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## POST-TRAUMATIC STRESS DISORDER AND DIFFICULTIES IN EMOTION REGULATION AMONG UNIVERSITY STUDENTS UNDER THE COVID-19 CONDITION

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### Abstract

The new global situation of COVID-19 affects the whole world in all aspects of life including mental health.

**The study's goal is to** detect the relationship between post-traumatic stress disorder (PTSD) and Emotion Regulation (ER) difficulties under the COVID-19 condition.

**Methods:** University students were asked to complete: 1) Emotion Regulation Difficulties Questionnaire (DERS) 2) PTSD Checklist (PCL- 5). 3) Life Events Checklist for DSM-5 (LEC-5).

**Results:** There were 441 students with suspected COVID-19 symptoms out of 1195 students. When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of PTSD symptoms (18.2% vs. 4.7%) and DERS (34.5% vs. 23.3%). Additionally, correlation studies demonstrated a significant positive link ( $P_s < .01$ ) between the PCL, the overall DERS, and all six categories of emotion regulation difficulties.

**Conclusion:** Students with suspected COVID-19 symptoms have more difficulty with emotion regulation and post-traumatic stress disorder than students without such symptoms. This research recommends that during the pandemic, health professionals should implement a suitable psychological intervention for students who exhibit COVID-19 symptoms.

**Keywords:** Difficulties in Emotion Regulation, Post-traumatic stress Disorder, University students, COVID-19, Egypt.

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## **Introduction**

Coronavirus disease 2019 (COVID-19) is a highly contagious virus that was initially identified in December 2019 in Wuhan, China (WHO, 2021). The ensuing lockdown interrupted many people's daily lives and had a detrimental effect on their mental health (Wang et al., 2020). Students may experience a sense of constraint in their independence, distress, worry and depression (Sun et al., 2020). Suicidal ideation, anxiety, negative thoughts, and insomnia were all associated with the lockdown and stay-at-home instructions. Due to the rapid spread of the COVID-19 pandemic around the world, some experts feel the pandemic is a traumatic experience that may result in chronic psychiatric diseases (Jacobson et al., 2020; Kira et al., 2020; Boyraz & Legros, 2020). Liu et al. (2020) found that 7% of individuals matched diagnostic criteria for PTSD one month after the COVID-19 epidemic. Females experienced much more PTSD in terms of re-experience and negative cognitive or mood changes. Participants who resided in Wuhan, one of the world's most severely damaged areas, reported higher PTSD symptoms than those who lived nearby. During COVID-19, researchers examined risk factors for PTSD, including as demographic characteristics and disease exposure, such as infection, residence in severely afflicted areas, or knowledge of someone who has been sick (e.g., Wathélet et al., 2021). FJiang et al. (2020) examined the association between (COVID-19) and post-traumatic stress symptoms and indicated that young people, women, and those with responsibilities and care for others were more prone to PTS symptoms.

Post-traumatic stress disorder (PTSD) is a condition that. characterized by repetitive thinking, flashbacks of prior traumatic events, nightmares, avoiding memories of trauma, avoidance behaviors, irritability, emotional numbing, hypervigilance, and sleep disruptions. Several different forms of trauma contribute to PTSD (APA, 2013). COVID-19 can be classified as type III trauma due to the fact that it is a case of chronic traumatic stress (Kira et al., 2008; Kira et al., 2020; Bridgland et al., 2021). The continuous and repeated traumatic experience makes the symptoms of post-traumatic stress disorder are more severe (Goral et al., 2017).

Previous study has established that patients with PTSD have greater difficulties regulating their emotions than individuals without PTSD (e.g., Bardeen et al., 2013, Powers et al., 2015, Sippel et al., 2016, Henschel et al., 2020, Klanecy Earl et al., 2020). Emotion regulation (ER) is the ability to successfully recognize, monitor, evaluate, modify, and manage emotional reactions, particularly in the context of goal-directed action (Gratz & Roemer, 2004). Gratz and Roemer (2004) identified six components of ER: emotional awareness, emotional acceptance, emotional clarity, impulse control, goal-directed activity, and strategies of emotional control.

Number of studies have demonstrated a correlation between the severity of PTSD and emotion dysregulation, and impulsive aggressiveness (e.g., Miles et al.,

2016). Lack of emotional acceptance, difficulty engaging in goal-directed activity when distressed, impulse control issues, limited availability to effective emotion regulation tools, and a lack of emotional clarity have all been identified as significant variables in PTSD (Tull et al., 2007). Additionally, PTSD was associated with a greater degree of expressive suppression and a decreased reliance on cognitive techniques (Boden et al., 2013). PTSD has been associated to ruminating, cognitive repression, and experience avoidance (Seligowski et al., 2015; Nagulendran & Jobson 2020).

Panayiotou et al. (2021) investigated the function of emotion regulation in determining overall quality of life during the COVID-19 pandemic. Panayiotou et al. (2021) found that the quality of life deteriorated among college students in Cyprus during the COVID-19 pandemic and lockdown. Significant predictors of reduction in quality of life were difficulty identifying feelings and difficulty accessing emotion regulation mechanisms. This highlights the relevance of emotional clarity and the availability of diverse range of distress-coping strategies. Also, Panayiotou et al. (2021) conducted prospective research with 210 American Indian participants to determine if emotion management skills are associated with subsequent PTSS associated with the initiation of a traumatic experience (COVID-19). They discovered that increased reappraisal was associated with decreased reported PTSS and increased suppression was associated with increased PTSS.

Shuwiekh et al. (2020) investigated the impact of COVID-19 on Arab countries' mental health. The researchers examined the prevalence of PTSD, depression, anxiety, and cumulative stressors in Egypt, Kuwait, Jordan, Saudi Arabia, Algeria, Iraq, and Palestine. According to Shuwiekh et al. (2020), Egypt has much higher rates of COVID-19 traumatic stress, anxiety, and depression than the other Arab countries. El-Zoghby, Soltan, and Salama (2020) found that the COVID-19 had a significant influence on 41.4% of people, with 34.1% experiencing increased work stress and 55.7% experiencing financial stress, according to researchers in Egypt. Additionally, Abdelghani et al. (2021) examined PTSD in an Egyptian sample of COVID-19 post-remission survivors and discovered that 72% of COVID-19 survivors experienced moderate-to-severe PTSS, compared to 53% of control patients.

Thus, the purposes of this study were to detect the relationship between (PTSD) and (ER) difficulties under the COVID-19 condition. This is the first study that investigates the association between PTSD and DERS among university students under the COVID-19 condition in Egypt.

## **Materials and Methods**

### *Study design*

This study is a descriptive cross-sectional correlational study.

*Time and place of the study*

The study was conducted between December 2020 and February 2021. The study was completed on 25 February 2021. The study was carried out in Cairo-Egypt.

*Population and sample*

All individuals were university students, who lived in Egypt, and met the inclusion criteria.

*Inclusion & Exclusion criteria*

Inclusion criteria were as follows: 1) Being an active student at the University, Exclusion criteria were having 1) cognitive difficulties, 2) schizophrenia (or any other psychotic disorders)

*Data collection tools*

A standardized e-questionnaires were generated using the Microsoft Form, and the links were shared through the student's university emails and social media—Facebook. The study data were collected using:

*Personal information and questions on the COVID-19:* such as participants' sociodemographic traits, personal, family-related, social, educational information.

*Life Events Checklist for DSM-5 (LEC-5):* is a self-report questionnaire that examines a person's life for potentially traumatic events. The LEC-5 assesses exposure to 16 events that have been linked to PTSD or distress, as well as one additional item that assesses any other severely stressful event not covered by the first 16 items (Weathers et al., 2013). An additional item that evaluates if the trauma was caused by COVID-19 was added in the current study.

*Post-traumatic Stress Disorder Checklist (PCL-5)* (Blevins, Weathers, Davis, Witte, & Domino, 2015) to measure the severity of the PTSD symptoms by the 20 items.

The PCL-5 is a self-report questionnaire that assesses PTSD symptoms as defined by the DSM-5 in the last month (Weathers et al., 2013). Items are assessed on a 5-point Likert scale from 0 (not at all) to 4 (extremely), and then the overall severity score is calculated. Subscale severity scores are obtained by adding items from each of the four DSM-5 PTSD symptom clusters: intrusions (Items 1–5), avoidance (Items 6–7), negative cognitions and mood (Items 8–14), and arousal and reactivity (AR; Items 15–20). (Weathers, et al. 2013). A cutoff score of PCL for the

present study was 45 or greater. The PCL has demonstrated acceptable psychometric properties (Blanchard et al., 1996; Weathers et al., 1993; Ruggiero et al., 2003). For the present study, internal consistency was acceptable at both time points ( $\alpha = 0.90$  and  $0.94$ ). Cronbach's alpha reliability of the scale in the current study was .93.

#### *Emotion regulation difficulties scale*

The (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire that assesses the difficulty in controlling emotions. Participants score items on a 5-point Likert scale (1 = nearly never to 5 = almost always), indicating how they feel about stressful emotional experiences. The DERS has six subscales: (a) Awareness, (b) Clarity, (c) Nonacceptance, (d) Impulsivity, (e) Goals, and (f) Strategies, as well as a total overall score for ER problems. The DERS subscales exhibited good internal consistency in the current study with Cronbach's  $\alpha$  values ranging from 0.82 to 0.94.

#### *Study process*

Students in Egypt were requested to submit a questionnaire including personal information and questions about COVID-19, LEC, PCL, and DERS. Participants were asked if they had experienced any of the COVID-19 symptoms described by the World Health Organization in the preceding 14 days (WHO, 2020). COVID-19 symptoms were assigned to students who demonstrated any of these characteristics. The students were requested to complete the surveys online using Microsoft Forms. The surveys took roughly 25–35 minutes to complete by the students. Additionally, the PCL-5 was administered with special consideration for the LEC-5. The LEC-5 was completed by participants based on the most painful traumatic incident indicated on the LEC-5.

#### *Ethics and Human Subjects Issues*

##### *Data Management*

All participants' data and demographic information are stored at OneDrive of the (-----) University in Egypt.

##### *Data analysis*

The data were evaluated using the IBM SPSS Statistics, version 23 software program. Descriptive statistics were employed. The binary logistic regression was utilized to investigate correlations between PTSD symptoms, DERS, and having suspected COVID-19 symptoms. Independent *t-tests* and *Chi-square* were conducted to compare PTSD and DERS scores of participants with and without suspection of COVID-19. Due to multiple comparisons, the alpha level was corrected according to the Bonferroni correction or according to the recommendations concerning multiple correlated tests (Li & Ji, 2005; Nyholt, 2004).

To control for Type I error, the Bonferroni adjustment was done by dividing the significance level (in this case, 0.05) by the number of tests were used, the new significance level is  $0.05/2 = 0.025$ . This means that if the  $p$ -value is larger than 0.025, we do not have a statistically significant result.

*Sample size*

SPSS Sample Power was used, statistical analyses ensured that the sample size was sufficient to detect meaningful differences in the outcomes. We set the following parameters based on previous research: the two-tailed test of significance, desired power=0.80, unstructured covariance matrix, the margin of error =5%. With (1000 students), the study has 80% power to detect a medium effect size of 0.60 for groups differences on primary outcomes

**3. Results**

*Sociodemographic characteristics*

There were ( $N=1195$ ), 50.7% female students. Table 1 presents the demographic and descriptive characteristics of the study sample. There were ( $N=441$ ) students with suspected COVID-19 symptoms, and ( $N=754$ ) students with no suspected COVID-19 symptoms.

**Table 1.** Association between Participants' sociodemographic characteristics, and suspicion of COVID-19

Variables		Students without suspected COVID-19 symptoms $n$ (%) 754 (63.1)	Students with suspected COVID-19 symptoms $n$ (%) 441 (36.9)
Gender	Males	428 (35.8)	161 (13.5)
	Females	326 (27.3)	280 (23.4)
Academic Level	Undergrade	635 (53.1)	340 (28.5)
	Postgrads	108 (9)	88 (7.4)
	Master	6 (0.5)	1 (0.1)
	Ph.D.	5 (0.4)	12 (1)
Age	15-19	559 (46.8)	316 (26.4)
	20-24	116 (9.7)	75 (6.3)
	25-29	29 (2.4)	36 (3)
	30-34	35 (2.9)	9 (0.8)
	>35	15 (1.3)	5 (0.4)
Subject of Study	Law	1 (0.1)	1 (0.1)
	Dentistry	80 (6.7)	24 (2)
	Media	104 (8.7)	37 (3.1)
	Pharmacy	453 (37.9)	357 (29.9)
	Computer sciences	34 (2.8)	16 (1.3)
	Engineering	82 (6.9)	6 (0.5)

Variables		Students without suspected COVID-19 symptoms <i>n</i> (%) 754 (63.1)	Students with suspected COVID-19 symptoms <i>n</i> (%) 441 (36.9)
Region of residence	Urban	741 (62)	407 (34.1)
	Rural	13 (1.1)	34 (2.8)
Income status	Income lower than expenses	11 (0.9)	23 (1.9)
	Equal income and expenses	685 (57.3)	378 (31.6)
	Income higher than expenses	58 (4.9)	40 (3.3)
Loneliness	Alone	56 (4.7)	108 (9)
	Living with family	698 (58.4)	333 (27.9)

### *PTSD, Difficulties in Emotion Regulation, and COVID-19*

Binary logistic regression revealed that the overall model was statistically significant when compared to the null model, ( $\chi^2(2) = 770.6, p < .000$ ), which explained 64% of the variation of suspected to COVID-19 and correctly predicted 84.6% of cases. When comparing students with suspected COVID-19 symptoms to students without suspected COVID-19 symptoms, PCL scores were higher ( $\beta I = 1.1, p < .000; 95\%CI: 1.07$  to  $1.10$ ). Also, when comparing students with suspected COVID-19 symptoms to students without suspected COVID-19 symptoms, DERS scores were higher ( $\beta I = 1.04, p < .000; 95\%CI: 1.03$  to  $1.05$ ).

There was a significant difference in DERS scores between students with and without PTSD [ $t(1193) = -85.3, P < .000$ ]. Students who have had PTSD have a considerably higher DERS ( $M=105.6, SD=25.1$ ) than students who do not have experienced PTSD ( $M=69.79, SD=27.5$ ).

### *PTSD outcomes*

Participants were assessed to define if they have experienced trauma or developed PTSD. Nearly 22.8% of the sample ( $N= 273$ ) met DSM-5 criteria for having current PTSD. Among the 22.8% that meet the criteria for PTSD, 4.18% are attributed to COVID-19. When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of PTSD symptoms (18.2% vs. 4.7%).

There was a significant difference between students who did not have suspected COVID-19 symptoms and those who did regarding their PCL scores [ $t(1193) = -35.3, P < .000, 95\%CI: -27.7$ – $24.7$ ]. Students who have suspected COVID-19 symptoms have significantly higher PCL scores ( $M=45.8, SD=8.3$ ) than students who did not ( $M=19.6, SD=17.2$ ).

As shown in Table 3. There was a significant association between the type of trauma and PCL's score ( $\chi^2= 62.8, p < .000$ ).

Table 2 shows that when compared to students who did not have suspected COVID-19 symptoms, those who did had significantly ( $P_s < .000$ ) greater scores on the PCL subscales.

**Table 2.** Association of having suspected COVID-19 symptoms with PCL’s subscales and DERS’s subscales

		Students without suspected COVID-19 symptoms <i>n</i> (%)	Students with suspected COVID-19 symptoms <i>n</i> (%)	Association with suspicion of COVID-19					
		<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>t</i>	<i>df</i>	<i>Sig.</i>	Mean Difference	95% CI for EXP(B)	
								Lower	Upper
PTSD	Intrusion symptoms	4.5 (4.5)	10.7 (4.1)	-23.6	1193	.000	-6.2	-6.8	-5.7
	Avoidance symptoms	2.3 (2.6)	4.8 (2.2)	-16.5	1193	.000	-2.4	-2.7	-2.1
	Cognitive-mood changes symptoms	6.3 (6.6)	16.6 (4.5)	-28.7	1193	.000	-10.2	-10.9	-9.5
	Arousal symptoms	6.4 (5.7)	13.5 (4.1)	-23.1	1193	.000	-7.1	-7.7	-6.5
DERS	Emotional awareness	8.6 (3.6)	13.8 (3.1)	-25.8	1193	.000	-5.2	-5.6	-4.8
	Emotional clarity	8.6 (3.8)	14.1 (3.2)	-26.1	1193	.000	-5.4	-5.8	-5.1
	Nonacceptance	9.1 (3.8)	14.7 (3.1)	-27.4	1193	.000	-5.5	-5.9	-5.1
	Impulsivity	13.4 (6.3)	22.3 (5.1)	-26.9	1193	.000	-8.9	-9.6	-8.3
	Goal-directed behavior	11.3 (6.1)	20.2 (5.1)	-26.5	1193	.000	-8.8	-9.5	-8.2
	Regulation Strategies	11.2 (4.7)	19.3 (4.6)	-30.3	1193	.000	-8.1	-8.6	-7.5

DERS Scores

When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of DERS (34.5% vs. 23.3%). There was a significant difference between students who did not have suspected COVID-19 symptoms and those who did regarding their DERS scores [ $t(1193) = -32.7, P < .000, 95\%CI: -44.7-39.6$ ]. Students who have suspected COVID-19 symptoms have significantly higher DERS ( $M=104.6, SD=18.7$ ) than students who did not ( $M=62.4, SD=25.4$ )

Table 2 shows that when compared to students who did not have suspected COVID-19 symptoms, those who did had significantly ( $P_s < .000$ ) greater scores on the DERS subscales. Their scores of the DERS were ordered from the highest to the lowest as follows: Impulsivity, Goals, Strategies, Nonacceptance, Clarity,

awareness. The students’ impulsivity was ( $M=16.7, SD=7.29$ ) and their difficulties in engaging in goal-directed behavior during the emotional distress were ( $M=14.6, SD=7.2$ ), and their difficulties in practicing the healthy emotion regulation strategies were ( $M=14.2, SD=6.1$ ), and their difficulties in acceptance were ( $M=11.1, SD=4.48$ ), and their difficulties in having a clear insight of their emotions were ( $M=10.6, SD=4.46$ ), difficulties in self-awareness were ( $M=10.5, SD=4.26$ ).

*The Life Events Checklist scores*

As indicated in Table 3, the “Sudden accidental death” was the most frequent traumatic incident experienced by the students during the COVID-19 Epidemic (22%), with average PCL scores of ( $M=36.2, SD=14.7$ ) and DERS scores of ( $M=86.3, SD=28.6$ ). There was a significant difference in PCL ratings between students exposed to stressful events and those who were not ( $\chi^2(1) = 62.8, p < .000$ ). There was a statistically significant difference in DERS ratings between students who were exposed to stressful situations and those who were not ( $\chi^2(1) = 160.2, p < .000$ ).

**Table 3.** The association between the Life Events Checklist for DSM-5, PTSD and DERS

	PTSD		Total	Total PCL M (SD)	Total DERS M (SD)	Association with PTSD $\chi^2$	Association with DERS $\chi^2$
	No PTSD	PTSD					
None	388	63	451	18 (20.7)	63.8 (31.1)	62.8***	160.2***
Fire or explosion	3	1	4	35 (13)	75 (30.7)		
Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	56	3	59	24.1 (12.3)	69.03 (26.2)		
Serious accident at work, home, or during recreational activity	2	0	2	30 (4.2)	70.5 (16.2)		
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	6	7	13	49.1 (15.6)	109.07 (20.2)		
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	5	0	5	23.4 (14.5)	71.8 (25.5)		
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	10	7	17	37.2 (17.2)	83.3 (29.8)		
Other unwanted or uncomfortable sexual experience	18	8	26	38.1 (13.05)	93.5 (27.1)		
Combat or exposure to a warzone (in the military or as a civilian)	17	5	22	35.5 (10.8)	88.4 (28.1)		
Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)	1	0	1	44	116		
Life-threatening illness or injury	38	15	53	32.3 (15.2)	78.5 (26)		
Severe human suffering	41	0	41	21.4 (6.4)	64.2 (21.3)		
Sudden violent death (for example, homicide, suicide)	4	2	6	43.8 (11.7)	99 (25.2)		
Sudden accidental death	185	78	263	36.2 (14.7)	86.3 (28.6)		

	PTSD		Total	Total PCL M (SD)	Total DERS M (SD)	Associa- tion with PTSD $\chi^2$	Associa- tion with DERS $\chi^2$
	No PTSD	PTSD					
Serious injury, harm, or death you caused to someone else	1	0	1	34	96		
Any other very stressful event or experience	73	34	107	38.7 (13.5)	88.5 (25.5)		
COVID-19	74	50	124	44.6 (9.7)	101.1 (17.8)		

## Discussion

The primary focus of the current study was to detect the relationship between PTSD and ER difficulties under the COVID-19 condition in Egypt. The results showed that students who had COVID-19 symptoms, had a greater prevalence of PTSD symptoms and DERS. The current study adds to the body of knowledge suggesting a link between emotion regulation difficulties and PTSD (Weiss et al., 2012; Ehring & Quack, 2010; Tyra et al., 2021). Students who exposed to trauma reported significantly higher levels of overall difficulty with emotion regulation, as well as difficulties controlling impulsive behaviors when distressed, difficulties engaging in goal-directed behavior when upset, limited access to effective emotion regulation strategies, difficulties accepting emotions, difficulties having a clear understanding of their emotions, and difficulties with self-awareness.

Additionally, our data suggested that the most prevalent stressful event faced by students during the COVID-19 Epidemic was “Sudden accidental death.” The unexpected loss of a loved one is the most devastating event, and in the event of an epidemic, guilt and worry are compounded (Banerjee, 2020). The unexpected death has been associated with subsequent increases in the symptoms of a number of psychopathologies, including severe depressive episodes, panic disorder, and post-traumatic stress disorder (Keyes et al., 2014).

Our data indicate that PTSD was prevalent among Egyptian students (22.8%). This might be because Egypt faces several stressors, since its citizens have endured numerous historical traumas, including the Arab-Israeli war (Schulze, 2016), the Arab Spring, and the Arab Winter (Dabashi, 2012; Kurzman et al., 2013). Additionally, Egypt’s dense population and economic hardships may add to the trauma epidemic’s high frequency (Shuwiekh et al., 2020).

The continuing COVID-19 epidemic is causing psychological problems, including an increased likelihood of feeling trauma. Participants may have negative emotions and lose interest during the lockdown. They have developed an inability to make significant life decisions as a result of their anxieties about the future (Jacobson et al., 2020). Additionally, quarantine decreased social activities, resulting in a decline in social and emotional support (Cao et al., 2020).

Another possible explanation for our findings is that we spent more time watching and reading COVID-19 news about the disease’s case count and death

count everyday than we did prior to the lockdown. Research has indicated that viewing and reading COVID-19 news in excess and for extended periods of time might result in psychological problems such as anxiety and depression (Dong et al., 2020, Gao et al., 2020, Huang et al., 2020).

The consequences and suggestions of this study include instructing participants on ways for strengthening their emotion regulation abilities in order to safeguard them against trauma.

**Limitations** and future directions: first, this study depends on self-reporting; a significant constraint is participants' capacity and willingness to share sensitive and personal information concerning trauma and ER difficulties. Second, the data were cross-sectional; the results indicated correlation, but correlation does not imply causality because no experimental manipulation occurred. Future research might incorporate longitudinal data on the association between PTSD and DERS, as well as a larger sample size. Third, the current study enrolled students from a single university. Despite being one of the major private colleges in Egypt, the present findings may not apply to all Egyptian students. Future study should involve students from different governorates to ensure that they are representative of all Egyptian students. Finally, because the primary objectives of the study, PTSD and DERS, were assessed using self-rating scales, there was a danger of response bias.

## **Conclusions**

Our findings indicate a significant positive association between PTSD and ER problems in COVID-19 condition. Mental health practitioners should pay close attention to the mental health of the students and give appropriate psychological therapies and coping skills.

## **Compliance with Ethical Standards**

**Funding:** there are no funds for this research

**Conflict of Interest:** No actual or potential conflicts of interest exist for any authors on this paper

**Ethical approval:** "All procedures performed in studies involving human subjects were following the ethical standards of the Egyptian clinical standards of practice." Also, according to the Helsinki Declaration, the study was conducted in strict conformity with all human subject protections

Approval from the (-----) University in Egypt Institutional Review Board was obtained to conduct the study (IRB Protocol CL-2101). Participants signed up for an online information sheet and an online consent form. They were informed of nature and procedure, the aims of the study, confidentiality of data, choice to

participate in the study, right to withdraw at any time from the study. Participants were made aware that the experiment includes psychological assessments.

**The corresponding author can provide reasonable access to the datasets created during and/or analyzed during the current investigation.**

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