

Relationship between Death Anxiety and Happiness of Undergraduate Students of Zanjan University of Medical Sciences During the Coronavirus Disease (COVID-19) Pandemic

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Abstract

Background: Death anxiety is common in disease with a high mortality rate. Coronavirus disease (COVID-19) pandemic is considered a crucial factor with remarkable impact on community different age groups' mental health.

Objectives: The present study aimed to determine the relationship between death anxiety and happiness during the COVID-19 pandemic among the undergraduate students of Zanjan University of Medical Sciences, Zanjan-Iran, in 2021.

Methods: This correlational-descriptive study was conducted on 395 undergraduate students of Zanjan University of Medical Sciences using convenience sampling method. Data was collected through a three-part questionnaire including demographic characteristics, Templers's Death Anxiety Scale (DAS), and Oxford Happiness Inventory (OHI). For data analysis Spearman, Mann-Whitney, and Kruskal-Wallis tests were used in SPSS software version 26.

Results: The results indicated that the mean (SD) scores of death anxiety and happiness were 34.04 (8.30) and 51.98 (14.43), and their median scores were 34 and 53, respectively. The death anxiety of 70.7% of the studied students was average, while the level of happiness of 40.8% of the students was average and 47.3% was high. A significant weak, inverse relationship was observed between the two variables of death anxiety and happiness ($r=-0.155$, $P=0.002$).

Conclusion: The results of the study indicated a slight decrease in happiness in students with higher death anxiety during the COVID-19 pandemic. But considering the high prevalence of death anxiety among students, especially female and non-native ones, it is necessary to pay particular attention to decreasing death anxiety in undergraduate medical students.

Keywords: coronavirus disease, happiness, death anxiety, students, undergraduate medical education

Introduction

In December 2019, the outbreak of a viral disease was reported in the city of Wuhan, China, the cause of which was a new type of virus from the

family of coronaviruses called Coronavirus disease 2019 (COVID-19). The outbreak of this virus was so fast and affect most of the countries all over the world in a short period of time. After

it's widespread, the World Health Organization (WHO) declared a global pandemic on March 11, 2020 [1]. At the beginning of this emerging disease, quarantine was implemented as the first way to prevent the disease in many countries. Quarantine, despite of having positive effects in controlling the disease, had unwanted consequences that have received less attention. Imposing quarantine can negatively affect mental health by keeping individuals away from social activities and relations and lead to stress, anger, and fear [2]. According to the policy of the Ministry of Health and Medical Education of Iran, in order to control the disease of Covid-19, regulations were established to prevent the presence of people in public places. For this purpose, training in schools and universities of the country was conducted in a non-attendance manner for more than two years [3]. In this way, many teenagers and young people were deprived from participating in social activities during the Corona era. According to a recent systematic review results the prevalence of depressive symptoms ranged from 14.6% to 48.3%. Although the reported rates are higher than previously estimated one-year prevalence (3.6% and 7.2%) of depression among the population prior to the pandemic [4]. In this regard, the study results of Lee & et al. (2020) indicated the individuals' level of death anxiety have increased in this unexpected crisis [5]. The study of Pradhan & et al. (2020) indicated the level of death anxiety during the COVID-19 pandemic in students of universities had increased [6]. Templer (1970) defines death anxiety as the fear of death and non-existence, talking about death, and fear of the unknown [7]. A recent study results showed an inverse relationship between death anxiety with happiness [8]. Happiness is positively and significantly associated with emotion regulation and life satisfaction, and a high level of happiness results in decreased depression and anxiety [9]. Argyle (2001) has defined happiness as a multidimensional concept involving emotional and cognitive dimensions, life satisfaction, and the lack of any negative emotions such as depression and anxiety [10]. Previous studies have assessed the relationship between death anxiety and happiness among different groups of individuals [11]. The results of Parvin et al.'s study aiming to investigate the relationship of

happiness and death anxiety of nurses working in the COVID-19 wards, revealed an inverse and significant relationship between the nurses' levels of death anxiety and happiness [8]. Considering the nature of clinical courses in medical and paramedical fields and the need for students to be in the clinical field during the coronavirus disease, it is expected that the level of death anxiety in this group of students due to being exposed to the disease and the risk of transmission to their family was higher risk than the students who did not have clinical training. On the other hand, the need to comply with the quarantine regulations during the 19-coronavirus disease in dormitories and public places seems to have reduced the level of students' happiness. However, since no study has been found on the relationship between happiness and death anxiety among the students of the University of Medical Sciences during the Coronavirus disease (2019) pandemic, the present study was conducted with the aim of determining the relationship between death anxiety and happiness of undergraduate students of Zanjan University of Medical Sciences during the Covid-19 pandemic.

Methods

This research is a correlational-descriptive study. The population under study consisted of all undergraduate students studying in Zanjan University of Medical Sciences (N=1522). The students' sampling was performed by convenience method for three months from February 2021 to April 2022, based on the quota and considering the proportion of students in each field until the quota was completed. The number of samples was determined based on the standard deviation reported for the happiness variable for undergraduate students (SD=14.87) in the study of Delavar and Shokohi Amirabadi [12], considering $\alpha=0.05$ and $d=1.5$, 375 student. Taking into account 10% sample loss, study sample size was determined 395 student. The characteristics of the people under investigation included the following: studying at the undergraduate level, no history of neurological and mental diseases or diagnosed depression according to self-report, not taking antidepressants medicine, no history of close relatives' death in the past six months, no history

of emotional problems in the past six months and membership in WhatsApp or Telegram groups. Data collection was carried out using three questionnaires.

The first questionnaire was related to personal information, including the demographic characteristics of gender, marital status, source of income, field of study, type of clinical internship during the COVID-19 period (in-person/virtual), the times of COVID-19 vaccination, history of COVID-19 infection. The second questionnaire was Templer's Death Anxiety Scale (DAS) (1970) [13]. DAS is a 15-item questionnaire scored on a 5-point Likert scale from zero to four ("Completely Disagree, Disagree, No Idea, Agree, Completely Agree"), indicating the subject's attitude toward death. The range of score changes in this tool is from 0 to 60. A higher score on this test denotes higher death anxiety. Questions 1, 2, 3, 6, 7, and 15 are scored inversely. In this study a score less than or equal to 20 was considered low death anxiety, 21-40 moderate and more than 40 high. The reliability of this questionnaire has been examined in Rajabi and Bahrani's study through the internal consistency method by calculating Cronbach's alpha coefficient, which was reported to be equal to 0.81 for the total scale [14]. In the current study, to assess the reliability of the intended scale, the questionnaire was distributed among 15 undergraduate students, and a Cronbach's alpha of 0.84 was obtained.

The third part of the study tool included the Oxford Happiness Inventory (OHI) (1989) developed by Argyle and Hills. The final form of the questionnaire has 29 items scored on a 4-point Likert scale from zero to three ("not at all, sometimes, rarely, and always"). The highest score one can obtain in this questionnaire is 87, and the lowest is 0. A higher score means more happiness. Argyle et al. reported the Cronbach's alpha coefficient of this questionnaire to be 0.90 [10]. In the present study, the standardized psychometric Persian version was used in Alipour and NoorBala's (2008) study. According to their results, the Persian version of the Hills and Argyle happiness questionnaire is a suitable tool for measuring the happiness of Iranian students and young people. In the factor analysis of Alipour et al., 5 factors of life satisfaction (questions 2, 3, 4, 5, 6, 8, 14, 15, 24, 25, 26), positive mood (questions 9, 13, 14, 17, 19, 22, 27, 29), health

(questions 1, 7, 8, 23, 28), efficiency (questions 12, 18, 20, 21) and self-esteem (questions 10, 11) were obtained, which together explained 57.1% of the variance of the total happiness scores in the studied sample. It should be mentioned that question number 14 was common to both factors 1 and 3 and question 8 was common to both factors 1 and 3. Despite the mentioned cases, the Persian version of the tool has been introduced as a suitable version for measuring the happiness of Iranian students and young people. The scale's Cronbach's alpha coefficient has been reported to be 0.93 [15]. To determine the cutoff point of happiness, a score less than or equal to 29 was considered as low, 30-58 as average, and more than 59 as high in this study.

The questionnaire was prepared in both written and electronic forms. The electronic version were designed as a virtual link in cooperation with the Porsline an online questionnaire production company. The virtual link was sent to all undergraduate students through WhatsApp and Telegram groups. The participants were initially assured that participation in this research was totally optional and their information would be kept confidential, and the study goals, methods, and benefits were then explained as well. 216 student completed and sent the questionnaire electronically, and in the following, given the proportion of students in each field, 179 questionnaires remained, and considering the number of samples remained from each field, after the classes being in-person, the questionnaires were distributed and collected after completion.

This study was approved by the Ethics Committee of Zanjan University of Medical Sciences with the code (ID IR.ZUMS.REC.1401-1400.392). Written informed consent was obtained from the participants of this project. The confidentiality of students' information and the use of research results only for scientific purposes have been observed in this study.

For data analysis, descriptive statistics methods, including absolute and relative frequency, mean and standard deviation, and median, were used; in the analytical statistic part, the Kolmogorov-Smirnov test was used to assess the normality of the data, and since the data were not distributed normally, non-parametric tests, including Spearman, Mann-Whitney, and Kruskal-Wallis

correlation coefficient tests were used. All statistical calculations were performed in SPSS version 26 software.

Results

The results are presented based on the 395 completed and returned questionnaire. The students' mean (standard deviation) age was 21.47 (2.31) years in the age range of 18-43 years. Most of the participants were female (80.5%), single (96.2%), non-native (77%), and their

source of income was the family (80%); 229 students (58%) had a clinical internship, of which 215 (93.89%) completed it in person.; At the time of sampling, 388 students (98.2%) had a history of vaccination with the Covid-19 vaccine, of which 382 (98.5%) had received two doses of the vaccine. Only 1.7% of all students studied had not received any of the types of Covid-19 vaccine and 244 (61.8%) had reported a history of disease infection in the last six months. (Table 1).

Table 1: Distribution of Demographic Variables of the Participants

Variable	Category	Number	Percentage
Gender	Female	318	80.5
	Male	77	19.5
	Total	395	100
Marital Status	Single	380	96.2
	Married	15	3.8
	Total	395	100
Source of Income	Part-time	50	12.7
	Family	316	80
	Personal	29	7.3
	Total	395	100
Residence Status	Native	91	23.0
	Non-native	304	77.0
	Total	395	100
Internship	Yes	229	58
	No	166	42
	Total	395	100
Type of clinical internship	in-person	215	93.89
	Virtual	14	6.11
	Total	229	100
History of vaccination	Yes	388	98.2
	No	7	1.8
	Total	395	100
Number of vaccine injection	Single Dose	6	1.5
	Two Dose	382	98.5
	None	7	1.8
	Total	395	100

The mean (SD) of total death anxiety and happiness scores among undergraduate students of Zanjan University of Medical Sciences during

the COVID-19 pandemic were obtained 34.04 (8.30) and 51.98 (14.43), respectively (Table 2).

Table 2: The Mean, Standard Deviation and Median Scores of Death Anxiety and Happiness in the Participants

Variable	Mean	Standard Deviation	Median
Death Anxiety	34.04	8.30	34
Life satisfaction	21.00	6.27	21
Positive mood	14.00	4.45	14
Health	11.0	3.26	12
Efficiency	6.18	2.40	6
Self-esteem	3.39	1.42	4
Total score	51.98	14.43	53

Data analysis shows that given the cut-off points of 20 and 40 in the TDAS, the majority of the participants have moderate to high death anxiety (93.7%). Also, considering the range of changes

of total happiness 0-87 and the cut-off points of 29 and 58 in the total score of the OHI, the level of happiness was observed to be moderate to high in most of the students (Table 3).

Table 3: Distribution of Happiness and Death Anxiety Level in Participants

Variable	Number	Percentage
Death Anxiety	Low ≤ 20	6.3
	Medium 21-40	70.7
	High ≥ 41	23
Happiness	Low ≤ 29	6.8
	Medium 30-58	45.8
	High ≥ 59	47.3

The comparison of the median score of death anxiety in undergraduate students based on demographic variables showed that the level of death anxiety in female students was significantly higher than that of male students (P = 0.001). The median score of death anxiety in non-native students was significantly higher than in native students (P=0.039). The results of this study did

not show a significant relationship between any of the dimensions of happiness with demographic variables, except for the dimension of positive mood and students' residence conditions. The comparison of the Mann-Whitney test results indicated that the score of positive mood was higher in native than in non-native students (P=0.027) (Table 4).

Table 4: Comparison of Participants Based on Median Total Score of Death Anxiety and Happiness According to Demographic Variables

Variable	Category	Death Anxiety				Happiness			
		Median	Interquartile Range	Test Statistic	P-value	Median	Interquartile Range	Test Statistic	P-value
Gender	Female	35.00	9.00	9223.00	0.001*	14.00	6.00	12646.500	0.653*
	Male	32.00	11.00			15.00	5.50		
Marital status	Single	34.00	9.00	3142.50	0.500*	14.00	6.00	2487.000	0.401*
	Married	34.00	12.00			12.00	7.00		
Income status	Part-time	35.00	10.50	4.13	0.127*	14.00	5.50	0.013	0.791*
	Family	34.00	9.00			14.00	6.00		
	Personal	32.00	9.00			17.00	8.50		
Residence status	Native	33.00	7.00	15798.00	0.039*	15.00	6.00	11719.50	0.027*
	Non-native	35.00	10.0			14.00	6.00		
Field of study	Public health	35.00	7.75	2.84	0.985**	14.00	7.25	5.79	0.832**
	Occupational health	34.00	13.00	2.84		13.00	11.00	5.79	

Environmental health	36.50	14.00	2.84	15.00	4.50	5.79
Radiology technology	33.00	16.25	2.84	14.50	7.75	5.79
Nursing	34.00	10.25	2.84	14.00	6.00	5.79
Anesthesiology	34.50	13.50	2.84	15.00	4.50	5.79
Midwifery	33.50	7.00	2.84	13.00	5.50	5.79
Medical staff	35.00	8.50	2.84	15.00	5.75	5.79
Nutrition science	36.00	12.00	2.84	13.00	7.00	5.79
Laboratory sciences	33.00	7.50	2.84	15.00	6.00	5.79
Operation room	33.00	8.00	2.84	14.00	6.00	5.79

*Mann-Whitney U test

**Kruskal-Wallis

The results of the Spearman correlation coefficient test indicated a weak and inverse but statistically significant relationship between total score of death anxiety and happiness ($r = -0.115$, $P = 0.002$). Death anxiety and self-esteem

dimension of happiness had the highest correlation ($r = -0.216$), and life satisfaction had the lowest correlation ($r = -0.104$). Also, no significant correlation was observed between the dimension of positive mood and death anxiety (Table 5).

Table 5: The Correlation between the Total Scores of Death Anxiety and Happiness and its Dimensions of Participants

Death Anxiety	Happiness					
	Life Satisfaction	Positive Mood	Health	Efficiency	Self-esteem	Total Score
Spearman correlation coefficient	-0.104	-0.094	-0.126	-0.184	-0.216	-0.155
P-value*	0.039	0.063	0.012	0.001>	0.001>	0.002

* Spearman correlation coefficient

There was a slight and inverse statistically significant relationship between life satisfaction dimension of happiness and age ($r = -0.116$, $P = 0.021$)

Discussion

This study results showed an inverse and significant relationship between total score of death anxiety and happiness of the undergraduate students of Zanjan University of Medical Sciences during the COVID-19 pandemic in 2021.

According to our findings the majority of the students under study had moderate to high death anxiety. Consistent with the current study, Pradhan et al., (2020) indicated that the COVID-19 pandemic had increased undergraduate students' level of death anxiety [6]. Sherman Lee et al., (2020) showed that the individuals' mental status had changed due to the COVID-19

pandemic and their level of death anxiety had increased [16]. The results of assessing the death anxiety status in terms of the students' gender demonstrated that the level of death anxiety was higher in females than in males. This finding is consistent with the findings of Mansournejad and Kajbaf (2012) that revealed female students experienced higher death anxiety than male students [17]. Regarding a higher level of death anxiety among females than males, Mayers and Diener (1996) believe that women generally experience both more negative and positive emotions and have a better acceptance of their negative emotions than men, whereas men deny having such factors [18]. Also, the analysis of the results between the students' death anxiety and their living status indicated a significant relationship between the level of death anxiety among native and non-native students in such a

way that non-native students had higher death anxiety than their native counterparts. Concerning the cause of a higher level of death anxiety in non-native than native students in the present study, it can be mentioned that non-native students in the present study resided in the university dormitory, and due to overcrowding and non-observance of health standards by others, the students evaluated the possibility of getting the COVID-19 disease in themselves more than non-native students, and this issue affected their level of death anxiety. The analysis of the results of the current research indicated that the level of happiness in the majority of studied students was at a medium to high level. In consistent with the present study, Delavar et al., (2020) study result's indicated that the level of happiness of nursing students of Islamic Azad University of Tehran and Tehran University of Medical Sciences during Corona crisis was high [12]. The findings of Van Mohed et al.'s research also showed that during the pandemic, students had a high level of happiness, and happiness is a protective factor to cope with severe stress. It seems that the closure of universities and students during the COVID-19 pandemic has had significant effects on the balance between work and family, the level of happiness, and negative signs in the feelings of university students [19]. The results of Hemmati (2019) study showed that the level of happiness of female students of Isfahan University was slightly higher than the average and was not satisfactory. It should be mentioned that Hammati's study was done before the start of the Covid-19 pandemic and the research population consisted of all students of Isfahan University [20].

The analysis of the results of Spearman correlation coefficient test concerning the relationship between students' happiness and demographic variables indicated a significant inverse but weak relationship between the life satisfaction dimension of the OHI and age. Thus, the higher the students' age, the low the life satisfaction will be. In this regard, the results of Safari et al. (2013) study on the happiness status of the medical students studying at Baqiyatollah University demonstrated a positive and significant relationship between the students' total happiness and age [21]. The difference in results may be due to the different characteristics of the individuals in the two studies. In Safari's study, the students'

mean age was 29 years, while in the present study, the mean age was 21.47 years, and the students' educational level in Safari's study included students from different levels, while in the current study, only undergraduate students were included in the study. Concerning the relationship between students' living conditions and the OHI dimensions, the analysis of the Mann-Whitney test results indicated that the positive mood score was higher among native than non-native students, meaning that the level of happiness of native students was higher than that of non-native students. In this regard, the results of Bayrami et al.'s (2011) study examining the relationship between happiness and demographic variables of students indicated that the level of happiness was higher in native students than in non-native students, which is in line with the present study results [22]. The results of Siamian et al.'s (2011) study showed that students' happiness depended on their field of study and educational level, and the variables of age, gender, and marital status, as well as being native, had no effect on the students' level of happiness, which is not in consistent with the present study results [23]. The difference in the results of the two studies appears to be primarily related to the homogeneity of the students investigated in the current research in terms of educational level, which due to the role of educational level in death anxiety, sampling was performed only among the undergraduate level. Moreover, Siamian's study is related to the year 2011, while the present study is related to the time of the COVID-19 outbreak, and the students evaluated in Siamian's study had no quarantine experience.

The analysis of the obtained results indicated a weak, inverse, and significant relationship between the two variables of death anxiety and happiness. The findings also showed that, in general, by increasing the students' level of death anxiety during the pandemic, their level of happiness decreased slightly. Consistent with the current research, the results of Parvin et al.'s study aiming to assess the relationship between happiness and death anxiety among nurses working in COVID-19 wards compared to those working in non-COVID-19 wards showed an inverse relationship between their levels of death anxiety and happiness. In fact, the level of death anxiety of nurses working in COVID-19 wards

was higher than that of nurses working in other wards; the level of happiness of nurses working in COVID-19 wards was lower than that of nurses working in other wards [8]. The present study was conducted during the COVID-19 pandemic, and part of its sampling was performed online, and another part was performed in person due to the university classrooms' being in-person, in a convenient method; therefore, generalizing its results should be cautious. Furthermore, the absence of a linear relationship between the two variables of death anxiety and happiness in this study can be due to the fact that these two variables do not have a normal distribution. Therefore, it is suggested that future studies be conducted with a larger sample size.

Conclusion

The results indicated that, in general, by increasing the students' level of death anxiety during the pandemic, the level of happiness slightly decreased. The analysis of the findings showed that, the COVID-19 pandemic was a serious crisis affecting individuals' lives and increasing the students' level of death anxiety during this period. Considering the high prevalence of death anxiety among students, especially female and non-native ones, it is necessary to pay particular attention to decreasing death anxiety in undergraduate medical students. As well it seems that in crisis situations such as COVID-19 pandemic, making classrooms non-attendance and sending non-native students to their hometowns can act as a good source of support to maintain students' morale and happiness.

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Conflict of interest

All authors declare that they have no conflict of interest. It should be noted that the corresponding author for this article is the editor of this Journal

and the first author's dissertation supervisor as well.

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Authors' contributions

All the authors participated in presentation of the idea and initial design, collection and analysis of data, the process of the initial writing of the manuscript and revision. Moreover, all authors accept the responsibility for the accuracy and correctness of the contents of the present manuscript and approve the final version of the manuscript.

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