.836
Cancer-related Negative Social Expectations Scale **				
Item 1	2.89	1.78	0.621	0.793
Item 2	3.93	1.61	0.620	0.784
Item 3	4.60	1.37	0.613	0.781
Item 4	3.14	1.75	0.610	0.797
Item 5	4.92	1.24	0.605	0.785

\* Hotelling's T-Squared 223,2  $F=36.58$   $p=0,000$

\*\* Hotelling's T-Squared 447  $F=110.9$   $p=0,000$

The mean score of CLS was  $18.28 \pm 5.2$ , the Cronbach's alpha coefficient was 0.88 and the Spearman-Brown correlation value was  $r = 0.81$ . The mean score of CRNSES was  $19.5 \pm 5.9$ , the Cronbach's alpha coefficient was 0.82 and the Spearman-Brown correlation value was  $r = 0.86$  ( $p < 0.001$ ) (Table 4).

**Table 4.** Skewness-Kurtosis Coefficients and Internal Consistency Values of Scales (n=300)

Scales	Mean±SS	Skewness	Kurtuosis	Cronbach Alpha	Spearman-Brown Correlation Coefficient	Guttman Split-Half
CLS	18.28±5.2	0.24±0.14 (-1.71)	-0.51±0.28 (-1.82)	0.88	0.81	0.78
CRNSES	19.5±5.9	-0.25±0.14 (-1.78)	-0.47±0.28 (-1.67)	0.82	0.86	0.82

CLS: Cancer Loneliness Scale

CRNSES: Cancer-related Negative Social Expectations

## 4. DISCUSSION and CONCLUSION

### 4.1. Validity of the Scales

Language adaptation of the scales was made according to WHO (2017) and ITC (2018) guidelines. In scope validity, expert opinions were evaluated with Davis technique and CVI was between 0.88 and 1.00. CVI value is expected to be greater than 0.80 (Davis, 1992; Erdoğan et al., 2017). According to our results, there is a consensus among the experts and the scales meet the criteria of scope validity.

If the scale in the study is newly developed, only Exploratory Factor Analysis (EFA) should be performed. However, if an existing scale is being adapted into another language, CFA should be performed (Erdoğan et al., 2017; Seçer, 2017). Within the scope of the CFA, direct and indirect effects between variables are tested in the context of a model constructed by researchers. Multiple indexes of fit are obtained in CFA and multiple indexes are evaluated together to assess whether the model is validated (Çokluk, Şekercioğlu & Büyüköztürk, 2014). Chi-square ( $X^2$ ) value,  $X^2/SD$  value, Root Mean Square Error of Approximation (RMSEA), Incremental Fit Index (IFI), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI) were investigated in order to assess the model fit in the study. Chi-square is called a poor fit index, and high values indicate poor fit. The  $X^2/SD$  value can be used as a criterion for fit in large samples. Values of three and below are accepted as perfect fit (Çokluk et al., 2014). By analyzing the RMSEA value given under the path diagram, the difference between population and sample covariance is evaluated and this is expected to be between 0-1 (Çokluk et al., 2014; Seçer, 2017). For acceptable fit, IFI, CFI, GFI and AGFI values should be above 0.90, 0.95 and 0.85, whereas for perfect fit these values should be above 0.95, 0.97 and 0.90 (Seçer, 2017; Erdoğan et al., 2017; Seçer, 2018).

In the first analysis of the CLS (base model), the majority of fit indices were not acceptable (IFI 0.88, CFI 0.88, GFI 0.80, AGFI 0.61,  $X^2/SD$  value 18.2, RMSEA 0.240) (Çokluk et al., 2014; Marcoulides & Schumacker, 2014; Erdoğan et al., 2017; Seçer, 2018). In a CFA model, it may be difficult to redefine the model if the acceptance levels of the fit indices are not met. In this case, it is useful to examine the proposed modification suggestions given in analysis results (Çokluk et al., 2014). IFI 0.98, CFI 0.98, GFI 0.96, AGFI 0.92, and  $X^2/SD$  2.99 were obtained in the post-modification model of the CLS, and perfect fit values were obtained. RMSEA was 0.08. Adams et al. also reported that in the final model, one-dimensional CLS showed perfect fit (RMSEA = 0.03; CFI = 1.00;  $X^2(13) = 15.73, P = 0.26$ ) (Adams et al., 2017).

In the base model of the CRNSES, the fit indices were not acceptable (IFI 0.41, CFI 0.83, GFI 0.85, AGFI 0.54,  $X^2/SD$  27.13, RMSEA 0.296) (Çokluk et al., 2014; Marcoulides & Schumacker, 2014; Erdoğan et al., 2017; Seçer, 2018). In the post-modification model, all indices showed perfect fit ( $X^2/SD$  1.33, GFI 1.00, AGFI 1.00, CFI 1.00, RMSEA 0.02). The single-factor structure of CRNSES consisting of 5 items was confirmed as a model. In the study in which CRNSES was developed, it was stated that perfect fit was obtained with the final model (RMSEA = 0.03; CFI = 1.00;  $X^2(4) = 4.70, P = 0.32$ ) (Adams et al., 2017). According to the results of our study, the structure of CLS and CRNSES was supported by confirmatory factor analysis.

A positive, strong and significant correlation was found ( $r = 0.69$ ) between CLS and UCLA General Loneliness Scale, while a positive moderate correlation was found between CRNSES and UCLA General Loneliness Scale. It can be said that the scales are valid for measuring the loneliness level as well as negative social expectations of cancer patients. Adams et al. also noted a strong correlation between CLS and UCLA ( $r = 0.67$ ), and between CRNSES and UCLA ( $r = 0.47$ ) in a positive manner (Adams et al., 2017). The correlation between CLS and general loneliness scale obtained in our study shows that CLS is a valid scale.

There was a positive moderate correlation between CLS and CRNSES ( $r = 0.48$ ). In the original scale, there was a strong positive correlation between CLS and CRNSES ( $r = .70$ ) and it was reported that findings consistent with loneliness theory were obtained (Adams et al., 2017). The correlation between CLS and CRNSES is important in terms of focusing on cancer-specific experiences.

#### 4.2. Reliability of Scales

Whether the study data fits normal distribution is important for the reliability and generalizability of the research results and it can be evaluated by performing different normality tests. The distribution is considered normal if the resulting value is between  $-1.96$  and  $+1.96$  when the Skewness-Kurtosis coefficients are divided by standard errors (Can, 2018). In our study, it was observed that both scales were within this range and showed normal distribution (CLS:  $-1.71$  and  $-1.82$ , CRNSES:  $-1.78$  and  $-1.67$ ).

Item analysis was carried out in order to identify the discriminative power of the scales (Seçer, 2017). As a result of item analysis, item-total correlations of CLS was found to be between  $0.52$  and  $0.70$ . Item-total correlations of CRNSES was found to be ranging from  $0.60$  to  $0.62$ . Items with a value of  $0.30$  and above are considered to have good discriminative power in terms of the measured property (Seçer, 2017). Item-total correlations of the scales were sufficient. It can be said that the item averages in both scales are different from each other, the items are not perceived by the participants with the same approach, the difficulty levels and measurement abilities of the items are different, and each item should be present in the scales ( $p < 0.001$ ). After the analysis (CLS: Hotelling's  $T^2$  test =  $223.2$ ,  $F = 53.44$ ,  $p < 0.001$ ; CRNSES: Hotelling's  $T^2$  test =  $447.9$ ,  $F = 53.44$ ,  $p < 0.001$ ), it was found that the nurses did not perceive the items with the same approach, and answered the items by directly reflecting their opinions at different degrees. The consistency of the items constituting a test among each other indicates internal consistency. Cronbach's alpha method is one of the most frequently used methods for determining internal consistency in scale adaptation studies (Seçer, 2017; Erdoğan et al., 2017; Can, 2018). Evaluation of Cronbach's alpha coefficient is as follows:  $0.40$ – $0.60$  low reliability,  $0.60$ – $0.80$  moderate, and  $0.80$ – $1.00$  high reliability (Tavşancıl, 2014). The internal consistency coefficient of both scales was above  $0.80$  and the scales were found to be highly reliable. According to these results, it can be said that the items of the scales are consistent with each other and the scales are homogeneous. Adams et al. determined the Cronbach's alpha coefficient of CLS as  $0.94$ . CRNSES was found as  $0.90$ . The internal consistency coefficients of the scales are highly reliable.

In our study, the mean score of CLS was  $18.28 \pm 5.2$  (min.7- max.32), and the mean score of CRNSES was  $19.5 \pm 5.9$  (min.5 - max.30). These results showed that the patients included in the study had moderate cancer-related loneliness but their negative social expectations were above the moderate level. Negative social expectations may be associated with cancer experience in particular. For example, their friends and family may show major level of support and sympathy after the diagnosis. The patients may feel, disappointed if such behaviors are not seen. Loneliness theory and studies have shown loneliness could have original precipitates in cancer patients (Adams, 2016).

Split-half reliability test have been developed to eliminate the time problem that emerges in the test-retest method and the difficulty of finding equivalent forms in the validity of equivalent forms (Seçer, 2017). If the correlation coefficient between the split-half of the scale is  $0.70$  or above, its internal consistency is high (Boyle, Saklofske, & Matthews, 2015; Erdoğan et al., 2017). Spearman-Brown correlation value was  $r = 0.81$  for CLS and  $r = 0.86$  for CRNSES ( $p < 0.001$ ). When CLS and CRNSES are evaluated as a whole, it can be said that they consist of closely related items and their internal consistency is high.



In conclusion, CLS and CRNSES are valid and reliable scales that can be used in Turkish society. These scales will help in the assessment and identification of loneliness and negative social expectations, which is a deficiency in treatment and care practices in cancer patients. In this context, the development of loneliness decreasing interventions can be crucial in terms of making the mental and physical health conditions of cancer patients better. In addition, reducing the disease-related mortality and morbidity with the psychosocial support given to the patients will increase the life standards of the family members and patients and will provide further benefit in terms of public health. The scales can be used in clinical practice and on cancer patients in the field, and also in academic studies that will contribute to the literature. The fact that CLS is shorter compared to the current loneliness scales is regarded as an advantage in terms of convenient and faster response by cancer patients.

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### Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the author(s).

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## 6. APPENDIX: Turkish Form of The Cancer Loneliness Scales (Sample Item)

**Table A1.** A few sample items from the Cancer Loneliness Scale (Kara, 2019).

Aşağıdaki ifadeler, kanser teşhisi konulduktan sonra insanların nasıl hissettiğini açıklar. Her ifade için, boşluklara ne sıklıkta o şekilde hissettiğinizi yazın.

ASLA 1	NADİREN 2	BAZEN 3	SIKLIKLA 4	HER ZAMAN 5	
					1.Kanser teşhisi konulduktan sonra ne sıklıkta, en yakın arkadaşlarının ya da aile bireylerinin seni yanlış anladığını hissediyorsun? .....
					2.Kanserle mücadelede, ne sıklıkta diğer insanların sana yeterince destek olamadıklarını düşünüyorsun? .....
					3.Kanser teşhisi konulduktan sonra ne sıklıkta çevrenizdeki insanlarla çok fazla ortak noktanız olmadığını hissediyorsun? .....
					4.....
					5.....
					6.....
					7.....

**Table A2.** A few sample items from the Cancer-related Negative Social Expectations (Kara, 2019).

Lütfen her bir satırda tek bir kutuyu işaretleyerek soruları cevaplayınız.

	Kesinlikle Katılmıyorum	Orta Seviye Katılmıyorum	Biraz Katılmıyorum	Biraz Katılıyorum	Orta Seviye Katılıyorum	Kesinlikle Katılıyorum
1.Eğer insanlara kanser geçmişimden bahsedersen endişelenir ve benim yanımda rahat davranamazlar...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.Eğer insanlar, kanser hastalığım hakkında konuşmak istemezse bunu duymak istemediklerini düşünürüm...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>