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How Hopelessness in University Students is Associated with Intolerance of Uncertainty and Other Factors: A Cross-Sectional Study

Üniversite Öğrencilerinde Umutsuzluğun Belirsizliğe Tahammülsüzlük ve Diğer Faktörlerle İlişkisi: Kesitsel Bir Çalışma

Esra ENGİN[1] , Cansu GÜLER[2] , Sevilcan YAŞAR[3]

[1] Ege University, Nursing Faculty, Department of Mental Health, and Psychiatric Nursing, İzmir, Türkiye
[2] Muğla Sıtkı Koçman University, Faculty of Health Sciences, Department of Nursing, Department of Psychiatric Nursing, Muğla, Türkiye
[3] Vivantes Hauptstadtpflege Haus Dr. Hermann Kantorowicz, Berlin, Almanya

Sorumlu Yazar/Corresponding Author:

Cansu GÜLER, Research Assistant, Ph.D.
Muğla Sıtkı Koçman University, Faculty of Health Sciences, Department of Nursing, Department of Psychiatric Nursing, Muğla, Türkiye
E-posta: cansuguler@mu.edu.tr
ORCID: 0000-0002-0939-1760

Esra ENGİN, Prof. Dr.
ORCID: 0000-0003-0836-1532

Sevilcan YAŞAR, Nurse
ORCID: 0000-0002-6780-7891

Abstract

Objective: This study aims to examine the relationship between hopelessness, intolerance of uncertainty, and other factors among university students.

Material and Methods: This study has a descriptive cross-sectional design. The sample of the study consists of 371 students continuing their education at a university. The data of the study were collected online using the Intolerance of Uncertainty Scale, Beck Hopelessness Scale, and a 10-item general characteristics form. Student's t-test, ANOVA, Pearson correlation coefficient, and hierarchical regression analysis were used for the analysis of data with normally distributed variables.

Results: The mean age of the participants is 22.03 ± 1.72. The mean score of intolerance of uncertainty is 39.38 ± 10.36, and the mean score of the Beck Hopelessness Scale is 7.07 ± 5.52. It has been observed that low income, receiving education in the field of health sciences, experiencing low efficiency in online education, and intolerance of uncertainty scores of university students predict levels of hopelessness ($p < 0.001$).

Conclusion: University students have low levels of hopelessness and moderate levels of intolerance of uncertainty. Students' levels of hopelessness are predicted by intolerance of uncertainty, low income, receiving education in health sciences, and experiencing low efficiency in online education.

Keywords: Intolerance of uncertainty, hopelessness, university students, COVID-19.

Öz

Amaç: Bu çalışmanın amacı, üniversite öğrencilerinde umutsuzluğun belirsizliğe tahammülsüzlük ve diğer faktörlerle ilişkisini incelemektir.

Gereç ve Yöntem: Bu çalışma tanımlayıcı kesitsel bir tasarıma sahiptir. Araştırmanın örneklemi bir üniversitede öğrenimlerine devam eden 371 öğrenciden oluşturmaktadır. Araştırmanın verileri Belirsizliğe Tahammülsüzlük Ölçeği ve Beck Umutsuzluk Ölçeği ve 10 soruluk genel özellikleri değerlendiren form yardımı ile, çevrimiçi olarak toplanmıştır. Normal dağılıma uyan verilerin analizinde Student's t-testi, ANOVA, Pearson korelasyon katsayısı, hiyerarşik regresyon analizi kullanılmıştır.

Bulgular: Katılımcıların yaş ortalaması 22.03 ± 1.72'dir. Belirsizliğe tahammülsüzlük puan ortalaması 39.38 ± 10.36 ve Beck Umutsuzluk Ölçeği puan ortalaması 7.07 ± 5.52'dir. Üniversite öğrencilerinin düşük gelir, sağlık bilimleri alanında eğitim alma ve online eğitimden düşük verim alma durumlarının ve belirsizliğe tahammülsüzlük puanlarının umutsuzluk puanlarını yordadığı görülmüştür ($p < 0.001$).

Sonuç: Üniversite öğrencilerinin umutsuzluk seviyeleri düşük, belirsizliğe tahammülsüzlük seviyeleri orta düzeydedir. Öğrencilerin umutsuzluk düzeyi belirsizliğe tahammülsüzlük, düşük gelir, sağlık bilimleri alanında eğitim görme, online eğitimden düşük verim alma durumları tarafından yordanmaktadır.

Anahtar Kelimeler: Belirsizliğe tahammülsüzlük, umutsuzluk, üniversite öğrencileri, COVID-19.

1. Introduction

Uncertainty refers to situations that are encountered for the first time, which are unfamiliar, complex, and characterized by multiple factors that are difficult to comprehend (1). Intolerance of uncertainty is the tendency to perceive uncertainty as threatening, causing anxiety and discomfort, and the inclination to avoid or reject such situations, even when the likelihood of their occurrence is low. There are four sub-dimensions of intolerance of uncertainty: being stressful and distressing, making the person feel inadequate to act, portraying uncertain situations as negative and to be avoided, and presenting uncertainty as unjust (2). This instinctual need to anticipate and secure one's future is inherent in human nature and forms the foundation of intolerance of uncertainty (3). This concept, which is also a component of anxiety, is one of the cognitive processes underlying generalized anxiety disorder (1). While intolerance of uncertainty leads to the dominance of destructive emotions and anxiety in an individual's life, it also brings forth numerous psychological and adjustment issues and negatively impacts the quality of life (1,2). Uncertainty prevailed during the COVID-19 pandemic, and the inability to tolerate uncertainty resulted in persistent and heightened concerns (4).

Hope can be defined as having positive expectations for the achievement of a future goal (5). Hope not only helps individuals persevere in life but also bolsters well-being and supports mental health. On the contrary, hopelessness is a cognitive-based negative emotional state manifested as pessimism about the future, a sense of aimlessness, unwillingness, and a lack of belief in one's success, often rooted in past experiences (6). Hopelessness comprises two fundamental components: 'negative expectations regarding outcomes' and 'a sense of despair that these outcomes can change' (7). Hopelessness poses a risk to future anxiety (5).

The COVID-19 pandemic has brought about significant changes not only in the field of education but also across various sectors in our country and around the world (8). Following the detection of the first COVID-19 case, one of the initial measures taken was the temporary suspension of education in all universities (9). On March 23, 2020, the Higher Education Council (YÖK) decided to continue education through digital platforms at universities equipped with digital capabilities (10). Consequently, education transitioned to digital platforms as an alternative to traditional in-person learning, and university students found themselves distanced from campus life (11).

The COVID-19 pandemic introduced uncertainty into the lives of university students, as it did for people worldwide. For the first time, measures such as distance education, curfews, social distancing, and mask mandates became a part of university students' lives due to the pandemic, resulting in significant changes in their living conditions (12). During this period, university students often encountered challenges that adversely affected their well-being, including separation from loved ones, feelings of loneliness, stress, anxiety, boredom, fear, hopelessness, intolerance of uncertainty, anxious behaviors, the shift to distance education, confinement at home or within

cities, and socioeconomic issues (9). The global reach of the COVID-19 epidemic instilled stress, fear, and anxiety in people due to the elevated risk of infection and mortality (4).

Hope emerged as a crucial coping mechanism and a vital determinant of well-being during this stressful period (13). Given the unpredictable nature of the pandemic, future expectations are prone to change. Amid the dominant uncertainties of the COVID-19 pandemic, no existing literature has explored the relationship between hopelessness and intolerance of uncertainty in any sample group, including university students. Therefore, this study seeks to investigate the correlation between hopelessness, intolerance of uncertainty, and other factors in university students.

2. Materials and Method

2.1. Design

This study was designed as a cross-sectional study.

2.2. Sample and Procedure

The study's sample comprised students currently enrolled at a university (n=371). Research data were collected between April and June 2021 via an online survey application. The research was distributed to individuals through various social media platforms such as Facebook and Instagram, WhatsApp, and email, using an online survey created on Google Forms. At the beginning of the survey, participants were provided with information about the research's purpose, confidentiality, voluntariness, withdrawal process, and the estimated time required for completing the questionnaires (10-15 minutes). Additionally, they were asked to confirm their voluntary participation by checking a statement. The questionnaire could not be submitted if this confirmation was not made. To ensure that participants met the inclusion criteria, they were required to confirm on the survey's initial page that they were currently enrolled at the relevant university and participating in distance education. Individuals who did not meet these criteria were unable to proceed with the study.

Next, to determine the number of survey participants, we tracked the individuals who received the survey web link. The total number of recipients was calculated to determine the response rate. To ensure participation from various faculties and departments, the survey was distributed via university student email addresses. The reason for employing this sampling method was to gather data from a diverse population with distinct characteristics, rather than limiting the study to a specific faculty. A total of 987 individuals from different university faculties were invited to partake in the study. Out of these 987 individuals, 379 chose to participate in the survey and responded. Duplicate data entries were removed during the dataset creation process (n=379). In the study, Mahalanobis, Cook's, and Leverage Values were examined to identify outliers, and 8 data points that did not pass at least two of these tests were excluded. After the removal of outliers, the final sample size amounted to (n=371).

2.3. Questionnaire

A structured questionnaire was used for this study. It consisted of a 12-item Intolerance of Uncertainty Scale

questionnaire and 20-item Beck Hopelessness Scale Several items (total 32 items) and 10 questions on general characteristics (age, gender, graduation semester, income, family type, living with whom, living place, faculty, satisfaction with online education and efficiency from online education, having COVID-19 and losing a relative due to COVID-19.

2.3.1. Intolerance of Uncertainty Scale (IUS-12)

Carleton et al. (14) developed this scale. In the present study, the Turkish version of the IUS-12 was used. Participants assess 12 items (e.g., "It frustrates me not having all the information I need") on a 5-point Likert-type scale ranging from 1 (not at all characteristics of me) to 5 (entirely characteristic of me). The scale has two sub-dimensions (future-oriented anxiety and debilitating anxiety), and a total score can be taken from the scale. The general internal consistency coefficient of the Intolerance of Uncertainty Scale is 0.88. Higher scores indicate higher levels of intolerance of uncertainty. It has been shown to have very good internal consistency reliability (α =0.88) (15). The Cronbach's α in the present study was very good (α =0.913).

2.3.2. Beck Hopelessness Scale (BHS)

It is the most used psychological scale to measure hopelessness worldwide. BHS was developed by Beck et al. (16). The adaptation study to Turkish was first made by Seber (17). Then, BHS was applied to a larger sample group by Durak and Palabıyıkoğlu (18), and its validity and reliability study was carried out again. BHS consists of 20 items and a high score from the whole scale indicates that the level of hopelessness is high. The Cronbach's alpha reliability coefficient of BHS was 0.85. As a result of the analyses conducted in this research, Cronbach's alpha coefficient of BHS was found 0.907.

2.4. Data Analysis

Downloaded data were cleaned and uploaded onto SPSS version 21. The significance level was accepted as 0.05. Descriptive statistics of frequencies, percentages, means, min-max, and standard deviations were calculated for socio-demographic variables and intolerance of uncertainty and hopelessness. The differences in BHS, according to the general characteristics, were analyzed using a paired samples t-test, ANOVA, and LSD post-hoc test. The associations between IUS-12 and BHS were analyzed using the Pearson correlation coefficient. The impact on BHS was analyzed using multiple hierarchical regression analysis. Cronbach's alpha was used to test the consistency of the survey results.

2.5. Statistical Assumption Tests

The results indicated that the skewness ranged from 0.652 to 0.127 and kurtosis ranged from -0.691 to 0.253 and were within the normality criteria. It was found that all reliability coefficients were highly above 0.70 and therefore acceptable. The entire Mahalanobis distance was below 24. The variance inflation factor (VIF) values were 1.001- 1.021, the tolerance values were 0.972-0.999, and the Durbin Watson value was 2.086, which indicates that there was no multicollinearity and residuals problem. As a result, all assumptions were met by Field's (19) suggestions.

2.6. Ethical Aspect of the Research

Ethics committee approval (08/04/2021-E-69586843-050.06.04-170208) and written permissions from the dean of the faculties of the university were obtained to conduct the study. The study was carried out only with volunteers. It was stated to the participants that they could withdraw from the research at any time. As part of the study, a survey created through Google Forms was administered. Before the study, consent was obtained from students who marked the 'I voluntarily agree to participate in this study' checkbox at the beginning of the survey form. The study data was collected after obtaining consent from these students. All the participants provided their consent for test result notification and signed a personal information usage agreement.

3. Results

3.1. Participants' Characteristics

The mean age of the participants (n=371) was 22.03±1.72. They were mostly female (72.3%). The majority of participants' income was equal to expenses (61.7%), had a nuclear family structure (88.1%), lived with their family members, and more than half lived in metropolitan (62.5%). The majority of the participants were studying in a department related to health sciences (63.6%), and more than half were not graduating semester (58.8%). While half of the participants were not satisfied with online education (51.2%), more than half did not find online education effective (60.1%). Nearly one-fifth of participants had COVID-19 (17%), and one-third of them lost a relative due to COVID-19 (33.2%) (Table 1).

3.2. Differences In BHS According to General Characteristics of Participants

BHS differed significantly according to sociodemographic, education status. There is a difference in the hopelessness scores according to several characteristics such as income, living place, studying in a health-related department, satisfaction with online education, and efficiency from online education (Table 1).

Table 1. Differences in BHS According to General Characteristics of Participants (n=371)

Characteristics	Categories	N (%)	Beck Hopelessness Scale	
			Mean±SD[a]	t or F (p)
Age	<25	348 (93.8)	7.07±5.49	-0.015/0.988
	25 and over	24 (6.2)	7.09±6.11	
	Mean± SD	22.03±1.72		
Gender	Female	272 (73.3)	6.75±5.51	-1.857 /0.064
	Male	99 (26.7)	7.95±5.48	
Income	Less than expenses[b]	83 (22.4)	9.52±5.89	**11.264/<0.001**** **Post hoc:** b<c,d
	Equal to expenses[c]	229 (61.7)	6.46±5.22	
	More than expenses[d]	59 (15.6)	6.00±5.22	
Living with Whom	Family	324 (87.3)	6.88±5.41	1.704/0.183
	Friend	30 (8.1)	8.10±6.10	
	Alone	17 (4.6)	8.94±6.35	
Living Place	Village/Town[b]	49 (13.2)	5.37±4.47	**4.193/0.016*** **Post hoc:** b<c
	County[c]	90 (24.3)	8.17±5.49	
	Province/Metropolitan[d]	232 (62.5)	7.00±5.66	

Table 1. (continue). Differences in BHS According to General Characteristics of Participants (n=371)

Characteristics	Categories	N (%)	Beck Hopelessness Scale	
			Mean±SD[a]	t or F (p)
Faculty	Health Sciences	236 (63.6)	6.47±5.29	-2.812/0.005*
	Others	135 (36.4)	8.13±5.77	
Graduation Semester	Yes	150 (40.4)	6.56±5.60	1.468 /0.143
	No	221 (59.6)	7.42±5.45	
Efficiency from Online Education	Low[b]	223 (60.1)	8.49±5.67	20,841 <0.001**
	Medium[c]	97 (26.1)	5.03±4.35	Post hoc: b<c,d
	High[d]	51 (13.7)	4.72±4.85	
Having COVID-19	Yes	63 (17.0)	7.11±6.09	-0.065/0.948
	No	308 (83.0)	7.06±5.41	
Lost a Relative due to COVID-19	Yes	124 (33.4)	7.59±5.46	1.283/0.200
	No	247 (66.6)	6.81±5.54	

[a]Standard deviation, *p<0.05, **p<0.001

3.3. Scores of Intolerance of Uncertainty (IUS-12), Hopelessness (BHS)

The mean score of intolerance of uncertainty was 39.38±10.36. Among the subscales of intolerance of uncertainty, future-oriented anxiety, and debilitating anxiety scores were 23.61±5.98, 15.77±5.23 respectively. The mean BHS score was 7.07±5.52 (Table 2).

Table 2. Scores of Scales and Subscales of Intolerance of Uncertainty (IUS-12), Hopelessness (BHS) (n=371)

Scale	Number Of items	Possible score range	Mean±SD[a]
Future-oriented anxiety	7	1-5	23.62 ±5.93
Debilitating anxiety	5	1-5	15.77 ±5.20
IUS-12	12	1-5	39.39 ±10.28
BHS	20	0-1	7.07±5.52

[a]Standard deviation

3.4. Correlations among Intolerance of Uncertainty and Hopelessness

Hopelessness score was significantly correlated with intolerance of uncertainty (r=0.327, p<0.001) (Table 3).

Table 3. Correlations among Intolerance of Uncertainty and Hopelessness (n=371)

Variables	Intolerance of Uncertainty	Beck Hopelessness Scale
Intolerance of Uncertainty	1	0.327
Beck Hopelessness Scale	0.327	1

p<0.001

3.5. Factors Associated with Hopelessness: Multiple Hierarchical Regression Analysis

To investigate how well hopelessness score when controlling intolerance of uncertainty score, income, faculty, and efficiency from online education respectively, a hierarchical linear regression was computed. The assumptions of linearity, normally distributed errors, and uncorrelated errors were checked and met. When intolerance of uncertainty score entered alone it significantly predicted hopelessness score $F_{(1,370)}=44.194$, p<0.001, Adjusted R^2 =0.105 (Model 1). When the income was added, it significantly improved the prediction, R^2change=0.042, $F_{(2,369)}=18.133$, p<0.001 (Model 2); then when the faculty was added, it significantly improved the prediction, R^2change=0.015, $F_{(3,368)}=6.657$, p<0.001 (Model 3); finally when the efficiency from online education was added, it significantly improved the prediction R^2change=0.073, $F_{(4,367)}=35.049$, p<0.001 (Table 4).

4. Discussion

Global epidemics trigger problems such as fear, anxiety, loneliness, depression, and hopelessness in all individuals, whether the risk of disease is high or not (19). This research was carried out during the COVID-19 pandemic, which has inevitable individual, social, and psychosocial effects (19,20). In the study, it was aimed to reveal the effect of university students' intolerance of uncertainty and other factors on hopelessness scores during the COVID-19 pandemic, where education is carried out remotely. In the study, it was found that university students had mild levels of hopelessness and their intolerance of uncertainty scores alone predicted 10.5% of their hopelessness scores (Model 1) income status was 4.2% (Model 2), education in health sciences was 1.5% (Model 3), low efficiency predicted 7.3% of hopelessness scores (Model 4) (Table 4).

University students' intolerance of uncertainty mean score was found to be moderate (39.38±10.36). In the national and international literature, Jensen et al. (22) and Bozkur et al. (5) in their research with university students (respectively; 31.68±8.64; 38.92±9.08), before the COVID-19 pandemic, Duman (23) with university students, Şentürk and Bakır (24) with nursing students, Satici et al. (25) with adults, reached similar results (respectively; 38.79±8.81; 37.18±10.10; 38.86±9.00) in their research during the COVID-19 pandemic. In parallel with the literature, it can be said that university students have a moderate level of intolerance of uncertainty and are generally like the general adult population. Deteriorated psychological well-being with the negative impact of epidemics such as COVID-19 affecting the whole world on the perception of loss of control, daily routines, and social support mechanisms may have triggered intolerance of uncertainty (4,25,26).

In the present study, mild-level hopelessness score averages were reached among university students. In the literature, studies conducted with university students before the COVID-19 pandemic by Bozkur et al. (5), Ergüt (6), Demirtaş and Yıldız (26), Şanlı Kula and Saraç (27), and Duman et al. (28) reported mild levels of hopelessness with scores of (respectively; 4.84±4.53; 4.92±3.87; 9.88±1.79; 6.08±4.78; 5.28±4.26). Similarly, Kaplan Serin and Doğan (20) found mild levels of hopelessness in nursing students (6.11±4.91) during the COVID-19 pandemic. The current research findings align with the existing literature, indicating that, overall, the level of hopelessness among university students before and after COVID-19 remains at a mild level. Accordingly, it is thought that the hopelessness scores of university students are affected by factors other than the COVID-19 pandemic.

Table 4. Multiple Hierarchical Regression Analysis of Factors Associated with Hopelessness

Variable	B	S.E[a]	B	R^2	Adjusted R^2	ΔR^2	F change	P (F change)
Model 1				0.107	0.105	0.107	44.194	p<0.001
IUS-12[c]	0.176	0.026	0.327					
Constant	0.153	1.075						
Model 2				0.149	0.144	0.042	18.133	p<0.001
IUS-12[c]	0.164	0.026	0.305					
Income (Less than expenses)[b]	2.725	0.640	0.206					
Constant	0.006	1.052						
Model 3				0.164	0.157	0.015	6.657	p<0.001
IUS-12[c]	0.162	0.026						
Income (Less than expenses)[b]	2.623	0.636	0.302					
Faculty (Health Sciences)[b]	-1.414	0.548	0.198					
Constant	0.986	1.111	-0.123					
Model 4				0.224	0.229	0.073	35.049	p<0.001
IUS-12[c]	0.156	0.025	0.291					
Income (Less than expenses)[b]	2.165	0.614	0.164					
Faculty (Health Sciences)[b]	-1.306	0.525	-0.114					
Efficiency from Online Education (Low)[b]	3.076	0.520	0.273					
Constant	-0.579	1.095						

[a]Standard error, [b]Dummy variables, [c]Intolerance of Uncertainty Scale

There is a positive, weak, and significant relationship between university students' hopelessness scores and their intolerance of uncertainty scores (r=0.327, p<0.001) (Table 3), and 10.5% of their hopelessness scores are predicted by their intolerance of uncertainty scores. A limited number of studies in the literature on university students show that hopelessness is positively associated with intolerance of uncertainty (5,26). Perception of ambiguous situations as threatening and disturbing and anxiety about the future seem to be associated with hopelessness features like negative thinking about the future and pessimistic outcome expectation (26). The COVID-19 pandemic has brought with it unpredictable conditions, contrary to human nature, to be aware of and ensure the future (3-5). In this respect, it can be said that the stress created by the intolerable level of uncertainty with the entry of COVID-19 into human life triggers intolerance of uncertainty and predicts hopelessness scores.

In the study, the hopelessness level of students with low income was found to be higher and it was seen that low-income level predicted 4.2% of their hopelessness scores (p<0.001) (Table 4). When the literature is examined, it is seen that there are inconsistent results for the income level variable. Şanlı Kula and Saraç (27) stated that low income is associated with high hopelessness scores in university students; Tetik and Yurtsever (29) and Duman et al. (28) concluded that income status did not affect hopelessness scores. Income level is very important in terms of future assurance (27). With the negative economic consequences of the COVID-19 quarantine process, the fear that individuals with low income will experience financial loss may be effective in their despair (20,30).

In the research, one of the important variables affecting the hopelessness scores is the faculty of education. Only 1.5% of hopelessness scores are predicted by the faculty variable.

On the other hand, it was concluded in the study that those studying in health-related department had significantly lower hopelessness scores (p<0.05; Table 1). Negative expectations about finding a job predict students' hopelessness scores (5,27,31). It can be thought that the increase in the demand for health services and therefore the possibility of being employed in a job during this period, as before the COVID-19 pandemic, affects the hopelessness scores of those studying in health-related department (27,31).

The COVID-19 pandemic has been a factor for almost all university students to become acquainted with distance education methods and techniques. The distance education process, which is an urgent and mandatory solution for the prevention of learning losses and the continuation of education, has been a different experience for the students, but the students evaluated this process as uncertain, inefficient, and negatively affecting their social lives (31,33). In the current study, it was seen that more than half of the students in the distance education process found online education inefficient and students who reported low efficiency from online education had significantly higher hopelessness scores than the other groups, and low-efficiency perception predicted 7.5% of their hopelessness scores (p<0.001). The online education process, which entered their lives with the COVID-19 pandemic and is perceived as something new and uncertain, as well as an obstacle to socialization, is believed to have the potential to impact the levels of hopelessness among university students, which is an important indicator of well-being (21). On the other hand, university students' positive expectations for the future are related to their belief that they will be successful in their profession (5,13). It can be thought that low professional self-efficacy belief may mediate the high hopelessness scores of students who receive low efficiency from online education.

4.1. Limitations of the Study

Research findings have some limitations. First, although a substantial sample size was reached in the study, the sampling method limits the generalizability of the findings. To increase the generalizability of the findings, a larger sample can be studied, and a random sampling procedure can be applied. Latter: the data were collected at a large state university in the west of Turkey, and although students from many different provinces participated in the research, it may be suggested to stratify the sample to cover more different provinces to increase the generalizability of the findings. Third; Self-report criteria were used in data collection. Although these measures are frequently used to collect data, the validity of self-report measures is limited, especially in sensitive subjects such as emotional and social structures, since they are limited to the perception of the participant and the possibility of giving socially desirable responses. Current research is in cross-sectional and relational design. Therefore, it is likely to change over time.

5. Conclusions and Recommendations

In line with the research findings, it was concluded that the university students in the distance education process participating in the research had a moderate level of intolerance of uncertainty and a low-medium level of hopelessness, and as their intolerance of uncertainty increased, their hopelessness increased. It was concluded that students' hopelessness levels were predicted the most by the intolerance of uncertainty variable, followed by low efficiency from online education, income status, and education in health sciences, respectively.

This research offers valuable results in terms of planning interventions aimed at addressing the psycho-social needs of students and increasing efficiency in education, considering the variables examined, to reduce the level of intolerance of uncertainty and therefore hopelessness of university students during the ongoing COVID-19 pandemic. In line with these results, it may be recommended to repeat similar studies in larger sample groups and to plan qualitative and mixed-method studies to investigate other factors predicting hopelessness in depth.

6. Contribution to the Field

The findings of this research reveal the relationship between intolerance of uncertainty and levels of hopelessness among university students engaged in online education. Understanding this relationship will contribute to grasping the connection between the psychosocial needs of university students and their education, as well as shaping interventions aimed at enhancing their hope. This study demonstrates that the low effectiveness of online education is associated with levels of hope. While considering the potential effectiveness of providing students with more effective and interactive online education in reducing levels of hopelessness, these results also facilitate a re-evaluation of optimal strategies for online education. Moreover, this research highlights the connection between the effectiveness of online education and the tolerance for uncertain situations during the COVID-19 pandemic, offering insights into how to better support students during similar crises in the future.

Conflict of interest

There is no conflict of interest regarding any person and/or institution.

Authorship Contribution

Concept: EE, SY; **Design:** EE, SY; **Supervision:** EE; **Funding:** EE, CG, SY; **Materials:** EE, CG, SY; **Data Collection/Processing:** SY; **Analysis/Interpretation:** CG; **Literature Review:** CG, SY; **Manuscript Writing:** CG; **Critical Review:** EE, CG, SY.

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