The impact of psychological hardiness on intolerance of uncertainty in university students during the COVID-19 pandemic

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Abstract
The purpose of the study was to measure the impact of psychological hardiness on the intolerance of uncertainty (IOU) among university students during the coronavirus disease 2019 (COVID-19) pandemic. A cross-sectional correlational research design was used in the study, where participants were selected by convenience sampling. The data was collected from 1217 undergraduate students from a university in Turkey through web-based questionnaires. The Intolerance of Uncertainty Scale assessed data, including intolerance of uncertainty. In addition, the Personal Views Survey III-R was used to measure students' psychological hardiness. The results indicated that Turkish undergraduate students overall had high IOU and above-average psychological hardiness. Psychological hardiness was negatively correlated with IOU. Students losing a loved one because of COVID-19 had increased intolerance to uncertainty and lower psychological hardiness. Psychological hardiness was a powerful predictor of IOU. These findings show the need to implement hardiness-training programs for undergraduate students to increase their tolerance to uncertainty and reduce the effect of grief.

Keywords
bereavement, COVID-19, distance education, grief, resilience, students, uncertainty
INTRODUCTION

The coronavirus disease 2019, also known as COVID-19, has led to a pandemic spread over several countries, including Turkey. The government has taken many measures to prevent the spreading of the virus. However, individuals’ personal and professional lives have been affected in unimaginable ways. Higher education institutions were closed within measures, and the online education system replaced face-to-face education. The online education system has undoubtedly created many problems for the Turkish students, such as not having access to computers or the internet to connect to online classes, lack of digital infrastructure and services, communication problems with lecturers, students, and teaching staff’s inability to use educational technology effectively (Akat & Karataş, 2020; Yıldız, 2020). These issues, combined with a certain level of uncertainty, have made university students one of the disadvantaged groups affected by the pandemic.

1.1 Intolerance of uncertainty

Uncertainty pervades every element of human life, especially in the event of a severe natural disaster or a sudden public health incident (Rosen et al., 2014). Therefore, the notion of “intolerance of uncertainty” has been developed to explain the individual variations in people’s tolerance for uncertain occurrences, which has become a prominent research topic.

Freeston et al. (1994) initially proposed the intolerance of uncertainty (IOU) construct in the sense of worry. They stated that one of the main reasons people worry is to gain control over circumstances to avoid potentially unfavorable outcomes. Several definitions of IOU have been made since then. Buhr and Dugas (2009, p. 216) defined IOU as “a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications and involves the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events.” According to Carleton (2016, p.31) IOU is “individual’s dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty.”

In theory, IOU is not a distinct causal agent because uncertainty is ubiquitous and perceived as a threat itself (Buhr & Dugas, 2002). Early development of the structure of intolerance to uncertainty leads to an overestimation of the likelihood of an adverse event, exaggeration of personal and emotional arousal in undesirable situations, maintenance of increased arousal levels in the face of adverse conditions, and the formation of higher tolerance thresholds for negative situations (Dugas et al., 2004). In other words, people with higher levels of IOU are more likely to exaggerate risks and find more issues than are currently present (Del Valle et al., 2020). Lower IOU may cause difficulties with emotional regulation, which affects the students’ career path, self-efficacy, and quality of life (Lee, 2019).

Multiple studies have evaluated the level of intolerance of uncertainty in university students during the COVID-19 pandemic. For example, in a study, Duman (2020) assessed the level of COVID-19 fear and intolerance of uncertainty in a sample of Turkish university students. The study results showed that the students’ fear of the Coronavirus disease and their intolerance of uncertainty levels were moderate. However, another study found that intolerance of uncertainty was high among college students in Wuhan during the pandemic (Zhuo et al., 2021). Furthermore, according to a survey conducted in Turkey, Turkish individuals aged 18 and 73 had a high intolerance to uncertainty. The study also demonstrated that college students were packed with doubt and pressured to face the uncertainty that most of them could not tolerate during this crisis (Satici et al., 2020).

Many of the problems that university students face can’t be solved immediately, and these problems necessitate students to withstand these problems before they can be solved. Therefore, university students require assistance in positively perceiving their current condition and solving their difficulties independently by anticipating and equipping themselves for such situations. The students’ ability to handle uncertainty is an essential trait that influences their mental health issues. Significant evidence suggests that IU is a transdiagnostic factor for various psychopathology (Carleton et al., 2012; Einstein, 2014). Therefore, it is assumed that increasing hardiness under challenging situations will boost university students’ tolerance for uncertainty, people, and the environment.
1.2 | Psychological hardiness

People's perceptions of stressful events and crises and their behaviors and preferred methods of dealing with negative situations vary. Psychological hardiness is a personality trait that positively affects individuals' performance, health, and mood in stressful situations. Kobasa (1979) was the first to introduce the construct of hardiness. It is a phenomenon that manifests as behaviors that convert potential threats in stressful situations into opportunities for development (Eroz & Onat, 2018). Hardiness has a solid theoretical basis and has been empirically established as a significant stress tolerance resource in a wide variety of communities (Bartone et al., 2016). Kobasa (1979) considers hardiness a combination of cognitive, emotional attitudes and behaviors necessary for survival and life enrichment during development. Considering the definition, an individual with high psychological hardiness should find life or work highly meaningful, believe in controlling events, influence the results, and be open to the change and struggle that life brings (Motan, 2002).

According to Kobasa (1979), psychological hardiness comprises three factors: commitment, control, and challenge. Although these three factors are related to each other and create hardiness, they focus on different issues.

Commitment entails the conviction that, regardless of how bad things are, it is vital to be engaged in whatever is going on rather than succumb to isolation and separation (Maddi, 2013, p. 8). Commitment refers to the propensity to get involved in life's events and to have a sincere interest in and concern about specific activities, objects, and other individuals. In contrast, struggle refers to the conviction that life improvements are opportunities for personal development (Kardum et al., 2012).

Control is the tendency to believe and behave in ways that affect life outcomes rather than becoming powerless in the face of adversity (Lambert et al., 2003). This dimension encourages one to conclude that no matter how bad things are, one must strive to turn the pressures of future crises into opportunities for development. Allowing oneself to sink into powerlessness and passivity seems to waste time (Maddi, 2013, p. 8).

The Challenge dimension was characterized as the conviction that change, instead of steadiness, is the typical method of life and comprises inspiring freedoms for self-awareness instead of dangers to security (Saxena, 2015). These three factors help people meet challenges within their contexts and transform stressful life circumstances into personal growth and enrichment opportunities. A lack of challenge, dedication, and control often results in burnout (Crosson, 2015). Kobasa et al. (1982) state that an individual with high hardiness has a solid commitment to life, as shown by engagement in maintaining self-worth and participation in the social community and the world. Individuals with hardiness characteristics rarely give up quickly under strain, get sick less often, and have the potential to act adaptively while under stress (Hasela et al., 2011). Eschleman et al. (2010) conducted a meta-analysis on the concept of hardiness. The study results indicated that hardiness appears to be positively related to other personality characteristics intended to protect individuals from stress, negatively related to personality traits expected to intensify the tension. Hardiness was negatively associated with stressors, strains, regressive coping, positive social support, active coping, and achievement. Studies have demonstrated that hardiness protects college students from the detrimental consequences of stress (Lifton et al., 2000; Maddi 2006).

1.3 | Relationship between intolerance of uncertainty and psychological hardiness

Hardiness is often essential for individuals' adaptation and development in challenging and unpredictable environments and psychological well-being (Andronnikova, 2021). Several studies indicated that intolerance of uncertainty impacted psychological well-being. For example, Satci et al. (2020) demonstrated that intolerance of uncertainty directly affects Turkish individuals' mental well-being. Zhuo et al. (2021), in a study, showed that higher IOU in university students was positively associated with adverse mental health results, such as anxiety, depression, and insomnia. Other studies also revealed that intolerance of uncertainty was related to mental health disorders such as generalized anxiety disorder (Zlomke & Jeter, 2013), depression (Gentes & Ruscio, 2011, Meeten et al., 2012), obsessive-compulsive disorder (Jacoby et al., 2013), and posttraumatic stress disorder (Boelen, 2010).
Higher intolerance of uncertainty can lead to lower resilience and hardiness. Higher psychological resilience has been reported to play a crucial role in dealing with the intolerance of uncertainty (Geçgin & Sahranç, 2017; Lee, 2019). Andronnikova (2021) also found a relationship between uncertainty tolerance and hardiness in schoolchildren in Grades 9–11 (15–18 years old). This study indicated a negative correlation between intolerance of uncertainty and hardiness levels of the students.

It is essential to investigate the link between tolerance to uncertainty and hardiness in university students during the COVID-19 crisis since there have been considerable changes that placed the students at an increased risk of a wide range of mental health issues, including depression, anxiety, and stress (Ochnik et al., 2021). However, the association between IOU and psychological hardiness among university students has been scarcely researched during the current pandemic. Thus, this study is crucial since it examines Turkish university students’ intolerance of uncertainty during the COVID-19 pandemic striving for academic success and addresses the influence of three factors of hardiness—commitment, control, and challenge—on IOU.

1.4 | Research objectives and hypotheses

The purpose of this study was to measure the impact of psychological hardiness on the intolerance of uncertainty among university students. The study aimed to achieve the following subobjectives:

(1) What is the level of psychological hardiness and intolerance of uncertainty among participants?
(2) Is there a relationship between losing a loved one because of COVID-19 and psychological hardiness among participants?
(3) Is there a relationship between losing a loved one because of COVID-19 and intolerance of uncertainty among participants?
(4) Is there a correlation between psychological hardiness and intolerance to uncertainty?
(5) What relationships exist between different facets of psychological hardiness and intolerance to uncertainty.

The current research suggests the following hypotheses based on the finding of previous literature.

(H1) It is predicted that significant negative correlations will exist between the students’ psychological hardiness and intolerance of uncertainty.

(H2) It is predicted that students with low psychological hardiness will highly tolerate uncertainty.

(H3) It is predicted that students with high psychological hardiness will have low intolerance to uncertainty.

(H4) It is predicted that the commitment, control, and challenge sub-domains of psychological hardiness will have a predictive power of the students’ intolerance of uncertainty.

(H5) It is predicted that students who experienced the loss of a loved one because of COVID-19 will have a high intolerance of uncertainty and low psychological hardiness.

2 | METHODS

2.1 | Setting and sample

A cross-sectional correlational research design was used in the study, where participants were selected by convenience sampling. The data were collected from 1217 undergraduate students attending various programs at a university in Turkey through web-based questionnaires. In addition, written and informed consent was obtained from all the students per the University Ethics Committee.
2.2 | Data collection

The data were collected in the Spring Semester of the 2020–2021 academic year. The target population was first contacted via email, and the email contained a personal link to the online survey. We used three data collection instruments in the study: (1) the student sociodemographic questionnaire, (2) Personal Views Scale (PVS III-R), and (3) Intolerance of Uncertainty Scale (IUS). The three separate data collection instruments were combined into one survey.

2.2.1 | Sociodemographic form

The student sociodemographic questionnaire covered personal characteristics such as gender, age, marital status, family income, and place of residence. Participants were also asked if they or a loved one had been diagnosed with COVID-19. They were also questioned if they had lost a loved one due to COVID-19 during the pandemic.

2.2.2 | Personal Views Scale (PVS III-R)

Maddi and Khoshaba developed the PVS III-R (2001) and adapted it to Turkish by Durak (2002). The scale contains 18 items that evaluate the psychological hardiness of individuals. It comprises three 6-item subscales measuring commitment, control, and challenge. PVS III-R is a 4-point Likert-type scale ranging from 0 (not at all true) to 3 (very true). The total hardiness scores range from 19 to 49, with an average of 38–41 (Maddi & Khoshaba, 2001). Higher scores reflect increased psychological hardiness. Maddi and Khoshaba (2001) indicated an internal consistency of 0.70–0.75 for the commitment, 0.61–0.84 on the control, 0.60–0.71 on the challenge subscales, and 0.80–0.88 on the total scale. Durak (2002) established the reliability of the Turkish version of PVS III-R. The item-total correlations for items 2, 5, 9, 12, 13, and 14 were below .20 in the validity and reliability study of the Turkish version of PVS III-R. Therefore, these items were removed from the scale. The item-total correlations of the remaining 12 items ranged between 0.23 and 0.50, although the internal consistency coefficient of the survey was found to be 0.68 (Durak, 2002). The Cronbach’s alpha coefficient for the Turkish version of the PVS III-R used in this study was 0.67.

2.3 | Intolerance of Uncertainty Scale (IUS)

Freeston et al. (1994) initially developed The IUS was in French to evaluate social, cognitive, and behavioral responses to uncertain situations, the effects of uncertainty, and efforts to control the future. Buhr and ve Dugas (2002) established the validity and reliability of the English version of the scale. The internal consistency of the English form was 0.94, and the test-retest reliability was 0.74. Sari and ve Dağ (2009) adapted the scale to Turkish. It contains 26 items and comprises four factors. The IUS is used to assess the following four factors: “Uncertainty is distressing and stressful,” “Uncertainty prevents from taking action,” “Uncertain events are negative and should be avoided,” and “Uncertainty is unfair and spoils everything.” Higher scores obtained from the first factor indicate individuals perceive uncertainty as a source of stress and react emotionally to uncertain situations. The second factor is not included in the original version of the scale. The third factor includes negative evaluations of the self. The second factor of the original scale is the fourth factor of the Turkish Version of the IUS. It describes the effect of the behavioral dimension. This factor provides information that people perceive uncertainty as dangerous and negatively affects taking action (Sari & ve Dağ, 2009). IUS is a 5-point Likert-type scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The Cronbach's alpha coefficient for the Turkish version of the IUS in this study was 0.84.
2.4 | Statistical analysis

All analyses were carried out using the IBM SPSS 20.0 Package Software. Before the statistical analyses, the competence of the scores obtained from the PVS III-R and IUS to normal distribution has been determined via Kolmogorov–Smirnov and Shapiro–Wilk Tests. The performed analyses have shown that the PVS III-R and IUS scores were normally distributed. Therefore, parametric analyses were conducted in the study. Descriptive analyses were used to describe the study's sociodemographic characteristics, including means, standard deviations, ranges, frequencies, and percentages. The independent samples t test was used in the comparison of two groups. Pearson Correlation analysis investigated the relationship between the students' psychological hardiness and their intolerance of uncertainty. A multiple regression analysis was used to determine the relationships between psychological hardiness and IOU.

3 | RESULTS

3.1 | Sociodemographic characteristics of the participants

The total sample size for this study included 1217 students. Table 1 demonstrates the sociodemographic characteristics of the participants.

3.2 | Students' intolerance of uncertainty

This sample's total IUS mean score was 85.68 (standard deviation \[SD\] = 22.75), showing a high intolerance of uncertainty. The mean score for the "uncertainty is distressing and stressful" factor was 30.02 (SD = 7.13). The mean score for the "uncertain events are negative and should be avoided" factor was 25.34 (SD = 11.43). The mean score for the "uncertainty is unfair and spoils everything" factor was 12.08 (SD = 3.47), and the mean score for the "uncertainty prevents from taking action" factor was 14.99 (SD = 5.23). The skewness and kurtosis values were within acceptable limits for a normal distribution. Table 2 demonstrates the participants' descriptive statistics for the IUS subscales.

3.2.1 | Loss of a loved one because of COVID-19

There were statistically significant differences between IUS total mean scores and losing a loved one due to COVID-19. Students who lost a loved one because of COVID-19 (M = 88.11, SD = 23.39) compared to students who did not (M = 84.53, SD = 22.41) demonstrated significantly higher scores, \(t(1215) = 2.486, p = 0.013\).

3.3 | Students' psychological hardiness

The hardiness percentile rank averages of the sample (M = 31.84, SD = 6.53) mean was in the 46%–87% range in the current study. Psychological hardiness raw scores in the 30–35 range, 40%–60%, are interpreted as average hardiness. The mean scores were 11.23 (SD = 2.99) for the commitment, 10.19 (SD = 2.44) for the control, and 10.42 (SD = 2.89) for the challenge subscales. Table 3 displays the participants' descriptive statistics for PVS III-R and its subscales and the skewness and kurtosis.
3.3.1 | Loss of a loved one because of COVID-19

There were statistically significant differences between PVS III-R total mean scores and having relative/s who passed away because of COVID-19. Students who lost relative/s because of COVID-19 ($M = 30.74, SD = 6.47$) compared with students who did not ($M = 32.28, SD = 6.50$) demonstrated significantly lower scores, $t(1215) = -3.747, p = 0.000$.

| TABLE 1 | Sociodemographic characteristics of participants at baseline ($n = 1217$) |
|---------|-----------------------------|
| Gender  | $\%$ |
| Female  | 906 | 74.4 |
| Male    | 311 | 25.6 |
| Age     |   |   |
| 18-20   | 819 | 67.3 |
| 21-23   | 323 | 26.5 |
| 24-26   | 42  | 3.5 |
| 27 and above | 33 | 2.7 |
| Marital status |   |   |
| Single  | 1178 | 96.8 |
| Married | 39  | 3.2 |
| Family income |   |   |
| Income less than expenses | 754 | 62.0 |
| Income equal to expenses  | 412 | 33.9 |
| Income more than expenses | 51  | 4.2 |
| Place of residence |   |   |
| Urban   | 578 | 47.5 |
| Rural   | 639 | 52.5 |
| Have you been diagnosed with COVID-19? |   |   |
| Yes     | 200 | 16.4 |
| No      | 1017 | 83.6 |
| Have you had any relatives diagnosed with COVID-19? |   |   |
| Yes     | 921 | 75.7 |
| No      | 296 | 24.3 |
| Have you lost a loved one because of COVID-19? |   |   |
| Yes     | 350 | 28.8 |
| No      | 867 | 71.2 |
Correlation analyses were performed to demonstrate any significant relationships between the participants’ psychological hardiness and IOU. In the current sample, the Pearson correlation analysis result showed that the total and subscales mean scores of PVS III-R and IUS were significantly and negatively correlated, indicating decreased psychological hardiness with increased intolerance of uncertainty. Table 4 represents the correlation between PVS III-R and IUS.

### 3.4 Relationships between psychological hardiness and intolerance of uncertainty

Correlation analyses were performed to demonstrate any significant relationships between the participants’ psychological hardiness and IOU. In the current sample, the Pearson correlation analysis result showed that the total and subscales mean scores of PVS III-R and IUS were significantly and negatively correlated, indicating decreased psychological hardiness with increased intolerance of uncertainty. Table 4 represents the correlation between PVS III-R and IUS.

### 3.5 The impact of university students’ psychological hardiness on intolerance of uncertainty

The researchers conducted a multiple linear regression analysis with the subscales of psychological hardiness, including commitment, control, and challenge, as independent variables to confirm the predictive power of participants’ psychological hardiness in their IOU. The results revealed that psychological hardiness explained 8% of the variance in total IOU scores. A higher level of commitment, control, and challenge led to lower levels of IOU. The t test results regarding the regression coefficients’ significance demonstrated that the psychological hardiness variable significantly predicts the students’ intolerance of uncertainty. Table 5 shows the results of the multiple regression analysis for predicting psychological hardiness.

The Durbin–Watson test was used to confirm the independence of residuals, which resulted in a value of 1.78. It was concluded that there was no correlation between the residuals. The standard difference limit of 0.68–0.82 and the variance inflation factor of 1.21–1.46 indicated that multicollinearity was not suspected for the independent variables.
The current study was conducted to assess the impact of psychological hardiness on Turkish undergraduate students' intolerance of uncertainty, demonstrating that the COVID-19 pandemic had a detrimental effect. The results are discussed, considering other studies investigating the research problem.

4.1 | Students' intolerance of uncertainty

The current research findings indicated that overall undergraduate students' intolerance of uncertainty was high. This conclusion may not come as a surprise, especially given the worry of uncertainty during pandemics. Previous research conducted on university students has found that the intolerance of uncertainty ranged from moderate to high during the pandemic. Zhuo et al. (2021) found that intolerance of uncertainty was high in college students in Wuhan during the pandemic. Satici et al.'s (2020) findings also showed high intolerance to uncertainty in the adult
Turkish sample. Duman (2020), in a study, found that the fear and intolerance of uncertainty was at a moderate level among Turkish university students. Ulukan (2021) demonstrated that the level of intolerance of uncertainty among undergraduate sports students was average. Hussien et al. (2020) indicated that undergraduate nursing students’ intolerance of uncertainty levels was moderate during the pandemic. The results regarding students’ intolerance of uncertainty in this study are in line with existing literature.

Intolerance of uncertainty increases the likelihood of experiencing unpleasant emotions or maladjustment in everyday life or interpersonal interactions, which leads to seeing unpredictable events as more dangerous, resulting in difficulties such as stress, anxiety, and depression (Lee, 2019).

4.1.1 | Loss of a loved one because of COVID-19

Students who lost a loved one because of COVID-19 demonstrated a significantly higher intolerance of uncertainty than students who did not lose relative/s because of COVID-19. The death of a beloved may destabilize an individual’s sense of self, responsibilities, aims, and plans and leave the bereaving individual with powerful feelings of uncertainty (Boelen et al., 2016). Boelen (2010) conducted a study on bereaved individuals, evaluating the relationship between intolerance of uncertainty and emotional distress on the study participants following the death of their loved one. The results indicated a significant positive association between intolerance of uncertainty and loss-related grief and posttraumatic stress disorder.

Losing a loved one may make individuals more conscious of their mortality, which may become a cause of anxiety and uncertainty (Joaquim et al., 2021). Inability to regulate the fear of death appears to be a common concern that underpins a variety of mental illnesses, including hypochondriasis, panic disorder, anxiety, and depressive disorders (Iverach et al., 2014).

4.2 | Students’ psychological hardiness

The study’s findings indicated that undergraduate students’ psychological hardiness was below average. Andronnikova (2021) evaluated the relationship between uncertainty tolerance and hardiness in adolescents and found that adolescents demonstrated average psychological hardiness. Qaisy (2016) assessed the psychological hardiness of Jordanian university students, and the finding indicated that the students’ hardiness levels were moderate. Civitci and Civitci (2015) also found that undergraduate students’ hardiness levels were average. However, the overall hardiness scores were not consistent with the results obtained by other studies evaluating the university students’ psychological hardiness levels. The inconsistency in the results could be because the current study was carried out during the COVID-19 outbreak. University students encountered distinct psychological distress due to substantial alterations in teaching and learning modes (Zhang & Liu, 2021). In a study, Yang et al. (2021) found that college students struggled with several academic, social, interpersonal, and environmental stressors during the COVID-19 outbreak. These stressors had adverse effects on their health.

When hardiness is below average (≤38 points), students may not develop a sense of control over external circumstances, commit to their everyday lives, and fight the unanticipated changes that occur. Therefore, universities can offer psychological hardiness programs for students to counteract the negative effects on their health brought on by the pandemic and assist them in viewing psychological and academic challenges as good experiences full of hope and optimism, as well as a chance for growth and development, rather than as a form of threat (Melhe et al., 2021).

4.2.1 | Loss of a loved one because of COVID-19

The findings of this study indicated that students who lost a loved one because of COVID-19 had significantly lower psychological hardiness than students who did not. A study examining the relationship between hardiness and
symptoms related to grief in bereaved college students indicated that hardiness was inversely associated with and a predictor of grief misery (Mathews & Servaty-Seib, 2007). The findings of a study by Campbell et al. (1991) demonstrated that hardiness predicted grief resolution among bereaved widows. Studies looking at younger adults are scarce, although loss appears to be quite frequent among college populations. According to Balk (2008), around 22%-30% of college students may have lost a loved one in the preceding 12-month period, and 47% are in the first 24 months of the grieving process. In a study, Balk et al. (2010) found that 30% of the college students experienced a loss within 12 months, and 39% had a loss within 24 months. Varga (2016) conducted a study with graduate students. The study findings indicated that roughly 26% of graduate students experienced losing a significant person or pet in their lives within the past 24 months. Our study demonstrated that approximately 29% of the undergraduate students reported losing relative/s because of COVID-19.

Research looking at the relationship between grief and mental health of college students during the COVID-19 pandemic showed that individuals who lost loved ones as a result of COVID-19 had increased psychological distress. The most common mental health problems experienced by young adults during the pandemic were anxiety, depression, and alcohol and substance use (Dodge et al., 2021; Li et al., 2021). In addition, previous research has demonstrated a negative relationship between mental health and psychological hardiness (Sadeghi & Einaky, 2021). This highlights the importance of psychological hardiness in bereaving higher education students.

4.3 | Relationships between psychological hardiness and intolerance of uncertainty

Another result of the study was a significant negative correlation between the university students’ intolerance of uncertainty and commitment, control, and challenge subdomains of psychological hardiness. Andronnikova (2021) recently researched the relationship between uncertainty tolerance and hardiness in adolescents. The findings indicated that the uncertainty tolerance of the adolescents was positively associated with hardiness. Vindeker et al. (2016) showed that students with a high tolerance for uncertainty had higher hardiness levels. As Bartone (2012) indicated, high-hardy people usually interpret the experience as fascinating and worthwhile, something they can control and challenge, offering opportunities to learn and improve. The findings of this study appear to be in line with existing literature. However, more studies are needed to clarify the relationship between psychological hardiness and intolerance of uncertainty.

When tolerance of uncertainty is lower in university students, they may seek excessive reassurance from others, make long to-do lists, double-check tasks, refuse to delegate tasks to others, procrastinate or avoid and keep busy to distract themselves from the uncertainty. These behaviors might lower the students' psychological hardiness levels and lead to poor academic performance. Therefore, efforts must be made to teach them to become more tolerant of uncertainty.

4.4 | The impact of university students' psychological hardiness on intolerance of uncertainty

The regression analysis showed that commitment, control, and challenge subdomains of psychological hardiness appeared as predictors of intolerance of uncertainty. Commitment, control, and challenge were strong predictors of intolerance of uncertainty, with higher commitment, control, and challenge leading to lower levels of intolerance of uncertainty. These results are in line with existing literature, where a significant correlation was found between uncertainty and resilience (Geçgin & Sahrań, 2017; Lee, 2019). This is to say that individuals with high psychological hardiness will become immersed in uncertain situations and perceive this as the best way to learn (commitment), are less likely to succumb to powerlessness in the face of uncertainty (control), and will perceive uncertainty as a natural part of life and gain insight from the unpleasant and positive experiences of a dynamic, evolving existence (challenge).
4.4.1 Hardiness versus resilience: What's the distinction?

The constructs of hardiness and resilience are sometimes used interchangeably in the literature. However, there is a distinction between these two constructs. Hardiness refers to one characteristic feature that moderates how traumatic factors are dealt with, whereas resilience is the capacity to respond to dire circumstances. Having a hardy personality, repressive coping style, and a positive attitude and emotions leads to resilience in individuals (Bonanno et al., 2011). Hardiness is frequently seen as a critical feature in psychological resilience or an individual-level process that leads to resilient results (Bartone & Hystad, 2010). Hardiness is a personality trait that contributes to and explains resilience. Bonanno (2004) indicated that several factors could contribute to resilience and psychological hardiness is one of the potential "pathways to resilience." Consequently, as psychological hardiness develops in an individual, it paves the way for resilience in stressful situations, which eventually leads to performance enhancement through active coping (Maddi, 2006). The constructs of hardiness and resilience are significant mental health indicators, and hardiness is shown to be a significant positive predictor of resilience (Raeyat Mohatashami et al., 2015).

4.5 Limitations of the study

This study has several limitations. First, we did not use a randomized sample in the study. Instead, we used a convenience sample of undergraduate students from a university. Therefore, the generalizability of the study's results may be limited. Second, the study also used a cross-sectional design where it is impossible to analyze levels of psychological hardiness and intolerance of uncertainty over time and may not help determine a cause-and-effect relationship. Third, our sample may not represent all college students in Turkey. Lastly, although article questionnaires have long been the preferred method for data collection in research, web-based questionnaires were used in the current study because of lockdown in the country due to COVID-19. There are several advantages of web-based data collection. It speeds up the data gathering process, is cost-effective, and automatically records responses in a database. It also allows for easier data management, lowers the risk of data errors, and increases the participants' response rate. However, there are also certain drawbacks to collecting data online, including the lack of an interviewer, inability to reach students who have no access to the internet or are not familiar with the internet. These may result in a bias in the results. Therefore, the results should be interpreted with caution.

5 CONCLUSION

This study adds to the existing literature on undergraduate students' intolerance of uncertainty and psychological hardiness. Our findings indicate that Turkish undergraduate students overall had high intolerance of uncertainty. The students had above-average psychological hardiness. Students losing a loved one because of COVID-19 had increased intolerance to uncertainty and lower psychological hardiness. Psychological hardiness was strongly associated with intolerance of uncertainty. Commitment, control, and challenge subdomains of psychological hardiness were powerful predictors of IOU.

6 IMPLICATIONS FOR PRACTICE

An important implication of our study derives from our finding on the psychological hardiness level of students that were below average. The results demonstrate the need for mental health workers employed in higher education to implement hardiness training programs for undergraduate students to increase their hardiness levels. Maddi (2013)
advises hardiness training for those with a raw score of 32 or less on the PVS III-R. The students’ mean raw score on PVS III-R in the current study was 31.84 ± 6.53.

Although individuals have varying levels of psychological hardiness as they mature, almost everyone who wishes to increase their hardiness level may try to be more active and dedicated in their life. Finding methods to view difficulties in life as a personal challenge to conquer is key to developing psychological hardiness. Maddi (2007) states that psychological hardiness is a skill that may be learned rather than innate and suggests introducing hardiness training programs that focus on educating individuals about coping, social support, and self-care to develop a sense of control and commitment challenge. Several studies show the effectiveness of hardiness training in decreasing depression and hopelessness in females (Rice, 1997) and bereaved college students (Mathews & Servaty-Seib, 2007). Undergraduate students may find it challenging to cope with the loss of a loved one during this crisis. Therefore, universities can address the severe impact of the loss in the lives of these students via the hardiness programs that will be offered to provide them with professional support during the grief process. It is assumed that helping university students develop positive feelings regarding themselves, their education, and family relationships through hardiness programs results in higher commitment. Having the students take active roles in their lives is likely to result in higher control. Helping them see crises as challenges and opportunities to grow will positively reduce their intolerance of uncertainty. The counseling centers of universities can administer the hardiness programs online, as the students have not yet returned to face-to-face education in Turkey. Online hardiness programs would allow reaching a significant number of students. Face-to-face hardiness training programs can also be offered to students who live in rural areas and do not have access to computers or the internet upon returning to education.

Another implication of our study originates from the high level of intolerance of uncertainty among the students. This finding points out the importance of faculty being flexible, having frequent contact with the students, and addressing any concerns or problems that the students may have. This way, students will feel supported and connected. Faculty should also refrain from making sudden curriculum changes and provide the students with specific information on any modifications as quickly as possible. It should not be forgotten that the faculty members are also human beings and may face many challenges, such as contracting the virus or grieving the loss of a family member. They may encounter difficulties in teaching or preparing for online classes. It will be beneficial if faculty can also participate in the hardiness-training programs offered to students, allowing them to share their experiences during the COVID-19 outbreak. Having both the students and the faculty in the program will probably help them develop empathy for each other. Future research may examine the effectiveness of hardiness training programs administered by universities to reduce Turkish students' intolerance of uncertainty.

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