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RESEARCH ARTICLE / ARAŞTIRMA YAZISI

# Preference of Acute Stress Disorder in Patients Diagnosed with Crimean-Congo Hemorrhagic Fever Disease

## Kırım Kongo Kanamalı Ateşi Hastalığı Tanısı Konulan Hastalarda Akut Stres Bozukluğu Yaygınlığı

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**Abstract:**

Crimean-Congo hemorrhagic fever (CCHF) is a severe tick-borne viral infection characterized by high fever, bleeding tendency, and multiple organ failure, with a mortality rate between 5% and 30%. The disease's severe course, isolation requirements, and uncertain prognosis can cause significant psychological stress in patients. Studies examining the development of acute stress disorder (ASD) after CCHF are limited. This study aimed to determine the prevalence of ASD and its related sociodemographic and clinical factors in patients diagnosed with CCHF. Eighty-one patients with confirmed CCHF were included. Clinical interviews were conducted twice by a psychiatrist in accordance with the Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition (DSM-5) criteria. The first interview took place during hospitalization, and the second about 20 days after discharge. Sociodemographic characteristics were assessed using a researcher-designed data form. Data were analyzed using SPSS version 21.0, with chi-square tests for categorical variables and paired samples t-tests for dependent variables. ASD was significantly more common among women, married individuals, and patients with chronic illnesses or prior psychiatric diagnoses. It was also more prevalent in those with a history of bleeding and in patients receiving fresh-frozen plasma treatment. A lower educational level was associated with greater stress responses at the initial assessment. In conclusion, CCHF has long-term psychological and physical consequences. Ongoing psychiatric follow-up, early identification of high-risk groups, and the provision of psychosocial support are essential. These findings emphasize the importance of recognizing psychiatric effects after infectious diseases and can inform future multidisciplinary research.

**Keywords:** Crimean-congo hemorrhagic fever disease, Acute stress disorder, Crimean-congo hemorrhagic fever virus

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**Öz:**

Kırım Kongo Kanamalı Ateşi hastalığı (KKKAH), kene aracılığıyla bulaşan, yüksek ateş, kanama eğilimi ve çoklu organ yetmezliğiyle seyreden, %5–30 oranında ölümcül olabilen ciddi bir zoonotik enfeksiyon hastalığıdır. Hastalığın ağır klinik seyri, izolasyon gerektirmesi ve belirsiz prognozu, hastalarda yoğun psikolojik stres oluşturabilmektedir. Literatürde bu hastalığı geçiren bireylerde akut stres bozukluğu (ASB) gelişimini değerlendiren çalışma sayısı oldukça sınırlıdır. Bu nedenle, bu çalışmada KKKAH tanısı konulan hastalarda ASB yaygınlığının ve ilişkili risk etmenlerinin araştırılması amaçlanmıştır. Tanısı kesinleşmiş 81 hasta çalışmaya dahil edilmiştir. Katılımcılarla Ruhsal Bozuklukların Tanısal ve İstatistiksel El Kitabı-5 (DSM-5) tanı kriterlerine göre iki farklı dönemde klinik görüşme yapılmıştır. İlk görüşme hastanede tedavi sırasında, ikinci görüşme taburculuktan yaklaşık 20 gün sonra gerçekleştirilmiştir. Katılımcıların sosyodemografik özellikleri araştırmacı tarafından hazırlanmış veri formu ile değerlendirilmiştir. Veriler SPSS 21.0 programında analiz edilmiş, kategorik değişkenlerde Ki-kare, bağımlı değişkenlerde eşleştirilmiş örneklem t testi kullanılmıştır. Kadınlarda, evlilerde, kronik hastalığı veya psikiyatrik tanı öyküsü bulunanlarda ASB oranı anlamlı olarak yüksektir. Kanama öyküsü olan ve taze donmuş plazma tedavisi alan hastalarda da ASB gelişimi daha sık gözlenmiştir. Ayrıca eğitim düzeyi düşük olan bireylerde ilk görüşmede stres tepkisinin daha yoğun olduğu görülmüştür. Sonuç olarak, KKKAH sadece bedensel değil, psikolojik olarak da uzun süreli etkiler bırakabilen bir hastalıktır. Bu nedenle taburculuk sonrası psikiyatrik izlemin sürdürülmesi, risk gruplarının erken tanımlanması ve ruhsal destek hizmetlerinin planlanması gereklidir. Bulgularımız, enfeksiyon hastalıkları sonrası psikiyatrik etkilerin erken tanınmasının önemine dikkat çekmekte ve gelecekte yapılacak multidisipliner çalışmalar için yol gösterici olabilecek niteliktedir.

**Anahtar Kelimeler:** Kırım kongo kanamalı ateş hastalığı, Akut stres bozukluğu, Kırım kongo kanamalı ateşi virüsü.

## Introduction

Crimean-Congo Hemorrhagic Fever (CCHF) is a disease caused by the Crimean-Congo Hemorrhagic Fever virus (CCHFV), characterized by severe bleeding during its clinical course. The mortality rate of the disease can reach up to 30% (Moming et al., 2018). How Crimean-Congo Hemorrhagic Fever (CCHF) is transmitted to humans includes tick bites and direct contact with the blood or tissues of infected farm animals or infected humans (Lindeborg et al., 2012). Veterinarians, butchers, and those involved in livestock farming are at higher risk (Sharifi-Mood, Metanat, and Alavi-Naini, 2014).

The clinical course of KKKAH is divided into four stages. The first stage is an incubation period lasting approximately one week. The second stage is the pre-hemorrhagic period, usually lasting less than one week, characterized by nonspecific symptoms such as fever, fatigue, headache, and nausea. The third stage is the hemorrhagic period, lasting less than a week, characterized by bleeding such as petechiae, hematemesis, and melena, and may involve disseminated intravascular coagulation or shock. The fourth stage is the recovery period, beginning 10-20 days after the onset of the disease (Güven et al., 2017).

Serological tests (enzyme-linked immunosorbent assay (ELISA), reverse transcription polymerase chain reaction (RT-PCR)) are generally used for the diagnosis of KKKAH (Metanat et al., 2013). There is no specific treatment for KKKAH; supportive therapy, including fluid therapy and blood products, is used to manage the disease (Johnson et al., 2018).

Recently, the prevalence of tick sightings in Europe has been increasing, and the European Union has prioritized tick-borne diseases among its list of priority diseases (Fanelli and Buonavoglia, 2021). The World Health Organization has classified tick-borne viruses as biosafety level 4 pathogens (Dayer, Dayer, and Rezatofighi, 2015).

Trauma is defined as a response to threatening events such as death, serious injury, or sexual assault that an individual directly experiences, witnesses, or learns about from their close environment, and is associated with intense psychological effects (Turk, 2025). Acute stress disorder (ASD) is a psychiatric condition that typically begins within three days after trauma and can last for up to a month. It includes symptoms such as re-experiencing (nightmares, flashbacks), avoidance (withdrawal from social activities, emotional numbness), and psychophysiological reactivity caused by traumatic stimuli (shortness of breath, sweating, exaggerated startle response) (Jovanovic et al., 2013; Schobinger et al., 2020). Among trauma patients, the prevalence of ASD is reported to range between 7% and 28% (Santana et al., 2017).

KKKAH is an important infectious disease that affects healthcare workers and the public every year (Fanelli and Buonavoglia, 2021). The modes of transmission, the necessity of isolation, the rapid deterioration of clinical course, and the risk of mortality can cause significant psychological stress in patients (Gül et al., 2011). This situation can negatively impact not only physical recovery but also the mental healing process. There are very limited studies in the literature examining the psychiatric outcomes of high-mortality infections like KKKAH; existing data are mainly derived from other viral infections, such as the COVID-19 pandemic (Alshehri and Alghamdi, 2021; Mazza et al., 2020).

Therefore, evaluating the psychological symptoms in patients who have experienced ICU admission is essential not only for individual mental well-being but also for the holistic planning of post-infection care. Recognizing the early signs of acute stress responses in patients facing the risk of death can contribute to the prevention of possible post-traumatic disorders. Additionally, the limited number of studies in this area underscores the need for new data to develop mental health monitoring programs and to strengthen multidisciplinary approaches.

In this context, this study aims to determine the prevalence of asymptomatic bacteriuria (ASB) in patients diagnosed with healthcare-associated infections (HAIs); to evaluate the relationship between the development of ASB and sociodemographic characteristics, as well as the clinical course of the disease (such as bleeding, need for intensive care, transfusion history, etc.). In this way, it is intended to contribute to understanding not only the physical outcomes of the disease but also its psychological effects and to facilitate early psychiatric support planning during the post-infection period.

## Method and Equipment

### Sample

Patients who were hospitalized in the Infectious Diseases ward of XXX Medical Faculty Hospital between 01.04.2021 and 01.01.2022, with a confirmed diagnosis of KKKAH and who were discharged, and who came for a follow-up at the infectious diseases outpatient clinic 25 days after their initial clinical assessment, were included in the study. Inclusion criteria for the study were: being between 18 and 65 years old, not having severe psychiatric or neurological conditions such as intellectual disability, dementia, or psychotic disorders that impair information acquisition or cognitive abilities, and voluntarily agreeing to participate in the study. A total of 81 patients meeting these criteria formed the study group. Written informed consent was obtained from the patients. The research was approved by the Sivas Cumhuriyet University Non-invasive Clinical Research Ethics Committee on 10.03.2021, with decision number 2021-03/34.

### Data collection tools

#### Sociodemographic data form

A questionnaire prepared by the researchers and administered to participants during the interviews. The sociodemographic information form includes details on age, gender, marital status, number of children, education level, occupation, employment status, perceived income level, place of residence, additional disease diagnoses, and psychiatric disorder diagnoses.

#### Diagnostic and Statistical Manual of Mental Disorders - 5 (DSM-5)

The first edition of the Diagnostic and Statistical Manual of Mental Disorders was published by the American Psychiatric Association in 1952, and the second in 1968. These two versions are not diagnostic guides but classifications that generally contain brief descriptions of a few sentences (Sorias, 2011). The third edition of the Diagnostic and Statistical Manual of Mental Disorders was published in 1980 to revise the definitions and treatments of psychiatric illnesses (Atbaşoğlu and Gülöksüz, 2013). In 1987, the third edition was revised, and in 1994, the fourth edition was published. The approach in these versions is similar, but some criteria, definitions, and categories have changed (Sorias, 2011).

The fifth and final edition of the Diagnostic and Statistical Manual of Mental Disorders was published in 2013 (Möller, 2018). In this version, alongside the categorical approach to conceptualizing psychopathologies, a dimensional approach is also included (Kraemer, 2007).

ASB: It is characterized as a disorder defined by the presence of nine or more symptoms from any five clusters, including involuntary symptoms, negative mood, dissociation, avoidance, and hyperarousal, which begin or worsen after traumatic events according to DSM-5. The duration of these symptoms ranges from 3 days to 1 month after exposure to trauma (Chapa-Koloffon et al., 2021). In our study, two clinical interviews were conducted with patients by an experienced psychiatrist at different time points within one month after experiencing the traumatic event. During both clinical interviews, the DSM-5 criteria for ASB were individually assessed, and based on the number of symptoms and their impact on the patient's functioning, a diagnosis of ASB was made. The effect of the COVID-19 pandemic on patients' stress levels at the time of the study was not accounted for.

### Statistical method

In this study, SPSS (Statistical Package for the Social Sciences, Chicago, IL, USA) version 21.0 was used for statistical analysis of the data. For descriptive statistics, mean and standard deviation values were used for continuous variables; for discrete variables, frequency and percentage values were used. To assess the normality of the measurement data, the arithmetic mean, mode, median, skewness, and kurtosis were examined.

The Chi-square test was used to compare two or more groups in categorical data. To compare mean values within dependent groups, the paired-samples t-test was used because the assumptions of parametric tests were met.

The analysis results were evaluated within a 95% confidence interval, and $p<0.05$ was considered statistically significant.

## Findings

A total of 81 KKKA patients were included in the study. Of the patients, 33 (40.7%) were women and 48 (59.3%) were men. Sixty-one (75.3%) of the patients were married, and 20 (24.7%) were single. The patients' socio-demographic data are presented in Table 1.

**Table 1.** *Demographic Information*

| Variables | n | % |
|---|---|---|
| **Age** | | |
| 18-29 | 17 | 21.0 |
| 30-39 | 12 | 14.8 |
| 40-49 | 16 | 19.8 |
| 50-59 | 20 | 24.7 |
| 60+ | 16 | 19.8 |
| **Gender** | | |
| Woman | 33 | 40.7 |
| Men | 48 | 59.3 |
| **Marital Status** | | |
| Married | 61 | 75.3 |
| Single | 20 | 24.7 |
| **Educational Status** | | |
| Illiterate | 10 | 12.3 |
| Primary School | 36 | 44.4 |
| Secondary School | 16 | 19.8 |
| High School | 10 | 12.3 |
| College/University | 9 | 11.1 |
| **Profession** | | |
| Unemployed | 16 | 19.8 |
| Civil Servant | 5 | 6.2 |
| Laborer | 7 | 8.6 |
| Farming/Animal Husbandry | 53 | 65.4 |
| **Additional Illness** | | |
| None | 60 | 74.1 |
| Present | 21 | 25.9 |
| **Previous Psychiatric Diagnosis** | | |
| None | 72 | 88.9 |
| Present | 9 | 11.1 |

At the time of the first clinical consultation, 17 patients (21%) had received fresh-frozen plasma, 13 (16%) had received platelet apheresis, 2 (2.5%) had required intensive care, and 6 (7.4%) had experienced bleeding. Table 2 summarizes the clinical course of Crimean-Congo Hemorrhagic Fever.

**Table 2.** *Clinical Course of Crimean-Congo Hemorrhagic Fever and Findings at First Examination*

| Variables | n | % |
|---|---|---|
| **Fresh Frozen Plasma** | | |
| Not Received | 64 | 79.0 |
| Received | 17 | 21.0 |
| **Platelet Apheresis** | | |
| Not Received | 68 | 84.0 |
| Received | 13 | 16.0 |
| **History of Intensive Care** | | |
| None | 79 | 97.5 |
| Present | 2 | 2.5 |
| **History of Bleeding** | | |
| None | 75 | 92.6 |
| Present | 6 | 7.4 |

At the second clinical visit, unlike the first, 18 patients (22.2%) received fresh-frozen plasma, 14 (17.3%) received platelet apheresis, 4 (4.9%) required intensive care, and 7 (7.4%) experienced bleeding. Table 3 shows the variables associated with the development of acute stress disorder.

**Table 3.** *Clinical Course of Crimean-Congo Hemorrhagic Fever and Findings from the Second Examination*

| Variables | n | % |
|---|---|---|
| **Fresh Frozen Plasma** | | |
| Not Received | 63 | 77.8 |
| Received | 18 | 22.2 |
| **Platelet Apheresis** | | |
| Not Received | 67 | 82.7 |
| Received | 14 | 17.3 |
| **History of Intensive Care** | | |
| None | 77 | 95.1 |
| Present | 4 | 4.9 |
| **History of Bleeding** | | |
| None | 74 | 92.6 |
| Present | 7 | 7.4 |

When examining the relationship between sociodemographic characteristics and the development of acute stress disorder, it was found that the development of acute stress was higher in women, married individuals, those with chronic illnesses, and those with a psychiatric history in both clinical assessments. No relationship was found with age or occupation. After the first clinical assessment, those with a lower education level showed a higher rate of acute stress development, but no difference was observed after the second assessment. Table 4 shows the relationship between sociodemographic features and acute stress disorder.

**Table 4.** *The Relationship Between Socio-Demographic Characteristics and the Development of Acute Stress Disorder*

| Variables | Acute Stress Diagnosis in the 1st Clinical Interview | | | | | Acute Stress Diagnosis in the 2nd Clinical Interview | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | None | | Present | | | None | | Present | | |
| | N | % | N | % | p | N | % | N | % | p |
| **Age** | | | | | | | | | | |
| 18-29 | 15 | 88.2 | 2 | 11.8 | | 15 | 88.2 | 2 | 11.8 | |
| 30-39 | 9 | 75.0 | 3 | 25.0 | | 8 | 66.7 | 4 | 33.3 | |
| 40-49 | 9 | 56.3 | 7 | 43.8 | | 10 | 62.5 | 6 | 37.5 | |
| 50-59 | 10 | 50.0 | 10 | 50.0 | p=0.081 | 10 | 50.0 | 10 | 50.0 | p=0.189 |
| 60+ | 8 | 50.0 | 8 | 50.0 | | 10 | 62.5 | 6 | 37.5 | |
| **Gender** | | | | | | | | | | |
| Woman | 16 | 48.5 | 17 | 51.5 | | 16 | 48.5 | 17 | 51.5 | |
| Men | 35 | 72.9 | 13 | 27.1 | p=0.025 | 37 | 77.1 | 11 | 22.9 | p=0.008 |
| **Marital Status** | | | | | | | | | | |
| Married | 34 | 55.7 | 27 | 44.3 | | 35 | 57.4 | 26 | 42.6 | |
| Single | 17 | 85.0 | 3 | 15.0 | p=0.019 | 18 | 90.0 | 2 | 10.0 | p=0.008 |
| **Educational Status** | | | | | | | | | | |
| Illiterate | 6 | 60.0 | 4 | 40.0 | | 6 | 60.0 | 4 | 40.0 | |
| Primary School | 16 | 44.4 | 20 | 55.6 | | 18 | 50.0 | 18 | 50.0 | |
| Secondary School | 13 | 81.3 | 3 | 18.8 | | 12 | 75.0 | 4 | 25.0 | |
| High School | 9 | 90.0 | 1 | 10.0 | p=0.021 | 9 | 90.0 | 1 | 10.0 | p=0.051 |
| College/University | 7 | 77.8 | 2 | 22.2 | | 8 | 88.9 | 1 | 11.1 | |
| **Profession** | | | | | | | | | | |
| Unemployed | 10 | 62.5 | 6 | 37.5 | | 10 | 62.5 | 6 | 37.5 | |
| Civil Servant | 1 | 20.0 | 4 | 80.0 | | 3 | 60.0 | 2 | 40.0 | |
| Laborer | 5 | 71.4 | 2 | 28.6 | p=0.222 | 5 | 71.4 | 2 | 28.6 | p=0.970 |
| Farming/Animal Husbandry | 35 | 66.0 | 18 | 34.0 | | 35 | 60.0 | 18 | 34.0 | |
| **Additional Illness** | | | | | | | | | | |
| None | 43 | 71.7 | 17 | 28.3 | | 45 | 75.0 | 15 | 25.0 | |
| Present | 8 | 38.1 | 13 | 61.9 | p=0.006 | 8 | 38.1 | 13 | 61.9 | p=0.002 |
| **Previous Psychiatric Diagnosis** | | | | | | | | | | |
| None | 51 | 70.8 | 21 | 29.2 | p<0.001 | 52 | 69.3 | 20 | 26.7 | p=0.001 |
| Present | 0 | 0 | 9 | 100 | | 1 | 11.1 | 8 | 88.9 | |

When examining the relationship between the course of the disease and the development of acute stress disorder, it was found that the incidence of acute stress was higher in those who received fresh frozen plasma treatment and in those with a history of bleeding, based on both clinical assessments. No correlation was found with the need for intensive care. Table 5 shows the relationship between the course of the disease and the development of ASD.

**Table 5.** *The Relationship Between Disease Course and Development of Acute Stress Disorder*

| Variables | Acute Stress Diagnosis in the 1st Clinical Interview | | | | | Acute Stress Diagnosis in the 2nd Clinical Interview | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | None | | Present | | | None | | Present | | |
| | N | % | N | % | p | N | % | N | % | p |
| **Fresh Frozen Plasma** | | | | | | | | | | |
| Not Received | 46 | 71.9 | 18 | 28.1 | | 47 | 73.4 | 16 | 26.6 | |
| Received | 5 | 29.4 | 12 | 70.6 | p=0.001 | 6 | 35.3 | 12 | 64.7 | p=0.001 |
| **Platelet Apheresis** | | | | | | | | | | |
| Not Received | 46 | 67.6 | 22 | 32.4 | | 48 | 70.6 | 19 | 29.4 | |
| Received | 5 | 38.5 | 8 | 61.5 | p=0.062 | 5 | 38.5 | 9 | 61.5 | p=0.015 |
| **History of Intensive Care** | | | | | | | | | | |
| None | 51 | 64.6 | 28 | 35.4 | | 52 | 65.8 | 25 | 34.2 | |
| Present | 0 | 0.0 | 2 | 100.0 | p=0.134 | 1 | 50.0 | 3 | 50.0 | p=0.117 |
| **History of Bleeding** | | | | | | | | | | |
| None | 50 | 66.7 | 25 | 33.3 | | 52 | 69.3 | 22 | 30.7 | |
| Present | 1 | 16.7 | 5 | 83.3 | p=0.024 | 1 | 16.7 | 6 | 83.3 | p=0.006 |

Additionally, patients' stress levels during the first clinical interview were higher than during the second. Table 6 presents a comparison between the first and second clinical interviews

**Table 6.** *Comparison of Acute Stress Levels in the First and Second Clinical Interviews*

| Situation | Test Group | n | $\bar{X}$ | s.s | t | p |
|---|---|---|---|---|---|---|
| Acute Stress | 1. Clinical Interview | 81 | 4.990 | 4.150 | 3.114 | 0.003 |
| | 2. Clinical Interview | 81 | 4.280 | 4.480 | | |

## Discussion

In this study, the relationship between the development of acute stress disorder (ASD) and sociodemographic and clinical variables was evaluated in individuals diagnosed with Crimean-Congo Hemorrhagic Fever (CCHF). The findings showed that female gender, being married, a history of chronic illness, a previous psychiatric diagnosis, a history of bleeding, and fresh frozen plasma treatment were significantly associated with the development of ASD. These results indicate that CCHF leads to not only physical but also psychological consequences, highlighting the necessity of psychiatric follow-up after discharge, especially in high-risk patients.

There are relatively few studies investigating the psychiatric effects associated with KKKAH in the literature. Therefore, data from similar viral infections have been used for comparison. For example, after the COVID-19 pandemic, it has been reported that symptoms of stress disorder and anxiety are common (Morkoç and Sezer, 2024). This finding suggests that isolation, uncertainty, and fear of death experienced during the infection process may also cause similar acute stress responses in patients with KKKAH.

Acute stress disorder is a short-term response that occurs after a traumatic event and is a risk factor for the development of post-traumatic stress disorder (PTSD) (Bryant et al., 2000). Diseases with high mortality rates and requiring isolation, such as COVID-19, can predispose individuals to persistent traumatic stress responses (Cénat et al., 2020; World Health Organization (WHO), 2025). In this study, the identified symptoms of ASD are considered to be related to the severity of the illness, clinical isolation conditions, and the perception of risk of death. The findings indicate that infectious diseases are not only physical health issues but also traumatic processes that affect mental well-being (Chapa-Koloffon et al., 2021).

A higher incidence of ASB development has been observed in women compared to men. Similarly, individuals who have experienced COVID-19 infection have been reported to show higher levels of stress disorder symptoms in women (Mei et al., 2022; Tu et al., 2021). This situation suggests that stress responses in women are more pronounced due to biological, hormonal, and social factors (Farhane-Medina et al., 2022). Additionally, it is noteworthy that married individuals are more likely to develop ASB than single individuals. In Turkish society, the high burden of family responsibilities, especially regarding spouse and child care, can increase anxiety levels in individuals who have experienced a life-threatening illness. Although previous studies have reported variable results regarding marital status (Dehelean et al., 2021; Wang et al., 2021), this supports the influence of cultural factors on stress responses.

The relationship between education level and the development of ASD was significant in the first clinical interview, but no difference was observed in the second interview. This finding suggests that individuals with lower education levels may initially have more limited coping skills for stress, but their psychological adaptation increases as the disease progresses. The literature also indicates that low education levels may increase the risk of traumatic stress disorder (Ju et al., 2021). Therefore, providing psychosocial support early on for individuals with low education levels may facilitate mental recovery.

Individuals with chronic illnesses were found to have a significantly higher development of ASB. This finding is consistent with evidence suggesting that chronic illness can worsen the course of infection and increase fear of death (Alshehri and Alghamdi, 2021; Zhang et al., 2024). Similarly, those with a history of psychiatric diagnosis were more frequently observed to develop ASB. It is thought that current psychological vulnerabilities may increase sensitivity to stressors and amplify the impact of traumatic events (Mazza et al., 2020; Park et al., 2020). This finding indicates that a history of psychiatric diagnosis should be considered in clinical follow-ups.

When examining the clinical features of the disease, the development of ASB is significantly higher in patients with a history of bleeding and who received fresh frozen plasma treatment. This finding indicates that the severity of the disease increases psychological effects. Previous studies have also reported that in patients with KKKAH, the risk of developing stress disorder rises as bleeding and transfusion requirements increase (Gül et al., 2011; Gül et al., 2012). The significant association observed with platelet apheresis treatment during the second assessment may suggest that the stress is re-triggered by the prolonged treatment process. However, no significant relationship was found between intensive care treatment and ASB; this may be related to the small number of patients receiving intensive care. Different results have been reported in the literature on this subject (Mongodi et al., 2021; Tarsitani et al., 2021).

In conclusion, acute stress disorder is common among patients who experience KKKAH and is associated with various sociodemographic and clinical factors. Even if physical recovery is achieved, the psychological effects may last longer and should be taken into account. Therefore, it is particularly important to continue psychiatric follow-up after discharge in individuals with a history of bleeding, chronic illness, low educational level, and a past psychiatric diagnosis. The findings emphasize the need for a holistic assessment of the biopsychosocial aspects of infectious diseases and serve as a guide for future multidisciplinary research.

This study has some limitations. The research was conducted at a single center, and the sample size is limited; therefore, the generalizability of the results may be restricted. Since the data were collected cross-sectionally, the long-term course of acute stress disorder could not be evaluated. The psychiatric histories of the participants are based on their self-reports, and the possibility of recall bias cannot be ignored. Additionally, including only cases followed in the hospital may exclude mild cases managed outside the hospital. Future multicenter, large-sample, and prospective studies are believed to strengthen the knowledge in this field.

## Declarations

**Ethics approval and participation permission**
The research was approved by the Non-Interventional Clinical Research Ethics Committee of Sivas Cumhuriyet University on March 10, 2021, with decision number 2021-03/34.

**Participant consent**
Written informed consent has been obtained from all individuals participating in the study.

**Availability of data and materials**
The data obtained during the study can be provided by the responsible author upon request.

**Conflict of interest**
The authors declare that there is no conflict of interest.

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**Author contributions**
BT wrote the methods, discussion, summary, and abstract sections of the study; contributed to the overall writing and editing of the article. NK analyzed and interpreted the research data and contributed to the writing and editing process of the article. All authors have read and approved the final version of the manuscript.

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