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# Gastrointestinal and Breast Cancer Survivor's Unmet Needs During Survivorship Journey: A Reliability and Validity Study

## Gastrointestinal Sistem ve Meme Kanserinden Sağ Kalanların Sağkalım Yolculuğu Sırasında Karşılanmamış Gereksinimleri: Bir Güvenilirlik ve Geçerlilik Çalışması

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**ABSTRACT**

**Objective:** To examine the psychometric properties of the Turkish version of the Cancer Survivors Unmet Needs scale.

**Methods:** Methodological study. Gastrointestinal and breast cancer survivors (n = 350) were included. Validity and reliability were assessed by content validity, discriminant validity, factor analysis, item-total correlation, internal consistency, and test–retest reliability.

**Results:** The most highly ranked unmet needs of survivors were changes to the body (42.0%), ongoing case manager (40.9%), and changes in the quality of life (37.1%). Cronbach's alpha for the overall scale was 0.95. In test–retest reliability, the correlation between unmet needs scores of 2 measurements was $r = 0.81$, and no statistically significant difference was found between the unmet needs scores of the 2 measurements' mean ranks. Discriminant validity revealed a statistically significant negative correlation between total needs score and survival and age. In confirmatory factor analysis, model fit indexes were as follows: Chi-square / Degree of Freedom, CMIN / DF) = 2.6, root mean square error of approximation = 0.06, comparative fit index = 0.93, root mean residual = 0.04, incremental fit index = 0.93, and Tucker–Lewis index = 0.93. The model fit indexes were found very close to excellent fit values.

**Conclusion:** Survivors have unmet needs for adaptation to changes in bodies and quality of life, throughout the survivorship journey. Cancer Survivors Unmet Needs—Turkish is a valid reliable tool for evaluating unmet needs among cancer survivors.

**Keywords:** Cancer survivors, health services needs, methodological study, needs, reliability and validity, survivorship

**ÖZ**

**Amaç:** Kanserden Sağ Kalanların Karşılanmamış Gereksinimleri Ölçeği'nin Türkçe psikometrik özelliklerini incelemektir.

**Yöntemler:** Metodolojik araştırma. Gastrointestinal sistem ve meme kanserinden sağ kalanlar (n=350) dahil edildi. Geçerlilik ve güvenilirlik; içerik geçerliliği, ayırt edici geçerlilik, faktör analizi, madde-toplam korelasyonu, iç tutarlılık ve test-tekrar test güvenilirliğiyle değerlendirildi.

**Bulgular:** Sağ kalanların en sık karşılanmamış gereksinimleri; vücuttaki değişiklikler (%42,0), devamlı vaka yöneticisi (%40,9) ve yaşam kalitesindeki değişikliklerdi (%37,1). Ölçek Cronbach alfa değeri 0,95 idi. Test-tekrar test güvenirliğinde, iki ölçümün karşılanmamış gereksinim puanları arasındaki korelasyon r=0,81, ölçümler arası karşılanmamış gereksinim puan sıra değerleri arasında istatistiksel olarak anlamlı fark bulunmamıştır. Ayırt edici geçerlilikte, total gereksinim puanı ile sağ kalım süresi ve yaş arasında istatistiksel olarak anlamlı negatif korelasyon bulundu. Doğrulayıcı faktör analizinde model uyum indeksleri Ki-kare / Serbestlik

Derecesi=2,6, Yaklaşık Hataların Ortalama Karekökü=0,06, Karşılaştırmalı uyum indeksi modeli=0,93, Hata Kareler Ortalamasının Karekökü=0,04, Artan Uyum İndeksi=0,93, Tucker-Lewis İndeksi=0,93. Model uyum indeksleri mükemmel uyum değerlerine çok yakın bulunmuştur.

**Sonuç:** Sağ kalanların, sağ kalım yolculuğu süresince yaşam kalitesi ve vücutlarındaki değişikliklere uyum sağlamak için destek gereksinimi bulunmaktadır. Kanserden Sağ Kalanların Karşılanmamış Gereksinimleri Ölçeği-TR, sağ kalanların karşılanmamış gereksinimlerini değerlendirmek için geçerli ve güvenilir bir araçtır.

**Anahtar Kelimeler:** Kanserden sağ kalanlar, metodolojik araştırma, sağlık bakım gereksinimleri, gereksinimler, güvenilirlik ve geçerlilik, sağ kalım.

## INTRODUCTION

Cancer is a common disease that affects both men and women all over the world. With early cancer diagnosis and healthcare modalities advances, the number of survivors is rising day by day. European Society for Medical Oncology defines survivors as "those people who do not have the disease after finishing the treatment, those who continue to receive treatment to reduce the risk of cancer coming back, or patients with the well-controlled disease and few symptoms. Survivorship can be defined as the process that starts with the diagnosis of cancer and goes on until the end of life."[1] Many cancer survivors reported that they experienced short-term or long-standing problems after cancer therapy and required various supportive care services. In the literature, the survivors had physical, psychosocial, emotional, relational, familial, social, health system-related, and financial problems and they had unmet needs in information, communication, care, and relationship.[2-4] Unless the requirements of cancer survivors are met, levels of depression, symptoms, fear of recurrence, and long-term complications increase, and health-related quality of life decreases.[5] Therefore, various need assessment scales have been created to evaluate healthcare-related unmet needs of patients with cancer. Some of these scales have limitations such as the high number of items, the lack of physical symptoms, sexual life, and social life requirements, specifically developed for young patients, and not focusing on survivorship phases.[6,7]

"The Cancer Survivors' Unmet Needs (CaSUN)" scale is one of the valid and reliable scales employed to determine the unmet needs of survivors. The CaSUN is the most comprehensive scale for cancer survivors, which comprises items in fewer numbers, and also an open-ended question for determining the other requirements not included in scales.[5] Validation and reliability studies of Spanish,[8] Dutch,[9] Chinese,[10-12] Japanese,[13] and Indonesian[14] versions of the CaSUN scale were performed.

### The Aim of Study

At the time of the initiation of the study, there was no valid and reliable instrument for evaluating the unmet needs of cancer survivors in Turkey. The psychometric properties of the Turkish version of CaSUN tool were examined.

## METHODS

### Design

Methodological study. The patients were recruited from the General Surgery Outpatient Clinic in a university hospital between September 2017 and March 2018. Thus, the gastrointestinal system and breast cancer survivors composed the population of the study. Purposive, convenience sampling was used. Survivors with the diagnosis of neurological and psychiatric disorders were not included. Eligible participants were aged >18, diagnosed with cancer, received and completed any primary cancer care, had the person, place, and time orientation, and had no hearing-speech problems. The sample size is recommended to be 5-10 times the number of items in the measure[15,16] since the CaSUN scale comprised 35 items, and 350 cancer survivors were included.

### Instruments

The CaSUN scale has been developed to recognize the needs of cancer survivors by Hodgkinson et al.[5] The CaSUN consists of 35 items and 5 domains. Cronbach's α was 0.96 (domains; 0.78-0.98). Items on the CaSUN can be scored in terms of items or domains of met, unmet and total needs, or strength of need. The total score is the sum of all need items (0-35), where higher scores indicate greater needs.

Sociodemographic characteristics, including age, type of cancer, gender, and survival were retrieved from electronic hospital records.

The data were collected by telephone interviews and face-to-face methods. The convenience sampling method was adopted. The researcher identified survivors through electronic medical records (diagnosed with cancer in 2010 year), those survivors who have an active phone number were called and the purpose of the study was announced. The survivors who met the sample criteria and consented to participate in the study were invited to the general surgery outpatient clinic room at their routine medical check-ups. The informed verbal/written consent was obtained from survivors. The scales were checked for missing items. The researcher applied the scale through the phone to the survivors who could not come to the clinic. The verbal consent was achieved through the phone call. If the survivor did not want to participate in the study, the interview was terminated.

### Statistical Analysis

The item analysis, internal consistency, and test–retest analysis were performed for reliability. The item-total correlation coefficient > 0.30 was admitted to the cut-off point in item analysis.[16] Based on the recommendation made by Hodgkinson et al.[5] 7 items from the scale that did not cluster into a subdomain were kept. For this reason, the items in which the item-total correlation was <0.30 were not removed from the scale, but these items were removed from factor analysis. For test–retest analysis, the scale was administered to survivors (n = 30) in 2-week intervals. Since the data had not a normal distribution, the relationship between the 2 measurements was determined by the Spearman correlation coefficient. The statistical significance between the 2-measurement means was examined with the Wilcoxon rank test.

In language validity, after forward translation, the back-translated scale was sent by e-mail to the developers of CaSUN to get an opinion on the similarity with the original CaSUN, but the developers did not return it. Then, 2 researchers decided that the draft scale was akin to the original tool. Then, the Turkish version was obtained as CaSUN-TR. Twenty survivors carried out a pilot practice to check the interpretation, cultural relevance, and comprehensibility of the instrument items. Survivors completed the questionnaire on average in 10-30 minutes by face-to-face approach. The scale was finalized according to the feedback received from survivors who had participated in the pilot study. The survivors gave feedback that the items should be shorter, clearer, and simpler. Based on the feedbacks, the wording/expressions were changed in items 5, 7, 8, 11, 12, 13, 16, 17, 25, 28, and 30.

For content validity, expert (n = 20) opinions were acquired using Polit & Beck method, and for each item, the item content validity index was computed.[17] The scale content validity index (S-CVI) for the CaSUN-TR was 1.00. Owing to S-CVI being very high, all items were kept on the scale.

Factor analysis involved both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Kaiser–Meyer–Olkin (KMO) value and Barlett's sphericity test were used. The EFA was used to investigate the structure of CaSUN-TR among these items. In the EFA, the principal component analysis procedure was employed for the factor extraction method. To decide the rotation method to be applied, the correlation between the factors was explored. First, the oblique rotation was achieved, the factor correlation matrix was checked, and 5 values exceeded 0.32.[15,18] Therefore, the oblique rotation method was used because there were correlations between the factors. Using a minimum eigenvalue of 1.0, we assigned the number of CaSUN-TR factors. A factor loading > 0.30 was the cut-off point for item retention.[5] The overlapping items (the difference between their loads on different factors < 0.10) were removed from the factor analysis.[16] The CFA was conducted to confirm the structure of the factors extracted from the EFA. The maximum likelihood method was used. The correlations between error covariance were included based on modification indices. The EFA and CFA procedures were made on the same sample. In the discriminant validity, based on the literature,[9,11,13] a hypothesis was determined that there was a negative correlation between needs scores (unmet and total) and age and survival. In the hypothesis test, the relationship between needs scores and continuous variables were measured with the Spearman correlation coefficient. Statistical Package for the Social Sciences version 24 (IBM) and Analysis of Moment Structures(AMOS) 24 were used for analysis.

### Ethics

Written permission from the hospital and the ethics committee approval from the Non-invasive Research Ethics Board of the Dokuz Eylül University was received (numbered 2926-GOA, dated November 3, 2016, decision numbered 2016/28-25). Since we could not access the first author for permission to validate CaSUN, because the mail of the first author was no longer in use, it could not be reached, the permission was obtained by e-mail from the second and third authors.

## RESULTS

Most survivors had colorectal cancer (n = 78, 22.3%) (Figure 1). The mean survival was 40.4 ± 26.13 months (3-128) and the mean age was 61.0 ± 12.08 years (24-92). Of the survivors, 52.6% were female and 47.4% were male. The greatest unmet needs reported by survivors were "changes to my body" (42.0%), "ongoing case manager" (40.9%), and "changes in the quality of life" (37.1%) (Table 1). The unmet needs score of CaSUN-TR was 7.93 ± 8.45 (0 – 33) and total needs score was 16.74 ± 9.52 (0 – 35) (Table 2).

The item-total correlations of the CaSUN-TR varied from 0.10-0.76. The item-total correlation of item 18 ($r = 0.25$), item 27 ($r = 0.24$), and item 13 ($r = 0.10$) were <0.30. The Cronbach's α for the overall scale was 0.95. Cronbach's α of the domains ranged from 0.85 to 0.91 (Hotelling's $T$-squared test = 1585.444; $P < .001$) (Table 3). A statistically significant high positive correlation was found between the unmet needs scores of the 2 measurements ($rho = 0.81$; $P < .001$) and between the total needs scores of the 2 measurements ($rho = 0.76$; $P < .001$). There was no statistically significant difference between the unmet needs mean rank scores of the first and second measurements ($P = 0.218$) and between the total needs mean rank scores of the measurements ($P = .603$).

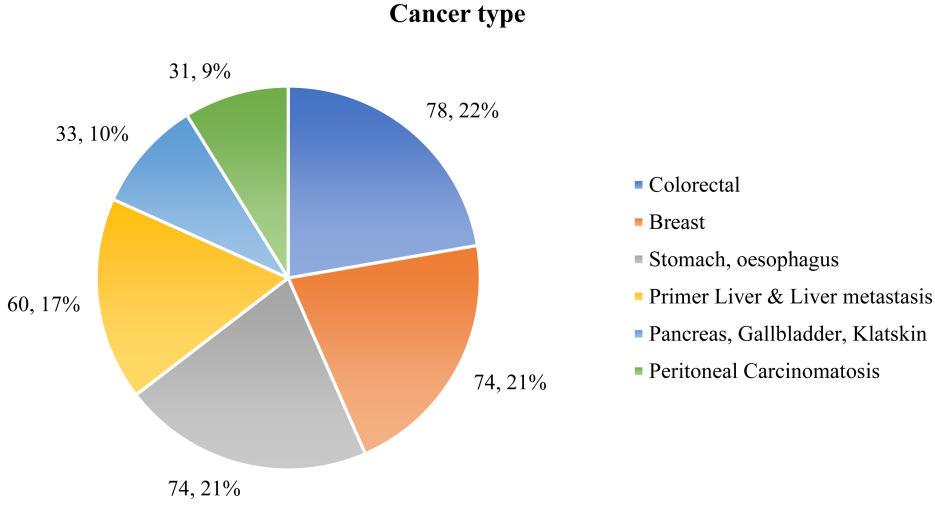


**Figure 1.** Cancer type of survivors.

**Table 1. The Most Highly Ranked Unmet Needs of Survivors (n = 350)**

| The most highly ranked unmet needs | n | % |
|---|---|---|
| "Adjust to changes to the way I feel about my body" | 147 | 42.0 |
| "An ongoing case manager to whom I can go to find out about services whenever they are needed" | 143 | 40.9 |
| "Adjust to changes in my quality of life as a result of my cancer" | 130 | 37.1 |
| "Manage my concerns about the cancer coming back" | 128 | 36.6 |
| "Try to make decisions about my life in the context of uncertainty | 121 | 34.6 |
| "Cope with changes to my belief that nothing bad will ever happen in my life" | 120 | 34.3 |
| "Manage ongoing side effects and/or complications of treatment | 113 | 32.3 |
| "Reduce stress in my life" | 111 | 31.7 |
| "Any complaints regarding my care to be properly addressed | 108 | 30.9 |
| "Up to date information" | 102 | 29.1 |

The construct validity was analyzed with the EFA and CFA. Because the item-total correlation of items 27, 18, and 13 was <0.30 in reliability analysis, these items were removed from the factor analysis. The item analysis was repeated after item removal (items 27, 18, and 13) and the item-total correlations were determined to range between 0.30 and 0.76. Then the first EFA was performed, in EFA results, the factor loads of some items (items 5, 28, 31, 32, 34, and 35) were overlapping. These overlapping items were removed from the analysis by starting to remove an item that had the lowest factor load, and the factor analysis was repeated after each item removal. After the removal of all overlapping items from factor analysis, item analysis was repeated, and the item-total correlation of item 14 was 0.28. Then, item 14 was removed from the factor analysis. After each removal of an item analysis was repeated. At the end of the EFA, 23 items were preserved finally. Similar to the original scale, CaSUN-TR was constructed to have a 5-domain structure. The first factor consists of items 10, 19, 20, 30, and 33; the second of items 1, 2, 3, 6, and 7; the third of items 15, 16, and 17; the fourth of items 9, 21, 22, 23, 24, and 25; and the fifth of items 8, 11, 12, and 26. The first factor was called psychosocial support, the second factor was information, the third factor was economic concerns, the fourth factor was relationships, and the fifth factor was quality of life. Three items that were not involved in any factor in the CaSUN created a new factor (items 15, 16, and 17) in our sample and 1 item was included in the other factor (item 9). Items of existential survivorship factor were distributed to other factors. Comprehensive cancer care and information factors merged as 1 factor. The 8 items (items 5, 18, 27, 29, 31, 32, 34, and 35) in the CaSUN did not enter any factor in our sample. The factor loads of items ranged from 0.54 to 0.94 (Table 3). The total variance explained was 71.2%. The KMO value was 0.90. Bartlett's test of sphericity was statistically significant ($\chi^2 = 6455.413$, $P < .001$).

**Table 2. Unmet Needs Level of Cancer Survivors**

| | Mean ± SD | Min-Max |
|---|---|---|
| **Cancer Survivors' Unmet Needs - Turkish (CaSUN-TR)** | | |
| Met needs | 8.18 ± 6.91 | 0-32 |
| Unmet needs | 7.93 ± 8.45 | 0-33 |
| Total needs | 16.74 ± 9.52 | 0-35 |
| **Sub domains of CaSUN-TR** | | |
| Psychosocial support | 4.38 ± 3.77 | 0-10.0 |
| İnformation | 5.62 ± 3.41 | 0-12.0 |
| Economic concerns | 1.48 ± 2.28 | 0-6.0 |
| Relationships | 2.92 ± 3.33 | 0-12.0 |
| Quality of life | 3.95 ± 2.89 | 0-8.0 |

SD, Standard deviation

In the CFA, the fit indexes of the model were calculated as; Chi-square (CMIN) = 671.020, Degree of Freedom (DF) = 256, CMIN/DF = 2.6 $P < 0.001$, root mean square error of approximation (RMSEA) = 0.06, comparative fit index (CFI) = 0.93, incremental fit index (IFI) = 0.93, root mean residual (RMR) = 0.04, goodness of fit index (GFI) = 0.86, Tucker–Lewis index (TLI) = 0.93. The standardized regression weights of items varied from 0.64 to 0.93.

In the discriminant validity analysis, the relationship between age, survival, and needs scores of the CaSUN-TR was explored. There was a statistically significant weak negative correlation between total needs score and survival (*rho* = −0.26, $P < 0.001$), and age (*rho* = −0.16, $P = 0.003$). A statistically significant very weak negative correlation between survival and unmet needs score (*rho* = −0.12, $P = 0.016$) and a statistically significant weak negative correlation between age and unmet needs score (*rho* = −0.13, $P = 0.010$) was found (Table 4).

## DISCUSSION

This study investigated the Turkish psychometric properties of the CaSUN. It was found that CaSUN-TR was a reliable and valid scale for cancer survivors.

In the reliability results, 3 items (items 13, 18, and 27) of CaSUN-TR had item-total correlation < 0.30. Since the mean age of our sample was relatively high and the sample did not include survivors of gynecological and urological cancer, the correlation for item 13 was deemed below. Similarly, the factor load of item 13 in the original CaSUN was low, and it remained in the measure as the clinical evaluation of this item was considered crucial.[5] The correlation item 18 may have been low. Because, during the data collection process, survivors stated that they came to the hospital by the services of the municipality (adjusted to carry cancer patients) or used public transportation. Therefore, survivors in our sample may not need parking. In the Chinese version, item 18 had the lowest factor load.[10] In the Spanish version[8] and Chinese version modified for Taiwan survivors,[11] this item was not included. Thus, the need for accessing hospital parking for cancer survivors was changeable based on society's characterizes. Item 27 evaluated the unmet sexual needs of survivors. Sexual problems are taboo in many cultures, even if patients have sexual problems they do not share these problems with someone.[19] Due to embarrassment or the expectation that the healthcare provider will start the conversation about sexual problems, patients may be reluctant to reveal sexual concerns.[20] Therefore, the total item-27 correlation may be poor.

Cronbach's α value of 0.80-1.00 suggests that the tool is extremely reliable.[16] The Cronbach's α for the overall scale and domains of CaSUN-TR was high. Evidence exhibited that CaSUN-TR had high-level internal consistency and reliability, which was consistent with other versions.[5,8,9,12]

**Table 3. Factor Analysis (n = 350)**

| Factors of Cancer Survivors' Unmet Needs—Turkish (CaSUN-TR) | Factor Load | Cronbach's Alpha |
|---|---|---|
| Factor 1 (Psychosocial support) | | 0.91 |
| 30…Help to cope with changes to my belief that nothing bad will ever happen in my life | 0.91 | |
| 33…Help to try to make decisions about my life in the context of uncertainty | 0.82 | |
| 19…Help to manage my concerns about the cancer coming back | 0.82 | |
| 10…Help to reduce stress in my life | 0.76 | |
| 20…Emotional support to be provided for me | 0.75 | |
| Factor 2 (İnformation) | | 0.90 |
| 3…Information provided in a way that I can understand | 0.85 | |
| 2…My family and/or partner needs information relevant to them | 0.79 | |
| 4…The very best medical care | 0.77 | |
| 1…Up to date information | 0.69 | |
| 7…To know that all my doctors talk to each other to coordinate my care | 0.58 | |
| 6…To feel like I am managing my health together with the medical team | 0.54 | |
| Factor 3 (Economic concerns) | | 0.91 |
| 16…Help getting life and/or travel insurance | 0.94 | |
| 17…Accessing legal services | 0.92 | |
| 15…Help to find out about financial support and/or government benefits to which I am entitled | 0.88 | |
| Factor 4 (Relationships) | | 0.85 |
| 23…Help with developing new relationships after my cancer | 0.90 | |
| 25…Help to handle the topic of cancer in social and/or work situations | 0.80 | |
| 22…Help to deal with the impact that cancer has had on my relationship with my partner | 0.78 | |
| 24…To talk to others who have experienced cancer | 0.59 | |
| 9…Access to complementary and/or alternative therapy services | 0.55 | |
| 21…Help to know how to support my partner and/or family | 0.54 | |
| Factor 5 (Quality of life) | | 0.87 |
| 12…Help to adjust to changes in my quality of life as a result of my cancer | 0.86 | |
| 11…Help to manage ongoing side effects and/or complications of treatment | 0.78 | |
| 8…Any complaints regarding my care to be properly addressed | 0.72 | |
| 26…Help to adjust to changes to the way I feel about my body | 0.67 | |
| Total Variance Explained: 71.25, Total Cronbach's alpha: 0.95 | | |

Extraction method: Principal component model, rotation method: Oblimin with Kaiser normalization.

In test–retest reliability, a statistically significant positive high correlation was found between the unmet needs scores of 2 measurements, and no statistically significant difference was found between the unmet needs mean score of the 2 measurements. In the validity and reliability study of the CaSUN-Spanish version by Tyson et al.,[8] a high correlation was determined between the two measures, alike our results. These results showed the CaSUN-TR to have high consistency.

**Table 4. The Relationship Between the Characteristics and Needs Score**

| | | Total Needs | Unmet Needs | Met Needs |
|---|---|---|---|---|
| Age | Rho† | −0.160* | −0.138** | −0.049 |
| | *P* | .003 | .010 | .359 |
| Survival | Rho† | −0.264** | −0.129* | −0.124* |
| | *P* | < .001 | .016 | .020 |

†Rho, Spearman's rho correlation; *$P < .05$; **$P < .001$.

For validity, translation and back-translation were implemented in language validity; a similarity was found between the 2 scales. In the content validity, expert opinions results appeared as an S-CVI of 1.00, much greater than the excellent criterion of 0.90,[17] which means that CaSUN-TR was appropriate for the sociocultural background and construct of Turkey.

Construct validity demonstrates how accurately the scale measures the desired structure/concept. The KMO value should be at least 0.50 (a KMO value > 0.90 is admitted as excellent) and Barlett's test must be significant for sample size adequacy.[16] In this study, the KMO value was excellent, and Barlett's test was statistically significant. The factor load values should be 0.30 and above.[15,16] The factor loads of CaSUN-TR, which were 0.54-0.94, were above the limits stated in the literature. The total variance is recommended to be at least 40%.[16] The total variance explained in the EFA of CaSUN-TR was at the ideal level. In the EFA, the 5-factor structure was obtained in Turkish culture. This 5-factor model was dissimilar from the previous model. In our model, 3 items that were not involved in any factor in the CaSUN created

the economic concerns factor, and item 9 was included in 1 factor. In our country, most cancer survivors and their families have no sufficient information about their socioeconomic and legal rights and benefits. No specialist informs survivors about these rights during the disease trajectory.[21] Therefore, it has been determined that the survivors need these issues. Item 9 evaluated the survivors' need for information about complementary/alternative therapy options. In a study conducted in Turkey, the majority of patients determined that they want to receive information from health professionals about alternative treatment options.[22] In another study, it was emphasized that patients made use of various complementary/alternative therapy methods very frequently and unconsciously.[23] The patients should be educated regarding the potential harms of these methods in more detail.[23] These findings account for survivors' needs on this need and remain item 9 in our model.

The CFA was applied in the verification procedure of a predetermined model. The CMIN/DF value of less than 5 is accepted as a good fit indicator.[16] If the RMSEA value is below 0.05, it points to a good fit and if it is less than 0.08, it implies an acceptable fit. The CFI, IFI, TLI, and GFI values > 0.90 are acceptable fit values, and values > 0.95 are excellent. As the RMR value gets closer to 0, it is a good fit indicator.[16,24] Our results revealed that the model fit indexes were within acceptable levels, and very close to excellent fit values, which indicated that the model was highly compatible.

In the discriminant validity, a hypothesis was determined that there was a weak negative correlation between needs scores (unmet/total needs) and age and survival.[9,11] A significant negative correlation was discovered between age and the total needs score of CaSUN-TR. Like our results, Keeman et al[9] determined a significant weak negative correlation between age and total needs score, and between age and unmet needs of score CaSUN—Dutch. Moreover, a significant negative correlation between survival and unmet needs score and a negative correlation between survival and total needs score of CaSUN-TR was found. Fang et al[11] reported that survivors who lived less than 60 months expressed much more unmet needs on CaSUN—Chinese.[11] Our hypothesis was consistent with the literature, as the age and survival progressed, and the total and unmet needs of survivors were reduced.

### Study Limitations

This research was carried out with survivors who were accompanied by gastrointestinal and breast cancer survivors in an outpatient general surgery clinic. The needs of today's patients may change. The outcomes of this study reflect the needs of the patients for whom data were collected and also may not reflect the healthcare-related unmet needs of other cancer survivors (e.g., bladder, kidney, prostate, lung, and ovarian cancer). The findings may not be generalized to all cancer survivors, and validation of the scale in other cancer survivors is recommended.

The findings of our study demonstrated that CaSUN-TR was a reliable and valid scale for cancer survivors living in Turkey. The CaSUN-TR can be applied in cancer practice through either printed, electronic, or telephone interview methods. It can be beneficial to define targeted cancer survivors' unmet information, emotional, and other needs across the entire disease journey.

Measuring the unmet healthcare needs of survivors via reliable and valid tools might make it easier to implement a survivorship care plan. The CaSUN-TR can be a pillar to determine high-risk survivors and plan patient-centered nursing care. The scale might make high-risk survivors visible who might profit from tailored nursing interventions.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Dokuz Eylül University (Date: November 3, 2016, Number: 2016/28-25).

**Informed Consent:** Verbal consent was obtained from the participants.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – E.C., F.V.; Design – E.C., F.V.; Materials – E.C.; Data Collection and/or Processing – E.C.; Analysis and/or Interpretation – E.C., F.V.; Literature Search – E.C.; Writing Manuscript – E.C.; Critical Review – F.V.

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**Hasta Onamı:** Katılımcılardan sözlü onam alındı.

**Hakem Değerlendirmesi:** Dış bağımsız.

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