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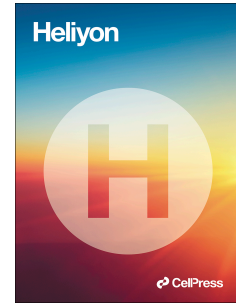
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Academic self-efficacy, self-esteem, satisfaction with studies, and virtual media use as depression and emotional exhaustion predictors among college students during COVID-19

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Abstract

The aim of the study was to explore the relationship between depression, emotional exhaustion, self-esteem, satisfaction with studies, academic self-efficacy, and the use of virtual media in Peruvian university students during the coronavirus disease 2019 (COVID-19) pandemic. A total of 569 college students (61.9% female), with a mean age of 21.73 years (standard deviation = 4.95), responded to the following questionnaires: Academic Self-Efficacy Scale, Single Item Self-Esteem Scale, Brief Scale of Satisfaction with Studies, Scale of Use of Virtual Media, Patient Health Questionnaire-2, and Single Item of Academic Emotional Exhaustion. Correlation statistics, regression models, and structural equation modeling (SEM) were used for data analysis. The results demonstrated a direct and significant correlation between virtual media use, academic self-efficacy, self-esteem, depression, and emotional exhaustion ($p < .01$). In addition, satisfaction with studies ($\beta = -0.13$), academic self-efficacy ($\beta = -0.19$), self-esteem ($\beta = -0.14$), and emotional exhaustion ($\beta = 0.19$) predicted depression significantly, whereas virtual media use ($\beta = 0.17$), study satisfaction ($\beta = 0.09$), and depression ($\beta = 0.20$) predicted emotional exhaustion associated with academics. The SEM model indicated that self-esteem, satisfaction with studies, and academic self-efficacy negatively predict depression, whereas academic self-efficacy positively predicts virtual media use. Finally, both virtual media use and depression positively predict emotional exhaustion. This model presents optimal goodness-of-fit indices ($X^2 = 8.926$, $df = 6$, $p = .178$; comparative fit = .991, Tucker–Lewis = .979, root mean square error of approximation = .029 [confidence interval 90% = .000–.067], standardized root mean square residual = .022). Thus, academic self-efficacy, self-esteem, satisfaction with studies, and

virtual media use predict depression and emotional exhaustion among college students during the COVID-19 pandemic.

Keywords: academic self-efficacy, self-esteem, emotional exhaustion, COVID-19, depression, college students

Introduction

The new coronavirus disease 2019 (COVID-19) has caused the world's worst health crisis in decades. It has had repercussions not only on global public health (Schmidt et al., 2020) but also on other important areas such as the economy (Nudelsman, 2013) and education (Britez, 2020). As a result, similar to the control of the influenza pandemic years ago, sudden changes had to be made to the way the world is now dealing with the consequences. Accordingly, as during the control of the influenza pandemic years ago, (Earn et al., 2012) it has been necessary to promote abrupt changes in learning modality, with virtuality being the only viable alternative. However, not all educational institutions were able to implement good quality virtual platforms on time (João & Carvalho-Filho, 2020).

In Peru, due to the restrictions imposed by the government in charge, changes were made to educational policies. These were designed to keep students from missing out on the academic year (Aquino-Canchari & Medina-Quispe, 2020). Therefore, online technology was used to ensure access to remote learning (Goodman, Melkers, & Pallais, 2017). Previous studies reported that it aligns well with pedagogy (Chauhan, 2017) and motivates learning (Furió, Juan, Seguí, & Vivó, 2014).

Despite these projections, it has been observed that the challenges posed by distance classes (Britez, 2020) have put the cognitive and emotional capacities of university students to test (OEI, 2020), increasing the probability of them suffering from psychological alterations, which are even more detrimental than those reported as a result of the events of a pre-pandemic formative period (Dominguez-Lara & Merino-Soto, 2019). In this case, based on the evidence found in the literature, the authors of the research consider it appropriate to focus on depression and emotional exhaustion.

Depression

Depression is defined as a mood disorder characterized by prolonged sadness, frustration, melancholy, and apathy (Botto, Acuña, & Jiménez, 2014). In the Peruvian context, studies

such as the one conducted by Sánchez-Carlessi et al. (2021) where 1264 students from 11 Peruvian universities participated found that more than 50% reported suffering from depression of at least some level (low, medium, or high). Similarly, in their study on university students in Ayacucho, Sandoval et al. (2021) reported that more than 30% experienced depressive symptoms of varying levels (mild, moderate, and severe).

The reality in other countries is not too different from Peru. For example, in Colombia, a high prevalence of depression was reported among students at the Public University of Cartagena (Arrieta, Díaz, & González, 2014). In Mexico, 31.7% of medical students at the Autonomous University of Puebla were diagnosed with major depression (Martínez-Martínez, Muñoz-Zurita, Rojas-Valderrama, & Sánchez-Hernández, 2016). In Chile, 37.9% of first-year medical students at the Universidad Tradicional del Norte were diagnosed with pathological depression (Barraza-Lopez, Muñoz-Navarro, & Behren-Pérez, 2017). In Jordan, it was observed to be prevailing at a moderate level (Dalky & Gharaibeh, 2019); the prevalence in China among male students from 15 universities was reported to be higher than among female students (Gao, Ping & Liu, 2020); and in France, Romania, and the Republic of Moldova, a high prevalence of 39.0% was observed (Habibirwe et al., 2018).

Emotional exhaustion

Emotional exhaustion is defined as mental fatigue caused by a lack of cognitive and emotional resources and is characterized by insomnia, a lack of motivation, and irritability. (García-Flores, Vega, Farias, Améstica-Rivas, & Aburto, 2018). Due to the demands of university life, it is common for researchers to report this type of fatigue as a result of any sustained effort to meet tasks, exhibitions, research work, among other academic demands (Dominguez-Lara et al., 2018).

Theoretically, emotional exhaustion is an indicator of variable stress and/or burnout (Rosales & Rosales, 2013). Therefore, it is usually implemented as one of its dimensions (Rodríguez-Villalobos, Benavides, Ornelas, & Jurado, 2019). As a variable, it represents one of the most frequent reactions experienced by university students during online learning (Celik et al., 2022). For example, in Madre de Dios, Peru, 50.4% of university students evidenced a high level of emotional exhaustion (Estrada & Gallegos, 2022). Furthermore, among psychology, engineering, administration, and law students in the three regions of Peru, predominantly in the department of Arequipa, it was observed that 31.4% of students also showed a similar level of burnout (Seperak-Viera et al., 2021).

Other reports from various parts of the world evidenced a similar trend. For example, in Iceland, nursing students from two universities reported personal and academic burnout when they felt that their studies were not progressing well (Sveinsdóttir et al., 2021); and in another study of 5000 university students in Mexico, 14% reported experiencing emotional fatigue due to the abundance of online activities and tasks (Camacho-Zuñiga et al., 2021).

Predictors of depression and emotional exhaustion

Based on what has been described, the available literature suggests that some variables may play a determining role in the development of depression and emotional exhaustion, the two main psychological manifestations of the COVID-19 pandemic in the undergraduate population. It should also be noted that there has been evidence of a reciprocal interaction between depressive symptoms and academic emotional exhaustion (Cheng, Zhao, Wang, & Sun, 2019; Kwak, Ji, Baek, & Baek, 2020; Xu et al., 2020).

In this regard, academic self-efficacy is proposed as the first predictor variable, which is the belief in one's own ability to successfully develop academic tasks and which has also shown to have an inverse relationship with depression and emotional exhaustion in previous studies (Galicia-Moyeda, Sánchez-Velasco, & Robles-Ojeda, 2013; Janko & Smeds, 2019; Jenaabadi, Nastiezaie, & Safarzaie, 2017; Jung, 2015; Salanova, Cifre, Grau, Llorens, & Martínez, 2005, Smeds et al., 2020). Self-esteem, a subjective self-valuation tailored toward the rejection or acceptance of oneself, is a second predictor variable that has also been shown to have an inverse relationship with depression (Dahlin, Joneborg, & Runeson, 2009; Lazarevich, Delgadillo-Gutiérrez, Mora-Carrasco, & Martínez-González, 2013; (Méndez, Martínez-Ramón, Ruiz-Esteban, & García-Fernández, 2020) Talih, Warakian, Ajaltouni, Shehab, & Tamim, 2016) and emotional exhaustion, indicating that people with high self-esteem tend to perceive situations as less stressful (Lledó, Perandones, Herrera, & Lledó, 2014). Satisfaction with studies, defined as the pleasurable state generated by being satisfied with the profession one is studying, is the third predictor variable (Bernal, Lauretti, & Agreda, 2017). There is evidence that suggests that depression and burnout have a functional theoretical relationship (Babar et al., 2021; Bolatov et al., 2020; Changwon, Hegde, Smith, Wang, & Sasangohar, 2020, Daroedono et al., 2020; Moreno-Fernandez et al., 2020; Rodríguez-Mantilla & Fernandez-Diaz, 2017; Silva & Figueiredo-Braga, 2019; Qinghua et al., 2022). The use of virtual media as the fourth predictor variable implies satisfaction with using virtual platforms based on educational technologies as a support for virtual teaching (Granados-Zúñiga, 2019). Previous studies have linked the use of virtual media to depression and burnout both before and during the pandemic (Zhang et al., 2019; Celik et al., 2022; Fauville et al., 2021; Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017; Zis, Artemiadis, Bargiotas, Nteveros, & Hadjigeorgiou, 2021).

Justification

Based on what has been presented, it is necessary to assume that, while university students are one of the groups that have shown favorable attitudes toward the use of educational technologies in the classroom (Morales, Zacatenco, Luna, García, & Hidalgo, 2020), the changes that virtual education has brought about due to COVID-19 have generated and, in some cases, aggravated the emotional repercussions they have suffered during the health crisis. Therefore, despite evidence of interrelationships between the proposed variables, this study focuses on testing a hypothesized model in which latent variables such as depression and emotional exhaustion are explained in terms of the presence of variables such as academic self-efficacy, self-esteem, satisfaction with studies, and the use of virtual media.

Furthermore, it aims to fill a theoretical gap caused by a lack of research on predictors of mental health in Peruvian university students during health crises.

Target

The aim of this study is to explore the relationship between depression, emotional exhaustion, self-esteem, satisfaction with studies, academic self-efficacy, and the use of virtual media in Peruvian university students during the COVID-19 pandemic.

Material and Methods

Study design

This was a nonexperimental and cross-sectional predictive study (Ato, López, & Benavente, 2013).

Participants

Through nonprobabilistic sampling, the study included 569 university students of both sexes (61.9% female) from different Peruvian universities aged 16–41 years (mean = 21.73; standard deviation [SD] = 4.95). Table 1 shows the sociodemographic characteristics of the study participants, of which; 332 (58.3%) were male, 369 (64.9%) were less than 22 years old, 515 (90.5%) studied at public universities, 225 (39.5%) were students of architecture and engineering, and 263 (46.2%) were from the coast.

Table 1. Sociodemographic characteristics of university students

Sociodemographic variables	n	%
Gender		
Female	352	61.9%
Male	217	38.1%
Age		
<= 22.0	369	64.9%
23.0+	200	35.1%
Institution		
Private	515	90.5%
Public	54	9.5%
Department		
Health Sciences	204	35.9%
Business Sciences	70	12.3%
Engineering and Architecture	225	39.5%
Human Sciences and Education	38	6.7%
Other	32	5.6%
Region of origin		
Coast	263	46.2%
Mountains	77	13.5%

Forest	229	40.2%
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Instruments

The Academic Self-Efficacy Scale (ASES; Palenzuela, 1983) was used with the objective of evaluating the perceived self-efficacy of the individuals specific to academic situations. This study used the scale adapted to Peruvian university students by Dominguez, Villegas, Yauri, Mattos, and Ramírez (2012). It comprises nine items, with four response options ranging from “never” to “always.” The ASES is valid (Kaiser–Meyer–Olkin test score = 0.938, Bartlett's test $p < 0.01$) and reliable ($\alpha = .89$).

The Single Item Self-Esteem Scale (SISE, Robins, Hendin & Trzesniewski, 2001) consists of a single item that assesses global self-esteem, with five response options (“strongly disagree = 1” to “strongly agree = 5”). It was proven as valid ($r = 0.622$; $p < 0.001$) and reliable ($\alpha = .92$).

Brief Scale of Satisfaction with Studies (BSSS; Merino-Soto, Dominguez-Lara & Fernández-Arata, 2017) is composed of three items that evaluate student satisfaction with respect to studies. The responses are collected through a five-anchor, Likert-type scale. (“strongly disagree = 1” to “strongly agree = 5”). The BSSS is valid (comparative fit [CFI] = 0.92, goodness-of-fit [GFI] = 0.99, RMSR=0.053) and reliable ($\alpha = .78$).

Scale of Use of Virtual Media (SUVM; Mamani-Benito et al., 2021) is composed of 10 items, with Likert-type response options where 1 is “totally disagree” and 5 is “totally agree.” The SUVM has been shown to be valid (CFI = .931; Tucker–Lewis [TLI] = .908; GFI = .957; root mean square error of approximation [RMSEA] = .071) and reliable ($\alpha = .74$).

Patient Health Questionnaire-2 (PHQ-2; Kroenke, Spitzer & Williams, 2003) briefly assesses emotional and cognitive aspects related to depression (discouragement, hopelessness, displeasure, and disinterest in things). It is composed of 2 items with 4 response options ranging from 0 (not at all) to 3 (almost every day). For the study, the PHQ-2 reported adequate reliability ($\alpha = .79$ [CI 95% = 0.75–0.81]).

The Single Item of Academic Emotional Exhaustion (SIAEE), developed by Dominguez-Lara and Merino-Soto (2017), holistically assesses academic emotional exhaustion. The SIAEE consists of five response options (strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree). The SIAEE is valid (CFI = .985; standardized root mean square residual [SRMR] = .051; RMSEA = 0.058) and reliable ($\alpha = .87$).

Procedure

Due to the COVID-19 pandemic, the students participated virtually. Prior to the development of the questionnaires, the participants were informed of the objective of the

study, and it was specified that participation was voluntary and anonymous and that the data collected were for research purposes only. They then declared their consent to participate and completed the tests through a form created on the Google forms platform. The research was approved by the ethics committee of the Universidad Peruana Unión (reference N°. 2021-CEUPeU-0065).

Data analysis

A descriptive analysis was performed to evaluate the normality of the variables taking into consideration the skewness and kurtosis coefficients (>1.5). Pearson's correlation coefficient was used to correlate these variables and a significance level of 0.05 was established for hypothesis testing. Two regression models were analyzed with the correlated variables, where depression and emotional exhaustion were considered to be the dependent variables.

Finally, a predictive model of both variables was proposed, a confirmatory factor analysis (CFA) was performed through structural equation modeling (SEM), and the maximum likelihood estimation method was used. These analyses helped to assess GFI indices from a perspective established by Escobedo et. al. (2016) and Kline (2015). Thus, CFI and TLI indexes ranging between 0.90 and 0.95 would indicate an acceptable fit and values above 0.95 would indicate an adequate fit. RMSEA and SRMR indices with values between 0.05 and 0.08 would indicate an acceptable fit and values below 0.05 would indicate an adequate fit. All statistical analyses were performed using SPSS and Amos 24.0.

Results

Table 2 shows the descriptive statistics of the study variables. The skewness and kurtosis coefficients are 1.5, which was below the appropriate range (Pérez & Medrano, 2010); however, the use of virtual media exceeds the range.

Table 2. Descriptive analyses of virtual media use, satisfaction with studies, academic self-efficacy, self-esteem, depression, and academic emotional exhaustion

Variables	M	SD	S	K
Virtual media use	3.506	.424	-.999	3.669
Study satisfaction	3.119	.956	.179	-.467
Academic self-sufficiency	2.851	.655	-.072	-.472
Self-esteem	3.838	.954	-.929	.846
Depression	1.789	.808	.974	.328

Academic emotional exhaustion	3.337	1.214	-.266	-.901
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Note: M = mean, SD = standard deviation, S = skewness coefficient, K = kurtosis coefficient

Correlation between use of virtual media, satisfaction with studies, academic self-efficacy, self-esteem, depression, and academic emotional exhaustion.

Table 3 shows the correlations (Pearson's coefficient) between satisfaction with studies, psychological distress, depression, and academic self-efficacy. A direct and significant correlation was observed between virtual media use and academic self-efficacy, self-esteem, depression, and emotional exhaustion ($p < .01$).

Table 3

Correlation analysis between the use of virtual media, satisfaction with studies, academic self-sufficiency, self-esteem, depression, and academic emotional exhaustion

	Virtual media use	Satisfaction with studies	Academic self-sufficiency	Self-esteem	Depression	Academic emotional exhaustion
Virtual media use	1					
Satisfaction with studies	.039	1				
Academic self-sufficiency	.100*	.431**	1			
Self-esteem	.088*	.257**	.404**	1		
Depression	.026**	-.237**	-.308**	-.247**	1	
Academic emotional exhaustion	.176**	.020	-.075	-.029	.207**	1

** Significant at level 0.01 (bilateral)

Predictive analysis of academic depression and emotional exhaustion

Multiple regression analysis was performed to analyze how the variables contributed to the variance of the variables depression and emotional exhaustion. Table 4 shows, the unstandardized regression coefficients (B), standard error of the estimate (SE), standardized regression coefficients (β), and statistics related to the predictor variable. The β coefficients show that satisfaction with studies ($\beta = -0.13$), academic self-efficacy ($\beta = -0.19$), self-esteem ($\beta = -0.14$), and emotional exhaustion ($\beta = 0.19$; predictor variables) significantly predict depression (criterion variable) ($R^2 = .16$, $F = 21.56$, $p < 0.001$).

The t-value of the predictor variables' beta regression coefficients was found to be highly significant ($p < 0.01$). Furthermore, virtual media use ($\beta = 0.17$), study satisfaction ($\beta =$

0.09), and depression ($\beta = 0.20$) were found to significantly predict academic emotional exhaustion. The t-value of the beta regression coefficients of the predictor variables were significant ($R^2 = .08$, $F = 9.751$, $p < 0.001$).

Table 4. Predictive analysis of depression and academic emotional exhaustion among university students

Predictors	Depression					Emotional exhaustion				
	B	EE	Beta	t	p	B	EE	Beta	t	p
(Constant)	2.62	0.30		8.82	0.000	1.02	0.50		2.05	0.041
VMU	0.05	0.08	0.03	0.72	0.471	0.50	0.12	0.17	4.25	0.000
SS	-0.11	0.04	-0.13	-2.93	0.004	0.11	0.06	0.09	1.98	0.048
AS	-0.23	0.06	-0.19	-4.09	0.000	-0.13	0.09	-0.07	-1.50	0.135
SE	-0.12	0.04	-0.14	-3.22	0.001	0.02	0.06	0.01	0.29	0.774
AEE	0.12	0.03	0.19	4.73	0.000	-	-	-	-	-
DE	-	-	-	-	-	0.31	0.06	0.20	4.73	0.000

Note: VMU = virtual media use, SS = satisfaction with studies, AS = academic self-efficacy, SE = self-esteem, AEE = academic emotional exhaustion, DE = depression, B = unstandardized coefficient, SE = standard error

CFA (Figure 1) showed a positive correlation among self-esteem, satisfaction with studies, and academic self-efficacy and that they negatively predict depression. Furthermore, academic self-efficacy positively predicts virtual media use. Finally, both virtual media use and depression positively predict emotional exhaustion. This model presents optimal GFI indices ($X^2 = 8.926$, $df = 6$, $p = .178$; $CFI = .991$, $TLI = .979$, $RMSEA = .029$ [CI 90% = .000–.067], $SRMR = .022$).

Discussion

The COVID-19 pandemic has had a severe impact on the health of the population, resulting in changes to the educational infrastructure as well. Universities suspended in-person academic activities and attempted to provide equivalent online classes. This unexpected and drastic change affected the educational system and created health risks among university students as a result of reduced academic engagement, which led to problems in their physical and psychological wellbeing. Therefore, the purpose of this study was to explore the relationship between depression, emotional exhaustion, self-esteem, satisfaction with studies, academic self-efficacy, and the use of virtual media in Peruvian university students during the COVID-19 pandemic.

First, the results show that depression has a direct impact on academic emotional exhaustion. This is in relation to previous studies that have suggested that there is a

reciprocal relationship between emotional exhaustion and depression that consistently interacts with each other (Kwak, Ji, Baek, & Baek, 2021; Xu et al., 2020). In addition, emotional exhaustion is the initial stage of academic burnout (Lee, Lee, Lee, Lee, & Cho, 2020). Even during the COVID-19 pandemic, a significant relationship persists between academic burnout and depression (Cheng, Zhao, Wang, & Sun, 2020). Therefore, it is essential to elucidate the negative influences of the academic world on students and in the event of severe mental impairments, appropriate interventions should be developed to mitigate burnout by creating an engaging learning environment that generates resilience and reduces burnout (Wei et al., 2021).

In addition, self-esteem is indirectly associated with emotional exhaustion through the mediating effects of depression. These results are consistent with previous findings. (Dahlin, Joneborg, & Runeson, 2009; Lazarevich, Delgadillo-Gutiérrez, Mora-Carrasco, & Martínez-González, 2013; Talih, Warakian, Ajaltouni, Shehab, & Tamim, 2016). Overall, the findings demonstrated that self-esteem can regulate the symptoms of depression and can alleviate emotional exhaustion; thus, improving the student's quality of life. Hence, people with high self-esteem tend to present fewer depressive symptoms, are less vulnerable to emotional exhaustion, and may be more satisfied with their studies (Méndez, Martínez-Ramón, Ruiz- Esteban, & GarcíaFernández, 2020). In emergency situations, such as the one experienced in response to the COVID-19 pandemic, initial programs should be implemented to include professionals who specifically focus on improving the students' self-esteem and self-efficacy, as students with higher levels of academic self-efficacy are more predisposed to experiencing depression during emergency situations. In addition, these efforts should be directed toward students that have low self-esteem as a primary means of preventing depression (Arima et al., 2020).

Study satisfaction was found to be directly associated with depression and indirectly associated with emotional exhaustion. These results support the hypothesis that emotional exhaustion reduces academic satisfaction, as students with lower levels of academic satisfaction have higher attrition (Babar et al., 2021; Moreno-Fernandez et al., 2020; Silva & Figueiredo-Braga, 2019; Qinghua et al., 2022). Furthermore, during the COVID-19 quarantine, those students who demonstrated satisfaction with studies experienced a lower prevalence of depression and emotional exhaustion after switching to an online modality when compared with the same indicators during the traditional learning period before the pandemic. However, students who indicated that their satisfaction with studies had worsened due to the online modality of learning showed more pronounced symptoms of burnout, depression, anxiety, and stress (Bolatov et al., 2020). This is due to the removal of spatial barriers, self-education motivations, the combining of studies with personal and family lives, and the decreased expenses, which thus provide favorable conditions to feeling academically satisfied (Rurato, 2011). This was contrary to those who showed greater concern for their academic performance and experienced greater emotional exhaustion due to the changing interpersonal relationships with peers and connectivity limitations, further contributing to lower academic satisfaction and increased levels of depression (Changwon, Hegde, Smith, Wang, & Sasangohar, 2020; Daroedono et al., 2020;

Rodriguez-Mantilla & Fernandez-Diaz, 2017). The findings could provide information for the development of workshops and seminars aimed at facilitating the better regulation of students' emotions, reducing their feelings of academic emotional exhaustion, helping them become more involved in academic activities, and outlining certain factors that can improve the teaching–learning process during the quarantine period (Moreno-Fernandez et al., 2020).

In this study, academic self-efficacy is directly associated with depression and virtual media use and indirectly associated with emotional exhaustion. This result is consistent with previous findings (Galicia-Moyeda, Sánchez-Velasco, & Robles-Ojeda, 2013; Janko & Smeds, 2019; Jenaabadi, Nastiezaie, & Safarzaie, 2017; Jung, 2015; Salanova, Cifre, Grau, Llorens, & Martínez, 2005, Smeds et al., 2020). The study revealed that students who have higher self-efficacy feel less depressed and exhibit less emotional exhaustion. Academic self-efficacy is a trait present in students and, due to academic reasons most students face a large amount of burnout (Akter, 2021). Long hours of studying during quarantine may contribute to a decrease in academic self-efficacy, further increasing the levels of burnout, which can lead to substance abuse and moderate to high rates of depression (Janko & Smeds, 2019). Furthermore, self-efficacy was associated with the use of virtual media, which demonstrated a direct effect on emotional exhaustion, implying that increased internet use leads to greater academic emotional exhaustion. The results are consistent with those of previous studies reporting that virtual media use leads to increased academic burnout (Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017). However, during the COVID-19 pandemic, digital learning among college students led to a greater increase in emotional exhaustion, due to the increased hours spent in virtual classes, compared with their peers who did not experience this change in educational modality (Zis, Artemiadis, Bargiotas, Nteveros, & Hadjigeorgiou, 2021). This may be because the students are not fully satisfied with the technological resources subscribed to by the university, with the primary problems being limited access to computers and a slow download speed, which affect the optimal use of electronic resources by students in public universities (Ahmed, 2013). Some students experience fatigue, sensitivity, and irritability as signs of emotional exhaustion due to learning demands (Rohmani & Andriani, 2021) and a lack of control over course organization during the pandemic, which results in the loss of confidence and further deterioration in academic performance (Reverté-Villarroya et al., 2021). Therefore, the promotion of specific coping strategies to assist students during the pandemic is necessary (Azzi et al., 2021).

A few limitations of this study must be considered when interpreting the findings. The first limitation of this study is the unsupervised self-assessment nature of the survey. The survey was administered early in the pandemic by COVID-19 students who may have experienced more or less emotional exhaustion during the rest of the year. Second, because the study only included college students and no probability sampling was used, the findings of this research cannot be standardized to other perspectives of online learning, and it is yet to be determined whether they are valid for other samples as well. Other studies should use probability sampling procedures and involve graduate students. Third, the study had a

cross-sectional design that only enables the relationships between variables to be observed in a specific time period. Also, additional longitudinal studies could be conducted in the post-COVID-19 context to identify changes in the emotional exhaustion levels of undergraduate students over a period of time. Fourth, only some predictor variables of depression and emotional exhaustion were considered, leaving out others that could have helped in developing a better understanding of the problem. Therefore, it is important to develop future studies that consider other variables such as emotional well-being, fatigue, academic procrastination, and psychological distress.

In conclusion, despite the limitations, the findings of this study suggest that academic self-efficacy, self-esteem, satisfaction with studies, and the use of virtual media are significant predictors of depression and emotional exhaustion in university students. These findings provide evidence to support the development of intervention programs aimed at preventing and reducing emotional problems in university students in order to improve their mental health and achieve their academic goals. Thus, interventions aimed at preventing or reducing depression should focus on reinforcing self-esteem, satisfaction with studies, and self-efficacy during periods of health emergency. In addition, online classroom systems should be improved, online education-friendly curricula should be developed, instructors' skills should be improved to ensure the highest level of interaction during lectures, and online education should be continued as a cultural practice.

Acknowledgements

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Figure Captions

Figure 1. Predictive model of depression and emotional exhaustion

Note: Goodness-of-fit indices for the predictive model: $\chi^2 = 8.926$, $df = 6$, $p = .178$; comparative fit (CFI) = .991, Tucker–Lewis (TLI) = .979, root mean square error of approximation (RMSEA) = .029 [confidence interval 90% = .000–.067], standardized root mean square residual (SRMR) = .022

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