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Burnout syndrome in the online learning period in university students during the COVID-19 pandemic

Síndrome de burnout *en el periodo de aprendizaje en línea en estudiantes universitarios durante la pandemia de COVID-19*

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Palabras clave:
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Abstract

Introduction: since the COVID-19 outbreak, studies have emerged describing higher levels of burnout and increased risk perception among college students during COVID-19 pandemic. Student burnout syndrome (SBS) is defined as a psychological problem derived continual exposure to stressors related to school and studies. **Objective:** the aim of this study was to describe and compare the frequency of burnout syndrome among the chiropractic students at the Universidad Estatal del Valle de Ecatepec (UNEVE) in a pandemic context due to COVID-19. **Material and methods:** a survey was conducted using the Unidimensional Student Burnout Scale (EUBE), designed and valid for undergraduate students, data were collected in two different periods, with the first collection taking place 25th November 2020 named group 1 (GI) and the second data collection occurred at 16th March 2021 named group 2 (GII) (both dates had suspension of presential activities). **Results:** the frequency of SBS among chiropractic students in the GI was 97.15%, while, in the GII was 94.09% (decreased by 3.06%) (p = 0.001), in GII, a mild level occurred at 53.76 % (12.04% more than GI) (p = 0.001), the moderate level 27.96% (12.04% less than GI) (p = 0.001), and in the severe level we detected in 12.37% (3.06% less than GI) (p = 0.001). **Conclusions:** the results of this study may be considered as an early investigation in understanding the impact of the COVID-19 pandemic among chiropractic students. The EUBE is overall a good instrument to allow levels of burnout to be identified, based on two sub-dimensions: the behavioral and emotional, this tool can be usable even with different student populations.

Resumen

Introducción: *desde la pandemia COVID-19, han surgido estudios que describen niveles más altos de agotamiento y una mayor percepción de riesgo entre los estudiantes universitarios. El síndrome de* burnout *estudiantil (SBS) se define como un problema psicológico derivado de la exposición continua a factores estresantes relacionados con la escuela y los estudios.* ***Objetivo:*** *el objetivo del presente estudio fue describir y comparar la frecuencia del síndrome de* burnout *entre los estudiantes de quiropráctica de la Universidad Estatal del Valle de Ecatepec (UNEVE) durante la pandemia por COVID-19.* ***Material y métodos:*** *se realizó una encuesta utilizando la Escala Unidimensional de* Burnout *Estudiantil (EUBE), diseñada y válida para estudiantes de pregrado, los datos se recolectaron en dos períodos diferentes, siendo la primera recolección el 25 de noviembre de 2020 denominado grupo 1 (GI) y la segunda recolección de datos ocurrió al 16 de marzo de 2021 denominado grupo 2 (GII) (en ambas fechas los alumnos tomaban clases en línea).* ***Resultados:*** *la frecuencia de SBS*

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entre los estudiantes de quiropráctica en el GI fue de 97.15 %, mientras que en el GII fue de 94.09 % (disminuyó 3.06 %) (p = 0.001), en el GII presentó un nivel leve de 53.76 % (12.04 % más en comparación con el GI) (p = 0.001), el nivel moderado fue de 27.96 % (12.04 % menos en comparación con el GI) (p = 0.001), y respecto al nivel severo observamos 12.37 % (3.06 % menos que el GI) (p = 0.001). ***Conclusiones:*** *los resultados de este estudio pueden considerarse como una investigación temprana para comprender el impacto de la pandemia de COVID-19 entre los estudiantes de quiropráctica. La EUBE en general es un buen instrumento para permitir identificar los niveles de* burnout*, que está basado en dos subdimensiones: conductual y emocional, esta herramienta puede ser utilizada incluso con diferentes poblaciones de estudiantes.*

INTRODUCTION

The coronavirus disease (COVID-19), which causes severe acute respiratory syndrome (SARS-CoV-2), imposed restrictions worldwide in 2020[1] directly impacting the education sector, therefore that restrictive measures be implemented to control the spread of the virus, including the interruption of face-to-face activities at educational centers at all levels, as well as admission and work in laboratories and research centers, social service activities, and professional practices. This protocol impacted the academic life of several students around the world and even caused a massive disruption of the educational system.[2] Many educational institutions implemented online activities, shortly changing the teaching-learning process.[3] The students modified their study/work routine due to social distancing.[4,5] Such changes, during the pandemic could influence student's quality of life and even contribute to the worsening of psychological disorders.[6,7] Student *burnout* syndrome (SBS) is defined as a psychological problem derived continual exposure to stressors related to school and studies[8-10] Schaufeli et al.[11] stated that *burnout* among students refers to feeling exhausted, the feeling of tension experienced in the study environment, and in particular to the chronic fatigue that may result from academic overload, having a cynical and detached attitude towards one's study, and feeling incompetent as a student. Overall, *burnout* occurs when students feel overwhelmed and exhausted without having (or feeling they do not have) the effective resources to face prolonged stressful events.[12,13] In this regard, various instruments in the literature are used to assess students' *burnout*, generally focused on three dimensions of the *burnout* construct, namely emotional exhaustion (i.e., feeling of tiredness and fatigue), cynicism (i.e., feeling of distance from school-related activities), and inadequacy (i.e., feeling incompetent as a student).[14] These dimensions, originally assessed concerning work-related *Burnout*, were then adapted to investigate study-related *burnout*.[14,15] Unidimensional Scale of Student *Burnout* (EUBE) is a is structured into two sub-dimensions: the behavioral, made up of 10 items that show behaviors of transitory presentation and that allow determining the mild degree of *burnout*, and the attitudinal, made up of 5 items, which allude to a prolonged process in the presentation of symptoms, and therefore allow moderate and severe *burnout* to be identified.[16,17] In a systematic review Kaggwa et al.[18] they showed that university students with severe *burnout* symptoms (particularly in healthcare courses) varied from 30.5% in high-income countries to 54.5% in low- and middle-income countries. In addition, several studies have shown that university students with *burnout* symptoms tend to show a high risk of developing eating disorders, sleep disorders, addiction, and mental health issues and even increased suicide risk, may also negatively impact academic achievements, specialty and career choice, as well as patients' care.[19-23] Therefore, considering that *Burnout* can have serious consequences, this study aimed to describe and compare the frequency of *burnout* syndrome among the chiropractic students at the Universidad Estatal del Valle de Ecatepec (UNEVE) in a pandemic context due to COVID-19.

MATERIAL AND METHODS

Study design

An observational, cross-sectional, comparative and non-experimental study was carried out. A questionnaire where students independently and anonymously reported their experience was used as a method of data collection.

Study participants and sampling

Convenience sampling was used and inclusion criteria were chiropractic students of the 7th and 8th semester by voluntary participation and that these

students were taking online classes. Exclusion criteria were university students of other professions and semesters, incomplete questionnaires and those who did not wish to participate in the research. Incomplete questionnaires with missing responses were excluded from the study. Three hundred and sixty-one students of 7th (n = 191) to 8th (n = 170) semester who were enrolled at Universidad Estatal del Valle de Ecatepec (UNEVE), public university, in the State of México, located in the central region of México were invited, by e-mail and social networks to participate in an online survey. Participants filled a questionnaire prepared on Google Forms (Alphabet, Mountain View, CA, USA). Data were collected in two different periods, with the first collection taking place on 25th November 2020 named group 1 (GI) and the second data collection occurring on 16th March 2021 named group 2 (GII) (both dates had suspension of presential activities). A survey was conducted using the EUBE, designed and valid for undergraduate students.[16,17]

Data collection tools and technique

In Mexico, Barraza[16,17] at the Pedagogical University of Durango designed and validated for undergraduate students the EUBE. The instrument consists of 15 items that can be answered using a Likert-type scale of four categorical values (never 1, sometimes 2, almost always 3 and always 4). The EUBE is structured into two sub-dimensions: the behavioral, made up of 10 items that show behaviors of transitory presentation and that allow determining the mild degree of *burnout*, and the attitudinal, made up of five items, which allude to a prolonged process in the presentation of symptoms, and therefore allow moderate and severe *burnout* to be identified. The average value of the survey for each student is calculated, transformed into a percentage and ordered according to the evaluation scale proposed by Barraza.[16,17] The parameters to determine *burnout* are the following; no present (0-25%), mild (26-50%), moderate (51-75%) and severe (76-100%). The studies carried out for the validation of the EUBE show a reliability of 0.91 in Cronbach's alpha, confirming the internal consistency of the instrument.[17]

Statistical analysis

The statistical analysis was carried out with the software JMP, SAS 16. The descriptive analysis was performed using frequency distribution tables. We used frequency rate to explore the differences between the degrees of student *burnout* syndrome (SBS) in the GI; no present, mild, moderate and severe. Normality of data was evaluated using the Kolmogorov Smirnov test. A *p-value* less than 0.05 was considered significant. The data were previously transformed into frequency rates and ANOVA test was used to relate the *burnout* level with age and gender. Finally, T-test were used to analyze which of these factors influence the score in each *burnout* subscale and check for possible significant differences.

RESULTS

As shown in *Table 1*, study participants were predominantly female and more to 60% of the participants were between the ages of 18 and 23 in both groups GI (72.6% females and 66.9% ages of 18 and 23) GII (69.9% females and 64.5% ages of 18 and 23).

In *Table 2*, shown the degrees of *burnout* in the GI found were in the chiropractic students, in respect of females we observed that the 30.29% exhibited *burnout* mild, 29.71% moderate and 10.86% severe (p = 0.0732). In male students found were 11.43% mild, 10.29% moderate and 4.57% severe (p = 0.0001). Regarding age in class intervals, the presence of *burnout* in the GI it is observed that the ages between 18-23 years were found 26.29% mild, 28% moderate and 12.57% severe (p = 0.0001). The ages between 24-29 years were 9.71% mild, 8.57% moderate and 1.14% severe (p = 0.0001).

In *Table 3*, shown the degrees of *burnout* in the GII found were in chiropractic students, in respect of females we observed that the 37.63% exhibited *Burnout*

Table 1: Sociodemographic characteristics in the two groups of the chiropractic students according to gender and age.

	G I (N = 175) n (%)	G II (N = 186) n (%)
Gender		
Female	127 (72.6)	130 (69.9)
Male	48 (27.4)	56 (30.1)
Age (years)		
18-23	117 (66.9)	120 (64.5)
24-29	37 (21.1)	43 (23.1)
30-35	12 (6.9)	10 (5.4)
36-40	4 (2.3)	6 (3.2)
> 41	5 (2.9)	7 (3.8)

Table 2: Degrees of student *burnout* syndrome in the group 1.

Variables	No present*	Mild*	Moderate*	Severe*	p
Female N = 127	3 (1.71)[a]	53 (30.29)[a]	52 (29.71)[a]	19 (10.86)[a]	0.0732
Male, N = 48	2 (1.14)[c]	20 (11.43)[a]	18 (10.29)[a]	8 (4.57)[b]	0.0001
Age in class intervals, [years]					
18-23, N = 117	0 (0)[c]	46 (26.29)[a]	49 (28.00)[a]	22 (12.57)[b]	0.0001
24-29, N = 37	3 (1.71)[b]	17 (9.71)[a]	15 (8.57)[a]	2 (1.14)[b]	0.0001

The superscript letters a, b and c in the same row indicate statistically significant differences ($p < 0.05$) between degree of SBS.
* Data expressed by frequency and percentage [n (%)].

Table 3: Degrees of student *burnout* syndrome in the group 2.

Variables	No present	Mild	Moderate	Severe	p
Female N = 130	8 (4.30)[c]	70 (37.63)[a]	38 (20.43)[a]	14 (7.53)[b]	0.0001
Male N = 56	3 (1.61)[c]	30 (16.13)[a]	14 (7.53)[a]	9 (4.84)[b]	0.0001
Age, [years]					
18-23, N = 120	4 (2.15)[c]	62 (33.33)[a]	37 (19.89)[a]	17 (9.14)[b]	0.0001
24-29, N = 43	2 (1.08)[b]	25 (13.44)[a]	13 (6.99)[a]	3 (1.61)[b]	0.0001

The superscript letters a, b and c in the same row indicate statistically significant differences ($p < 0.05$) between degree of prevalence of student *burnout* syndrome.
* Data expressed by frequency and percentage [n (%)].

Table 4: Degrees of student *burnout* syndrome in the group 1 and group 2.

	GI N = 175*		GII N = 186*		
Variables	Female N = 127	Male N = 48	Female N = 130	Male N = 56	p
Degrees of SBS					
No present	3 (1.71)[a,b]	2 (1.14)[b]	8 (4.30)[a]	3 (1.61)[ab]	0.0340
Mild	53 (30.29)[b]	20 (11.43)[c]	70 (37.63)[a]	30 (16.13)[c]	0.0001
Moderate	52 (29.71)[a]	18 (10.29)[c]	38 (20.43)[b]	14 (7.53)[c]	0.0001
Severe	19 (10.86)[a]	8 (4.57)[b]	14 (7.53)[a,b]	9 (4.84)[b]	0.0001

SBS = student *burnout* syndrome.
The superscript letters a, b and c in the same row indicate statistically significant differences ($p < 0.05$) between GI and GII.
*Data expressed by frequency and percentage [n (%)].

mild, 20.43% moderate and 7.53% severe (p = 0.0001). In male students found were 16.13% mild, 7.53% moderate and 4.84% severe (p = 0.0001). Regarding age in class intervals, the presence of *Burnout* in the GII it is observed that the ages between 18-23 years were found 33.33% mild, 19.89% moderate and 9.14% severe (p = 0.0001). The ages between 24-29 years were 13.44% mild, 6.99% moderate and 1.61% severe (p = 0.0001).

In the *Table 4*, shown the degrees of *burnout* in the GI and GII found were in the chiropractic students, in respect of females' students with mild degree of prevalence of SBS we observed an increase of 7.34% (p = 0.0001) in the GII compared to GI (37.63 vs 30.29%, respectively). However, we observed that in female students with a moderate degree of SBS prevalence there was a 9.28% decrease (p = 0.0001) in the GII compared to the GI (20.43 vs

29.71%, respectively). Likewise, we note the decrease of 3.33% (p = 0.0001) in the severe degree of SBS frequency in female students in GII compared to the GI (7.53 vs 10.86%, respectively). In respect to males' students with mild, moderate and severe degree of SBS we observed levels were maintained in GI and GII (p = 0.0001).

DISCUSSION

Since the COVID-19 outbreak, studies have emerged describing higher levels of *burnout* and increased risk perception among college students during COVID-19 pandemic.[24-27] The results obtained in the GI and GII allowed us to observed that most chiropractic students, presented *burnout* (97.15 and 94.09%, respectively), for the most part, it occurs at a mild (GI: 41.72%; GII: 53.76%) and moderate level (GI: 40%; GII: 27.96%), the severe level we detected in 15.43 and 12.37%, respectively. This coincides with reports by Ochoa et al.[28] they used the same measurement instrument (EUBE) and reported that 50% of fourth-year medical students presented mild *burnout*, while 40.9% presented moderate *burnout* and 9.09% presented severe *burnout*. Likewise, it coincides with data reported by Asencio-López et al.[29] who reported mild (63.9%), moderate (27.8%) and severe (8.3%) *burnout* in medical students from fourth to sixth year. The contingency caused by COVID-19 disrupted that process, because the academic activities of the students were affected and had to be changed to online activities, so taking classes virtually, doing homework, preparing and presenting the tests in this new modality, and temporarily stopped attending the patients of the university clinic. The shift in the education strategy towards online teaching has led students to spend more time in front of screens, tablets and smartphones.[30] Previous studies have shown that high exposure to these devices increases the state of stress and exhaustion,[31,32] which are associated with higher levels of SBS.[33] Regarding the age in class intervals revealed that the most affected to COVID-19 pandemic were chiropractic students, between 18 to 29 years old. In the GI we observed that 36% presented mild level, 36.57% moderate level and 13.71% severe level, while in GII 46.77% presented mild level, 26.88% moderate level and 10.75% severe level. Most chiropractic students, at UNEVE belong to the millennial and Z generations (87.81%), both generations (millennial: born between 1981 and 1996; Z generation: born between 1997 and 2015) prefer learning via the use of technology but they deficient in time management.[34] These characteristics, could have influenced their skills in organization, learning, and engagement, which could have affected the levels of SBS in this range of age. Arnout et al.[35] mentioned that the adaptation process during the pandemic can trigger mental health symptoms such as anxiety, depression, stress, etc. In connection with the point previously mentioned, Nguyen and Patel[36] examined students' perspectives of remote learning during COVID-19 in dental students relative to their generation (generations Y and Z), these authors reported that dental students strongly agreed (85%) that the move to remote learning was relatively easy, in addition, they reported that after the pandemic, more dental students agreed (93%) that some classes should continue online. Although there are advantages with remote education, future science research should investigate whether exposure to COVID-19 pandemic had a negative consequence associated with laboratory/clinical skills and the patient relationships dynamics. The prevalence of SBS among chiropractic students, in the GI was 97.15%, while, in the GII was 94.09% (decreased by 3.06%), in GII, a mild level occurred at 53.76% (12.04% more than GI) and moderate level 27.96% (12.04% less than GI), and in the severe level we detected in 12.37% (3.06% less than GI) (p = 0.0001). Bolatov et al.[25] mentioned the level and prevalence of SBS among medical students (1st year to 5th year) during traditional education was 27.6%, while, during the period of online learning, this indicator dropped to 16.7%. Allen et al.[37] demonstrated in a meta-analysis study that online learning does not reduce student satisfaction compared to traditional teaching methods. Some factors that may explain the improvement in academic efficacy over time may include: elimination of spatial and temporal barriers, independence of learning, flexibility of time and less need for commuting and the decrease of costs of indirect expenses (transport, additional meals, and extra accommodation).[25,38,39] Other factors that could decreased *burnout* were the ability to combine studying with personal and family life, physical environment and lack of interaction with patients during clinical placements.[25] Regarding the sex variable, in the present study, we observed that the female chiropractic students, presented a higher frequency of SBS (GI: 70.86%; GII: 65.59%) compared to male chiropractic students, (GI: 26.29%; GII: 28.5%), respect of SBS levels, in a mild level, female students in GII presented 7.34% increase compared than GI, in moderate level, presented 9.28% decreased than GI, and in severe level 3.33% less compared than GI (p =

0.0001), with reference to male students maintained the same mild, moderate and severe levels of SBS in the GI and GII. Gender is a key dimension when *burnout* is analyzed from students' perspectives. Some studies show that female students tend to adapt and perform better in self-regulated online learning compared to males.[40,41] Our results were similar to previous studies' findings that, in general, female students report more exhausted than their male counterparts.[10,13,42-46] The COVID-19 pandemic shifted students' priorities, some of the changes in behavior were the result of mandatory requirements (such as: increased hand washing, lockdowns, mandatory mask wearing), many were worried about their own health, health of their families, or struggling financially, perhaps making them less focused on academics, and increasing academic difficulties. It is possible that in circumstances surrounding COVID-19 pandemic female students were more exhausted, which can be related to the environment, where the activities were no longer what they used to be, because in addition to developing academic activities, the female students had to carry out other possibly increase the domestic activities (cleaning, cooking, washing, etc.) as well as caring for other persons like a children that were also took online classes. In the case of a recurrence of a similar pandemic where quarantine measures and online training are necessary, Bolatov et al.[25] and Detyna et al.[47] recommend developing and implementing innovative methods as a preventive action to maintain positive interactions between students. In this sense, the adoption of hybrid teaching (e.g. the Hyflex model combines face-to-face and online learning), another online resource used to supplement students' understanding of laboratory techniques is the Learning Sciences tool,[48] this provides practical simulations for scientific experiments. Student exposure to a mixture of teaching styles can both facilitate and expand their ability to learn as well as improve learning skills for strategies with which they are less well matched. Online learning makes higher education more accessible to a wider range of individuals as it creates educational opportunities that are free of time and geographic constraints.[49] Institutions should be recognising and taking the necessary steps to ensure digital equity amongst students and staff; this is crucial for hybrid, hyflex and distance learning.[50] In addition, college support services may have a crucial role in helping students navigate the life challenges associated with this type of pandemics may help to improve their mental health.

CONCLUSIONS

The COVID-19 pandemic argued educational institutions across the world to rapidly transition to distance learning, the students adapted to the new learning environment. The results of this study may be considered as an early investigation in understanding the impact of the COVID-19 pandemic among chiropractic students. The frequency of SBS were high and mostly occurring at mild and moderate levels, it is important to highlight that we were able to observe a 3.06% decrease in *burnout* in the GII compared to the GI, likewise, we observed an increase of 12.04% in the mild level of *burnout* in the GII compared to the GI, but in respect to moderate level and severe we noticed a decrease in the GII compared to the GI (12.04 and 3.06%, respectively). Regarding the age in class intervals revealed that the most affected to COVID-19 pandemic were chiropractic students, between 18 to 29 years old. In addition, our findings show that gender also showed significant differences, the female students presented a higher frequency of SBS compared to male students in both groups. Finally, the EUBE is overall a good instrument to allow levels of *burnout* to be identified, based on two sub-dimensions: the behavioral and attitudinal, this tool can be usable even with different student populations.

Declaration of competing interest: the authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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