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The Effect of Epidemic Anxiety on Perceived Stress Level in The Students of Sport Sciences Faculty: The Mediating Role of Intolerance of Uncertainty*

Emrah SEÇER[1], Oğuz Kaan ESENTÜRK[1], Yunus Emre YARAYAN[2], Ekrem Levent İLHAN[3], İbrahim YILDIRAN[3]

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ORIGINAL ARTICLE

[1]Erzincan Binali Yıldırım University, Faculty of Sport Sciences, Erzincan/Türkiye

[2]Siirt University, Physical Education and Sports High School, Siirt/Türkiye

[3]Gazi University, Faculty of Sport Sciences, Ankara/Türkiye

Correspending Author:
Emrah SEÇER
emrahsecer10@gmail.com

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Abstract

This study was conducted to examine the role of intolerance of uncertainty in the effect of pandemic anxiety on perceived stress levels among university students studying sports sciences. The study, designed using a survey model, included 605 sports science faculty students (359 male and 246 female). Data were collected using the Pandemic Anxiety Scale (PAS), Perceived Stress Scale (PSS), and Intolerance of Uncertainty Scale (IUO). In analyzing the data, confirmatory factor analysis (CFA) was first performed to test the measurement model. Correlation tests and regression analysis based on the Bootstrap method were then applied to examine the study's hypotheses. The study found a positive relationship between PAS and PSS and IUO (Hypothesis I). According to the results of the regression analysis based on the Bootstrap method, it was determined that PAS had a significant effect on IUO. When a mediating variable was added to the model proposed in the study, it was found that PAS was a significant predictor of PSS. Additionally, when PAS was held constant, it was determined that IUO had a significant effect on PSS. Finally, it was determined that PAS has a significant indirect effect on PSS through IUO (Hypothesis II). The findings of the study indicate that controlling factors that create uncertainty is necessary for students to protect themselves from the stress caused by pandemic anxiety.

Keywordsr: Mediating Effect, Uncertainty, Anxiety, Stress.

Spor Bilimleri Fakültesi Öğrencilerinde Salgın Hastalık Kaygısının Algılanan Stres Düzeyine Etkisi: Belirsizliğe Tahammülsüzlüğün Aracılık Rolü

Öz

Bu araştırma spor bilimleri alanında öğrenim göre üniversite öğrencilerinin salgın hastalık kaygılarının algıladıkları stres düzeylerine etkisinde belirsizliğe tahammülsüzlüğün rolünü incelemek amacıyla yapılmıştır. İlişkisel tarama modelinde tasarlanan araştırmaya, 605 spor bilimleri fakültesi öğrencisi (359 erkek ve 246 kadın) katılmıştır. Araştırmanın verileri, Salgın Hastalık Kaygısı Ölçeği (SHKÖ), Algılanan Stres Ölçeği (ASDÖ) ve Belirsizliğe Tahammülsüzlük Ölçeği (BTÖ) kullanılarak toplanmıştır. Verilerin çözümlenmesinde, ilk olarak ölçüm modelinin test edilmesi amacıyla doğrulayıcı faktör analizi yapılmıştır (DFA). Araştırmanın hipotezlerinin incelenmesinde ise, korelasyon testi ve Bootstrap yöntemini esas alan regresyon analizi uygulanmıştır. Araştırmada, SHK ile AS ve BT arasında pozitif yönlü ilişki tespit edilmiştir (Hipotez I). Bootstrap yöntemini esas alan regresyon analizi sonuçlarına göre, SHK'nın BT üzerinde anlamlı bir etki yarattığı belirlenmiştir Araştırmada öne sürülen modele aracı değişken eklendiğinde, SHK'nın AS'nin anlamlı bir yordayıcısı olduğu tespit edilmiştir. Ayrıca SHK sabit tutulduğunda, BT'nin AS üzerinde anlamlı bir etkisinin olduğu belirlenmiştir. Son olarak, SHK'nın BT aracılığıyla AS üzerindeki dolaylı etkisinin (Hipotez II) anlamlı olduğu tespit edilmiştir. Araştırmada elde edilen bulgular, öğrencilerin salgın hastalık kaygılarının yarattığı stresten korunabilmelerinde, belirsizlik yaratan faktörlerin kontrol edilmesi gerektiğini işaret etmektedir.

Anahtar Kelimeler: Aracı Etki, Belirsizlik, Kaygı, Stres.

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Giriş

Epidemic Anxiety and Perceived Stress Level

Throughout history, humanity has occasionally faced epidemics and pandemics that have had a global impact, such as the plague, smallpox, leprosy, malaria, and cholera (Qiu et al., 2016). Recent global epidemics have significantly affected individuals' mental health and caused a marked increase in anxiety levels. Epidemic disease anxiety leads to an increase in the stress perceived by individuals due to uncertainty and health threats (Taylor et al., 2020). In particular, this anxiety has been found to negatively affect psychological well-being among young adults (Asmundson & Taylor, 2021; Solmaz et al., 2024; Küçükalpelli et al., 2025). The most recent and effective example of such epidemics, the COVID-19 pandemic, emerged in December 2019 in Wuhan, China, and quickly turned into a global public health crisis (Stanton et al., 2020). Due to its potentially fatal effects, the pandemic has been considered a serious source of anxiety for individuals (Tekin, 2020). Anxiety is defined by the Turkish Language Association as "sadness, worrying thoughts, grief"; psychologically, it is explained as a natural defense mechanism developed by individuals in response to situations where they perceive a threat and do not feel safe (TDK, 2025). It is defined as a negative emotional state characterized by tension and restlessness based on anxiety about the future, arising from an individual's perception of a threat to their life and future (Passer & Smith, 2012). The economic problems experienced on a global scale have triggered sociological difficulties at the societal level; in addition, the negative effects of the pandemic on individuals' psychological health have further deepened its societal impact (Belostecinic et al., 2022; Ho et al., 2020). This situation has been strongly felt in the world of sports, as in many other areas. In particular, the infection of well-known athletes playing for major clubs with COVID-19 has created a serious atmosphere of concern among stakeholders in the sports community (Meijer & Webster, 2020; Polatcan & Kaptangil, 2021; Yarayan et al., 2025). Measures implemented during the pandemic, such as social distancing rules, mandatory mask wearing, travel restrictions, curfews, and the cancellation of sporting events, have seriously disrupted athletes' daily routines and training programs (Ebrahim et al., 2020; Mehrsafar et al., 2020). In this context, the postponement of the Tokyo 2020 Olympic Games has become a symbol of both emotional and professional uncertainty and stress for athletes (Gallego et al., 2020; Toresdahl & Asif, 2020). During the pandemic, hyperventilation experienced by athletes in group sports activities increases the risk of transmission, even when social distancing rules (1.5 meters) are followed. This is because droplets of various sizes can spread up to 7-8 meters, contributing to the transmission of the disease (Bourouiba, 2020). In the early stages of the pandemic, the lack of treatment and vaccine solutions increased uncertainty, leading to heightened feelings of anxiety and fear among athletes (Ahorsu et al., 2020). Sports scientists emphasize the need for more

psychological support and strategies to protect athletes' mental health during the pandemic (Solmaz & Yarayan, 2025). Furthermore, negative comments spread by social networks and media, along with the rising death rates and increasing numbers of patients in intensive care, deepened athletes' feelings of fear, stress, and panic (Lai et al., 2020). These factors have negatively affected athletes' performance and overall well-being, making the importance of sports psychology even more evident during the pandemic. The cessation of sports activities, the loss of goals, and the decrease in physical activity levels have caused athletes to face negative emotional states such as anxiety, stress, and loss of motivation (Sevinç Yılmaz & Seçer, 2022). During this process, sports science faculty students and active athletes have become a special risk group psychologically due to concerns about both performance and health. Lack of training, social isolation, and constant uncertainty have increased perceived stress levels in these individuals; therefore, the relationship between pandemic anxiety and stress is more pronounced in these groups (Clemente-Suárez et al., 2020). All this information shows that pandemic anxiety causes serious psychological pressure on individuals. At this point, it is important to comprehensively address the stress levels experienced by individuals, and athletes in particular, during the pandemic. In this context, a detailed analysis of psychological factors such as stress, fear, and anxiety caused by the disease during the pandemic is of great importance in understanding the effects of the pandemic on mental health and in developing effective strategies to protect human health during similar crisis periods (Wang et al., 2020). Similarly, fear arising from large-scale health crises such as pandemics leads to an increase in anxiety and stress levels in healthy individuals and exacerbates existing symptoms in individuals with pre-existing psychiatric disorders (Shigemura et al., 2020). The inability of athletes to train regularly and participate in competitions during the pandemic has brought with it the fear of losing performance (Fernandes et al., 2025). During this process, psychological problems such as increased anxiety levels, excessive irritability, stress, and emotional fluctuations have been observed to occur frequently among athletes.

The concept of perceived stress, which is shaped based on individuals' subjective assessments of events or situations they encounter in their lives (Bedini et al., 2011), refers to the stress levels experienced by the individual at a given moment or the intensity of emotions and thoughts during a specific time period (Shaw et al., 2017). When it comes to athletes in particular, the effects of perceived stress become more pronounced on performance and psychological health. It is known that stress is one of the main causes of burnout in athletes (Gustafsson et al., 2017). In this context, it can be said that perceived stress has negative effects on athletes, causing performance loss, low motivation, and psychological distress (Karababa and Bedir, 2025). When faced with a negative life event, such stress situations and the individual's perception of stress can be exacerbated by the lack of social relationships necessary to maintain overall well-being (Segrin & Rynes, 2009). In this context, it is suggested that the current emergency situation may have a strong emotional impact on

individuals (Xiang et al., 2020). Under conditions characterized by uncertainty and restrictions, increased negative emotions and emotional distress are particularly notable (Lades et al., 2020). Considering the negative effects of turbulent times on an individual's emotional and physical experience, it is thought that these worrying and stressful situations may also affect athletes' emotional experiences and psychobiological states related to emotions; thus, they may lead to functional or dysfunctional outcomes on their performance (Di Fronso et al., 2020). Sun et al. (2020) suggest that the COVID-19 pandemic has increased the risk of anxiety and/or depression among university students, highlighting the need to consider the effects of pandemic anxiety on individuals' mental health. Particularly in individuals with high levels of anxiety sensitivity (DeGrace et al., 2021), the pandemic process has been associated with intense stress, psychological distress, and health concerns. This situation leads to an increase in perceived stress levels and causes individuals to perceive pandemic-related threats as larger and more unmanageable. Athletes have also been significantly affected by this process. Uncertainties related to the pandemic and health concerns, combined with factors such as being away from competitions, fear of not meeting performance expectations, and disruption of training routines, have further increased perceived stress levels. It has been suggested that this increase may have contributed to the development of anxiety and depression symptoms in athletes (Landeghem & Jakobson, 2025). These psychological factors can also directly affect athletes' tolerance levels for uncertainty. Living in a world full of uncertainty can cause emotional responses such as fear, anxiety, and stress in individuals. However, the intensity of these emotions and the way individuals cope with this situation vary from person to person and from culture to culture. While some cultures perceive uncertainty as a serious threat and develop strict rules and structures to control it, others may view uncertainty as intriguing and a natural part of individual development (Şahinler, 2021).

The Mediating Role of Intolerance of Uncertainty

Intolerance of uncertainty refers to the discomfort and anxiety individuals experience in the face of uncertainty and uncontrollable situations related to the future (Carleton, 2016). In unpredictable crisis periods such as epidemics, intolerance of uncertainty emerges as an important factor contributing to increased psychological stress. Intolerance of uncertainty is the tendency of individuals to struggle with emotional, cognitive, and behavioral responses to unknown or unpredictable situations (Dugas et al., 2004). It has been noted that individuals with high levels of uncertainty experience greater psychological distress in situations that cause anxiety and stress (Buhr & Dugas, 2002). According to Koerner and Dugas (2006), intolerance of uncertainty is the tendency of individuals to think negatively about uncertain events and their outcomes. Uncertainty can cause unease, insecurity, and stress in individuals; in some cases, it can lead to reactions such as anxiety

and anger. According to psychological stress and coping theory, the main factor that triggers stress in individuals is often not the event itself, but how the event is perceived. In this context, uncertainty does not have a direct effect, but rather affects individuals through the anxiety and fear it creates (Öz, 2001).

The conflicting and confusing information presented to the public about the pandemic has led to increased levels of anxiety in individuals (Egunjobi, 2020). Uncertainty about the nature of the pandemic, the constant sharing of death statistics, unpredictability about the future, and questions about the adequacy of the measures taken are among the main factors that increase anxiety levels in individuals (Moghanibashi-Mansourieh, 2020). In this context, sports science students and athletes have also been directly confronted with pandemic-specific uncertainties. Situations such as training cancellations, competition postponements, and uncertain expectations regarding their performance may have paved the way for the development of high levels of intolerance to uncertainty in this group of individuals. Intolerance of uncertainty stands out as an important psychological factor contributing to increased perceived stress levels. Therefore, the mediating role of this variable during the pandemic is of critical importance in terms of athlete psychology and performance management.

The hypotheses of the study conducted to examine the effect of epidemic disease anxiety on the perceived stress level of sports science faculty students and the mediating effect of intolerance to uncertainty in this effect are as follows:

H1: There is a positive relationship between epidemic disease anxiety and perceived stress levels.

H2: Intolerance of uncertainty plays a mediating role in the relationship between epidemic disease anxiety and perceived stress levels.

Method

Research Model

This study examined the relationship between pandemic anxiety and perceived stress levels among university students enrolled in sports science faculties. In addition, the mediating role of intolerance of uncertainty in this relationship was investigated. Within this scope, the research was designed using the correlational survey model from quantitative research models (Büyüköztürk et al., 2024). In research, the examination of mediating variables is important in terms of expanding the existing body of knowledge, contributing to studies in a unique way, and presenting social reality in a more comprehensive manner (Gürbüz, 2021). In this regard, the theoretical model to be tested in the present study is presented in Figure 1.

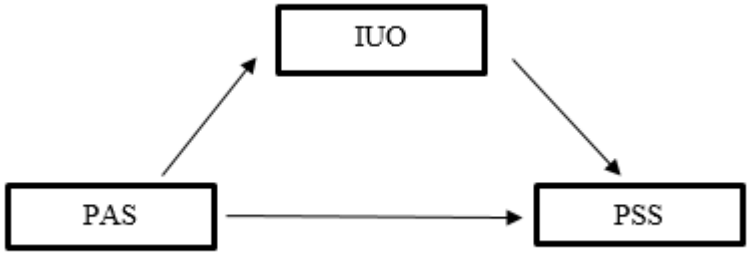


Figure 1. Proposed Theoretical Model

Research Group

In this study, a power analysis based on multiple regression analysis was performed using G*Power software to evaluate whether the sample size was statistically sufficient. The analysis revealed that, based on 95% statistical power (1-β = .95), a 5% significance level (α = .05), and a medium effect size (f^2 = 0.10), a minimum of 215 participants were required to achieve meaningful results. However, in line with the recommendations of Suresh and Chandrashekara (2012), which take into account possible data losses or missing data, the sample size was increased by approximately 10% to obtain more reliable results. In this context, 605 active sports students enrolled in sports science faculties at universities were included in the study. Of the 605 participants in the study group, 359 (59.3%) were male and 246 (40.7%) were female students. The participants' ages ranged from 17 to 35 (21.58±3.54).

Data Collection Tools

Epidemic Disease Anxiety Scale

The five-point Likert scale developed by Sayar et al. (2020) consists of 4 factors and 18 items under the names “Epidemic, Economy, Quarantine, Social Life.” The results of the AFA (explanatory factor analysis) conducted during the scale development process were examined to determine the factor structure and characteristics of the scale. When the Cronbach's alpha (a) reliability coefficient values of the scale were examined, the overall reliability coefficient was calculated as a = .90. The reliability coefficient analyses conducted for the subscales revealed the lowest value as a = .77 (economic) and the highest as a = .89 (epidemic).

Perceived Stress Scale

Developed by Cohen and colleagues (1983) and adapted into Turkish by Eskin and colleagues (2013), this five-item Likert scale is a two-factor measure (perceived self-efficacy deficiency, perceived stress/distress) consisting of 14 items. According to the results of the DFA conducted during the scale adaptation process, the suitability of the scale's factor structure was determined.

When examining Cronbach's alpha (a) reliability coefficients, Perceived Lack of Self-Efficacy was calculated as a=.81 and Perceived Stress/Distress as a=.76.

Intolerance of Uncertainty Scale

Developed by Carleton et al. (2007) to measure individuals' emotional and behavioral patterns in response to uncertain events, this scale consists of 12 items and 2 subscales and is scored on a 5-point Likert scale. An increase in the total score obtained from the scale indicates an increase in the level of intolerance of uncertainty. The validity and reliability study of the Turkish version of the scale was conducted by Sarıçam et al. (2014), who reported that the factor loadings ranged from .55 to .87, the Cronbach's alpha coefficient for the entire scale was .88, the Cronbach's alpha coefficients for the forward-looking anxiety subscale and the inhibitory anxiety subscale were .84 and .77, respectively, and the test-retest coefficient was .74.

In this study, Level 2 Confirmatory Factor Analyses (CFA) were applied separately for each scale to examine the construct validity of the measurement tools used. Since the multivariate normality of the data was determined, the Maximum Likelihood (ML) estimation method was preferred in the analyses. DFA results were evaluated in line with the goodness-of-fit indices frequently used in the relevant literature, and necessary modifications were made based on theoretical foundations to improve the model's fit. In addition to the model fit statistics of the scales used in the study, Cronbach's Alpha reliability coefficients were reported in tabular form to determine the level of internal consistency. The criteria proposed by Byrne (2016) and Gürbüz (2021) were used as a basis for evaluating the goodness-of-fit criteria. George and Mallery's (2019) recommendations were taken into account to interpret the reliability of the scales; according to these recommendations, a Cronbach's Alpha coefficient above .80 indicates good reliability, while a coefficient above .90 indicates high reliability

Table 1

Goodness-of-Fit Indices and Threshold Values Used in SEM, Normality, Skewness-Kurtosis, Reliability Cronbach Alpha Values of Scales

İndeks	Good Fit	Acceptable	PAS	PSS	IUO
X^2/df	<3	<3(X^2/df)<5	4.532	3.595	3.498
GFI	>.95	>.90	.892	.951	.948
CFI	>.95	>.90	.936	.955	.961
RMSEA	<.05	<.08	.076	.066	.064
Cronbach Alpha	-	-	.932	.930	.910

Data Analysis

The statistical analyses were performed using SPSS version 25.0 and AMOS version 26. Initially, the dataset was screened for missing values and outliers. To assess the normality of the data

distribution, multiple indicators were examined, including Mahalanobis distance, standardized Z-scores, and the skewness and kurtosis coefficients. Skewness and kurtosis values falling within the ±2 threshold were considered indicative of a normal distribution (George & Mallery, 2019), while Z-scores ranging between -3 and +3 further supported this assumption. Additionally, scatter plot analyses were used to examine linear relationships among variables, revealing no substantial deviations from linearity. Multicollinearity was also assessed before further analysis. All bivariate correlation coefficients were below 0.80, suggesting no serious concern for multicollinearity. This interpretation was reinforced by tolerance values exceeding .20 and Variance Inflation Factor (VIF) values remaining below 10. To confirm the construct validity of the measurement instruments, Confirmatory Factor Analysis (CFA) was conducted. Upon verification of the factor structures, Pearson correlation analyses, Independent samples t-test, One Way Anova and Bootstrap-based regression analyses were carried out to test the study's hypotheses (Hayes, 2022). To address the potential for standard method variance, Harman's single-factor test was first applied. Subsequently, descriptive statistics and correlation coefficients were computed for the primary study variables. To examine the hypothesized mediation effects, Model 4 of the PROCESS macro for SPSS (Hayes, 2017) was employed. Statistical significance for the mediating effect was determined based on 95% bootstrap confidence intervals that excluded the value of zero (Preacher & Hayes, 2008).

Ethical Approval and Procedures

The data for this study were collected after obtaining informed consent from the participants and approval from the Erzincan Binali Yıldırım University Health and Sports Sciences Ethics Committee on April 28, 2023 (protocol no: 04/14). Participants were informed that they could withdraw from the study at any time. All procedures conducted in this study are in accordance with the 1964 Helsinki Declaration and ethical standards. The data collection process lasted approximately two months. The data were collected face-to-face by researchers from sports science faculty students studying at different universities who voluntarily participated in the study and whose consent was obtained through a voluntary consent form. Throughout the current research process, actions were taken in accordance with the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions."

Bulgular

Common Method Bias Test

Standard method bias (CMB) refers to the portion of systematic error variance shared among variables when data are collected using the same measurement method or from the same source (Richardson, Simmering, & Sturman, 2009). Such bias can distort the observed relationships between

constructs and potentially undermine the validity of the study's conclusions (Campbell & Fiske, 1959). To assess the potential influence of standard method variance, Harman's single-factor test was employed, as recommended in prior research (Zhou & Long, 2004). An exploratory factor analysis was conducted without rotation, and the results revealed that seven distinct factors with eigenvalues greater than one emerged, collectively accounting for 64.10% of the total variance. Notably, the first unrotated factor had an eigenvalue of 12.76 and explained only 28.99% of the variance, well below the 50% threshold often used to indicate serious standard method bias. These findings suggest that no single factor dominates the variance, indicating that common method bias is unlikely to pose a significant threat to the validity of the results in the present study.

Table 2

Descriptive Statistics and Relationships between Variables (n = 605)

Variables	**X** ± Ss	PAS	PSS	IUO
PAS	54.03±16.38	1		
PSS	41.72±7.84	0.216**	1	
IUO	42.75±10.23	0.473**	0.302**	1

**p<0.001

Table 2 presents the descriptive statistics (mean and standard deviation) along with the Pearson correlation coefficients for the primary variables. As shown, pandemic-related disease anxiety was positively and significantly correlated with both perceived stress (r = .216, p < .001) and intolerance of uncertainty (r = .473, p < .001). Furthermore, a significant positive correlation was also observed between perceived stress and intolerance of uncertainty (r = .302, p < .001). These results provide empirical support for Hypothesis 1, indicating that higher levels of pandemic-related anxiety are associated with greater perceived stress and a higher intolerance of uncertainty.

Table 3

Comparison of Study Variables on Gender and Income Level

Variables	***n***	**PAS**	***t/F***	**PSS**	***t***	**IUO**	***t***
		X **± Ss**		***X*** **± Ss**	***X*** **± Ss**	***X*** **± Ss**	
Gender							
Male	359	51.43 ± 16.43	4.81***	41.08 ± 7.52	2.48**	41.89 ± 10.24	4.30***
Female	246	57.83 ± 15.57		42.68 ± 8.20		44.00 ± 10.10	
Income Level							
Low	140	57.51 ± 15.90	5.149***	43.41 ± 8.20	7.521***	43.84 ± 10.61	3.701**
Medium	407	53.39 ± 16.31		41.57 ± 7.52		42.83 ± 9.76	
High	58	50.27 ± 16.81		38.79 ± 8.25		39.53 ± 11.89	

**: p<0.01, ***: p<0.001

The results of the t-test showed significant differences in favor of women in terms of epidemic disease anxiety (t: 4.81; p<0.001), perceived stress (t: 2.48; p<0.01), and intolerance of uncertainty levels according to gender. ANOVA results showed significant differences in pandemic disease anxiety, perceived stress, and intolerance of uncertainty levels according to perceived income level (p<0.001). As perceived income level increased, significant decreases were observed in pandemic disease anxiety, perceived stress, and intolerance of uncertainty levels.

Testing for Mediating Effect

The study examined whether intolerance to uncertainty mediates the relationship between pandemic anxiety and perceived stress (Hypothesis 2). In line with this, Hypothesis 2 was tested using Process Macro Model 4 after controlling for gender and perceived income level. As shown in Table 4, epidemic disease anxiety was positively associated with intolerance to uncertainty [β = 0.29, t = 12.59, p<0.001, 95% CI = (0.245, 0.335)] and perceived stress [β = 0.089, t = 4.60, p<0.0 01, 95% CI = (0.051, 0.127)]. Additionally, when the mediator variable (Intolerance of Uncertainty) was included in the model, the relationship between pandemic disease anxiety and perceived stress became insignificant [β = 0.033, t = 1.58, p>0.001, 95% CI = (-0.008, 0.075)]. According to the bootstrap analysis results, it was determined that intolerance of uncertainty has a significant mediating effect on the relationship between pandemic disease anxiety and perceived stress [(β = 0.055, p < 0.001, 95% CI = (0.031, 0.081)]. This finding indicates that intolerance of uncertainty plays a mediating role in the relationship between epidemic disease anxiety and perceived stress levels. Thus, Hypothesis 2 is supported.

Table 4

Mediation Effect

Independent Variables (IV)	**Model 1 (IV: PSS)**			**Model 2 (IV: IUO)**			**Model 3 (IV: PSS)**		
	β	*SE*	*t*	*B*	*SE*	*t*	*β*	*SE*	*t*
PAS	0.089	0.019	4.60***	0.29	0.023	12.59***	0.033	0.021	1.58
IUO							0.19	0.033	5.72***
R²	0.06**			0.22**			0.12**		

**: p<0.01, ***: p<0.001

Discussion and Conclusion

The study found that concern about infectious diseases had a positive effect on perceived stress and that intolerance of uncertainty played a mediating role in this effect. In this section, the findings of the study are evaluated in light of the literature.

As with all epidemics, the current COVID pandemic has been a global crisis that has significantly tested individuals' psychological resilience. During this process, groups under both academic and physical performance pressure, such as student athletes, have experienced significant levels of stress and anxiety. Findings from studies indicate that pandemic-related anxiety increases perceived stress levels, with intolerance of uncertainty playing a significant mediating role in this relationship. Indeed, various studies have supported the notion that individuals with low capacity to cope with uncertainty have more intense threat perceptions, which in turn elevate their anxiety and stress levels (Bavolar et al., 2023; Rettie & Daniels, 2021). According to the stress assessment model proposed by McCauley et al. (2013), when individuals primarily assess the situation experienced during a crisis as a threat, their stress responses become more intense, and the perceived inadequacy of resources to increase psychological resilience during this process leads to an increase in perceived stress. In particular, increased anxiety levels related to the pandemic trigger individuals' fears about the pandemic, and this situation, combined with additional stressors such as unmet performance expectations in athletes, increases the psychological burden (Córdova-Martínez et al., 2022; Özçelik et al., 2022). Additionally, it has been noted that third- and fourth-year university students and active athletes experience higher levels of stress during the pandemic (Aslan et al., 2021; Herres et al., 2023). These findings suggest that the psychological effects experienced by individuals in uncertain situations such as the pandemic are not merely temporary but can create a longer-term mental burden. In this context, the development of protective mental health policies and the implementation of interventions aimed at reducing intolerance to uncertainty and strengthening individuals' psychological resilience are of great importance (Özden & Ermiş, 2024). These interventions could include mindfulness programs, cognitive behavioral therapy (CBT), and emotion regulation training to specifically address intolerance of uncertainty, thereby reducing stress and anxiety among athletes. Furthermore, considering that physical and school-based sports activities both support emotional well-being and are effective in reducing perceived stress, the integration of such programs into education policies is thought to contribute to the psychological well-being of student athletes in the post-pandemic period (Di Martino et al., 2025). Incorporating these programs into the educational system and sports curricula can help athletes manage uncertainty and stress in a more resilient way, ensuring long-term mental health benefits. While the studies support the research findings, they also align with theoretical approaches in the literature and support theoretical models explaining the relationships between pandemic anxiety, intolerance of uncertainty, and perceived stress.

According to Lazarus and Folkman's (1984) Stress and Cognitive Appraisal Theory, individuals develop stress responses by assessing environmental demands and their capacity to meet those demands. It points out that pandemics can cause stress to increase at the cognitive level by posing a threat to both health and academic future, especially for sports science students. Similarly,

the Protective Loss Theory (Hobfoll, 1989) suggests that epidemics increase stress levels by increasing the threat of loss of resources (such as health, time, and academic achievement) that individuals possess. In particular, interruptions in athletes' training, competition, and academic routines reinforce this perception of resource loss. Furthermore, when evaluated within the framework of Bandura's (1986) Social Cognitive Theory, it is emphasized that pandemic anxiety weakens individuals' self-efficacy beliefs, negatively affecting coping strategies and further intensifying stress. The findings also show that pandemic anxiety increases intolerance to uncertainty. Carleton's (2016) Intolerance of Uncertainty Theory explains that individuals' low tolerance for uncertain situations can increase stress and anxiety. The conflicting flow of information about the pandemic, constantly changing measures, and uncertainty about the future are highlighted as factors that may strain individuals' information processing capacity (Miller, 1956) and disrupt the functioning of cognitive structures (Dugas et al., 1998), thereby triggering intolerance of uncertainty. This situation is consistent with Beck's (1979) Cognitive Behavioral Theory, as individuals with a high perception of threat in the face of uncertainty interpret the situation more negatively, which leads to stress. Additionally, Monroe and Simons' (1991) Diathesis-Stress Model suggests that individual sensitivity factors (e.g., intolerance of uncertainty) can interact with environmental stressors to produce negative psychological outcomes.

As a result, the research model is consistent with Lazarus and Folkman's Cognitive Appraisal Model of Stress (1984). Anxiety about infectious diseases triggers uncertainty, which in turn increases individuals' threat assessment and raises their stress levels. Grupe and Nitschke's (2013) Threat and Uncertainty Modeling also supports this process, arguing that uncertainty directly strengthens threat perception, which in turn increases cognitive stress responses. In this context, research findings not only strengthen the theoretical foundation but also provide essential directions for designing intervention programs aimed at enhancing individuals' psychological resilience.

This study provides a novel contribution to the literature by specifically addressing the psychological effects of crises like the pandemic on athletes, a group under unique academic and physical performance pressures. While previous research has focused on general stress during pandemics, this study distinguishes itself by examining the specific psychological challenges faced by athletes, such as the dual stress of academic and athletic demands, compounded by the uncertainties surrounding the pandemic. This perspective offers new insights into how pandemic-induced uncertainty uniquely affects athletes and their emotional responses, which has been underexplored in the existing literature. The findings also highlight the critical role of intolerance of uncertainty in amplifying stress and anxiety during the pandemic, and the importance of developing targeted interventions that address these issues. Although the study's statistical methods increased the

reliability of the results, the cross-sectional design, limited sample structure, and self-reported data partially limit generalizability. Future studies should adopt longitudinal and mixed-method approaches, involve different demographic groups, and explore additional factors such as psychological resilience and social support. Experimental studies that examine the protective effects of physical activity on stress and anxiety will be invaluable in developing practical, pandemic-specific intervention programs to support athletes' mental health during and after crises.

Ethical Approval Information

Ethics Committee: Erzincan Binali Yıldırım University Health and Sports Sciences Ethics Committee

Date of Approval: 28 April 2023

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Author Contribution Statement

The study design was conducted by E.S. and İ.Y.; data collection by O.K.E., Y.E.Y., and E.S.; statistical analysis by Y.E.Y. and E.L.İ.; and manuscript preparation and literature review by E.S., E.L.İ., and İ.Y.

Conflict of Interest Statement

The authors declare that there is no conflict of interest related to this research.

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