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*Scientific articles*

## **Burnout por covid-19 durante las clases en línea en estudiantes universitarios**

***Burnout by COVID 19 during online classes in university students***

***Burnout por COVID 19 durante aulas online em universitários***

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### **Resumen**

Una de las medidas adoptadas por los gobiernos para preservar la salud de las personas durante la pandemia por covid-19 fue la implementación del distanciamiento físico. Esto obligó a las universidades a transitar de las clases presenciales a las clases en línea, lo que generó un panorama incierto para los estudiantes. Por ende, el propósito de esta investigación fue identificar la proporción de estudiantes que experimentaron el síndrome de *burnout* durante las clases en línea impartidas durante la pandemia. Para ello, el estudio se enfocó en una población de estudiantes universitarios de diversas áreas del conocimiento en una universidad pública ubicada en Tabasco, México. La investigación se llevó a cabo mediante un enfoque cuantitativo y descriptivo, con un diseño no experimental de tipo transversal. Para recopilar datos, se utilizó un cuestionario elaborado en Google Forms, que fue administrado



de manera voluntaria a 268 estudiantes. Asimismo, se aplicó un análisis factorial exploratorio para validar el instrumento, y la confiabilidad se evaluó mediante el coeficiente alfa de Cronbach que arrojó un valor de  $\alpha = 0.950$ . Los hallazgos indicaron que los porcentajes más altos de *burnout* se identificaron en las dimensiones de *agotamiento* y *despersonalización*. Esto se atribuyó a las dificultades para prestar atención durante las clases en línea, el agotamiento causado por las demandas académicas, el estrés asociado con las tareas, la falta de sueño debido al trabajo escolar y las dificultades en la comunicación con los profesores cuando surgían dudas sobre las clases. En general, los resultados señalaron que más de la mitad de los estudiantes presentaron baja realización personal, agotamiento y despersonalización. Por tanto, se concluye que estos datos representan una alerta en la población estudiada, y subrayan la necesidad de implementar medidas dirigidas a reducir el burnout en los estudiantes. Además, se sugiere realizar investigaciones adicionales al regreso de las clases presenciales para evaluar la presencia del *burnout* en ese contexto.

**Palabras clave:** estrés, desgaste emocional, enseñanza virtual, universidad pública.

### Abstract

One of the measures taken by governments to preserve people's health during the Covid 19 pandemic was physical distancing. In this context, universities went from face-to-face classes to online classes, which caused an uncertain outlook for students. The objective of this research was to identify the proportion of students who presented burnout syndrome during online classes taught during the pandemic in a population of university students from various areas of knowledge at a public university located in Tabasco, Mexico. The research was quantitative, descriptive, with a non-experimental cross-sectional design; For data collection, a questionnaire prepared in Google Forms was applied to 268 students who responded voluntarily. For the validity of the instrument, an exploratory factorial analysis was applied and for reliability the Cronbach's Alpha coefficient was used, which reported  $\alpha = 0.950$ . The results indicated that more than half of the students presented low personal fulfillment, exhaustion and depersonalization. It is concluded that these data represent an alert in the population studied, so it is necessary to carry out actions aimed at reducing burnout in students and carry out other investigations on the return of face-to-face classes to determine the presence of burnout in this context.

**Keywords:** Stress, emotional exhaustion, virtual teaching, public university.

## Resumo

Uma das medidas tomadas pelos governos para preservar a saúde das pessoas durante a pandemia da Covid 19 foi o distanciamento físico. O objetivo desta pesquisa foi identificar a proporção de alunos que apresentaram a síndrome de burnout durante as aulas online ministradas durante a pandemia em uma população de universitários de diversas áreas do conhecimento de uma universidade pública localizada em Tabasco, México. A pesquisa foi quantitativa, descritiva, com delineamento transversal não experimental; Para coleta de dados, foi aplicado um questionário elaborado no Google Forms a 268 alunos que responderam voluntariamente. Para a validade do instrumento foi aplicada a análise fatorial exploratória e para a confiabilidade foi utilizado o coeficiente Alpha de Cronbach, que reportou  $\alpha = 0,950$ . Os resultados indicaram que mais da metade dos alunos apresentou baixa realização pessoal, exaustão e despersonalização. Conclui-se que esses dados representam um alerta na população estudada, por isso é necessário realizar ações que visem diminuir o burnout nos alunos e realizar outras investigações sobre o retorno das aulas presenciais para determinar a presença de burnout em este contexto.

**Palavras-chave:** Estresse, esgotamento emocional, ensino virtual, universidade pública.

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## Introduction

In the late 1960s, the concept of *burnout emerged* in the health field to refer to the emotional aspect and psychological stress experienced by doctors and nurses dedicated to caring for patients. Since then, the term *burnout* has been used to define the stress associated with work in various environments ( Rotenstein *et al .*, 2018).

The pioneer in using the concept of *burnout* was Freudenberg (1974) who, when conducting a study in a drug addict clinic, investigated individuals predisposed to exhaustion and the implications of dedication and work commitment. Freudenberg observed that staff experienced a loss of energy resulting in exhaustion, anxiety, demotivation, and depersonalized attention. Their contributions included findings on the process of emotional exhaustion and lack of motivation and commitment (Maslach *et al .*, 2001).

Now, the study of *burnout* as a syndrome is attributed to Maslach and Jackson (1981) who conceptualized it as a syndrome that involves emotional exhaustion and cynicism (depersonalization) in individuals who work with people. To do this, they developed a scale of high validity and reliability to measure *burnout* , from which three dimensions emerged



for analysis: emotional exhaustion, depersonalization and low personal achievement (Maslach *et al.*, 1997).

Emotional exhaustion manifests itself as chronic stress that manifests itself through physical and psychological exhaustion, arising as a response to tense situations in the workplace between people. Depersonalization, for its part, implies a negative, insensitive or distant response to work, while low personal fulfillment refers to the absence of achievements and productivity in the workplace. This syndrome results in a deterioration in the quality of care provided by staff, and is manifested through factors such as absenteeism, low morale, anguish, physical exhaustion, alcohol and drug consumption, as well as family problems derived from the workload. of work and the work environment ( Maslash *et al.*, 2001).

Subsequently, *burnout* was defined in the organizational field from a psychosocial perspective as “a response to sources of chronic work stress linked to social relationships between service providers and recipients of the same, it is a coping and self-protection mechanism against the stress generated in the professional-client relationship, professional-organization relationship” (Gil-Monte, 2007, p. 5). This author maintains that this phenomenon has been the subject of study by numerous researchers, who describe it as an adaptation to stressful work conditions characterized by professional disorientation, emotional exhaustion, feelings of guilt due to lack of professional development and isolation.

The phenomenon of *burnout* has also been addressed in the context of university students, where the idea has emerged that this group feels pressured and saturated by educational demands, hence it has become a syndrome that has moved from the workplace to the workplace. educational (Torres-Zapata *et al.*, 2023). In fact, various investigations have documented the manifestation of this syndrome in the student population as a consequence of the Covid-19 pandemic, which began at the end of 2019 (Llanes-Castillo *et al.*, 2022; Seperak -Viera, 2021; Torres- Zapata, 2023).

Now, in 2020, in response to the rapid spread of the covid-19 virus, governments implemented physical distancing measures to safeguard the health of the population (Izquierdo *et al.*, 2021). Consequently, the universities, in compliance with government guidelines, suspended face-to-face classes and opted for the distance modality, which caused an unknown scenario with limitations in both human and technological resources, and generated stress in students in the face of an uncertain future. (González, 2020).

Facing the challenges in the teaching-learning process during the Covid-19 pandemic was not an easy task for students and teachers, since many homes lacked adequate space to

work. There were even significant problems related to the lack of computer equipment and Internet access, which affected students, teachers and their families (Montoya-Restrepo *et al.*, 2022). In addition, the lack of preparation on the part of teachers to teach online classes and the difficulties of students in accessing virtual education contributed to the students being more affected than the teachers. Symptoms of depression, anxiety and stress were observed in the university community during the covid-19 pandemic, especially among students (Moya and Andrade, 2022).

The pandemic, therefore, has accentuated the growth of *burnout syndrome*, which has raised deep concern in today's society (Llanes-Castillo *et al.*, 2022). University students show a greater tendency towards complications related to mental health, which manifest themselves more intensely when they suddenly go from virtual to face-to-face teaching (Banda *et al.*, 2023), hence this health problem in university students. requires attention from both families, universities and society in general (Cao, 2020).

Among the studies carried out on *burnout in university students during the covid-19 stage*, the research by Llanes-Castillo *et al.* stands out. (2022) who explored the persistence of *burnout syndrome* during online classes, a result of confinement due to covid-19 in 184 Mexican students. The approach of this research was quantitative, non-experimental, descriptive, transversal and analytical, and the results indicated that the study subjects experienced high emotional exhaustion, with greater emphasis on women.

On the other hand, Torres-Zapata (2023) carried out research with the objective of evaluating the presence of *burnout* as a factor that could influence academic performance. This study was quantitative, descriptive and non-experimental in nature, with a sample of 114 university students. The results revealed that 90% of the participants had low levels of *burnout*, while less than 1% showed high levels of this syndrome. Furthermore, no data were found indicating significant relationships between poor academic performance and *burnout*. Likewise, Seperak -Viera *et al.* (2021) carried out an investigation on the prevalence of academic *burnout* in 341 university students, for which they evaluated possible differences according to gender and level of study. The results revealed high levels and risk of *burnout* in the population studied, also with a higher rate in women. The authors concluded that *burnout* is associated with anxiety and depression.

Considering this background that underlines the importance of the study of *burnout in university students in the context of the covid-19 pandemic*, the objective of the present investigation was to identify the proportion of students who experienced burnout syndrome

during online classes taught in the pandemic period. The sample included university students from various areas of knowledge at a public university located in Tabasco, Mexico.

## Materials and methods

### Design of the investigation

This research is framed within a quantitative and descriptive approach, for which a non-experimental cross-sectional design was adopted. When collecting data, efforts were made not to modify the context in which the study subjects were found to avoid manipulation of the study variable. The analysis of the information collected was carried out using descriptive statistical techniques (Cohen *et al.* . 2007; Hernández-Sampieri and Mendoza, 2018).

### Subjects of study

In this research, convenience sampling was carried out, where subjects were selected according to the accessibility of the researcher. The participants were volunteers and expressed their agreement to be included in the study; Furthermore, they were selected due to the usefulness and proximity of the researcher to the study subjects. This type of sampling was applied due to its efficiency and speed in obtaining information ( Otzen and Manterola, 2017; Robledo, 2005; Tamayo, 2000).

In total, 268 students from a Mexican public university from various areas of knowledge participated voluntarily. The sample was divided equally between women (134) and men (134). Regarding age distribution, 31 % (83) were between 18 and 20 years old, 50.4% (135) between 21 and 23 years old, 10% (27) between 24 and 26 years old, and 8.6% ( 23) between 27 and 29 years old. 94.8% (254) of the participants were single.

In relation to the semester they were studying, 16.8% (45) were in the first three semesters, 20.9% (56) from the fourth to the sixth, 51.5% (138) from the seventh to the ninth, and 10.8% (29) from the tenth to the twelfth semester. Regarding grades, 12.7% (34) had an average of 7 to 7.9, 55.8% (149) of 8 to 8.9, and 31.5% (85) of 9 to 9.9.



## **Data collection procedure**

To carry out the data collection, contact was established with the Information Technology Department of the university with the purpose of requesting their collaboration to send the students, via email, the link to the survey prepared in Google Forms . . In order to comply with ethical principles in the research, detailed information about the objective of the study was provided and participants were assured of the confidentiality and anonymity of their responses. The students, attracted by the relevance of the study, participated voluntarily.

## **Reliability and validity of the instrument**

To achieve the objective of the research, the instruments developed by Correa-López (2019) with 15 items and by López-Aguilar and Álvarez-Pérez (2021) with 21 items were taken as a basis. Each instrument was carefully analyzed to adapt it to the specific context of the university under investigation. This analysis focused on verifying that each item specifically considered the university in question, since the reference instruments were designed for other units of analysis and some of their items were not applicable to the present study. Additionally, the wording of the items was reviewed to ensure that they were clearly understood by respondents.

Subsequently, an exploratory factor analysis was carried out that validated a final instrument with 20 items, structured in two sections. The first collected information about the faculty to which the student belongs, the degree they are studying, the semester, age, gender, grade point average, and marital status. The second section consists of 20 items on a Likert-type scale ranging from 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.

The reliability of the instrument was calculated using Cronbach's alpha coefficient, which reported acceptable reliability for the three identified factors: low personal achievement with eight items, exhaustion with nine items and depersonalization with three items (table 1). This methodological process was based on the recommendations of Field (sf).

**Table 1.** Instrument reliability

Factor	Cronbach's alpha ( $\alpha$ )
Low personal fulfillment	0.950
Exhaustion	0.918
Depersonalization	0.720
Reliability of the 20 items	0.950

Source: self made

Burnout in students was analyzed through three factors or dimensions: low personal achievement, exhaustion and depersonalization . The definitions are found in table 2.

**Table 2.** Definition of the factors of the *burnout variable* in university students

Factor	Definition
Low personal fulfillment	It refers on the part of students to feelings such as lack of enthusiasm, interest, incompetence in studying and anxiety during online classes in times of pandemic.
Exhaustion	It represents exhaustion, stress, tiredness, lack of sleep, restlessness, lack of attention and feelings of loneliness on the part of students during online classes in times of pandemic.
Depersonalization	It represents insensitivity on the part of students towards others, difficulty in communication, in relationships with teachers and with others during online classes in times of pandemic.

Source: self made

To validate the instrument, an exploratory factor analysis was carried out using the maximum likelihood method and Varimax rotation . To verify the suitability of the data for this analysis, the Kaiser Meyer Olkin (KMO) measure of sampling adequacy was calculated , which obtained a result of 0.963. Furthermore, Bartlett's test of sphericity yielded values of ( $X^2= 4167.526$ ,  $df = 190$ ,  $p \leq .000$ ). These results confirmed that the factor structure was



adequate for the factorization of the correlation matrix, which explains 68.47% of the variance (Moral, 2011).

The exploratory factor analysis validated the instrument with three clearly identified factors: 1) low personal accomplishment, 2) exhaustion, and 3) depersonalization. The model showed an acceptable structure according to the criteria established by Moral (2011) with factor loadings greater than 0.5 (table 3). This validation process contributed to supporting the robustness and validity of the instrument used in the research.

**Table 3.** Exploratory factor analysis of the *burnout variable* in university students

Items	1	2	3
With online classes my enthusiasm for my studies decreased.	0.805		
I lost interest in studying by having online classes	0.805		
The projection towards my studies was harmed with online teaching.	0.798		
When I took online classes I felt incompetent in my studies.	0.793		
When I received online classes I felt demotivated about my studies.	0.792		
When I had online classes I doubted the importance of my studies.	0.745		
Academic isolation hurt my grades.	0.693		
Studying in times of pandemic made me anxious.	0.592		
When I had online classes I felt exhausted by my studies.		0.803	
When classes were online the assignments caused me stress.		0.779	
When I took online classes I felt tired.		0.772	
Sometimes I didn't sleep well thinking about school work.		0.681	
Online classes made me uneasy.		0.647	
It was very difficult to organize my time when I was taking online classes.		0.593	
When I had online classes it was difficult to pay attention.		0.552	
I found it difficult to take online classes.		0.547	
I felt alone when I took online classes and did my schoolwork from home.		0.531	

When I had online classes I became insensitive to others.			0.727
It was difficult to communicate with the teachers when I had questions about the classes.			0.706
The pressure from homework and classes made it difficult for me to relate to others.			0.509

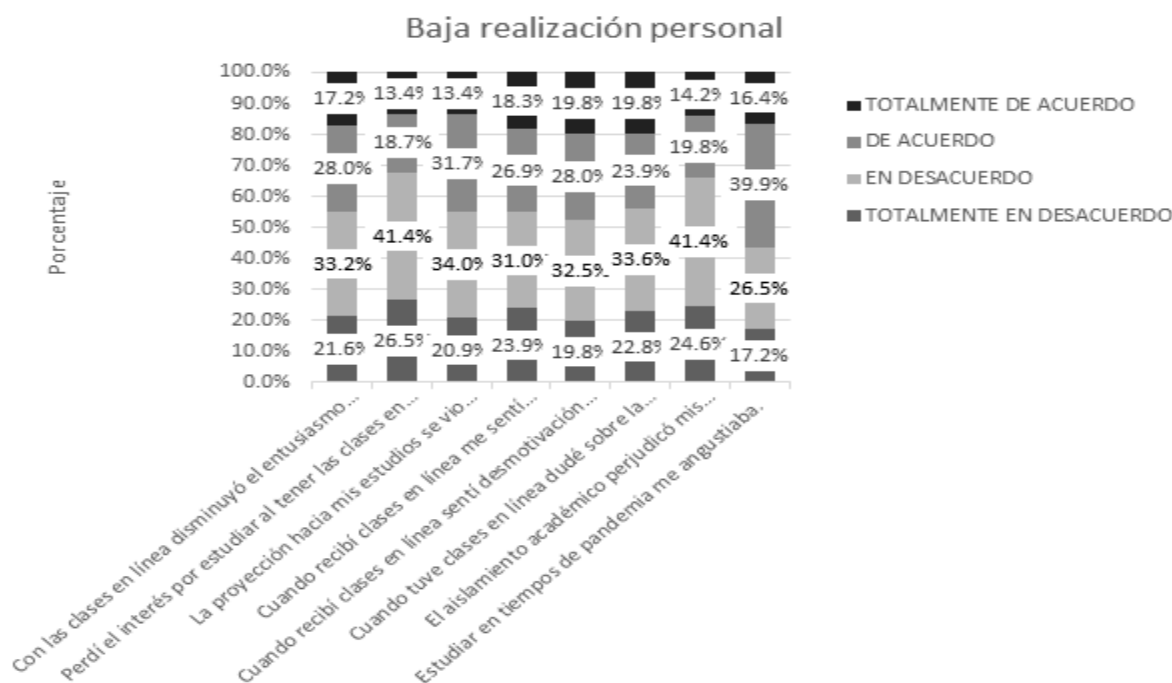
Source: self made

## Results

### Low personal fulfillment

In this dimension, it is observed that more than half of the students (56.35%) stated that studying in times of pandemic caused them anxiety, and a similar percentage (56.4%) doubted the importance of their studies. In addition, 47.77% declared that they felt unmotivated by their studies, and 45.15% agreed that with online classes their enthusiasm for studying decreased, which affected their projection towards their studies and generated feelings of incompetence with online teaching. On the other hand, more than a quarter of the population (34%) mentioned that academic isolation harmed their grades, and 32% reported having lost interest in studying (figure 1).

**Figure 1.** Low personal achievement of students due to covid-19 during online classes

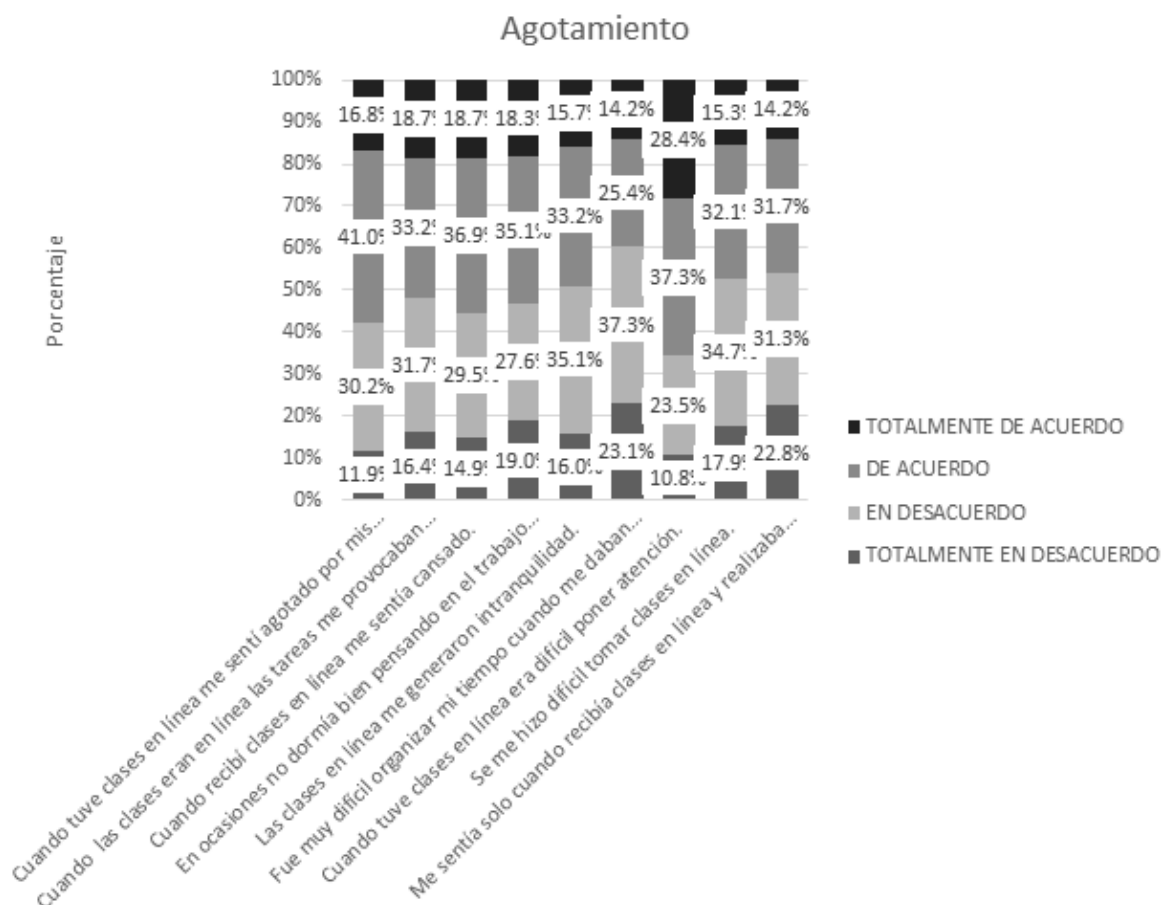


Source: self made

### Exhaustion

In the exhaustion dimension, high values were observed in five of the nine items evaluated. 65.7% of participants agreed that they experienced difficulty paying attention during online classes. More than half (57.8%) reported feeling exhausted by their studies, while 55.6% reported experiencing fatigue. Additionally, 53.4% said they sometimes had difficulty getting a good night's sleep due to worries about schoolwork. Additionally, 51.9% reported that academic tasks caused them stress, and 48.9% felt uneasy with online classes. 47.4% found it difficult to take online classes, 45.9% experienced a feeling of loneliness during online classes, and 39.6% stated that they found it very difficult to organize their time (figure 2).

**Figure 2.** Student exhaustion due to covid-19 during online classes

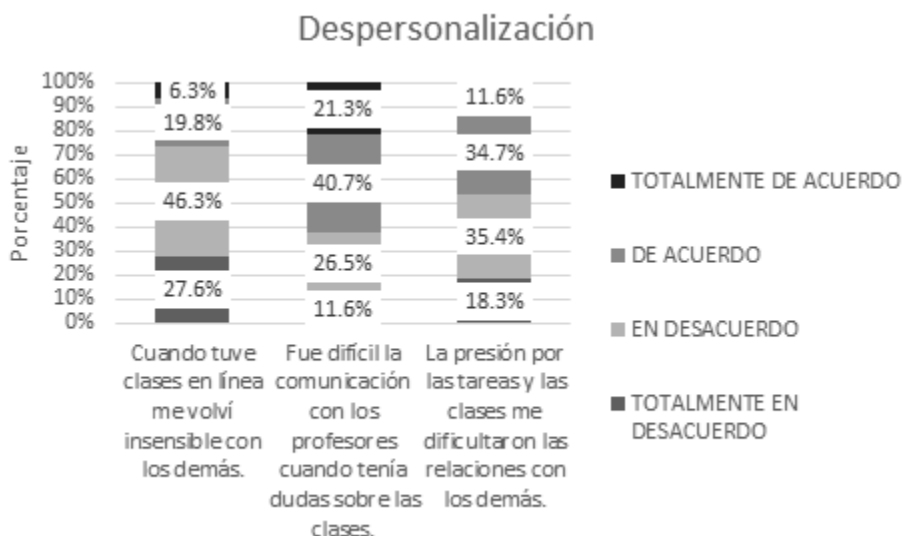


Source: self made

### Depersonalization

In this dimension, the item that obtained the highest percentage of responses (61.9%) indicated that communication with teachers was difficult when students had doubts about classes. In addition, 46.3% of participants indicated that the pressure derived from homework and classes made their relationships with others difficult. On the other hand, 26.1% reported having become insensitive to others when they had online classes (figure 3).

**Figure 3.** Depersonalization of students due to covid-19 during online classes



Source: self made

### Discussion

In the first dimension of *burnout analyzed*, the findings revealed a high percentage of students experiencing low personal fulfillment, which reflects anguish and doubts about the importance of their studies, as well as demotivation, loss of interest, lack of enthusiasm, lack of projection and incompetence when taking online classes. Although to a lesser extent, some students indicated that academic isolation influenced low grades and caused a loss of interest in studying. These results suggest the importance of considering this impact in future decisions related to student absenteeism, failure, and dropout.

The highest percentages of *burnout* were found in the exhaustion dimension, which highlights the difficulty in paying attention during online classes. Furthermore, the *depersonalization dimension* revealed difficulties in communicating with teachers when students had doubts about classes. These data indicate that more than half of the students

experienced exhaustion, which could be a consequence of the lack of a favorable environment at home to receive classes, problems with technology and the lack of preparation of teachers, as Montoya points out. -Restrepo *et al* . (2022) and Moya and Andrade (2022).

Regarding depersonalization, students indicated the existence of a lack of communication with teachers and experienced difficulties relating to other people as a result of the pressure derived from homework and online classes. In this dimension, a quarter of the population claimed to have become desensitized during the pandemic.

In general terms, the findings revealed that more than half of the students presented exhaustion, which coincides with what was reported by Llanes-Castillo *et al* . (2022), who identified a high percentage of burnout in university students in their research. However, these results differ from the findings of Torres-Zapata (2023), who found low levels of *burnout* in the majority of the study subjects.

In short, this research reported high percentages of *burnout* , which coincides with the results obtained in other studies that have pointed out the presence of the syndrome in university students during the covid-19 pandemic (López-Aguilar and Álvarez-Pérez, 2021; Montoya -Restrepo *et al* ., 2022; Salazar *et al* ., 2021).

## Conclusions

This study determined the percentage of university students enrolled in various areas of knowledge at a Mexican public university who experienced academic *burnout* during online classes in the context of the pandemic caused by Covid-19. In this sense, the validity and reliability of the research instrument used allowed us to obtain reliable results that offer a clear vision of the experience lived by university students during the pandemic. These results can be useful for both teachers and university authorities, since they provide valuable information that can guide decision-making with the aim of improving the academic performance of students. Furthermore, the methodology used in this study can be replicated in other contexts where there is interest in identifying the presence of *burnout* as a symptom of school problems.

On the other hand, although students have returned to in-person classes, it is evident that they could face deficiencies in subject knowledge due to the stress experienced during the pandemic. Therefore, the results of this work serve as support for the design of strategies aimed at improving the teaching-learning process in the post-covid-19 period.

In conclusion, the research findings offer solid data that is useful for making decisions aimed at reducing *burnout* among students. Therefore, it is suggested that other studies be carried out during the return to face-to-face classes to determine if in this context students continue to experience *burnout* after having received online classes.

### **Future lines of research**

This work provided data on the percentages of *burnout* experienced by university students during classes taught online as a consequence of the pandemic caused by Covid-19. However, these results demand further investigation in order to fully understand the causes that led to these findings. An option to explore this topic in detail could be the application of qualitative instruments, such as interviews, for data collection.

Another viable alternative is to carry out a study aimed at the teaching staff with the purpose of identifying the levels of *burnout* and its relationship with students in the teaching-learning process, which would allow us to propose concrete measures aimed at significantly reducing this problematic. Likewise, it would be possible to determine the existence of statistically significant differences between low personal achievement, exhaustion and depersonalization with variables such as gender, age, grade point average and semester through the ANOVA analysis of variance and the T test. of Student .



## References

- Banda, J., D'Amico, R. and Robles, VH (2023). Quasi-experimental intervention in academic burnout in university students. *RIDE Ibero-American Journal for Educational Research and Development*, 13 (26). <https://doi.org/10.23913/ride.v13i26.1414>
- Cao, W., Ziwei, F., Guoqiang, H., Mei, H., Xinrong, X., Jiabin, D. and Jianzhong, Z. (2020). The psychological impact of the COVID 19 epidemic on college students in China. *Psychiatry Research*, 287. <https://doi.org/10.1016/j.psychres.2020.112934>
- Cohen, L., Manion, L., and Morrison, K., (2007). *Research methods in education* (6th<sup>ed.</sup>). Routledge. <https://doi.org/10.4324/9780203029053>
- Correa-López, LE, Loayza-Castro, JA, Vargas, M., Huamán, MO, Roldán-Arbieto, L. and Pérez, M. (2019). Adaptation and validation of a questionnaire to measure academic burnout in medical students at the Ricardo Palma University. *Journal of the Faculty of Human Medicine*, 19 (1), 64-73. <https://doi.org/10.25176/RFMH.v19.n1.1794>
- Field, A. (sf). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). Sage. <http://repo.darmajaya.ac.id/5678/1/Discovering%20Statistics%20Using%20IBM%20SPSS%20Statistics%20%28%20PDFDrive%20%29.pdf>
- Freudenberger, H. J. (1974). Staff Burn-Out. *Journal of Social Issues*, 30 (1), 159-165. <https://doi.org/10.1111/j.1540-4560.1974.tb00706.x>
- Gil-Monte, PR (2007). Burnout syndrome as a cross-cultural phenomenon. *Psychological Information*, (91-92), 4-11.
- González, L. (2020). Academic stress in university students associated with the COVID-19 pandemic. *R&D Space, Innovation Plus Development*, 9 (25). <https://doi.org/10.31644/IMASD.25.2020.a10>
- Hernández-Sampieri, R. and Mendoza, CP (2018). *Research methodology: quantitative, qualitative and mixed routes*. McGraw Hill.
- Izquierdo, J., Sandoval, MC, De la Cruz, V. and Zapata, R. (2021). University Language Instructors' Preparedness for Technology-Mediated Instruction and Burnout During the COVID-19 Pandemic. *Íkala, Magazine of Language and Culture*, 26 (3), 661–695. <https://doi.org/10.17533/udea.ikala.v26n3a11>
- Llanes-Castillo, A., Pérez-Rodríguez, P., Reyes- Valdéz, ML and Cervantes-López, MJ (2022). Burnout: Effects of confinement on university students in Mexico. *Journal of Social Sciences*, 28 (3), 69-81. <https://doi.org/10.31876/rcs.v28i3.38451>

- López-Aguilar, D. and Álvarez-Pérez, PR (2021). PLS-SEM predictive model on intention to drop out of university academics during COVID-19. *Complutense Magazine of Education*, 32 (3), 451-461. <https://doi.org/10.5209/rced.70507>
- Maslach, C. and Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior* , (2), 99-113. <https://doi.org/10.1002/job.4030020205>
- Maslach, C., Jackson, S.E. and Leiter, M.P. (1997). *Maslach Burnout Inventory* (3rd<sup>ed</sup>.). Consulting Psychologist Press.
- Maslach, D., Schaufeli, W.B. and Leiter, M.P. (2001). Job Burnout. *Annual Review of Psychology* , 52 , 397-442. <https://doi.org/10.1146/annurev.psych.52.1.397>
- Montoya-Restrepo, IA, Rojas-Berrío, SP and Montoya-Restrepo, LA (2022). Student burnout due to Covid-19: a study in Colombian universities. *Panorama* , 16 (30), 139–160. <https://journal.poligran.edu.co/index.php/panorama/article/view/3131>
- Moral, J. (2011). Factor analysis and its application to scale development. In R. Landero and M. González, *Statistics with SPSS and research methodology* (pp.387-443). Thresholds.
- Moya, CF and Andrade, JR (2022). Challenges in higher education and mental health in university students in times of Covid-19. *Etic@net* , 22 (2), 283-295. <https://doi.org/10.30827/eticanet.v22i2.23696>
- Otzen , T. and Manterola, C. (2017). Sampling techniques on a study population. *International Journal of Morphology* , 35 (1), 227–232. [https://www.scielo.cl/scielo.php?script=sci\\_arttext&pid=S0717-95022017000100037&lng=en&nrm=iso&tlng=en](https://www.scielo.cl/scielo.php?script=sci_arttext&pid=S0717-95022017000100037&lng=en&nrm=iso&tlng=en)
- Robledo, J. (2005). Sampling designs (II). *Nure Research* , 12 (2), 1–7. <https://www.nureinvestigacion.es/OJS/index.php/nure/article/view/214>
- Rotenstein , L., Torre, M., Ramos, MA, Rosales, R., Guille, C., Sen, S. and Mata, D. (2018). Prevalence of Burnout Among Physicians: A Systematic Review. *JAMA*, 320 (11), 1131-1150. <https://pubmed.ncbi.nlm.nih.gov/30326495/>
- Salazar, JF, Ruiz, ED, Valdivia, M. de J., Hernández, M. and Huerta, IR (2021). Burnout syndrome in technological higher education students at the Tierra Blanca campus in times of covid-19. *RIDE Ibero-American Journal for Educational Research and Development* , 11 (22). <https://doi.org/10.23913/ride.v11i22.896>

- Seperak -Viera, R., Fernández-Arata, M. and Domínguez-Lara, S. (2021). Prevalence and severity of academic burnout in university students during the COVID-19 pandemic. *Interactions*, (7), e199. <http://dx.doi.org/10.24016/2020.v7.199>
- Tamayo, G. (2000). Sampling designs in research. *Economic Semester* , 4 (7). <https://revistas.udem.edu.co/index.php/economico/article/view/1410>
- Torres-Zapata, AE, Zarza-García, AL, Acevedo-Olvera, GE and Brito-Cruz, TJ (2023). Burnout and academic performance in university students during the Covid-19 pandemic. *Ibn Sina – Semi-annual electronic journal in Health Sciences* , (14). <https://doi.org/10.48777/ibnsina.v14i1.1340>

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