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Psychometric Evaluation of the Depression, Anxiety and Stress Scale (DASS21) Among a Sample of Egyptian University Students

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Abstract

Objectives: The study aimed to investigate the global structure of depression, anxiety and stress scale. Previous studies have shown that there is a conflict in determining the most accurate construction. The study verified seven models like first and second order of general factor model, Confirmatory 3 factor model, two factor and Bifactor model.

Methodology: 434 students from Suez Canal University, College of Education participated in this study. The sample was chosen by the snowball method. The abbreviated version was translated into Arabic with the help of English language curriculum specialists. The scale consisted of 21 items distributed on three factors: anxiety, stress and depression. The five-point Likert scale was chosen to respond to items. IBM SPSS V26 and M Plus V8 used to perform the data analysis.

Results: The results reached the perfection of the exploratory three factors than the Bifactor model. The overall stability of the scale by the alpha coefficient reached 0.949, while the alpha coefficient ranged from 0.854 to 0.884 for the three dimensions. The study showed high rates of stress, while levels of depression and anxiety were moderate among participants. The study limitations were that the high sample size in females than males, which doubts the generalization of depression dimension results in new samples.

Keywords: Depression • Anxiety • Stress scale • Factor analysis • Bifactor model • Psychometric properties

Introduction

The new Corona virus, known as COVID-19, appeared in the city of Wuhan, capital of the Chinese province of Hubei, in December 2019 and soon spread to most countries of the world at the beginning of 2020 and turned into a pandemic (extending its impact to all countries of the world) as many individuals suffer from it in all countries Almost the world and cases of injuries and deaths decreased in the summer of 2020, but soon cases of deaths rose in all countries of the world at the beginning of the autumn season of the same year and the beginning of the period of rapid rise in deaths was called the second wave of the COVID-19 pandemic and this was given the name of second wave, the high incidence of COVID pandemic, which increased by more than 90 million people and nearly two million deaths around the world at the moment of writing the research report. This pandemic has caused many emotional problems for individuals.

Depression, anxiety and stress are among the most common psychological problems in psychology. It is believed that stress, anxiety and depression are distinct concepts and structures, but there is a strong connection among them. Several scales have been designed to measure these psychological problems, but the best of these scales is the Depression, Anxiety, Stress scale (DASS) of Lovibond PF and Lovibond SH [1]. A third factor that was called stress, which expresses agitation, nervous tension, difficulty in relaxation and emotional excitability when the scale is used on unsatisfactory samples [2].

This scale has been widely used in foreign studies to measure the profile of emotional disorders in different societies of adolescents, young adults and the elderly. The initial version of the scale consisted of 42 items and it was shortened to 21 items by Lovibond PF and Lovibond SH [1], which was characterized as a short form and was characterized by its ease of application in a short period of time. It has been translated into many languages and different cultures. The scale consists of three sub-dimensions: depression measures hopelessness, apathy, self-help and worthlessness of life, while anxiety is an acute response to fear and stress includes tension, agitation, impulsivity and difficulty in relaxing.

Over the past two decades, the results of psychometric analysis have produced conflicting results, but there is strong empirical psychometric support for the scale in terms of its three-dimensional factor structure and internal consistency of clinical and non-clinical samples in different environments and cultures. Many studies supported its tripartite structure and proved good matching with the data, a good degree of convergent and discriminatory honesty and a good degree of internal consistency stability, most of which exceeded 0.80 in many cultures, including in the American society for a satisfactory and unsatisfactory sample [3], in English society [4,5], in Spanish society [6] and in Portuguese society [7], a sample of Arab immigrants in Australia [8] and in the Indonesian community [9], I have university students in Malaysian society [10,11] and in Kosovar society [12]. And in Pakistani society [13] and also in Iranian society [14].

While some studies did not support the three-dimensional structure of the scale, where there was a clear overlap between the three-dimensional items on the factors, especially for the factors of anxiety and stress & Henry. In the Portuguese society, Apóstolo JLA, et al. [15] found using exploratory factor analysis that the scale consists of two factors, the first factor saturates most of the anxiety and stress items, while the second factor saturates most of the items that measures depression and the two factors explain 58.54% of the

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total variance. While the internal consistency of alpha ranged from 0.90 for depression, 0.86 for anxiety, 0.88 for stress and 0.95 for the three measures together.

In the Polish society, Zawislak, Zur-Wyrozumska, Habera, Skrzypiec, Agnieszka and Cebula using exploratory factor analysis reached four factors, despite that they supported the three factors model on the grounds that the fourth factor is not essential and has three items saturation and low stability. While Henry & Crawford reached a four-factor structure that consisted of three dimensions of depression, anxiety and stress in addition to a general factor of the second order that represents the optimal fit for all the structures tested and thus this supports the hypothesis that the scale consists of three independent factors, but You acknowledge that there is a more general factor that shares the variance with the other three factors.

Duffy, Cunningham and Moore attributed this difference to demographic characteristics, especially for the age groups under 17 years. By conducting a meta-analysis of studies that verified the measurement properties of the Depression, Anxiety and Stress Scale of the Abbreviated Formula 21, Lee, et al. to verify the validity of the content with a sufficient degree of quality and it was found that the scale reflects the structural validity of the bifactor with a high degree and a high degree of internal consistency. Regarding the validity of the test, the depression dimension showed a sufficiently high quality.

In a meta-analysis of 48 studies that verified the psychometric properties of the scale, Lee, et al. that about structural honesty, models appeared in heritage in addition to the model of the three factors, which are: The three-factor model for most studies. Two-order three-factor model.

- Bifactor model where the item is saturated with a specific factor in addition to its saturation with a general factor. The Employee Model.
- The general factor model was found by two studies. Accordingly, the study seeks the following: 1. Evaluating the internal consistency of the scale. 2. Verifying structural validity using exploratory and confirmatory factor analysis. 3. Testing competing confirmatory factor models that reflect different visions of the three dimensions of knowledge, which one is more compatible with the sample data are as follows: The general factor model, which reflects the principle of simplicity, where the variance is due to the general factor in addition to the variance of the error associated with each item. The two-factor model: generated from the exploratory factor analysis. The third model of the three factors assumed in the theoretical construction of the scale.
- Bifactor testing of the confirmatory factor analysis model.
- The three-order two-factor model.
- 4. Determining the levels of depression, anxiety and stress among university students in the Egyptian environment.

The importance of the study comes from the psychometric evaluation of the most important measures prevalent in the psychological heritage in Arab society considering the second wave of the Corona pandemic, as well as determining the levels of anxiety, depression and stress generated considering the second wave of the Corona pandemic among university students.

Methodology

Study design: An exploratory cross-sectional study was conducted on a sample of university students, Arab Republic of Egypt, through an electronic survey.

Participants: The scale was applied electronically to the students of the Faculty of Education, Suez Canal University, Ismailia Governorate, one of the Canal cities in the Arab Republic of Egypt, where the scale was sent to them and alerted to them by sending it to their fellow students, so the sample is of the type of snowball. The sample size was 434 male and female students, with an average age of 19.6 years and a standard deviation of 1.33 and according to gender, it varied to 32 (7.4%) males and 403 (92.6%) females and ranged according to the study group to 300 (69.6%) in the first year and 41 (9.5%) in the first year. The third division and 90 (29%) in the fourth division.

Depression, Anxiety and Stress Scale DASS21: The shortened version of the Depression, Anxiety and Stress Scale, consisting of 21 items, was used and three English language experts were hired to translate the scale into Arabic, in addition to the researcher. The items of the scale has been formulated to measure these emotional disturbances in light of the second wave of the Corona pandemic and it consists of three factors, the first represents depression (items (3, 5, 10, 13, 16, 17, 21) and the second represents anxiety items 2, 4, 7 , 9, 15, 19, 20)), The third: represents stress (items: (1, 6, 8, 11, 12, 14, 18), but the correction method has been modified to be in the light of the five-point Likert scale instead of the quadrilateral .

Procedures: The scale was applied in addition to the basic data through social media, especially WhatsApp and Facebook, on an electronic link in Google form, in the period from 11/20/2020 to 2/1/2021. Respondents were warned that the data is confidential to be used for scientific research purposes and that this scale measures the manifestations of anxiety, depression and stress during the second wave of the Corona pandemic and the Excel data file was converted to a SPSS file.

Statistical analysis: IBM SPSS v26 program was used to verify the frequency distributions, check the moderations, descriptive statistics, calculate the internal consistency stability coefficient Alpha Cronbach, exploratory factor analysis using principal components, Promax oblique rotation, determine the appropriateness of the data and the correlation matrix using the Kaiser-Mayer-Olkin criterion. The MPLUS program was used to compare the matching of factor analysis models for the three dimensions of the scale and the maximum likelihood method was used and the chi-squared statistic was relied on, in addition to the P-value and the RMSEA, TLI, CFI indices, in addition to the AIC index.

Results

First

The stability of the DASS 21 list for depression: The stability was estimated using Cronbach's alpha coefficient, whose value for the scale items was 0.949. The value of Cronbach's alpha coefficient for the stress dimension was 0.884. While the alpha coefficient for the depression dimension was 0.854. Cronbach's alpha coefficient for items after anxiety was 0.877. Considering the definition of Cronbach's alpha coefficient, which is defined as the scale's ability to highlight the variations in individuals' responses to items, the dimension of stress is the most capable of showing interpersonal stress, followed by anxiety, then depression. Accordingly, the number of items in the final image of the list was 21, which corresponds to the abbreviated version of Lovibond & Lovibond. The results of the alpha coefficients for the current study were close to those of Apóstolo, et al. which was 0.90 for depression, 0.86 for anxiety, 0.88 for stress and 0.95 for all three scales.

Second

The exploratory factor model of the three-dimensional structure of the scale of anxiety, depression and stress: The model was verified in two ways: (1) by doing an exploratory factor analysis using the M plus program and using the Geomin vertical rotation and (2) the exploratory factor analysis using the principal component and item extraction on three factors.

Exploratory factor analysis using M plus program and orthogonal rotation by Geomin method: (Table 1).

Stability was observed after depression, except for two items, one of which was saturated on the anxiety factor and the other was saturated on the stress factor. It was also observed that the anxiety factor was stable, except for two items that were saturated with the depression factor. It was also noted that the stress factor is an unstable factor, as only two items were saturated on the anxiety factor, while the rest of the item was saturated on the depression factor. Considering this result, the researchers see that the three factors are intertwined in nature, as they are an emotional reflection of the nature of mood through a certain stage that the individual goes through. Stress is a temporary process and its item has been saturated with anxiety and depression factors.

Table 1. The geomin exploratory model for the DASS 21 list.

	Items	Factor Analyzed		
		First	Second	Third
	Stress Dimension Items			
1	I find it is fatigued to feel psychological comfort when I hear the injuries and deaths of the Corona pandemic	.483	.404	-.041
6	I tend to have critical reactions to the details and events surrounding me due to the Corona pandemic	.051	.695	.051
8	I feel nervous about hearing the effects of this virus on social media news	.372	.489	-.043
11	I feel confused and shocked when thinking of this pandemic effect	.384	.467	.011
12	I do not feel at leisure considering the Corona pandemic	.449	.349	.104
14	I cannot sustain any worries or problems in my life or work these days	.290	.256	.051
18	I tend to get very nervous when I talk to others and my family surrounding this pandemic	-.279	.934	-.010
	Depression Dimension Items			
3	I don't feel positive emotions at all in this pandemic	-.061	.570	.184
5	I have no willingness or initiative to do anything among this pandemic	.064	.466	.347
10	I have nothing to look for as a result of the disappointment of hearing the injuries and deaths of Corona	.079	.650	.226
13	I feel sad and anxious when I hear the death of one of my relatives or friends from this pandemic	.893	-.186	.015
16	I have no interest or drive to do anything considering this pandemic	-.004	.512	.623
17	I feel I am a person of little use when I cannot help sufferers Corona	.242	.385	.083
21	I feel that my life has no meaning during Corona pandemic	-.162	0.800	.120
	Anxiety Dimension Items			
2	I feel dry throat when hearing the symptoms and the effect of this virus on us	.096	.630	-.129
4	I feel tightness in my chest that prevents me from breathing freely due to the fear for my family from this pandemic	.426	.256	-.127
7	I felt trembling (in my hands or body, for example) upon hearing one of my relative's dead	.860	-.101	-.043
9	I lose control of my nerves and emotions, especially when a friend or one of my family infected with this virus	.773	.017	-.165
15	I feel terrified when I hear the number of deaths from the virus among my family and friends and in our country	.797	.038	.051
19	I feel the speed of my heart beating upon hearing the effects of this pandemic	.000	.888	-.211
20	am frightened by the rapid spread of the pandemic in our city	.531	.305	.011

Despite this, researchers believe that the saturation of the items of the stress factor with two words on the anxiety factor and five on the factor of depression, this means that stress is either a process accompanying anxiety and depression, or that all stress are generated by the individual in certain interim circumstances that generate a kind of anxiety and the result is the final one is depression. Or this view may be in favor of the scale being of a dual-structural nature.

The exploratory factor analysis model in the IBM SPSS program using the basic components PC method and item extraction on three dimensions, with acceptance constraints of saturation equal to 0.32 and the results were as follows: (Table 2).

The value of the Kaiser-Mayer-Olkin test was equal to 0.956. It was noticed from the values of the latent roots of the three factors that the first factor was polarized to the items, so the value of the potential root was 10.57, while the latent roots of the other two factors converged to the correct one before rotation. Using the oblique rotation by Promax method, the latent roots reached 8.43, 8.55 and 8 and the total explanatory variance was 62.19%, which is a high value.

It was observed from the results of Table 2 that the depression factor was stable, except for one that was saturated on the anxiety dimension. It was noted that the stress factor was stable, while two terms of it were saturated, one on the anxiety factor and the other on the depression factor, while it was noted that the anxiety factor was an unstable factor, as its item was saturated with the stress factor. This is the most accurate construction that perfectly matches the views of Apóstolo, et al.

Accordingly, it can be concluded statistically that the exploratory factor analysis and the use of oblique rotation gives the best construction for the psychological phenomenon depending on the internal variations of the items. However, there is a difference produced by the orthogonal rotation in the Mplus program, which is the most accurate description of the phenomenon of depression in comparison with other study structures. This construction explains the overlap between the three factors. The emotional state consists of three stages, one of which is temporary, which causes stress, the other state is temporary, which means the association of anxiety and the final stage is a behavioral stage that appears in the emergence of depression. These are concomitant symptoms that accumulate emotionally with the individual until the individual accompanies depression. This justifies the theoretically better-matched model that Mplus produced (Table 3).

Third

The dual-structure model to interpret the dass-21 model of depression: The Bifactor model, which verifies the general factor of the first order and in the same model of the three factors in the same construct, has been verified. The analysis was performed with MPlus software. The results were as follows:

It was observed from the saturations of the general factor model that all of them are a function. This means that the nature of the structure in expression is the phenomenon of depression, anxiety and stress. It is a structure that expresses a pathological nature or predicts symptoms that may cause relapse later and it is more comprehensive in expressing the phenomenon in a comprehensive way.

As for the dimensional saturations, the saturations in the stress dimension were inflated. This indicates the predominance of stress on the sample members. Just as there is an item in each dimension that is saturated with another factor, the triple structure was free of these items. The results of the anxiety dimension in the Bifactor model agreed with the results of the exploratory tripartite construction in excluding items 2, 9 and 15. However, the anxiety dimension in the Bifactor model was more accurate as the number of items excluded was reduced. The items came after depression in the stable Bifactor model. The results in the Bifactor and EFA models agreed, excluding item 13.

This means that building a Bifactor model is better at describing the phenomenon in its general nature and at expressing it in its precise dimensions. The construction is more accurate in describing the infrastructure of the

Table 2. The promax exploratory model for the DASS 21 list.

	Items	Factor Analyzed		
		First	Second	Third
	Stress Dimension Items			
1	I find it is fatigued to feel psychological comfort when I hear the injuries and deaths of the Corona pandemic	-	-	.649
6	I tend to have critical reactions to the details and events surrounding me due to the Corona pandemic	.433	-	.456
8	I feel nervous about hearing the effects of this virus on social media news	-	-	.489
11	I feel confused and shocked when thinking of this pandemic effect	-	-	.455
12	I do not feel at leisure considering the Corona pandemic	-	.364	-
14	I cannot sustain any worries or problems in my life or work these days	.687	.376	-
18	I tend to get very nervous when I talk to others and my family surrounding this pandemic	.488	-	.511
	Depression Dimension Items			
3	I don't feel positive emotions at all in this pandemic	.697	-	-
5	I have no willingness or initiative to do anything among this pandemic	.696	-	-
10	I have nothing to look for as a result of the disappointment of hearing the injuries and deaths of Corona	.664	-	-
13	I feel sad and anxious when I hear the death of one of my relatives or friends from this pandemic	-	.887	-
16	I have no interest or drive to do anything considering this pandemic	.999	-	-
17	I feel I am a person of little use when I cannot help sufferers Corona	.412	-	-
21	I feel that my life has no meaning during Corona pandemic	.621	-	-
	Anxiety Dimension Items			
2	I feel dry throat when hearing the symptoms and the effect of this virus on us	-	-	.928
4	I feel tightness in my chest that prevents me from breathing freely due to the fear for my family from this pandemic	-	.358	.558
7	I felt trembling (in my hands or body, for example) upon hearing one of my relative's dead	-	.870	-
9	I lose control of my nerves and emotions, especially when a friend or one of my family infected with this virus	-	.781	-
15	I feel terrified when I hear the number of deaths from the virus among my family and friends and in our country	-	.734	-
19	I feel the speed of my heart beating upon hearing the effects of this pandemic	-	-	.737
20	am frightened by the rapid spread of the pandemic in our city	-	.462	.328

Table 3. The bifactor model's item factor loadings.

Item	Three-factor Item Loading				General Factor Item Loading			
	Estimate	S.E.	Est./S.E.	P-value	Estimate	S.E.	Est./S.E.	P-value
S1	1.000	.000	999.000	999.000	.800	.069	11.51	.000
A2	1.000	.000	999.000	999.000	.640	.083	7.67	.000
D3	.608	.065	9.41	.000	.452	.071	6.35	.000
A4	.471	.131	3.61	.000	.801	.071	11.25	.000
D5	.717	.068	10.50	.000	.579	.077	7.50	.000
S6	1.53	.241	6.37	.000	.692	.082	8.48	.000
A7	-.024	.160	-.152	.880	.925	.056	16.54	.000
S8	1.073	.157	6.85	.000	.877	.070	12.60	.000
A9	.058	.164	.36	.722	.977	.056	17.32	.000
D10	.754	.072	10.41	.000	.746	.078	9.55	.000
S11	1.165	.161	7.22	.000	.893	.072	12.48	.000
S12	1.020	.155	6.59	.000	.870	.065	13.32	.000
D13	-.023	.062	-.378	.706	.766	.044	17.34	.000
S14	1.007	.195	5.16	.000	.668	.069	9.68	.000
A15	.206	.122	1.69	.091	.929	.047	19.64	.000
D16	.846	.066	12.90	.000	.620	.081	7.68	.000
D17	.378	.077	4.91	.000	.694	.066	10.56	.000
S18	1.774	.325	5.452	.000	.504	.091	5.54	.000
A19	1.157	.135	8.56	.000	.777	.091	8.53	.000
A20	.564	.109	5.16	.000	.873	.060	14.55	.000
D21	.759	.081	9.36	.000	.610	.089	6.85	.000

Notes: D is devoted to depression subscale items, while A referred to anxiety subscale items. Finally, S is indicated to stress subscale items.

psychological phenomenon and describing it in its general form. Accordingly, the variations in the responses of individuals to the general factor and to the underlying dimensions of the phenomenon are more accurate in precisely expressing the nature of the phenomenon being studied.

Fourth

The comparison between the factorial models for the interpretation of the DASS 21 model of depression: checking the structural validity of the models using the MPLUS program and the results were as shown: (Table 4).

Table 4. Comparison of the matching of different factorial models for the DASS 21 list.

Model	Model Fit Indices							
	X2 (P)	X2/df	SRMR	CFI	TLI	RMSEA [90% CI]	AIC	BIC
Bifactor	592.06 P=.0000	3.59	.037	.925	.904	.077 [.070 -.084]	25049.53	25404.08
3F CFA	955.92 P=.0000	5.14	.060	.864	.847	.098 [.091 - .104]	25371.4	25430.92
gF CFA	1065.17 P=.0000	5.64	.059	.846	.829	.103 [.097 - .109]	25474.64	25731.39
2nd gF CFA	955.92 P=.0000	5.13	.060	.864	.847	.098 [.091 - .104]	25371.4	25640.40
gF EFA	857.71 P=1.243	4.34	.059	.850	.833	.090 [.084 - .096]	25474.64	25731.38
2F EFA	553.48 P=1.203	3.16	.039	.914	.893	.072 [.066 - .079]	25115.26	25453.51
3F EFA	433.28 P=1.090	2.89	.031	.936	.911	.066 [.059 - .073]	24959.94	25375.62

It was noted that the exploratory factor model generated by the Mplus program is better in terms of matching, then the Bifactor model.

The study aimed to assess the structural validity of the DASS21 three-factor depression scale, which refers to: (1) depression, which indicated lack of motivation, low self-esteem and dysphonia, (2) anxiety, which indicated physical and subjective symptoms of anxiety, severity of emotional reactions, (3) Stress: It refers to the assessment of irritability, impatience, tension and persistent emotional agitation. Previous studies differed in the explanatory nature of its dimensions. Some studies found the existence of two factors, while others concluded the tripartite structure of factors, while others made a comparison between some models in the presence of the general factor and the Bifactor model.

The results of the confirmatory analysis of the scale in two and three dimensions were very close; This means that the dimensions of anxiety and stress are associated with a person in stressful situations. This view is consistent with the views of Mihić, Volarov, Oljača and Novović that the use of the Anxiety Subscale is used in clinical studies when the psychiatrist wants to assess individuals with conditions mixed with stress and anxiety.

In addition, the superiority of the Bifactor model in its matching indicators over the confirmatory two- and three-factor model confirms the idea that the variance of an individual's responses on the depression scale and its variance on its dimensions confirm that each of the three factors that make up the scale are overlapping emotional factors. It expresses the accumulation of moods across the social contexts of the individual and one of them, depression, is the result of stress and anxiety. Due to this interaction between anxiety and stress, which has been proven to be a single factor and two separate factors, this is difficult to use in cases of neurotic anxiety or intense fear. This supports the recommendation of Mihić, et al. that the stress gauge should only be used in cases of phobias and neurotic anxiety.

Fifth

Descriptive analyses: according to the mean, median, standard deviation, skewness and kurtosis of the scale items and the results were as follows: (Table 5).

Regarding the dimension of stress, the median of stress item scores was between 3 and 4, which means that the students' response to stress was high and that the degrees of skewness and kurtosis did not exceed the correct one and this means that the degrees of item after stress expressed moderation to a large extent.

For the anxiety dimension, the median response in all statements was 4, which means that there is a high degree of agreement in the expression of anxiety and the item word "2" was low in expressing anxiety, as its level was close to the middle in terms of the average response, which equaled 2.58. The kurtosis of the words "4" and "19" was greater than the correct one, which means relative agreement on anxiety and the degrees of skewness were not more than the correct one, which means that moderation was available to an acceptable degree.

About the dimension of depression, it was noted that the median response on its item ranged between 3 and 4, which means that the response to the item expressing depression was high and to a degree that expresses the persistence of depression due to the conditions accompanying the procedures of coexistence or because of the living conditions that were affected in one way or another by this epidemic. Or it may be due to the expectation of worse images than those that occurred in the first wave, such as commercial depression, declining living income, academic postponement, or an imbalance in the relative position of the student, especially the fourth-year students, who represent 69.6% of the total sample size. It is noted that there are five phrases whose skewness exceeds the correct one, which means that there is no moderation and the skewness of the karsts means the relative unanimous agreement on the response.

Sixth

Levels of depression, anxiety and stress for the study sample considering the Corona pandemic: Frequencies and percentages were estimated for the three dimensions of the scale, as well as skewness, kurtosis and measures of central tendency. The lowest and highest quartiles were also calculated to determine the actual levels of depression, anxiety and stress experienced by university students considering the second wave of the Corona pandemic. The results were as follows: (Table 6).

The overall mean of the depression dimension was 22.38, which represents 52% of the total sample size. While 27.5% suffer from low levels of anxiety in the light of the lowest quartile. While 24.4% were sufferings from high levels of depression, or nearly a quarter of the sample.

The overall mean of the anxiety dimension was 24.16, which represents 47.6% of the total sample size. It is close to half of the sample whose concern is on average. While the highest quartile was 23.4%. That is, nearly a quarter of the sample suffers from high levels of anxiety.

The general average of the stress dimension was 22.81 degrees, which represents 52.2% and it represents more than half of the sample to a small degree. While 26.2% of the sample suffers from low levels of stress, while 22.8% suffers from high levels of stress.

Frequencies were calculated to determine the number of cases with low anxiety, depression and stress levels. As for the dimension of depression: the number of cases of low depression was 119, while the cases of high depression were equal to 119 cases. For the anxiety dimension, the number of cases of low anxiety by calculating the frequency was 125 cases, while the cases of high anxiety were 121 cases. As for the stress dimension, the low stress cases were 114, while the number of high cases was 117.

The cases in the depression presentation were equal, which means that the concentration of the number of depressed cases lies around the mean value and this is justified by both the mean and the median being equal. While

Table 5. Descriptive analyses of the depression, anxiety and stress scale items.

	Average	Median	Std Deviation	Skewness	Kurtosis
Stress Dimension					
1	3.48	4	1.25	-.46	.76
6	2.88	3	1.28	.14	.94
8	3.37	3	1.25	.25	.94
11	3.27	3	1.28	.24	.97
12	3.60	4	1.25	-.54	.65
14	3.60	4	1.29	-.57	.74
18	2.63	3	1.30	.33	.93
Anxiety Dimension					
2	2.58	2	1.30	.36	.97
4	3.43	4	1.40	-.41	1.10
7	3.90	4	1.27	.95	.21
9	3,73	4	1.28	.73	.54
15	3.94	4	1.12	-.96	.25
19	2.90	3	1.32	.11	1.07
20	3.68	4	1.19	-.69	.35
Depression Dimension					
3	2.85	3	1.21	.06	.77
5	2.88	3	1.31	.16	1.01
10	2.86	3	1.29	.16	.99
13	4.32	4	1	-1.66	2.34
16	3.16	3	1.33	-.14	1.05
17	3.45	4	1.28	-.49	.75
21	2.86	3	1.38	.16	1.20

Table 6. Levels of depression, anxiety and stress among university students considering the second wave of corona.

Dimension	Mean	Median	Std Deviation	Skewness	Kurtosis	Lower Quartile	Upper Quartile
Depression	22.38	22	6.46	-.088	.409	18	27
Anxiety	24.16	26	6.76	-.473	.361	20	29
Stress	22.81	23	6.83	-.288	.498	18	28

the cases of low anxiety increased to a degree close to the average, which justifies the negative skew and the lower value of the lower quartile was lower than the average, while the number of high anxiety cases was less than that. This means that people have lived with the epidemic and the processes of adapting to the conditions have begun using precautionary measures. As for the dimension of stress, cases of high stress for cases of low stress. This may justify the emergence of a relatively new strain of the Corona virus that differs from the two strains in the first wave of the Corona epidemic.

Discussion

The general results of the scale were superior in terms of matching in the two-factor model and the three-factor exploratory factor model of the first order. The exploratory structure came with three overlapping factors and depression was the most stable factor, but the stress and anxiety factors were more overlapping. The items of the anxiety factor on stress was saturated once when using Promax oblique rotation and the items of the stress factor on the anxiety factor was saturated when using Geomin orthogonal rotation. This may mean that one is complementary to the other, or that they are related to personality traits and one appears before the other in certain circumstances, or that one of them is correlative. These results may converge with studies which sees that the factors of anxiety and stress are intertwined in the triple structure.

The study tried to perform exploratory factor analysis using SPSS program using the PC basic components method, leaving the factors free and diagonal rotation using Promax method. The item was extracted on two factors, which explained 57.58% of the total variance of the correlation matrix. This explained variance is less than what was found by Apóstolo, et al., which amounted to 58.54% of the total variance.

The results of the study supported the findings of the studies conducted on samples of normal and sick people in heterogeneous cultures, alpha coefficients exceeded 0.8 in each and all three dimensions.

The study agrees in the presence of convergence in the results with previous studies, although the application of the study list came at the height of the second wave of the Corona pandemic and this had only a slight impact on the internal consistency coefficients in the two dimensions of depression and this may justify that coexistence with the Corona pandemic was better than its counterpart in the wave First.

Conclusion

The results of the descriptive analyses of the items and dimensions of the scale showed that there is a relative agreement among the sample members on the high rates of stress, while the levels of depression and anxiety were moderate among the sample members. The results of the study can be generalized to university students, but the study suffers from some limitations as the female sample is higher than the male sample and this may justify the high levels of depression, as females are superior in expressing depressive symptoms than males.

Conflict of Interest

Authors have no conflicts of interest with the organization or individuals to declare.

Informed Consent

All procedures followed were following the ethical standards of the

responsible committee on human experimentation (Institutional and national) and the Helniski Declaration of 2013. Informed consent was obtained from all participants to doing included in the study orally.

Data Availability

The raw data supporting the conclusion of this article will be available upon request to the corresponding author.

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