

ORIGINAL ARTICLE

Evaluation of COVID-19 fear and quality of life in patients with haematopoietic stem cell transplantation during the COVID-19 pandemic

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Abstract

Objective: We aimed to determine the coronavirus disease 2019 (COVID-19) fear state in haematopoietic stem cell transplant patients and to examine its relationship with quality of life.

Methods: In this prospective study, 64 patients who underwent HSCT during the pandemic were included. The COVID-19 fear situation was evaluated with the Fear of COVID-19 Scale (FCV-19S). Quality of life was evaluated with the European Organisation for Quality of Life Research and Treatment Core Questionnaire (EORTC QLQ-C30) (Version 3).

Results: The median FCV-19S score was 16.5 (12.0–22.0). The FCV-19S score was significantly higher in urban residents than rural residents. The general health score was 59.64 ± 20.04 . The strongest positive correlation between fear level and life quality was found in emotional function. A weak, significant, positive correlation was observed between role function, nausea–vomiting, pain, appetite loss and fear level.

Conclusion: FCV-19S is a quick, safe and valid tool that can be used to determine the COVID-19 fear level in vulnerable patient groups such as HSCT patients and to direct them to the necessary psycho-oncological support.

KEYWORDS

COVID-19, FCV-19S, haematopoietic stem cell transplantation, quality of life, SARS-CoV-2

1 | INTRODUCTION

On 11 March 2020, the World Health Organisation (WHO) declared the coronavirus disease 2019 (COVID-19) caused by the SARS-CoV-2 virus a pandemic (Cucinotta & Vanelli, 2020). On the same date, the first COVID-19 case in Turkey was announced. Since then, Turkey, like any country dealing with this pandemic, has taken necessary measures to stop the spread of the COVID-19, including the mandatory imprisonment of citizens, limiting the number of people in public transportation and stores, banning meetings and shutting down schools. In addition to social restrictions, changes have been made in the organisation and functioning

of the healthcare system in hospitals, such as postponing elective surgical procedures, banning attendants, reducing intensive treatments and treating patients by phone. In patients with haematological malignancies, measures were taken, such as reducing intensive induction regimens, postponing radiotherapy and haematopoietic stem cell transplantation (HSCT) (Sahu & Cerny, 2020; Yahalom et al., 2020). The pandemic period was planned to be completed with oral chemotherapeutic agents and targeted therapies during the COVID-19 pandemic for patients scheduled for HSCT (Sahu & Cerny, 2020). However, due to the prolongation of the pandemic process, patients with HSCT indications could not be kept any longer.

HSCT is one of the most effective treatment methods for haematological malignancies, solid tumours and immunodeficiency diseases. But HSCT complications are frequently observed due to conditioning regimes, cytokines, damage-related molecular models and cellular and humoral immune deficiency (Tabbara et al., 2002). Fear and anxiety rates of cancer patients due to treatments and complications have been relatively high at 17%–46% (Rogers et al., 2020). After the COVID-19 pandemic, the high rate of fear and anxiety in this vulnerable patient group may increase even more due to the pandemic's nature and the fear of death due to COVID-19. Infectious diseases cause fear, depression and anxiety (Mowbray, 2020; Tucci et al., 2017).

Fear can cause irrational and ambiguous thoughts in individuals (Ahorsu et al., 2020). This circumstance could make managing HSCT patients more difficult. Current studies on COVID-19 specifically include infectious control and vaccine studies, but few studies on the psychological effects of COVID-19. Also, no studies are evaluating the level of fear in HSCT patients in the current literature. Ahorsu et al. developed the Fear of COVID-19 Scale (FCV-19S). The validity and reliability of this scale have been confirmed in many studies in different countries. We aimed to determine the COVID-19 fear situation with FCV-19S in our highly sensitive HSCT patients and examine its relationship with the quality of life. In this way, it will be ensured that the necessary psycho-oncological supportive care in this patient group can be met at the earliest stage.

2 | MATERIAL AND METHODS

2.1 | Study population and design

In this prospective study, questionnaires were collected from 15 January 15 to 15 March 2021. Patients who underwent HSCT between 11 March 2020 and 31 December 2020 were included. The starting date was taken as 11 March 2020 as it was the date when the first COVID-19 case was detected in our country and was declared a pandemic by WHO. Between these dates, 83 HSCTs, including 46 autologous HSCT (ASCT) and 37 allogeneic HSCT (allo-HCT), were performed in our clinic (Figure 1). Patients under 18 and over 65 years of age were excluded. Tandem HSCTs were also not included. Since the questionnaires were administered to patients who came to the hospital for their routine check-ups, those treated with telemedicine were omitted. Patients from Bahrain and Oman for overseas treatment were excluded from the study because they were followed up after HSCT in their countries. Psychiatric consultation was provided to all patients before HSCT. Those with psychiatric disorders were excluded from the study. As a result, 35 ASCT and 29 allo-HCT patients were included in our study.

2.2 | Research instruments

Age, gender, diagnosis, HSCT type, education level, COVID-19 occurrence alone or in any family member, having children, marital status

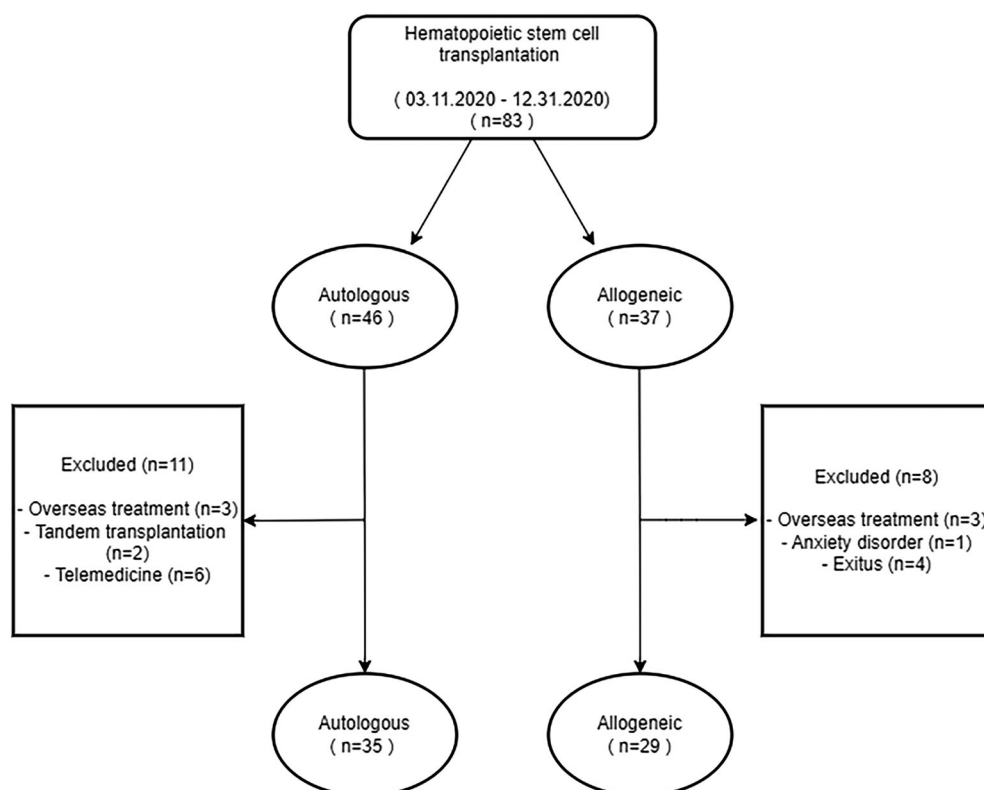


FIGURE 1 Flow chart diagram of patients included in the study

and residence constituted demographic data. Metropolis and province were taken as urban residents, while county, town and village were taken as rural residents. The patients were asked whether they had anxiety about going to the hospital. Subsequently, the FCV-19S and the European Organisation for Quality of Life Research and Treatment Core Questionnaire (EORTC QLQ-C30) were administered.

2.3 | The FCV-19S

The FCV-19S is a unidimensional seven-item scale developed by Ahorsu et al. to measure an adult's fear level (Ahorsu et al., 2020). It is a 5-point Likert scale that uses the values 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*. With this scale, patients can score from 7 up to 35 points. The higher the score, the stronger the fear of COVID-19. The FCV-19S has been one of the most effective tools in assessing the fear of COVID-19 worldwide. It has been validated and reliable in Turkey (Kaya, Dünder, & Çakıroglu, 2020; Satıcı et al., 2020) and many different countries (Martínez-Lorca et al., 2020; Pang et al., 2020; Reznik et al., 2020; Soraci et al., 2020). In the Turkish validity and reliability study, it was analysed with item-total correlations (>0.5) and Cronbach alpha internal consistency coefficients (0.874) (Kaya, Dünder, & Çakıroglu, 2020).

2.4 | EORTC QLQ-C30 (Version 3)

The EORTC QLQ-C30 Version 3.0 quality of life scale is a globally used scale developed by EORTC in cancer patients (Fayers, Bottomley, & EORTC Quality of Life Group, 2002). In Turkey, a content validity and reliability study was carried out by Beşer and Öz. The Cronbach alpha coefficient was $r = 0.9014$ (Beşer & Öz, 2003). The scale consists of three sub-dimensions, namely, general health score (general well-being), functional scale and symptom scale, and includes 30 questions for the previous week. The functional scale includes physical, role, cognitive, emotional and social functions. The symptom scale consists of subtitles of weakness, pain, nausea-vomiting, dyspnea, insomnia, loss of appetite, constipation, diarrhoea and financial difficulty. The first 28 of the 30 items in the scale is a 4-point Likert-type scale, and the items are scored as *not at all* = 1, *a little* = 2, *quite a bit* = 3, *much* = 4. In the 29th question of the scale, the patient is asked to evaluate his health with a scale from 1 to 7 (1 = *very poor* and 7 = *excellent*) and the general quality of life in the 30th question. The 29th and 30th questions in the scale are questions that form the field of general well-being. The high functional scale and general health status scale scores and the low symptom scale scores indicate that the quality of life is high.

2.5 | Statistical analysis

Histogram and q-q plots were examined, and the Shapiro-Wilk test was performed to assess the data normality. To compare the differences between groups, the Mann-Whitney *U* test was used for con-

TABLE 1 Socio-demographic data ($n = 64$)

Variables	Descriptive statistics
Age	45.5 (38.5–57.0)
Gender, n (%)	
Female	21 (32.8)
Male	43 (67.2)
Diagnosis, n (%)	
Acute myeloid leukaemia	12 (18.8)
Acute lymphoblastic leukaemia	8 (12.5)
Multiple myeloma	23 (35.9)
Hodgkin lymphoma	5 (7.8)
Non-Hodgkin lymphoma	9 (14.1)
Other	7 (10.9)
Haematopoietic stem cell transplantation, n (%)	
Autologous	35 (54.7)
Allogeneic	29 (45.3)
Education level, n (%)	
Primary school	21 (33.9)
Middle school	8 (12.9)
High school	21 (33.9)
University	12 (19.4)
Marital status, n (%)	
Unmarried	10 (15.6)
Married	54 (84.4)
Having a child, n (%)	
No	11 (17.2)
Yes	53 (82.8)
Having COVID-19 disease, n (%)	
No	57 (89.1)
Yes	7 (10.9)
Having COVID-19 disease in any family member, n (%)	
No	43 (67.2)
Yes	21 (32.8)
Anxiety about going to the hospital, n (%)	
No	25 (39.1)
Yes	39 (60.9)
Place of residence, n (%)	
Rural	31 (48.4)
Urban	33 (51.6)

Note: Values are expressed as median (first to third quartiles) and n (%).

tinuous variables. To compare the differences among groups, the Kruskal–Wallis test was used for continuous variables. The Bonferroni test was used for multiple comparisons. The relationship among quantitative data was evaluated using the Spearman correlation analysis. Analysis was conducted using Turcosa Cloud (Turcosa Ltd Co, Turkey) software. A *p*-value less than 5% was considered statistically significant.

3 | RESULTS

3.1 | Characteristics of the study group

Sixty-four patients with HSCT were included in this study. The median age was 45.5 (38.5–57.0) years, 21(32.8%) of whom were female. The most diagnosed disease was multiple myeloma, comprising 35.9% (*n* = 23) of all patients. At the educational levels, 33.9% (*n* = 21) had high school education, 33.9% (*n* = 21) primary school, 19.4% (*n* = 12) university and 12.9% (*n* = 8) middle school. In marital status, 84.4% (*n* = 54) of the patients were married, and 82.8% (*n* = 53) had children. Prior COVID-19 disease had affected 10.9% (*n* = 7) of patients and 32.8% (*n* = 21) of their family members. Anxiety about going to the hospital was present in 60.9% (*n* = 39) of the patients. According to the place of residence, 51.6% (*n* = 33) lived in urban areas, and 48.4% (*n* = 31) lived in rural areas. Basic demographic characteristics of patients are shown in Table 1.

3.2 | Outcomes of FCV-19S

The median level of FCV-19S scores was 16.5 (12.0–22.0) (Table 2). The examination of the relationship between the variables in our study and FCV-19S scores is shown in Table 3. The FCV-19S score was significantly higher in those living in urban areas than those living in rural areas [19.0 (15.0–23.5) vs. 14.0 (9.0–22.0); *p* = 0.044]. Also, the FCV-19S score was significantly higher in those who had anxiety about going to the hospital than those without [19.0 (15.0–23.0) vs. 9.0 (8.0–19.5); *p* < 0.001]. No statistically significant difference was observed between other variables and the FCV-19S score (Table 3).

3.3 | Outcomes of EORTC QLQ-C30 (Version 3)

The patients' mean scores from the sub-dimensions of the EORTC QLQ-C30 quality of life scale; The general health score is 59.64 ± 20.04, the functional scale is 69.98 ± 22.64, and the symptom scale is 24.15 ± 24.45 (Table 2). In the functional scale subgroup averages, cognitive function was 78.91 ± 22.47, physical function 71.15 ± 18.63, role function (RF) 69.27 ± 25.93, social function 62.50 ± 27.70 and emotional function (EF) 78.39 ± 21.04.

TABLE 2 Distribution of patients' Fear of COVID-19 Scale and EORTC QLQ-C30 quality of life averages

Variables	Mean/median Standard deviation/range	Items
Fear of COVID-19 scale	16.5 (12.0–22.0)	1–7
EORTC QLQ-C30 quality of life		
Functional scale ^a	69.98 ± 22.64	
Physical functioning	71.15 ± 18.63	1–5
Role functioning	69.27 ± 25.93	6–7
Cognitive functioning	78.91 ± 22.47	20, 25
Emotional functioning	78.39 ± 21.04	21–24
Social functioning	62.50 ± 27.70	26, 27
Global health status ^b	59.64 ± 20.04	29, 30
Symptom scales ^c	24.15 ± 24.45	
Fatigue	35.07 ± 22.94	10, 12, 18
Nausea and vomiting	16.67 ± 26.39	14, 15
Pain	26.04 ± 23.73	9, 19
Dyspnoea	11.98 ± 17.18	8
Insomnia	26.56 ± 26.68	11
Appetite loss	25.00 ± 30.86	13
Constipation	11.98 ± 17.18	16
Diarrhoea	16.15 ± 23.75	17
Financial difficulties	47.92 ± 31.36	28

Note: Values are expressed as median (first to third quartiles).

^aFunctional scale score; it ranges from 0 to 100. High score indicates high functional level.

^bGlobal health status score; it ranges from 0 to 100. High score indicates well-being.

^cSymptom score; it ranges from 0 to 100. High scores indicate that the symptom is severe.

3.4 | Assessment of FCV-19S relationship with EORTC QLQ-C30 (Version 3)

There was no significant correlation between FCV-19S scores and general health scores (Table 4). In terms of functional scale, a positive, weak, significant relationship was observed between FCV-19S scores and role function and emotional function (respectively, *r* = 0.347, 0.474 and *p* < 0.01, <0.01). On the symptom scale, there was a positive, poor, significant relationship between FCV-19S scores and nausea–vomiting, pain and appetite loss (respectively, *r* = 0.259, 0.253, 0.311 and *p* < 0.05, <0.05, <0.05) (Table 4).

4 | DISCUSSION

The COVID-19 pandemic has triggered a wide range of psychological problems such as panic attacks, anxiety, fear, depression, stress and insomnia (Kang et al., 2020; Qiu et al., 2020). Also, fear can lead to an increased risk of developing mental health problems like adjustment disorder and depression (Zhang, Wu, et al., 2020). The COVID-19

TABLE 3 Values of fear of COVID-19 scale in the study group

Variables	Fear of COVID-19 Scale	U	p
Age			
≤46 (n = 33)	17.0 (13.0–22.5)	443.000	0.357
>46 (n = 31)	16.0 (9.0–21.0)		
Gender			
Female (n = 21)	18.0 (14.0–24.0)	380.500	0.309
Male (n = 43)	16.0 (12.0–21.0)		
Diagnosis			
Acute myeloid leukaemia (n = 12)	19.0 (15.3–23.0)	4.081	0.538
Acute lymphoblastic leukaemia (n = 8)	18.5 (13.0–24.3)		
Multiple myeloma (n = 23)	16.0 (9.0–21.0)		
Hodgkin lymphoma (n = 5)	14.0 (12.5–18.5)		
Non-Hodgkin lymphoma (n = 9)	15.0 (11.5–23.5)		
Other (n = 7)	16.0 (9.0–22.0)		
Haematopoietic stem cell transplantation			
Autologous (n = 35)	16.0 (9.0–21.0)	441.500	0.373
Allogeneic (n = 29)	17.0 (13.5–22.5)		
Education level			
Primary school (n = 21)	14.0 (9.0–18.0)	4.303	0.231
Middle school (n = 8)	20.5 (8.3–26.5)		
High school (n = 21)	18.0 (13.5–22.5)		
University (n = 12)	18.5 (15.3–21.0)		
Marital status			
Unmarried (n = 10)	18.5 (16.3–21.3)	235.000	0.517
Married (n = 54)	16.0 (12.0–22.3)		
Having a child			
No (n = 11)	18.0(15.0–21.0)	263.000	0.611
Yes (n = 53)	16.0(12.0–22.5)		
Having COVID-19 disease			
No (n = 57)	17.0 (12.5–22.0)	161.000	0.422
Yes (n = 7)	15.0 (7.0–24.0)		
Having COVID-19 disease in any family member			
No (n = 43)	16.0 (12.0–22.0)	437.500	0.841
Yes (n = 21)	18.0 (12.0–22.0)		
Anxiety about going to the hospital			
No (n = 25)	9.0 (8.0–19.5)	224.500	<0.001
Yes (n = 39)	19.0 (15.0–23.0)		
Place of residence			
Rural (n = 31)	14.0 (9.0–22.0)	361.500	0.044
Urban (n = 33)	19.0 (15.0–23.5)		

Note: Values are expressed as mean ± standard deviation and n (%).

pandemic and its pandemic nature have caused fear and anxiety (Ahorsu et al., 2020). The mortality rate due to COVID-19 has increased 10 times in patients with malignancy (Zhang, Zhu, et al., 2020). Therefore, the rate of fear may be higher in our patient group. To the best of our knowledge, this is the first study during the COVID-19 pandemic to examine the state of fear in HSCT patients.

The FCV-19S score was observed between 16.79 and 27.39 in previous studies (Table 5) (Ahorsu et al., 2020; Bakioğlu et al., 2020; Kaya, Uzdil, & Cakiroğlu, 2020; Martínez-Lorca et al., 2020; Reznik et al., 2020; Sakib et al., 2020; Sigorski et al., 2020; Soraci et al., 2020). In our study, however, the FCV-19S score was observed 16.5 (12.0–22.0). Although the FCV-19S score in our study was lower

than in other studies, these results indicate the presence of fear in our patients. Since the study population and time are different, it is not possible to compare with other studies. Only one of these studies included oncological patients (Sigorski et al., 2020). Most oncological patients perceive cancer as the main threat and do not consider the COVID-19 pandemic a real-life threat (Sigorski et al., 2020). HSCT is performed in our patients by providing remission with intensive chemotherapy and/or radiotherapy. For this reason, patients are afraid of the recurrence of their pre-HSCT disease. Fear of recurrence in our patients may be more than fear of COVID-19. Also, it was reported that patients receiving cancer treatment experienced significant physical and emotional difficulties and anxiety when they feared recurrence after treatment was completed (Holland & Bultz, 2007).

TABLE 4 Investigation of the relationship between Fear of COVID-19 Scale (FCV-19S) and EORTC QLQ-C30 quality of life test scores

Variables	Fear of COVID-19 Scale
Functional scale	
Physical functioning	0.203
Role functioning	0.347**
Cognitive functioning	0.149
Emotional functioning	0.474**
Social functioning	0.343
Global health status	-0.379
Symptom scales	
Fatigue	0.200
Nausea and vomiting	0.259*
Pain	0.253*
Dyspnoea	-0.078
Insomnia	0.233
Appetite loss	0.311*
Constipation	0.208
Diarrhoea	0.113
Financial difficulties	-0.038

* $p < 0.05$.

** $p < 0.01$.

Martínez-Lorca reported that fear was more significant in younger students ($p \leq 0.015$). Romite et al. showed that younger patients with lymphoma in the COVID-19 pandemic have more anxiety ($p = 0.03$). However, no significant relationship was observed between FCV-19S score and age in both our and others' studies (Reznik et al., 2020; Sakib et al., 2020; Soraci et al., 2020). Sigorski et al. reported that fear was more marked in women than men (20.18 ± 7.56 vs. 16.54 ± 6.83 ; $p < 0.001$) ($p = 0.037$). The same study observed that fear was higher in those with breast cancer. However, in our study, no significant difference was found between the FCV-19S score and both gender and diagnoses.

Bakioğlu et al. reported that metropolis and province residents had lower FCV-19S scores than the county and village residents (FCV-19S scores, respectively, 19.36 ± 5.99 , 19.08 ± 6.29 , 20.09 ± 5.78 and 20.03 ± 6.18). However, Fu et al. observed that urban residents had a higher rate of anxiety symptoms than rural residents (30.6% vs. 22.0%) ($p = 0.001$). The FCV-19S score was significantly higher in urban residents than rural residents in our study. The fact that rural residents are away from the pandemic centre may have made them feel relatively safe. The urban resident also experienced the epidemic directly, but rural residents' lives did not change significantly (Fu et al., 2020). A different study observed that rural residents were less engaged in health behaviours such as wearing masks (Callaghan et al., 2021). A certain level of COVID-19 fear encourages people to be cautious against COVID-19 (Harper et al., 2020). Lower fear levels of rural residents may motivate them less to take action against COVID-19. However, since access to healthcare is more difficult in rural areas, it is important to pay attention to healthcare measures in these areas (Liu et al., 2020).

In our study, the relationship between FCV-19S and quality of life was evaluated. The most vital relationship was observed in the emotional function. In the EORTC QLQ-C30, EF consists of four questions about feeling tense, irritable, depressed and worry. It has been shown that fear and anxiety, which are constantly felt in the COVID-19 pandemic, can lead to mental disorders such as depression (Dong & Zheng, 2020). Another significant difference in our study was observed in role function. RF consists of two questions asking whether there is an obstacle preventing doing work or daily activities and pursuing hobbies. RF is affected by social constraints and lockdowns caused by the COVID-19 pandemic. Although weaker, a

TABLE 5 Studies on Fear of COVID-19 Scale (FCV-19S)

Study	Country	Participant number	Age	FCV-19S score
Sigorski et al.	Poland	306	63 (25–87)	18.5 ± 7.44
Kaya et al.	Turkey	1,012	28.3 ± 8.7	19.1 ± 6.3
Reznik et al.	Russia and Belarus	580	34.8 ± 13	$17.22 (7–32)$
Martínez-Lorca et al.	Spain	606	21.59 ± 3.04	16.79 ± 6.04
Soraci et al.	Italy	249	34.5 ± 12.21	16.86 ± 6.06
Ahorsu et al.	Iran	717	31.25 ± 12.68	27.39 ± 6.39
Sakib et al.	Bangladesh	8,550	26.53 ± 9.09	21.38 ± 7.87
Bakioğlu et al.	Turkey	960	-	19.44 ± 6.07

positive correlation was observed between the fear score and nausea–vomiting, pain and loss of appetite. This situation shows that fear will affect the symptom scale in the COVID-19 pandemic.

There are some limitations to our study. First, although our study was the first to evaluate the fear situation in HSCT patients, its single-centre experience is a limitation. Second, our study's nature was cross sectional, so we cannot establish a causal link between pandemic fear and quality of life. Third, there is no threshold value specified for FCV-19S. Therefore, it is not known at what scores FCV-19S is low or high. This makes evaluating FCV-19S more subjective in the current clinical setting. High levels of fear can cause irrational thoughts and mental illness, but low levels can cause a decrease in motivation to take precautions related to COVID-19. Therefore, both the low and high scores of FCV-19S are essential.

5 | CONCLUSION

The median FCV-19S score in our patients who underwent HSCT during the COVID-19 pandemic period was 16.5 (12.0–22.0). The FCV-19S score was observed significantly higher in urban residents than rural residents. The strongest positive correlation between the fear level and quality of life was found in emotional function. Specific psycho-oncological support programmes are required to improve coping styles with the fear of COVID-19 in vulnerable patient populations requiring close monitoring, such as HSCT patients. With the SARS-CoV-2 mutation variants, the pandemic process due to increased contagiousness is prolonged, and this need increases more. In conclusion, FCV-19S is a quick, safe and valid tool to help haemato-oncologists meet this need.

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CONFLICT OF INTEREST

The authors report no conflict of interest. The authors declare that this manuscript has not been published previously and is not currently being assessed for publication by any journal. Each author has contributed substantially to the research, preparation and production of the paper and approves of its submission to the Journal.

DATA AVAILABILITY STATEMENT

The datasets used and analysed during the current study are available from the corresponding author on request.

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