fortune Journals

Research Article

JOURNAL OF WOMENS HEALTH AND DEVELOPMENT

ISSN: 2644-2884

Anxiety and Depression During the COVID-19 Pandemic in Healthcare Students

Adriana Gomes Luz[1*], Emily Gazzoli[2], Erika Zambrano Tanaka[3], Carina F R Angelini[4], Cássia Raquel Teatin Juliato[1], Priscila Gava Mazzola[5], 'Fernanda G Surita[1]

Abstract

Background: The coronavirus (COVID-19) pandemic corroborated a state of mental stress worldwide, in health students like health professionals, so it is essential to analyze the emotional stability of these students.

Objective: To evaluate depression and anxiety among undergraduate healthcare students using validated scales, in addition to knowing their reactions and perceptions about the implementation of emergency remote education (ERS) in this period of isolation due to the COVID-19 pandemic.

Methods: We invited by institutional e-mail, healthcare students regularly enrolled at the University of Campinas. After agreement and consent, a google form link was sent to access the data collection form.

Results: We sent 1204 invitations and 270 (22.4%) students agreed to participate (medicine 17.4%, nursing 19.3%, pharmacy 36.3%, and phonoaudiology 27%). Most participants were female (83%), up to 22 years of age (63%), white (69%), and between the first and third years of the course (64. 5%). Regarding remote education, 51.1% of participants reported having some degree of difficulty to follow up. Regarding the perception of social relationships, 37.8% considered themselves to be compromised, and 72.2% reported not feeling able to act in the COVID pandemic. Regarding mental health, 74% had high levels of anxiety, and 37% had moderate or severe depression.

Conclusion: Healthcare students had high levels of severe anxiety and moderate/severe depression. Dissatisfaction with remote education contributed to the increase in depression rates in all courses. Healthcare students' needs future strategies for mental health during pandemic conditions.

Keywords: COVID-19; Anxiety; Depression; Stress; Digital education

Introduction

The World Health Organization (WHO) declared COVID -19 pandemic in March 2020, also known as the coronavirus pandemic, caused by severe acute respiratory syndrome coronavirus. The outbreak had rapid evolution, which spread across all continents, generating global concern, not only for the number of cases of infection and death but also for the biopsychosocial impact caused. The pandemic has been associated with mental health because it can overcome the ability to cope with affected people, affecting emotional experiences in several aspects that constitute mental health. [1]. The lack of protective equipment, exposure to the risk of becoming infected, fear of

A iliation:

[1]Department of Obstetrics and Gynecology, Faculty of Medical Sciences, State University of Campinas-UNICAMP, Brazil

[2]Undergraduate students in Medicine - Pontifical Catholic University of Campinas -PUCC, Brazil

[3]Faculty of Nursing, State University of Campinas - UNICAMP, Brazil

[4]São Leopoldo Mandic -Faculty of Medicine, SLM, Brazil

[5]Faculty of Pharmacy, State University of Campinas - UNICAMP, Brazil

***Corresponding Author**
Adriana Gomes Luz, Department of Obstetrics and Gynecology-DOG, Faculty of Medical Sciences, State University of Campinas-UNICAMP, Brazil.

Citation: Luz AG, Gazzoli E, Tanaka EZ, Angelini CFR, Juliato CRT, Mazzola PG, Surita FG. Anxiety and Depression During the COVID-19 Pandemic in Healthcare Students. Journal of Women's Health and Development 7 (2024): 10-16.

Received: July 24, 2023
Accepted: July 28, 2023
Published: March 13, 2024

Luz AG et al., J Women's Health Dev 2024
DOI:10.26502/fjwhd.2644-288400115

transmission to family members, and death may influence the emotional state of students and health professionals. The COVID-19 pandemic is unprecedented for healthcare professionals, requiring new protocols that change the routine and work process, intensifying experiences of fear, fatigue, and insecurity, among others. One reviewed study and an editorial stated that mental health strategies needed to be intensified for healthcare professionals, as there was a risk of emotional collapse [2, 3]. The situation may be even more serious regarding health students, as there is uncertainty about their training and performance. Studies before the pandemic already showed a high prevalence of mental suffering in medical students compared to the general population [4, 5, 6]. Several factors are associated with the impairment of students' mental health, such as pressure to learn, a large amount of new information, a lack of time for social activities, contact with serious diseases, and death. The COVID-19 pandemic and the need to implement distance learning (DL) could affect students' mental health, especially in the healthcare area. One study with medical students during the COVID-19 pandemic showed that 81.4% of students had psychological or behavioral changes during the period of isolation, and 79.4% showed poor adaptation to teaching distance [7]. Given this context and the need caused by the pandemic for a period of social detachment, including online classes and academic activities with digital technology resources, the evaluation of the mental health of health students has become an important point. This study aimed to evaluate depression and anxiety frequency and the risk associated with these symptoms among healthcare students during the COVID-19 pandemic.

Material and Methods

We conducted a cross-sectional study at the University of Campinas (UNICAMP), Campinas SP, Brazil, from September 2020 to December 2020 with healthcare students. The Research Ethics Committee of the university approved the study protocol (CAAE: 32634420.90000.5404). The students consented to participate in the study. We invited the healthcare students of nursing, pharmacy, speech Therapy, and medicine courses regularly enrolled at UNICAMP to participate in the study. We invited the students to participate by institutional e-mail. We sent three invited e-mail during the (22/09/2020 a 2/12/2020, monthly). After agreement and consent, we sent a google form link to access the data collection form. We included students under 18 years of age and we excluded those who were away from academic activities for any reason. The google form instrument contained questions regarding sociodemographic characteristics, issues related to the pandemic and academic activities virtually. The students answered The State-Trait Anxiety Scale8 (STAI) [8] questionnaire that contains a score in three levels of anxiety: (1) Low level of anxiety: 20 to 40 points, (2) Medium level of anxiety: 41 to 60 points, and (3) High level of anxiety: 61 to 80 points, and Beck Scale (Beck Depression Inventory, BDI-II) (Gorenstein C, Andrade L,1996), with a score of 0 to 3 and total scores ranging from 0 to 63. (1): 0-13, minimal depression/no depression; (2) 14-19, mild depression; (3) 20-28, moderate depression; and (4) 29-63, severe depression. For this study, we calculated a reduced version of the STAI score, using the proportionality of the values of the original classification. In the reduced version of the STAI, the score is divided into three levels of anxiety: (1) Low level of anxiety: 12 to 18 points, (2) Medium level of anxiety: 19 to 29 points, and (3) High level of anxiety: 30 to 48 points. We used Cronbach's α to measure the reliability of the STAI and Beck scales in the short version. There was high internal consistency (alpha> 0.60) for both scales. At the end of the application of the online questionnaire, each participant automatically received their score value on both scales and orientation to contact the researchers or the psychological support centers of each institution if they wished. We used the Chi-square or Fisher's exact test (for expected values less than 5) to compare categorical variables between the two groups. We used the Mann–Whitney test to compare the numerical variables with the not normal distribution of the variables. The significance level adopted was $P < 0.05$. Simple and multiple logistic regression (with stepwise criteria for variable selection) was performed to study the relationship between factors associated with anxiety symptoms (high vs. medium/low) and factors associated with symptoms of depression (minimal/mild vs. moderate/severe).

Results

We sent a total of 1204, with 270 (22.4%) responses agreeing to participate (medicine 17.4%, nursing 19.3%, pharmacy 36.3%, and phonoaudiology 27%). Most participants were female (83%), up to 22 years of age (63%), white (69%), and between the first and third years of the course (64.5%) (Table 1). Most participants reported being with their family (77.4%), and almost all reported having had losses in their formation (95.6%) during the pandemic (Table 1). Regarding digital education, 51.1% of the participants reported having some degree of difficulty in monitoring, 45.5% reported dissatisfaction with remote education, and 62% dedicated more than 5 hours per day to studies (Table 1). Regarding the perception of social relationships, more than one-third considered being compromised (37.8%), and 72.2% reported not feeling able to act during the COVID pandemic. (Table 1).

Regarding the mental health of health students, 74% had high levels of anxiety, and slightly more than a third had moderate or severe depression (37%) (Table 2). Cronbach's coefficient α were > 0.60 for both scales. The Coefficient α Cronbach's was 0.886 for anxiety short version STAI scale and 0.833 for short version Beck Depression Scale.

Luz AG et al., J Women's Health Dev 2024
DOI:10.26502/fjwhd.2644-288400115

Table 1: Characteristics and aspects related to the COVID-19 pandemic of undergraduate students in healthcare courses.

Variable	Categories	N=270	%
Course	Nursing	52	19
	Pharmacy	98	36
	Phonoaudiology	73	27
	Medicine	47	17
Year of the course	1 or 2	112	42
	3 or more	158	59
Age (years)	Até 22 years old	170	63
	23 years old or more	100	37
Ethinicity	White	188	70
	Brown or Black	65	24
	Other	17	6.3
Gender	Female	224	83
	Male	44	16
	Other	2	0.7
With whom quarantined	Family	209	77
	Partner	27	10
	Friends	15	5.6
	Alone	12	4.4
	Other	7	2.6
Do you think that your training suffered damage in the pandemic?	Yes, I totally agree	165	61
	Yes, partially agree	93	34
	No, partially disagree	7	2.6
	No, I totally disagree	2	0.7
	I do not know how to evaluate	3	1.1
Internet access for academic activities	Easy access	126	47
	Few difficulties	136	50
	Many difficulties	8	3
Regarding digital education	Followed with difficulty	138	51
	Needed help from colleagues/coordinator	46	17
	Managed to follow up	86	32
Regarding their study	I follow remotely, I'm afraid to go back to face-to-face classes, get COVID, and pass it on to my family	116	43
	I follow remotely, I don't want to go back to face-to-face classes this year	59	22
	I follow remotely, I want to go back to the face-to-face classes	53	20
	I returned to the face-to-face classes and feel insecure	18	6.7
	I returned to the face-to-face classes and feel safe	24	8.9
Regarding digital education, you are	Dissatisfied	123	46
	Indifferent	53	20
	Satisfied	94	35
Regarding the remote classes were equivalent to the face-to-face classes	Less than 50%	41	15
	50 -70%	101	37
	70 -80%	67	25
	80 -100%	61	23
How many hours/day have you dedicated to classes or other academic activities?	Less than 2 hours/day	26	9.6
	2 to 5 hours/day	76	28
	More than 5 hours/day	168	62

Luz AG et al., J Women's Health Dev 2024
DOI:10.26502/fjwhd.2644-288400115

Table 2: Anxiety and depression scores in healthcare students during the COVID-19 pandemic

Questionnaire	Scores Categories	N=270	%
STAI Anxiety Scale	Low	4	1.5
	Medium	66	24.4
	High	200	74.1
Beck Depression Scale	Minimum	117	43.3
	Light	53	19.6
	Moderate	60	22.2
	Severe	40	14.8

*Anxiety (STAI) and Depression (BECK) scales short versions. Anxiety: Low (12-18 points), Medium (19-29 points), High (30-48 points). Depression: Minimum (0-8 points), light (9-12 points), moderate (13-17 points), severe (18-39 points)

Table 3: Results of the multiple logistic regression analysis for anxiety and depression symptoms (n 270)

Variables	Categories	P-Value	OR*	95% Confiance Interval
Moderate/severe anxiety				
Course	Nursing (ref.)	---	1	---
	Pharmacy	**<0.001**	65.2	17.8 – 238.8
	Phonoaudiology	**<0.001**	920.7	98.7 – 8586.5
	Medicine	**<0.001**	376.7	39 – 3639.2
Period of the course (years)	1 and 2 (ref)	---	1	---
	03-Jun	**0.016**	3.1	1.2 – 7.9
Moderate/severe depression				
I have meaning physical reactions	Never/little (ref.)	---	1	---
	Moderate	**<0.001**	6.1	2.3 – 16.4
	Very	**0.007**	2.9	1.3-6.1
Social relationships are compromised	Never/little (ref.)	---	1	---
	Moderate	0.191		0.8-3.6
	Very	**0.007**		1.8-6.9
I am afraid to persist with exaggerated concern	Never/little (ref.)	---	1	---
	Moderate	0.37	0.7	0.3-1.5
	Very	**0.031**	2.2	1.1-4.3
Remotol education	Satisfied (ref.)	---	1	---
	Indifferent	0.788	1.1	0.5-2.6
	Dissatisfied	**0.018**	2.2	1.2-4.4

* OR (odds ratio) = risk ratio for anxiety (n = 70 low/medium and n = 200 high). 95% CI OR = 95% confidence interval for OR. Stepwise criterion for variable selection. Ref: reference level. All 20 independent variables of the above univariate analysis were considered. * OR (odds ratio) = risk ratio for depression (n = 170 minimal/mild and n = 100 moderate/severe). 95% CI OR = 95% confidence interval for OR. Stepwise criterion for variable selection. Ref: reference level. All 20 independent variables of the above univariate analysis were considered.

Luz AG et al., J Women's Health Dev 2024
DOI:10.26502/fjwhd.2644-288400115

The healthcare students with highest risk of anxiety symptoms were those in the pharmacy (OR 65.2, 95%, CI 17.8-238.8), Phonoaudiology (OR 920.7, 95%, CI 98.7-8586.5) and Medicine courses (OR 376.7, 95%, CI 39-3639.2). Students in the last years of the course (3-6 years) had a 3.1 times higher risk of presenting moderate or severe anxiety (OR 3.10, 95% CI 1.21-7.921). The factors associated with moderate or severe depression were the healthcare students who experienced moderate (OR 6.1, 95%, CI 2.3-16.4) and severe physical reactions (OR 2.8, 95%, CI 1.3-6.1), those with very compromised social relationships (OR 3.5, 95%, CI 3.5, 95%, CI 1.8-6.9), those with a lot of fear of persisting with exaggerated concern (OR 2.2, 95% CI 1.8-6.9) and those with a dissatisfactory relationship with remote education (OR 2.3, 95% CI 1.2-4.4) (Table 3).

Discussion

Our study showed high levels of severe anxiety and moderate/ severe depression in healthcare students during the isolation due to COVID-19 pandemic. The factors associated with moderate/severe anxiety were the undergraduate course (nursing, pharmacy, phonoaudiology and medicine) and period of the course. Moderate and severe depression were associated with physical symptoms, excessive concern, compromised social relationships, and dissatisfaction with remote education reported by the students. We found very high levels of severe anxiety (74%) and moderate/severe depression (37%) in healthcare students during the pandemic. These values are higher than found in a Chinese study with the general population (16.5% reported moderate to severe depressive symptoms, 28.8% reported moderate to severe anxiety symptoms, and 8.1% reported moderate to severe stress levels) [9]. However, our results are in agreement with one study conducted in Portugal that compared the levels of anxiety, depression, and stress among students and showed a significant increase in psychological distress during the pandemic [10]. Other study conducted in France also showed high rates of psychological impairment (16.1% of university students had severe depression, 74.4% had moderate and severe depression, and 11.4% had suicidal ideation), that was associated with the fact that in Europe the beginning restrictions due to the pandemic began earlier [11]. The factors associated with moderate and severe anxiety were the healthcare course type and the period of the course in the health area. We observed that medical school, phonoaudiology, and pharmacy students had higher levels of anxiety. In addition, students in recent years had higher levels of anxiety, probably because these students needed to have contact with patients due to the practical courses [12]. In agreement with our results, one Spanish study was conducted one year after the ongoing pandemic to evaluate stress among 252 students in healthcare courses, and also showed higher levels of psychological impairment (showed 13.1% stress, 71.4% anxiety, and 81% depression) [13]. In addition, a cross-sectional American study evaluated 1,428 students from 40 medical schools, 30.6% reported experiencing anxiety symptoms, and 24.3% reported depressive symptoms. These values are lower than found in our study, but they are much higher levels than similar studies conducted in regular periods (without the pandemic). They suggested that professors and coordinators of medical courses should be more attentive and sensitive to the mental health of students during the COVID-19 pandemic because they have a higher potential risk for psychological stress [14,15]. The factors associated with moderate and severe depression were the course type and the period of the course in the healthcare area. Several studies confirm the higher prevalence of depression in women, which has been observed in the general population, in university students [16,17], and particularly in medical students [18], which is manifested in pre-pandemic studies and is confirmed during the pandemic by COVID-19 [11]. A more comprehensive study included 2,349 students from 9 different countries (Colombia, Czech Republic, Germany, Israel, Poland, Russia, Slovakia, Turkey, and Ukraine) and evaluated risk factors for depression and anxiety seeking to relate them with sociodemographic factors in addition to exposure to COVID-19 and impact on student well-being. The authors emphasize that gender was not related to risk factors for anxiety and depression in all countries evaluated. The results obtained showed varied predictors of mental health in the cultural, political, and economic situation of each location, highlighting the importance of differentiated psychological intervention and support programs [19].

The perception of the covid with physical symptoms, such as the information transmitted by the various media, as well as the social distancing with confinement measures, may have contributed to the increase in mean scores. The monitoring of the situation at the global level and the increase in cases positive for COVID-19 seem to have generated levels of anxiety, depression, and stress among college students, even though we know that this would not be a group of higher risk in terms of lethality [20]. In our results, 77.8% of the students answered that they were afraid of contracting the disease and transmitting it to the people they love, in agreement with the data in the literature. Similarly, it cannot be assumed that the increase in anxiety, depression, and stress levels is due only to the pandemic. This may be due to several other factors (such as personality and perceived social support). Nevertheless, this study is a starting point for future research in this area. Due to the COVID-19 pandemic, the University of Campinas (Unicamp) was the first Brazilian public university to decree the suspension of face-to-face activities and change to emergency education activities. The measure was accompanied by a series of institutional actions, including the main actions, the access of students to remote activities in this period, and the updating of teacher training for the use of digital resources in distance education. In the healthcare area, gradual plans for resuming activities were

elaborated, together with Health and Education Policies at the State and Federal levels. This plan aimed at conducting practical modules, considered essential for both the training of undergraduate and graduate students and the service to the population offered by the different courses of the University [21]. Dissatisfaction with remote education was associated with twice the odds of having moderate or severe depression. Among the many challenges of this period of digital teaching, we cannot fail to highlight the primary role of the University and the professors and the responsibility of supporting them in the difficulties. Our results reflect this because when questioned about losses in their training due to the pandemic, the vast majority of students agree that they had losses. The same occurred about the remote modality; half of our students reported having some degree of difficulty following, which led them to feel some degree of dissatisfaction. In addition, during the pandemic, it was essential to support the development of digital competencies by the faculty [21, 22]. With this in mind, we can understand that the difficulties encountered and reported by our students are all the challenges of that moment. The strengths of our study were the use of anxiety and depression validated questionnaires. However, as a limitation of the study, we can highlight the low rate of response to the invitation to participate in the study. The reason for the low response may be the fact that during this period, the students received numerous invitations to participate in studies of various scopes. Another limitation is the fact that we did not compare these data with the pre-pandemic period. Due to the results obtained, with high levels of anxiety and moderate and severe depression, new studies with a larger number of students and with an assessment of the mental health of students in the health area are needed. The emerging mental health problems related to COVID-19 infection worldwide can evolve into lasting health problems, isolation, and stigma. Global health measures should be employed to address psychosocial stressors, particularly those related to the use of isolation/quarantine, fear, and vulnerability among the general population. In addition to these issues, it will be essential to support the development of digital skills for faculty and students, and together, we think about strategies to minimize losses. In summary, this study shows by its results the need to be aware of the psychological effects of this pandemic on our students and that we need to think about future strategies for the mental health of these professionals.

Conclusion

Healthcare students showed high levels of severe anxiety and moderate/ severe depression. Anxiety is associated with the course type and the period of the course during the pandemic period and it is higher in medical students and the last years of the course. Moderate and severe depression was associated with factors related to the perception of pandemics and social relationships. Dissatisfaction with remote education contributed to the increase in depression rates.

Declaration

The Research Ethics Committee of the university approved the study protocol (CAAE: 32634420.90000.5404).

Informed consent was obtained from all subjects to participate in the study. All participants were age more than 16 years old.

Funding

This research was funded by the São Paulo Research Foundation (FAPESP), grant (2020/07231-1).

Declaration of Interest Statement

The authors declare no conflicts of interest.

Author contribution

AGL, substantial contribution to the conception, design, analysis, and interpretation of data, writing of the article and final approval of the version to be published. EZT and CFRA contribute to the conception and design of the study.EG contributed to the data collection, analysis, and interpretation of data and the article's writing. CRTJ and PGM contributed to the analysis and interpretation of data and revised the final manuscript. FGCS contributed to the conception, design, analysis, and interpretation of data, relevant critical review of the intellectual content and final approval of the version to be published. AGL is the guarantor responsible for the general content. "**All the authors have read and approved the manuscript".**

Availability of Data and Materials

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Consent for publication

Not applicable

Acknowledgments

This research was funded by the São Paulo Research Foundation (FAPESP), grant (2020/07231-1). The authors thank "Espaço da Escrita – Pró-Reitoria de Pesquisa -UNICAMP" - for the language services provided.

References

1. WHO. Novel Coronavirus (2019-ncov) Situation Report-*22 Situations. WHO*; Geneva, Switzerland: (2020).
2. Braquehais MD, Vargas-Cáceres S, Gómez-Durán E, et al. The impact of the COVID-19 pandemic on the mental health of healthcare professionals (2020): 207.

Luz AG et al., J Women's Health Dev 2024
DOI:10.26502/fjwhd.2644-288400115

3. Ornell F, Schuch JB, Sordi AO, et al. "Pandemic fear" and COVID-19: mental health burden and strategies. Braz J Psychiatry 42 (2020): 232-235.

4. Conceição LS, Batista CB, Dâmaso JGB, et al. Saúde mental dos estudantes de medicina brasileiros: uma revisão sistemática da literatura. Rev da Aval da Educ Superior 24 (2019): 785-802

5. Baldassin SP, Silva N, Alves TCTF, et al. Depression in medical students: Cluster symptoms and management. Journal of Affective Disorders 150 (2012): 110-114.

6. Alves, JGB et al. Qualidade de vida em estudantes de Medicina no início e final do curso: avaliação pelo Whoqol-bref. Rev Bras Educ Med Rio de Janeiro 34 (2010): 91-96.

7. Teixeira CFS, Soares CM, Souza EA, et al. The health of healthcare professionals coping with the Covid-19 pandemic. Cien Saude Colet 25 (2020): 3465-3474.

8. Andrade L, Gorenstein C, Vieira Filho AH, et al. Psychometric properties of the Portuguese version of the State-Trait Anxiety Inventory applied to college students: factor analysis and relation to the Beck Depression Inventory. Braz J Med Biol Res 34 (2001): 367-374.

9. Wang C, Pan R, Wan X, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int J Environ Res Public Health 17 (2020): 1729.

10. Maia BR, Dias PC. Ansiedade, depressão e estresse em estudantes universitários: o impacto da COVID-19. Estud. Psicol (2020).

11. Wathelet M, Duhem S, Vaiva G, et al. Factors Associated with Mental Health Disorders Among University Students in France Confined During the COVID-19 Pandemic. JAMA Netw Open 3 (2020): e2025591.

12. Marcén-Román Y, Gasch-Gallen A, Vela Martín de la Mota II, et al. Stress Perceived by University Health Sciences Students, 1 Year after COVID-19 Pandemic. International journal of environmental research and public health 18 (2021): 5233.

13. Halperin SJ, Henderson MN, Prenner S, et al. Prevalence of Anxiety and Depression Among Medical Students During the Covid-19 Pandemic: A Cross-Sectional Study. Journal of medical education and curricular development (2021).

14. Torales J, O'Higgins M, Castaldelli-Maia JM, et al. The outbreak of COVID-19 coronavirus and its impact on global mental health. Int J Soc Psychiatry 66 (2020): 317-320.

15. Pacheco JP, Giacomin HT, Tam WW, et al. Mental health problems among medical students in Brazil: a systematic review and meta-analysis. Braz J Psychiatry 39 (2017): 369-378.

16. Auerbach RP, Mortier P, Bruffaerts R, et al. WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. J Abnorm Psychol 127 (2018): 623-638.

17. Weiss P, Murdoch DR. Clinical course and mortality risk of severe COVID-19. Lancet 395 (2020): 1014-1015.

18. Ochnik D, Rogowska AM, Kuśnierz C, et al. A Comparison of Depression and Anxiety among University Students in Nine Countries during the COVID-19 Pandemic. Journal of Clinical Medicine 10 (2021): 2882.

19. Amaral E, Polydoro SAJ, Carvalho MAAG. Os desafios da mudança para o ensino remoto emergencial na graduação na unicamp – Brasil. Linha mestra 41 (2020): 52-62.

20. Domínguez-González AD, Guzmán-Valdivia G, Ángeles-Téllez FS, et al. Depression and suicidal ideation in Mexican medical students during COVID-19 outbreak. A longitudinal study. Heliyon 8 (2022): e08851.

21. Zhang Y, Ma ZF. Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. Int J Environ Res Public Health 17 (2020): 2381.

22. Gorenstein C, Andrade L. Validation of a Portuguese version of the beck depression inventory and the state-trait anxiety inventory in Brazilian subjects. Braz J Med Biol Res 29 (1996): 453-457.