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## Students' mental health status during COVID-19 outbreak(\*)

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## مستوى الصحة النفسية للطلّابات أثناء تفشي فيروس كوفيد-19

### عزيزة مسلط القحطاني

عضو هيئة تدريس بكلية التربية والتنمية البشرية  
جامعة الأميرة نورة بنت عبد الرحمن – السعودية

### منيرة عبد الرحمن المقرن

عضو هيئة تدريس بكلية التربية والتنمية البشرية  
جامعة الأميرة نورة بنت عبد الرحمن – السعودية

### الملخص

الأهداف: هدفت هذه الدراسة إلى مسح مستوى الصحة النفسية للطلّابات في جامعة الأميرة نورة بنت عبد الرحمن أثناء تفشي فيروس كورونا (كوفيد-19) واستكشاف العلاقة بين القلق والاكتئاب والوسواس القهري لديهن.

منهجية البحث: خلال جائحة كوفيد-19، تم توزيع استبيان عبر البريد الإلكتروني لطلّابات جامعة الأميرة نورة بنت عبد الرحمن، إحدى جامعات الإناث في المملكة العربية السعودية. أكمل الاستبيان 4151 طالبة. شمل المسح سلسلة من الاستبيانات بما فيها مقياس ييل-براون للوسواس القهري (Y-BOCS)، ومقياس الاكتئاب لاستبيان صحة المريض، ومقياس القلق GAD-7.

النتائج: أظهرت الطّالّبات مستويات عالية من الاكتئاب والقلق والوسواس القهري خلال جائحة كوفيد-19. كما كانت هناك علاقة إيجابية بين القلق والاكتئاب والوسواس القهري. علاوة على ذلك، فإن مستوى اضطراب الوسواس القهري (OCD) خفف العلاقة بين مستوى اضطراب القلق والاكتئاب. الاستنتاج: كشفت هذه الدراسة عن ارتفاع ملحوظ في معدل انتشار الاكتئاب والقلق والوسواس القهري بين الطّالّابات أثناء تفشي فيروس كورونا (COVID-19). ارتبطت النتائج على المقاييس الثلاثة بشكل إيجابي، كما أن الوسواس القهري يخفف من العلاقة بين القلق والاكتئاب. الكلمات المفتاحية: القلق، الأنثى، الاكتئاب، الوسواس القهري، والصحة النفسية.



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### Abstract

**Objectives:** This study aimed to survey the mental health of female students at Princess Nourah bint Abdulrahman University during the COVID-19 outbreak and explore the relationship between anxiety, depression, and OCD among them.

**Methods:** During the COVID-19 pandemic, an online survey was distributed to students at Princess Nourah University, a women's university in Saudi Arabia, via email. A total of 4151 students completed the survey. The survey included a series of questionnaires including The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), the Patient Health Questionnaire depression scale, and the GAD-7 anxiety scale.

**Results:** Students tended to show high levels of depression, anxiety, and OCD during the COVID-19 pandemic. Anxiety, depression, and OCD were positively related. Furthermore, scores on the obsessive-compulsive disorder (OCD) scale moderated the relationship between scores on the anxiety and depression scales.

**Conclusion:** This study revealed a significantly high prevalence of depression, anxiety, and OCD among students during the COVID-19 outbreak. Scores on the three scales are related positively and OCD moderated the relationship between anxiety and Depression.

**Keyword:** Anxiety, female, Depression, OCD, and mental health



## Introduction

In the face of the COVID-19 pandemic, maintaining our health has become a priority, with local and international guidelines and recommendations emphasizing social distancing and avoiding gatherings to limit the spread of the COVID-19. The prolonged nature of the COVID crisis and the uncertainty surrounding when life would return to what it was before COVID-19 have led to increased rates of psychological disorders<sup>3</sup>.

The coronavirus crisis has exacerbated levels of psychological and social disorders, such as an increase in the level of obsessive-compulsive disorder, anxiety disorder, and depression. In a recent study, Pan and his colleagues compared two groups—surveyed before and during COVID-19<sup>1</sup>. The second group had a higher level of symptoms such as loneliness and worry than the first group, suggesting that the pandemic had had an impact on the levels of mental disorders. Moreover, a review of the files of 62,000 people who were infected with COVID found that 1 in 5 people developed a mental disorder within 90 days of the infection<sup>2</sup>.

OCD is defined as repetitive, intrusive, unwanted, compulsive, time-consuming, disturbing, and anxiety-inducing thoughts that may interfere with daily life<sup>3</sup>. A study of the impact of the COVID-19 pandemic on the development of obsessive-compulsive symptoms in Saudi Arabia found a significant increase in the number of people with OCD compared to the pre-pandemic period. Prior to the pandemic, 26.1% expressed concern about dirt, germs, and viruses, and 13.8% had a compulsion to wash their hands. During the COVID-19 pandemic, more than half of respondents (57.8%) had new concerns about dirt, germs, and viruses, and 45.9% of them had new compulsive handwashing symptoms<sup>4</sup>.

A recent study<sup>5</sup> reported that the prevalence of OCD symptoms among young adults in Saudi Arabia was 3.4%, while an earlier study found a lifetime prevalence in females of 5.4%.<sup>6</sup> Collecting prospective data regarding the prevalence of OCD is important due to the varied nature of the phenomenon of OCD over the years<sup>6</sup>.

Abba-Aji and colleagues<sup>7</sup> investigated the prevalence of obsessive-compulsive disorder (OCD) symptoms during the COVID-19 pandemic in Canada. More than half of the respondents showed OCD symptoms and had



compulsions to wash their hands. Respondents who had compulsions to wash their hands were significantly more likely to have moderate/high stress and anxiety.

A study of 471 Brazilian medical students examined the prevalence of symptoms suggestive of obsessive-compulsive disorder (OCD) and their correlation with depression. Results showed that OCD is more frequent in medical students than in the general population and is associated with depressive symptoms. The "obsession" dimension was correlated with being a freshman, depressive symptoms, and having received psychological/psychiatric treatment<sup>8</sup>.

A recent study with a variety of occupational groups investigated the relationship between mental health status and demographic variables and the psychological impact of COVID-19. Findings showed that students experienced a higher level of psychological impact of COVID-19 than other occupational groups<sup>9</sup>.

The aim of this study was to survey the mental health of the students in Princess Nourah University during the COVID-19 outbreak. The second goal was to explore the relationship between anxiety, depression and OCD among female students at Princess Nourah bint Abdulrahman University.

### Subjects and Method(s)

An online survey was distributed via email. Participants were administered the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS),<sup>10</sup> translated and validated by Ahmed and colleagues<sup>11</sup>, and parts of the Patient Health Questionnaire (PHQ)<sup>12</sup>, translated and validated by Al-Hadi et al.<sup>13</sup>. Specifically, participants completed the Generalized Anxiety Disorder (GAD7-PHQ) scale, a 7-item scale, and the PHQ9, a 9-item depression scale.

### Participants

The study collected responses from 4151 female university students (approximately 15% of the total university students according to the numbers published on the university's website). Participants were recruited by distributing the questionnaire online. The sample consisted of 4151 female students representing all departments and specializations at Princess Noura University.



Students from all schools or departments at the university were represented. Representation ranged from only 0.4% of participants who were in the School of Dentistry to 42% who were in Humanities, while 13.5% were in the College of Science.

The study sample represents all academic levels at Princess Nourah University from the first to the eighth level, which in turn reflects the varying ages of the participants in the study. First level students represented one third of the sample.

### Procedure and measures

Participants were presented with a brief explanation of the study and gave their informed consent to take part in it. The survey started with the Patient Health Questionnaire (PHQ), which consists of three parts, the Generalized Anxiety Disorder (GAD7-PHQ) scale, the PHQ9 depression scale, followed by Yale-Brown Obsessive-compulsive scale (Y-BOCS).

The **Generalized Anxiety Disorder (GAD7-PHQ)** scale measures the level of symptoms of generalized anxiety disorder. It consists of 7 questions that ask participants about the experience of anxiety symptoms such as “not being able to stop or control worrying.” Participants responded to each item on a scale from never to nearly every day, where 0 equals no occurrence of the symptom and 4 equals a high frequency of the symptom. In the current study, Cronbach’s alpha for the total score was 0.90. These levels of internal consistency were considered adequate psychometrically.

The **Depression Disorder (PHQ9)** scale measures the level of symptoms of depression. It consists of 9 questions that ask participants about the experience of depressive disorder symptoms such as “feeling down, depressed, or hopeless.” Participants responded to each item on a scale from not at all to nearly every day, where 0 equals no occurrence of the symptom and 3 equals a high frequency of the symptom. The Cronbach’s alpha for the PHQ9 score was 0.87 in the present study, which is considered adequate.

The **Yale-Brown Obsessive Compulsive Scale (Y-BOCS)** measures the severity of obsessive-compulsive disorder symptoms. It consists of 10 questions that ask participants about obsessive thoughts and behaviors such as “How much of your time is occupied by obsessive thoughts?”. Participants



answered each item on a scale from 0 to 4, where 0 represents absence of symptoms and 4 represents appearance of high number of symptoms. The Cronbach's alpha for the Y-BOCS was 0.86 in the current study, which is considered adequate.

### Statistical analyses

**The results** were carried out using the Statistical Package for the Social Sciences software. Percentages and frequencies for all responses to the PHQ-9, GAD-7, and Y-BOCS were calculated.

Table 01 presents scores for obsessive-compulsive symptoms, depression, generalized anxiety symptoms. Of the participants, 12% suffer from extreme or severe OCD symptoms, while 66% suffer from mild to no OCD symptoms. The results of the PHQ-9 questionnaire revealed that the prevalence of depressive symptoms was 89%, and it ranged from mild to severe: 22.8% of the participants were considered to have mild depression, 23.8% had moderate depression, 21.4% had moderately severe depression, and 21% had severe depression. The results of the GAD questionnaire revealed that the prevalence of generalized anxiety symptoms was 82.4%, and it ranged from mild to severe: 25% of the participants were considered to have mild anxiety, 24.6% had moderate anxiety, and 32.8% had severe anxiety. Also presented in the table are the means and standard deviations for each scale.

### Relationship between generalized anxiety, depression, and obsessive-compulsive disorder

Table 01 shows Pearson's correlations between the study variables. The correlations were all positive, and all relationships were statistically significant at  $p < 0.05$ .

**Table 01: Correlation analysis**

Measurements	OCD	PHQ	GAD
OCD	(0.86)		
PHQ	0.663**	(0.88)	
GAD	0.657**	0.787**	(0.90)
Two-tailed * $p < 0.05$ . ** $p < 0.01$ .			



The dependent variable, depression symptoms, on independent variables of obsessive-compulsive symptoms and generalized anxiety disorder symptoms: OCD and GAD scores significantly predict depression scores,  $F(2,4148) = 3967.3, p < 0.01$ . Moreover, the  $R^2 = .657$  indicated that the model explains 65.7% of the variance in depression.

Additionally, coefficients were further assessed to ascertain the influence of OCD and anxiety on depression. The results revealed that obsessive compulsive symptoms are significantly and positively depression ( $B = .213, t = 20.3, p < 0.01$ ), and generalized anxiety significantly and positively associated with depression ( $B = .705, t = 51.3, p < 0.01$ ).

**Table 02: Regression model with depression, GAD with OCD as the dependent variable**

Regression Weights	B	t	P-Value
GAD->OCD	0.487	19.793	<0.01*
PHQ->OCD	0.458	21.207	<0.01*

Note: \*indicates  $P < 0.05$

The dependent variable OCD on independent variables of depression and generalized anxiety disorder: The independent variables, depression and GAD, significantly affect OCD,  $F(2,4148) = 1973.96, P < 0.01$ , which indicates that depression and anxiety have a significant impact on OCD. Moreover, the  $R^2 = .488$  depicts that the model explains 48.8% of the variance in OCD.

Additionally, coefficients were further assessed to ascertain the influence of each of the independent variables (depression and GAD) on the dependent variable (OCD). The results revealed that generalized anxiety has a significant positive impact on OCD ( $B = .487, t = 19.8, P < 0.01$ ) and depression has a significant positive impact on OCD ( $B = .458, t = 21.2, P < 0.01$ ).

**Table 03: Regression model with OCD and GAD symptoms with depression symptoms as the dependent variable**

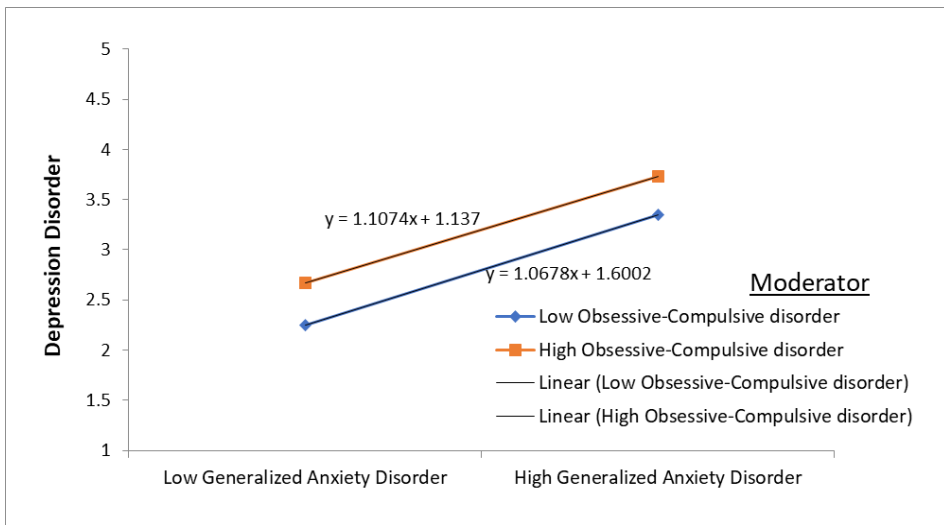
Regression Weights	B	t	P-Value
OCD->PHQ	0.213	21.207	<0.01*
GAD->PHQ	0.705	51.257	<0.01*

Note: \* indicates  $p < 0.05$



The moderating role of obsessive-compulsive symptoms (OCD) in the relationship between generalized anxiety and depression was assessed. The results revealed a negative and significant moderating impact of OCD on the relationship between generalized anxiety and depression disorder ( $b = -0.099$ ,  $t = -10.28$ ,  $p = .000$ ).

Results of simple slope analysis are presented to better understand the nature of the moderating effects. These are shown in figure 1. The line is steeper for High OCD; this shows that at a high level of OCD, the relationship between GAD and depression is stronger in comparison to low OCD.

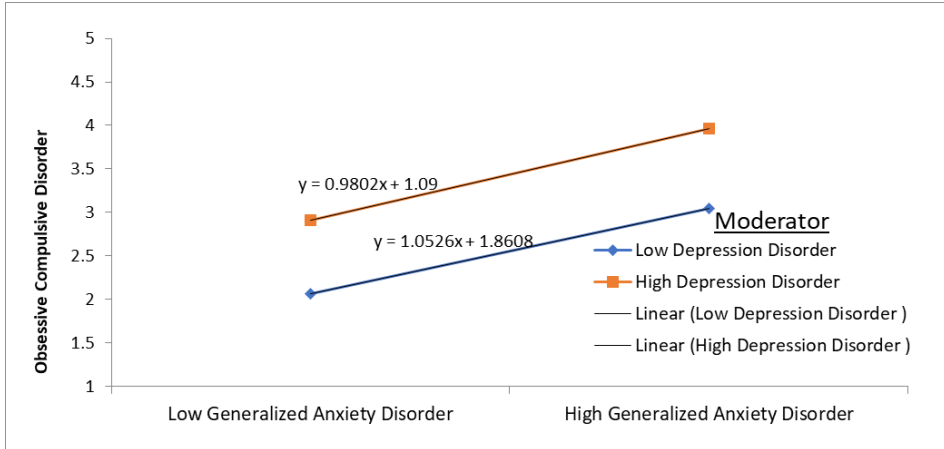


**Fig 1: obsessive compulsive disorder symptoms moderate the relationship between depression and generalized anxiety**

The moderating role of depression on the relationship between generalized anxiety and obsessive-compulsive symptoms was assessed. The results revealed a positive and significant moderating impact of depression on the relationship between generalized anxiety and obsessive-compulsive symptoms ( $b = 0.181$ ,  $t = 7.852$ ,  $p = .000$ ), thus supporting the hypothesis.

Results of simple slope analysis are stated to better understand the nature of the moderating effects. These are shown in figure 2. The line is much steeper for High Depression Symptoms, this shows that at a high level of depression symptoms, the impact of GAD on OCD is much stronger in comparison to at a low level of depression symptoms. We can conclude as the

level of Depression Symptoms increased, the strength of the relationship between generalized anxiety symptoms and obsessive-compulsive symptoms decreased.



**Fig 2: Depression symptoms moderate the relationship between obsessive compulsive symptoms and levels of generalized anxiety symptoms**

## Discussion

The current study assessed the level of mental health of university students in terms of levels of depression, anxiety, and OCD. In line with previous research on the prevalence of OCD in young Saudis<sup>4</sup>, we found that participants showed high levels of OCD. One of the possible explanations of this increase is that people are overwhelmed with COVID-19 safety procedures which include washing hands, and not touching stuff in public places compared to the lifetime prevalence in females that reported earlier. In line with Tan and colleague's research<sup>14</sup>, the depression and anxiety disorder scale results showed very high levels of depression and anxiety during COVID-19. It was surprising to find that Saudi participants had a higher level of depression and anxiety disorders than in various other Saudi studies such as Alsubaie study where young adults in Saudi Arabia scored 3.4%<sup>5</sup>. However, Alqahtani assumed that Saudi students experienced a higher level of psychological impact of COVID-19 than other occupational groups<sup>9</sup>.

The current study explored the relationship between OCD, depression, and anxiety. Similar to our findings, a Canadian study found a positive relationship between OCD and both depression and generalized anxiety.<sup>7</sup>



Additionally, a Brazilian study found an association between OCD and depression in medical students<sup>8</sup>. Similarly, a study of adults in Japan found that levels of anxiety and depression were positively related<sup>15</sup>. Likewise, our study found that anxiety is positively related to depression.

Given the current exposure to various types of stressors such as health, education, concerns about the future, and social life, we additionally added obsessive-compulsive disorder (OCD) as a moderator of the relationship between generalized anxiety disorder (GAD) and depression disorder (DD). The results showed that this relationship was moderated by OCD. At a high level of OCD, the relationship between anxiety and depression is much stronger than was the case for a low level of OCD. We can conclude that as the level of OCD increases, the strength of the relationship between generalized anxiety symptoms and depression symptoms increases. Previous studies conducted during the pandemic revealed that the number of people with mental illnesses increased compared to the rate prior to the pandemic. Some studies have shown that people with other mental illnesses are more likely to have high levels of anxiety and depression<sup>16</sup>.

## Conclusion

The main goal of this research was to investigate the mental health status of Princess Nourah University students during the COVID-19 outbreak. Following previous research<sup>4, 13</sup>, students tended to show high levels of depression, anxiety, and OCD during COVID-19. This study found that Saudi students experienced higher level of psychological impact of COVID-19 than other occupational groups, consistent with other recent research<sup>9</sup>. Future research should focus on examining why the pandemic was more stressful for students than other groups of people. It would be fruitful to conduct in-depth qualitative studies to investigate this issue.

The second goal of the research was to explore the relationship between anxiety, depression, and obsessive-compulsive disorder among female students at Princess Nourah bint Abdulrahman University. This study replicated previous findings that anxiety, depression, and OCD are positively related<sup>7, 8</sup>. Furthermore, obsessive-compulsive symptoms (OCD) moderated the relationship between generalized anxiety disorder (GAD) symptoms and depression scale scores. Alateeq and colleagues<sup>4</sup> found that people with other



mental illnesses are more likely than the general population to show high levels of anxiety and depression.

Our research is not without limitations, first, participants were female university students, which raises the question of whether our findings would generalize to other groups of people. Even though the current study successfully investigated the relationship between different facets of mental health status in a specific sample, future research should replicate the findings with different samples, as well as with other measures of depression, anxiety, and OCD. All these future steps will help in giving a clear picture of mental health in Saudi Arabia.

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### **Conflict of Interest**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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### **ETHICS APPROVAL AND CONSENT TO PARTICIPATE**

This study was approved by the Institutional Review Board at PNU (IRB-PNU:21-0424) in Riyadh, Saudi Arabia. Informed consent was obtained from all the participants.

### **Authors contributions**

The authors confirm contribution to the paper as follows: AMA conceived and designed the study; conducted research; provided research materials and analysis tools; Performed the analysis; reviewed the results and wrote the paper. MAA Contributed to the data collection, analysis tools and performed the analysis.

All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.



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