Assessment of suicide risk among newly diagnosed cancer patients

Osman Hasan Tahsin Kilic[1], İhsan Aksoy[2], Umut Varol[3], Murat Anil[4], Ahmet Alacacioglu[5], Afra Sevde Çetin[6]
[1]Assist. Prof., Department of Psychiatry, Izmir Democracy University, Izmir, Turkey https: //orcid.org/0000-0001-7070-6808
[2]MD, Department of Psychiatry, Ataturk Sanatorium Training and Research Hospital, Ankara, Turkey https://orcid.org/0000-0001-8426-2072
[3]Prof., Department of Internal Medicine and Oncology, Izmir Democracy University, Izmir, Turkey, https://orcid.org/0000-0002-4669-2052
[4]Prof., Department of Pediatrics and Emergency, Izmir Democracy University, Izmir, Turkey, https://orcid.org/0000-0002-2596-4944
[5]Prof., Department of Internal Medicine and Oncology, Izmir Katip Celebi University, Izmir, Turkey, https://orcid.org/0000-0003-3428-5932
[6]Psychologist, Department of Psychology, Izmir Democracy University, Izmir, Turkey, https://orcid.org/0000-0002-1825-6421

SUMMARY

Objective: We aimed to assess clinical (type, grade, symptom, quality of life), demographical, and psychological (social support, anxiety, and depression) risk factors of suicidality among newly diagnosed cancer patients in Turkey.

Method: 122 cancer patients within their first month of diagnosis were enrolled in the study. Sociodemographic Form, Suicide Probability Scale (SPS), Multidimensional Scale of Perceived Social Support (MSPSS), European Organization for Research and Treatment (EORTC) quality of life questionnaire (QLQ-C30), Edmonton Symptom Assessment System (ESAS), and Hospital Anxiety and Depression Scale (HADS) were given to the patients.

Results: There were no relationships between SPS scores and age, gender, having metastatic cancer, being religious, marital status, having health insurance or employment. The EORTC QLQ-C30 cognitive function (p= 0.003, r= -0.267) and emotional function (p= 0.006, r= -0.249) and social function (p= 0.019, r= -0.212) were found to be negatively and weakly correlated with SPS. Among ESAS variables, only severe insomnia was significantly correlated with high SPS scores (p= 0.012). There were no statistical significance between SPS scores and having anxiety (p=0.110) or depression (p=0.591). There was no statistically significant relationship between SPS and MSPSS scores.

Discussion: There have been no study published in the literature that assesses the correlation between suicide risk and a variety of clinical and sociodemographic characteristics among Turkish cancer patients who have just received a diagnosis. According to our results, special attention must be given to cancer patients with severe insomnia and poorer cognitive, emotional, and social functioning.

Key Words: Anxiety, depression, functioning, cancer, suicide

INTRODUCTION

A diagnosis of cancer may cause psychological distress which may negatively affect treatment compliance and life quality and may result in psychiatric disorders that may lead to suicide (1). The risk of suicide among cancer patients has been found 4.4 times that of the general population (2). Demographic risk factors for suicide among cancer patients in western countries are similar to those among the general population; higher in elderly, white, and unmarried males (2). However, suicide risk factors may show regional and cultural differences. For example, in Turkey, suicidal behaviors are lower in the elderly population (3). Additionally, suicide rates in Turkey are lower compared to western countries and similar to those of Muslim countries (3).

Although it is mostly detectable and preventable, the majority of suicides among cancer patients seems to occur within 1 month of their last medical visit (4). It would sometimes be challenging for oncology healthcare professionals, especially in

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newly diagnosed patients, to distinguish normative grief symptoms which are expectable after diagnosis. Unfortunately, suicide risk is highest in the initial period after diagnosis and oncology healthcare professionals' training and awareness on identifying suicide risk is reported to be lacking (5,6).

In the current study we aimed to assess clinical (type, grade, symptom, quality of life), demographical, and psychological (social support, anxiety, and depression) risk factors of suicidality among newly diagnosed cancer patients in Turkey.

METHOD

In this cross-sectional descriptive study, we included patients who have been newly diagnosed with cancer (within one month of diagnosis) and were admitted to Izmir Katip Celebi University Ataturk Research and Training Hospital Medical Oncology Clinic for treatment from June 2020 to March 2021. Among 286 patients admitted to the clinic, 122 newly diagnosed cancer patients agreed to participate in the study. The eligibility criteria for inclusion in the study were patients who were 18 years old or older, intended to undergo chemotherapy, and have been informed of their cancer diagnosis. Patients with mental retardation, cognitive disorder or an inability to comprehend Turkish language were excluded. The study protocol received an institutional review board approval (TPF-20H03) according to the provisions of the Declaration of Helsinki, and all participants provided informed consent.

Sociodemographic Data Form, Suicide Probability Scale (SPS), Multidimensional Scale of Perceived Social Support (MSPSS), European Organization for Research and Treatment (EORTC) quality of life questionnaire (QLQ-C30), Edmonton Symptom Assessment System (ESAS), and Hospital Anxiety and Depression Scale (HADS) were given to the patients.

Sociodemographic Data Form: In this form, there are 15 questions about sociodemographic data of the patients prepared by the researchers including age, education, religion, employment, marital status, disease and treatment history, alcohol and drug consumption, and tobacco use. The Eastern Cooperative Oncology Group (ECOG) Performance Status score was also noted. ECOG score assesses the quality of life and degree of well-being in patients with cancer. ECOG 0 represents asymptomatic (fully active, able to carry on all pre-disease activities without restriction), ECOG 4 means bedbound (completely disabled, cannot carry on any self-care), and ECOG 5 is equal to death.

Hospital Anxiety and Depression Scale (HADS): HADS is a self-report scale developed by Zigmond and Snaith which is used to determine anxiety and depression levels (7). It consists of 14 questions, each of which is scored between 0–3. Anxiety and depression are evaluated with seven questions each. The lowest possible scores for depression and anxiety are 0, and the highest possible scores are 21. Higher scores indicate increased severity of anxiety or depression. The reliability and validity of the Turkish language version were examined by Aydemir et al. and Cronbach alpha coefficients for anxiety is 0.85 and for depression is 0.78 (8). Cut-off scores for Turkish society have been determined as 7 for anxiety and 10 for depression (8).

Suicide Probability Scale (SPS): This scale evaluates the risk of suicide in adolescents and adults and includes 36 items with responses on a 4-point Likert-type scale. High scores on the scale indicate a high probability of suicide. Turkish validity and reliability study was conducted by Atli et al. and Cronbach alpha coefficient is 0.89 (9).

European Organization for Research and Treatment quality of life questionnaire EORTC QLQ C30 (version 3.0): EORTC-QLQ-C30 (version 3) was translated and validated in the Turkish language by Hoopman et al. (10). It has been developed for patients' self-assessment. It is a "30-item cancer-specific questionnaire" designed for patient self-completion. It is organized into functional scales (physical function, role function, cognitive function, emotional function, social function), symptom scales (fatigue, pain, dyspnea, loss of appetite,

insomnia, diarrhea, constipation, nausea–vomiting, and financial difficulties), and global health status. It also includes a single item assessing the overall quality of life. Cronbach alpha coefficient are all above 0.70 except cognitive function subscale which is 0.57 (10). The scale scores are transformed into a 0 to 100 scale. Therefore, a high score on the functional scale represents a high level of functioning; a high score on a symptom scale represents a high severity level of symptoms (11).

Edmonton Symptom Assessment System (ESAS): The ESAS scale was developed by Eduardo Bruera et al. to improve the management of care for patients with cancer (12). The main rule (golden rule) of the symptom assessment is based on the opinion of a patient regarding the severity of his/her symptoms (13). The ESAS is designed to assist in the assessment of nine symptoms that are common in patients with cancer: pain, tiredness, nausea, depression, anxiety, drowsiness, appetite, loss of well-being, and shortness of breath (there is also a line labeled as "Other Problems"). The patients were asked if, in addition to the nine listed symptoms, they have other symptoms. The additional symptoms reported by patients were as follows: (1) skin and nail changes, (2) mouth sores, and (3) hand numbness. The severity at the time of the assessment of each symptom was rated on a numerical scale from 0 to 10, with 0 meaning that the symptom was absent and 10 meaning the worst possible severity.

Multidimensional Scale of Perceived Social Support (MSPSS): It was developed by Zimet et al. and adapted into Turkish by Eker and Arkar (14, 15). Cronbach alpha coefficient is 0.89 in the Turkish version (15). This instrument evaluates the qualitative presence of social support. Each item is graded using a 7-point scale with Likert-type ratings. Totals of the subscale of the instrument vary between 4 and 28, while the total scores can be between 12 and 84. Higher scores indicate higher perceived social support. Accordingly, participants were grouped as "low social support" (12-48 points), "intermediate social support" (49-68 points), and "high social support" (69-84 points).

Statistical analysis

Survey results were analyzed with IBM SPSS 20.0 Statistics (IBM Corporation, New York, USA) package program. Categorical data were indicated by numbers (n) and percentages (%). The numerical data that met the parametric assumptions are shown with arithmetic mean ± standard deviation (mean ± SD) and minimum-maximum (min-max) values; those that did not meet the parametric assumption were expressed with median and interquartile range (IQR). The parametric assumption was assessed by the Kolmogorov-Smirnov test. The Chi-square test was used to compare categorical data. Post-hoc Bonferroni correction was used to compare more than two groups. Mann-Whitney U test was used to compare two independent variables that did not meet the parametric assumptions, and the Kruskal Wallis test was used to compare more than two nonparametric variables. The relationship between the two groups was examined with Spearman's correlation analysis. $p<0.05$ value was considered statistically significant.

RESULTS

Among 122 patients, 67 (54.9%) were women and 55 (45.1%) were men. The average age of the participants was 56,85 ± 13,30. Ninety-nine (81.1%) of the participants were married and 23 (19.9%) were single. 114 (93.4%) patients were religious whereas 8 (6.6%) were not. Ten (8.2%) of them did not have any health insurance and 100 (82%) patients were unemployed.

Seventy-two (59.0%) patients were receiving adjuvant chemotherapy while 50 (41.0%) patients were receiving chemotherapy due to metastatis. Most of the patients had ECOG 0 performance score (n=107; 87.7%). Primary cancer localizations were; 27 (22.1 %) colorectal cancer, 40 (32.8%) breast cancer, 12 (9.8%) lung cancer, 8 (6.6%) gastric or esophageal cancer, 5 (4.1%) pancreatic cancer and 29 (23.8%) cancer of other primaries. There were not statistically significant relationships between SPS scores and age (p=0.225), sex (p=0.167), having metastatic cancer (p=0.174), being religious (p=0.662), marital status (p=0.257), having health insurance (p=0.470) or employment (p= 0.879)

Table 1. SPS scores according to characteristics of the patients.

	n (%)	SPS (mean–sd)	t/U values	p
Age				
<65	82 (67.2%)	85.04–9.57	1.176*	0.242
≥65	40 (32.8%)	82.88–9.47		
Marital Status				
Married	99 (81.1%)	84.62–8.93	0.679*	0.257
Single	23 (19.9 %)	83.11–12.01		
Sex				
Male	55 (45.1%)	83.45–10.91	0.275*	0.167
Female	67 (54.9%)	82.74–9.43		
Metastasis				
Yes	50 (41%)	85.13–10.48	-0.762*	0.174
No	72 (59%)	83.78–8.88		
Religiosity				
Yes	114 (93.4%)	84.42–9.64	391.5**	0.662
No	8 (6.6%)	83.09–8.58		
Health Insurance				
Yes	112 (91.8%)	84.42–9.58	414**	0.470
No	10 (8.2%)	81.69–8.78		
Employment				
Yes	22 (18%)	83.45–10.01	1030.5**	0.879
No	100 (82%)	83.09–10.15		
Smoking				
Yes	27 (22.1%)	90.08–10.14	751**	0.003
No	95 (77.9%)	82.87–8.83		
Suicide thought last month				
Yes	4	98.30–13.96	83.5**	0.029
No	118	83.69–8.92		
Past suicide attempt				
Yes	7	93.01–9.18	190.5**	0.020
No	115	83.81–9.35		

*Independent samplest-test, **Mann Whitney U test,
SPS: Suicide Probability Scale

(Table 1).

The EORTC QLQ-C30 physical function, role function, cognitive function, emotional function, social function subscale scores and global health status scores were 67.73±24.22, 73.80±29.91, 79.58±23.80, 75.35±24.11, 76.40±26.78, and 58.40±26.34 respectively. Cognitive function (p= 0.003, r= -0.267) and emotional function scores (p= 0.006, r= -0.249) were found to be negatively and weakly correlated with SPS scores. Social function (p= 0.019, r= -0.212) scores were found to be negatively and weakly correlated with SPS scores. There were no statistically significant relationships between other function subscales of EORTC QLQ-C30 and SPS (Table 2).

Table 2. Correlations between SPS and EORTC QLQ-C30 subscales.

	Suicide Probability Score	
EORTC QLQ-C30	*r*	*P**
Physical function	-0.108	0.238
Role function	0.00	0.997
Cognitive function	-0.267	0.003
Emotional function	-0.249	0.006
Social function	-0.212	0.019
Global health status	-0.009	0.920

*Spearman's correlation analysis.
SPS: Suicide Probability Scale, EORTC QLQ-C30: European Organization for Research and Treatment Quality of Life Questionnaire

With using Edmonton Symptom Assessment System, we compared symptom severity and suicidality. Only severe insomnia was significantly correlated with high SPS scores (p= 0.012). Other symptoms like pain, fatigue, nausea, constipation, anorexia, shortness of breath and well-being were not found to be related with suicide risk (Table 3).

According to the cut-off scores, 45.9% (n=56) and 18.9% (n=23) of the patients had depression and anxiety, respectively. There was not any statistical significance between SPS scores and having anxiety (p=0.110) or depression (p=0.591) (Table 4).

The average score of MSPSS were 69,80±14,19. There was no statistically significant relationship between SPS and MSPSS scores (p= 0.451).

Table 3. Relationship between ESAS and SPS scores

Symptom Severity	None SPS (mean–sd)	Mild SPS (mean–sd)	Moderate SPS (mean–sd)	Severe SPS (mean–sd)	p
Insomnia	81.06–8.11*	85.46–9.49	83.62–9.14	89.82–10,99*	0.012*
Pain	84.86–9.20	82.12–7.71	84.02–10.35	87.37–11,32	0.237
Fatigue	84.59–8.92	83.58–8.83	82.74–10.29	87.40–10,42	0.328
Nausea	83.76–8.79	84.62–10.68	85.21–9.47	85.69–11.77	0.894
Constipation	84.34–9.41	76.94–10.01	83.23–6.29	91.87–9.71	0.056
Anorexia	84.28–9.77	84.14–8.72	83.90–9.04	85.17–11.16	0.971
Shortness of Breath	83.89–9.08	83.26–10.38	89.03–8,13	84.10–11.24	0.309
Well-being	87.30–8.82	81.88–8.50	83.73–9.04	86.32–11,55	0.124

*The difference between none and severe sample groups
ESAS: Edmonton Symptom Assessment System, SPS: Suicide Probability Scale

DISCUSSION

To the best of our knowledge, this is the first study that examines the association between suicidality and a wide range of demographical, clinical, and psychological factors among newly diagnosed cancer patients in Turkey. We found that having severe insomnia and lower cognitional, emotional, and social functioning is related to higher suicide probability. There was no correlation between suicidality and demographic or social factors among newly diagnosed cancer patients.

Previous studies investigating the associations between physical symptoms and suicidality among cancer patients reported that pain and anorexia enhance suicide risk (16,17). But we didn't find any correlation between suicidality and any symptom except insomnia. Unlike previous studies, we included only newly diagnosed cancer patients who applied to our outpatient clinic. Therefore, pain and lack of appetite may not be as severe as in hospitalized patients which may explain these contradictory results. Thus, only one-sixth of our patients had severe pain and only one-sixth had severe anorexia. Besides, we found that severe insomnia is related to increased suicidality. Consistent with our results, Qingyi et al. demonstrated significant associations between insomnia and suicidal ideation among Chinese patients with cancer (18). Insomnia is generally considered an independent risk factor for suicide. Because after psychiatric disorders and related symptoms are controlled, the risk of suicide continues as long as sleep problems persist (19). It is hypothesized that insomnia may have an indirect effect on suicidal behavior by altering endocrinological and immunological pathways (20). For example, the serotonergic system takes a role in the sleep-wake cycle and its dysfunction is related to suicidal behaviors. Furthermore, insomnia is related to cognitive impairments which is also a mediator for suicide (20). Therefore, clinicians should pay particular attention to the sleep quality of their patients; should screen their patients for sleep disturbances, assess the severity of the problem, and provide appropriate interventions.

It has been shown in many studies that cancer patients frequently experience functional limitations and changes in family and social roles, which lowers their life quality (21,22). Furthermore, lower quality of life has been shown to increase suicidality among cancer patients (23). Consistent with this data we found negative correlation between life quality in terms of cognitive, emotional, and social functioning and suicide probability. Evidence indicates that after diagnosis, cancer patients face significant psychological stress and individuals with poorer cognitive skills are more likely to experience suicidal ideation in response to stress (24,25). We can speculate that receiving a diagnosis of cancer may increase suicidality by increasing stress in patients with lower cognitive functioning in the short term but self-rating scales for cognitive function may have limitations and could be biased.

Cancer patients have an increased risk for depressive and anxiety disorders, affecting 20% and 10% of them, respectively (1). We found depression in almost half of the patients and anxiety in one-fifth. Compared to the literature, the high rates of anxiety and depression in our study may be due to the use of different diagnostic tools and patient group characteristics. In a recent study from Turkey that

Table 4. Relationship between HADS and Suicide Probability

HADS	n (%)	Suicide Probability (mean – sd)	*p*
HADS-A ≥10	23 (18.8%)	91.70 – 10.04	p=0.591
HADS-A <10	99 (82.2%)	82.62 – 8.62	
HADS-D ≥7	56 (45.9%)	85.60 – 10.55	p=0.110
HADS-D <7	66 (54.1%)	83.26 – 8.54	

HADS: Hospital Anxiety and Depression
(A: Anxiety, D: Depression subscale)

used the same tools with our study, the rates of depression and anxiety symptoms were reported similar to our results as 52.7% and 29.2% (26). Contrary to our hypothesis and previous studies, we found no correlation between suicide probability and having anxiety or depression according to HADS (27-29). This is maybe due to the risk of suicide varies depending on the nature of depressive/anxiety disease and other circumstances like the previous history of suicide, age, social status, religiosity, and spiritual beliefs (30,31). Although depression and anxiety disorder rates in Turkey are similar to western countries, suicide rates are much lower (32). This data indicates that suicide is a complex condition that cannot be simplified by diagnosis of psychiatric disorders.

We also did not find any correlation between suicidality and perceived social support which is inconsistent with previous studies (33). Compared to previous studies, we found higher perceived social support scores in our patients. This may indicate that patients have lower expectations from their family, friends, and significant others in the early period and their social support is higher compared to the later stages of the disease. Being an elder is a known risk factor for suicide in both the general population and among cancer patients but we didn't find any enhanced risk in this population. Living in an extended family for all generations thought to protect elderly from loneliness and psychological difficulties.

First and perhaps the most important limitation to our study is the recruitment process of patients; it is not clear whether the patients who refused to participate in the study were less or more prone to the suicide. Lack of motivation to participate may indicate the latter, therefore generalizability of our study is limited. Further limitations arise from the cross-sectional structure of the study, which may increase potential bias of self-reported scales. Also the low number of participants in the study limited our statistical ability to search for further associations by means of regression analyses.

Further studies are needed to examine the potential mediating and moderating factors that may influence the relationship between suicide risk in patients with cancer. Also, further research is needed to develop reliable and valid screening tools for suicide risk in patients with cancer. Finally, future studies should consider using objective measures of cognitive function to validate the self-reported cognitive function scores.

CONCLUSION

There has been no study published in the literature that assesses the correlation between suicide risk and a variety of clinical and sociodemographic characteristics among Turkish cancer patients who have just received a diagnosis. According to our results, special attention must be given to cancer patients with severe insomnia and poorer cognitive, emotional, and social functioning. Suicide prevention needs to be considered as one of the main interventions to the patients diagnosed with cancer, especially in the first month of receiving the diagnosis. So that, oncology medical professionals must be adequately trained and be aware of the warning indicators of suicide when they first deliver the diagnosis.

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Correspondence address: M.D. İhsan Aksoy, Department of Psychiatry, Ataturk Sanatory Training and Research Hospital, Ankara, Turkey drihsanaksoy@gmail.com

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