INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

LEVEL OF STRESS AND REACTION TO STRESS AMONG PHYSICAL THERAPY STUDENTS DURING PANDEMIC COVID-19

Original Research

Manahil Shahid[1]*, Esma Araf[2], Sana Bashir[3], Hafsa Butt[4], Umm E Habiba Rasool[5]

[1]Lecturer, Foundation University College of Physical Therapy (FUCP), Foundation University, Islamabad, Pakistan.
[2]Musculoskeletal Physical Therapy Student, Foundation University College of Physical Therapy (FUCP), Foundation University, Islamabad, Pakistan.
[3]Assistant Professor, Foundation University College of Physical Therapy (FUCP), Foundation University, Islamabad, Pakistan.
[4]Physiotherapist, Islamabad Healing Centre, Rawalpindi, Pakistan.
[5]Physiotherapist, Intensive Health Services, Rawalpindi, Pakistan.

Corresponding Author: Manahil Shahid, Lecturer, Foundation University College of Physical Therapy (FUCP), Foundation University, Islamabad, Pakistan, manahil.shahid@fui.edu.pk

Acknowledgement: The authors acknowledge the participation and cooperation of all physical therapy students involved in this study.

Conflict of Interest: None

Grant Support & Financial Support: None

ABSTRACT

Background: The COVID-19 pandemic triggered widespread concern regarding the psychological health of university students, particularly those in health-related fields such as physical therapy. Sudden disruptions in academic routines, social isolation, and uncertainty about the future contributed to increased stress levels. In this context, assessing how physical therapy students perceived and responded to stress during the pandemic is crucial to inform appropriate academic and mental health interventions.

Objective: To assess the levels and sources of stress and the corresponding reactions among physical therapy students, and to evaluate the correlation between general stress levels and COVID-19-specific stress during the pandemic.

Methods: This descriptive, cross-sectional correlational study was conducted over a period of 10 months and included 241 physical therapy students aged 18–30 years from multiple institutions in Rawalpindi and Islamabad. Data collection employed a non-probability convenience sampling technique. The Student Stress Inventory (SSI) and COVID-19 Student Stress Questionnaire (CSSQ) were used to evaluate general and pandemic-specific stress levels, respectively. Data were analyzed using SPSS version 21, with correlation assessed via Spearman's Rho due to non-normal distribution.

Results: Among the 241 participants, 51 (21.2%) were males and 189 (78.4%) were females. Based on the SSI, 150 students (62.2%) exhibited moderate stress, 86 (35.7%) had mild stress, and 5 (2.1%) experienced high stress. Academic and environmental stressors both accounted for high stress levels in 153 participants (63.5%). On the CSSQ, 122 students (50.6%) reported moderate pandemic-related stress. A weak positive correlation was found between SSI and CSSQ scores ($p = 0.434$), though not statistically significant.

Conclusion: The study highlights a predominance of moderate stress among physical therapy students during the COVID-19 pandemic, emphasizing the need for institutional mental health support and tailored interventions to mitigate academic and environmental stressors.

Keywords: Academic Stress, COVID-19, Mental Health, Physical Therapy Students, Psychological Stress, Student Stress Inventory, University Students.

INTRODUCTION

Since March 2020, the unprecedented global outbreak of the novel coronavirus SARS-CoV-2 (COVID-19) significantly disrupted life in Pakistan, triggering a national health crisis that extended beyond physical illness and deeply affected psychological well-being. The sudden imposition of social distancing measures, closure of educational institutions, and a shift to remote learning posed numerous challenges for the general population, with students being among the most affected. Adapting to such rapid changes was initially difficult, especially as people struggled to maintain social connectivity and manage the uncertainties of a global pandemic (1,2). The virulence and systemic effects of the virus, along with the fear of contagion and prolonged isolation, have been linked to a marked deterioration in mental and emotional health (3). Among students, particularly those enrolled in rigorous academic programs such as physical therapy, the psychological toll of the pandemic was magnified. Stress, anxiety, and depressive symptoms have become increasingly prevalent in university populations, undermining not only academic performance but also interpersonal functioning and long-term career development (4). These emotional stressors were further exacerbated by increased academic workload, uncertainty regarding examinations, online learning fatigue, and social isolation, leading to a cumulative rise in mental health issues (5). Academic stressors such as assignments, examination pressure, and the volume of syllabus material were identified as the most significant contributors, with testing and evaluation being the most prevalent source of distress (6).

Stress is a complex and multifactorial phenomenon. As defined by studies, stress reflects the rate of wear and tear experienced by the body in response to various external and internal demands (7,8). It can manifest in numerous forms, including physical symptoms like fatigue, sleep disturbances, headaches, and musculoskeletal pain when coping mechanisms fail or are overwhelmed. Interpersonal stressors, such as strained relationships or social disconnection, often lead to emotional issues such as loneliness, low self-esteem, and depression. Environmental factors, including poor living conditions, excessive noise, or commuting difficulties, also contribute significantly to psychological stress among students. Yet, among all these, academic stress remains the most dominant, especially in disciplines like medicine and physiotherapy, where the academic environment is characterized by high expectations, competitive performance, and continuous assessments (9,10). These cumulative pressures often predispose students to emotional exhaustion and clinical depression (11). The importance of coping mechanisms cannot be overstated, as they serve as protective strategies that buffer the harmful effects of stress. Positive coping methods help students navigate through challenging circumstances, reduce psychological burden, and promote resilience (12,13). Despite growing international recognition of academic stress and its consequences, there remains a significant gap in local research addressing these challenges within the Pakistani context, particularly among physical therapy students—a group exposed to unique stressors due to the demanding nature of their curriculum. This study aims to assess the levels and sources of stress experienced by physical therapy students in Pakistan during the COVID-19 pandemic and to explore how these students react to and manage stress. The objective is to identify specific stressors and their severity, offering insight into how the pandemic has influenced student mental health. This research seeks to fill a critical gap in existing literature by focusing on this specific population and contextualizing stress within the unique circumstances of a global health crisis.

METHODS

This descriptive, correlational, cross-sectional survey was conducted between September 2020 and July 2021 to assess stress levels and stressor responses among physical therapy students during the COVID-19 pandemic. The study population was drawn from various physical therapy institutes located in Rawalpindi and Islamabad, including Foundation University Institute of Rehabilitation Sciences (FUIRS), Riphah International University (RIU), Yusra Institute of Rehabilitation Sciences (YIRS), University of Lahore Islamabad Campus (UOL), Shifa Tameer-e-Millat University (STMU), and Isra Institute of Rehabilitation Sciences (IIRS). Ethical clearance was obtained from the Ethical Review Committee of Foundation University Medical College, Islamabad (Ref: FF/FUMC/215-95-2/Phy/21). All participants provided informed consent prior to inclusion in the study. Participants were selected through non-probability convenience sampling. The inclusion criteria comprised physical therapy students of either gender, aged between 18 to 30 years, currently enrolled in any of the aforementioned institutions and residing within the Rawalpindi-Islamabad region. Students were excluded if they had a prior diagnosis of any major physical or mental illness, including but not limited to neuromuscular, cardiopulmonary, traumatic, or psychiatric disorders, to prevent potential confounding influences on stress levels.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

The sample size was determined using the Raosoft calculator, yielding a target of 241 participants based on an estimated population of 2800 students, a 5.30% margin of error, 95% confidence interval, and a 50% response distribution. Data collection was conducted both face-to-face and through web-based surveys to accommodate pandemic-related restrictions and ensure wider accessibility. For students enrolled in institutions other than FUIRS, data were obtained through online consent forms, and additional institutional permissions were deemed unnecessary due to the nature of remote participation. Stress levels were measured using two validated instruments. The primary tool, the Student Stress Inventory (SSI), comprised 40 negatively phrased items divided equally across four subscales: physical stress, interpersonal relationship stress, academic stress, and environmental stress. Each item was rated on a 4-point ordinal scale (Never, Somewhat Frequent, Frequent, Always). Total scores were interpreted as follows: 40–80 indicating mild stress, 81–121 indicating moderate stress, and 122–160 reflecting severe stress (11). Additionally, the COVID-19 Student Stress Questionnaire (CSSQ) was employed to assess pandemic-specific stressors. The CSSQ includes 7 items rated on a 5-point Likert scale from 0 ("Not at all stressful") to 4 ("Extremely stressful"), covering domains such as relational issues, social isolation, academic challenges, and fear of contagion. The total CSSQ score ranges from 0 to 28, with values ≤6 representing low, 7–15 moderate, and ≥16 high levels of perceived COVID-19-related stress (12). Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive statistics, including frequencies and percentages, were used for categorical variables, while means and standard deviations were reported for continuous data. The analysis also involved graphical representations to visualize distributions and highlight key findings.

RESULTS

A total of 241 physical therapy students participated in the study, comprising 51 males (21.2%) and 189 females (78.4%). The age range of participants was between 18 and 30 years, with a mean age of 20.73 ± 6.40 years. Based on the Student Stress Inventory (SSI), the stress levels were categorized as mild, moderate, and high. Mild stress was observed in 86 participants (35.7%), who demonstrated good coping abilities, positive attitudes, high self-efficacy, and adaptability. Moderate stress was reported by 150 participants (62.2%), who showed moderate coping skills and partial adaptability. High stress was identified in 5 participants (2.1%), marked by poor coping mechanisms, difficulty in adjusting to environments, and strained interpersonal relationships. In terms of physical stressors, 38 participants (15.8%) showed mild physical stress with low vulnerability to illness, 119 (49.4%) reported moderate physical stress with moderate vulnerability, and 84 (34.8%) exhibited high physical stress with increased health vulnerability. Regarding interpersonal relationship stress, 59 students (24.5%) scored mild, indicating strong social connectedness and relationship-building skills; 133 (55.2%) scored moderate, reflecting average social adaptability; and 59 (24.5%) had severe interpersonal stress with reduced social interaction and connectedness.

In the academic domain, 22 participants (9.1%) were identified as high achievers with mild academic stress, exhibiting high motivation and effective time management. Moderate academic stress was recorded in 66 participants (27.4%), who showed average performance and motivation. A significant proportion, 153 students (63.5%), demonstrated high academic stress with low motivation and poor time management, reflecting increased academic burden. Environmental stressor analysis revealed that 153 students (63.5%) scored mild, displaying high resilience and strong adaptability to environmental stress. Seventy students (29.0%) scored moderate, and 18 students (7.5%) scored high, indicating low resilience and difficulty adjusting to their social surroundings. The COVID-19 Student Stress Questionnaire (CSSQ) scores were also categorized. Low COVID-19-related stress was reported by 57 participants (23.7%), average stress by 122 (50.6%), and high stress by 62 (25.7%). These scores reflected varied impacts of the pandemic on students' psychological well-being.

Correlation analysis between SSI and CSSQ scores was conducted using Spearman's Rho test, as the data were non-normally distributed. The correlation coefficient was 0.000, indicating a weak positive correlation, and the p-value was 0.434, which was not statistically significant as it exceeded the threshold of 0.05. Subgroup analysis revealed variations in stress levels by gender and institution. Among male participants, 47.1% reported mild stress, 51.0% moderate stress, and 2.0% high stress. In contrast, among females, 33.1% experienced mild stress, 64.6% moderate stress, and 2.3% high stress, indicating a slightly higher prevalence of moderate and high stress among female students. Institutional differences were also notable. Students from the University of Lahore (UOL) reported the highest percentage of mild stress (47.5%) and no cases of high stress, while students from Isra Institute of Rehabilitation Sciences (IIRS) showed the highest prevalence of high stress (8.6%) and the lowest mild stress scores (22.9%). Riphah International University (RIU) had a relatively balanced distribution with 40.8% mild and 55.1% moderate stress. Foundation University (FUIRS) students had 41.5% mild and 58.5% moderate stress, with no high stress reported. Shifa Tameer-e-Millat University (STMU) students presented the highest rate

of moderate stress at 76.6%, with only 2.1% reporting high stress. These findings underscore the importance of tailoring stress management interventions not only by gender but also by institutional context.

Table 1: Demographic Characteristics of Participants (n=241)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	51	21.2
	Female	189	78.4
Age (years)	Mean ± SD	20.73 ± 6.40	—
	Range	18–30	—

Table 2: Total Stress Levels (Student Stress Inventory - SSI)

Stress Level	Frequency (n)	Percentage (%)
Mild	86	35.7
Moderate	150	62.2
High	5	2.1

Table 3: Subscale Distribution of Stressors (SSI)

a. Physical Stressors

Stress Level	Frequency (n)	Percentage (%)
Mild	38	15.8
Moderate	119	49.4
High	84	34.8

b. Interpersonal Relationship Stress

Stress Level	Frequency (n)	Percentage (%)
Mild	59	24.5
Moderate	133	55.2
High	59	24.5

c. Academic Stressors

Stress Level	Frequency (n)	Percentage (%)
Mild	22	9.1
Moderate	66	27.4
High	153	63.5

d. Environmental Stressors

Stress Level	Frequency (n)	Percentage (%)
Mild	153	63.5
Moderate	70	29.0
High	18	7.5

Table 4: COVID-19 Student Stress Questionnaire (CSSQ) Global Stress Score

CSSQ Stress Level	Frequency (n)	Percentage (%)
Low	57	23.7
Average	122	50.6
High	62	25.7

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Table 5: Gender-wise Stress Level Distribution (in %)

Gender	Mild	Moderate	High
Male	47.1	51.0	2.0
Female	33.1	64.6	2.3

Table 6: Institution-wise Stress Level Distribution (in %)

Institution	Mild	Moderate	High
FUIRS	41.5	58.5	0.0
IIRS	22.9	68.6	8.6
RIU	40.8	55.1	4.1
STMU	21.3	76.6	2.1
UOL	47.5	52.5	0.0

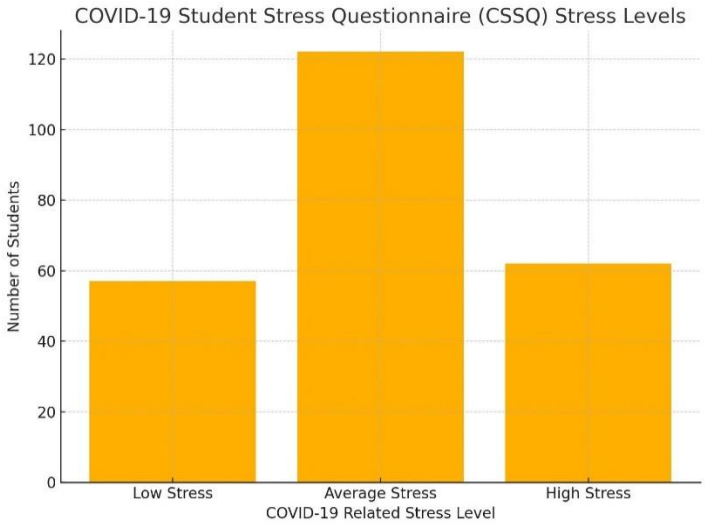

Figure 1 COVID-19 Student Stress Questionnaire (CSSQ) Stress Levels

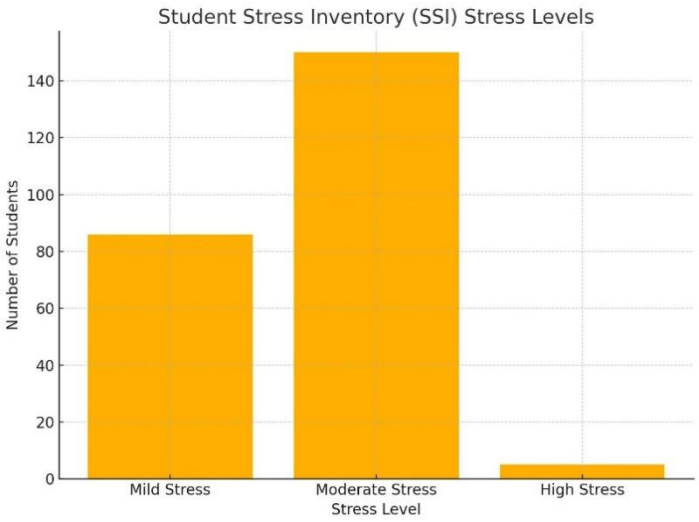

Figure 2 Student Stress Inventory (SSI) Stress Levels

DISCUSSION

The findings of this study highlighted that moderate stress levels were prevalent among undergraduate physical therapy students during the COVID-19 pandemic, with only a minority experiencing either mild or severe levels of stress. These outcomes reinforce the growing recognition that psychological, emotional, and academic well-being among health sciences students has been significantly affected by prolonged exposure to stressors, particularly during a global crisis. The observed weak positive correlation between general stress levels, as measured by the Student Stress Inventory (SSI), and pandemic-specific perceived stress levels, assessed via the COVID-19 Student Stress Questionnaire (CSSQ), underscores the multifactorial nature of student stress (14,15). Although a statistical correlation was present, it lacked significance, indicating that while both stressors coexisted, their relationship may be influenced by other intervening variables not captured in this analysis. Several prior investigations have supported the presence of moderate to severe psychological distress among physiotherapy and other health sciences students, identifying anxiety, depression, and academic pressure as common contributors (16,17). However, those studies largely focused on symptom prevalence without exploring the nuanced reactions to stressors or their interaction with extraordinary circumstances such as a pandemic. The current research builds upon this foundation by including both academic and pandemic-related stress metrics, enabling a more contextually relevant understanding of the student experience during COVID-19 (18). While some earlier studies suggested a strong association between stress levels and academic performance, this study focused more on stress categorization and inter-variable correlation rather than performance outcomes (19,20).

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

A notable strength of this study lies in its dual-instrument approach, combining general and pandemic-specific stress scales to provide a comprehensive picture of the psychological burden on students. Furthermore, the inclusion of subscale analyses offered insights into the types of stressors most prominently affecting physical therapy students, such as academic overload and social disconnection. This multi-dimensional assessment has practical implications for designing targeted interventions and academic support systems. Nevertheless, the study has several limitations. The sample was confined to physical therapy students from select institutions within the Rawalpindi-Islamabad region, limiting the generalizability of the results to broader student populations or other academic disciplines. The cross-sectional design restricts interpretation of temporal relationships or causality, and the reliance on self-reported questionnaires may introduce response biases. The sample size, although adequate for descriptive analysis, was relatively small given the diversity of stress responses and demographic variability that might exist across other academic programs or regions.

External constraints imposed by the COVID-19 pandemic further influenced the scope of the research, including limitations in participant recruitment and data collection duration. Despite these challenges, the study provides critical insights into how students responded to unprecedented disruptions in their academic and personal lives. The pandemic's impact extended beyond academic interruptions, influencing students' psychological resilience, interpersonal relationships, and perceived self-efficacy in coping with evolving demands. To address the psychological burden identified, it is essential that institutional support mechanisms are strengthened. Strategies may include integrating mental health education into the curriculum, facilitating access to counseling services, and engaging families in the mental wellness discourse (21,22). Educators can further contribute by adapting assessment criteria and offering academic flexibility to accommodate students' mental well-being. Additional interventions such as physical activity programs, stress management workshops, and peer mentoring can be introduced to build coping capacity. Future research should extend beyond discipline-specific populations and adopt longitudinal designs to examine the lasting effects of pandemic-related stress. There is also a need to explore the efficacy of institutional interventions and coping strategies over time, particularly in transitioning from crisis management to sustainable mental health frameworks. Expanding the scope of inquiry to include students from non-health disciplines and diverse geographic regions would also contribute to a more inclusive understanding of student mental health dynamics. In doing so, researchers can inform more robust policies aimed at fostering academic resilience and psychological well-being in higher education.

CONCLUSION

This study concluded that physical therapy students in Rawalpindi and Islamabad experienced moderate levels of stress during the COVID-19 pandemic, with academic and environmental stressors playing a particularly significant role. The weak positive correlation observed between general stress and pandemic-specific stress highlights the complex and layered impact of the pandemic on student mental health. These findings emphasize the importance of addressing both academic pressures and external stressors through targeted institutional support, mental health awareness, and adaptive learning environments. By identifying these stress patterns, the study contributes valuable insights that can inform future strategies to promote psychological resilience and well-being among university students in times of crisis and beyond.

AUTHOR CONTRIBUTION

Author	Contribution
Manahil Shahid*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Esma Araf	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Sana Bashir	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Hafsa Butt	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Umm E Habiba Rasool	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

REFERENCES

1. Mosteiro-Diaz MP, Baldonedo-Mosteiro C, Campos Pavan Baptista P, Gamez-Fernandez A, Franco-Correia S. Anxiety and depression among nursing students during the COVID-19 lockdown: A cross-sectional correlational study. J Clin Nurs. 2023;32(15-16):5065-75.
2. Muaddi MA, El-Setouhy M, Alharbi AA, Makeen AM, Adawi EA, Gohal G, et al. Assessment of Medical Students Burnout during COVID-19 Pandemic. Int J Environ Res Public Health. 2023;20(4).
3. Liu Z, Liu R, Zhang Y, Zhang R, Liang L, Wang Y, et al. Association between perceived stress and depression among medical students during the outbreak of COVID-19: The mediating role of insomnia. J Affect Disord. 2021;292:89-94.
4. Moayed MS, Vahedian-Azimi A, Mirmomeni G, Rahimi-Bashar F, Goharimoghadam K, Pourhoseingholi MA, et al. Coronavirus (COVID-19)-Associated Psychological Distress Among Medical Students in Iran. Adv Exp Med Biol. 2021;1321:245-51.
5. Curcio F, González CIA, Zicchi M, Sole G, Finco G, Ez Zinabi O, et al. COVID-19 Pandemic Impact on Undergraduate Nursing Students: A Cross-Sectional Study. Int J Environ Res Public Health. 2022;19(14).
6. Harries AJ, Lee C, Jones L, Rodriguez RM, Davis JA, Boysen-Osborn M, et al. Effects of the COVID-19 pandemic on medical students: a multicenter quantitative study. BMC Med Educ. 2021;21(1):14.
7. Wercelens VO, Bueno ML, Bueno JL, Abrahim RP, Ydy JGM, Zanetti HR, et al. Empathy and psychological concerns among medical students in Brazil during the COVID-19 pandemic. Int J Psychiatry Med. 2023;58(5):510-21.
8. Joshi VR, Younger JM, Das S, Goud BKM, Pramanik K. Factors influencing burnout in millennial medical students during the COVID-19 pandemic! Ir J Med Sci. 2023;192(2):513-9.
9. Seetan K, Al-Zubi M, Rubbai Y, Athamneh M, Khamees A, Radaideh T. Impact of COVID-19 on medical students' mental wellbeing in Jordan. PLoS One. 2021;16(6):e0253295.
10. Jupina M, Sidle MW, Rehmeyer Caudill CJ. Medical student mental health during the COVID-19 pandemic. Clin Teach. 2022;19(5):e13518.
11. Rolland F, Hadouiri N, Haas-Jordache A, Gouy E, Mathieu L, Goulard A, et al. Mental health and working conditions among French medical students: A nationwide study. J Affect Disord. 2022;306:124-30.
12. Berdida DJE, Lopez V, Grande RAN. Nursing students' perceived stress, social support, self-efficacy, resilience, mindfulness and psychological well-being: A structural equation model. Int J Ment Health Nurs. 2023;32(5):1390-404.
13. Khanna RC, Honavar SG, Metla AL, Bhattacharya A, Maulik PK. Psychological impact of COVID-19 on ophthalmologists-in-training and practising ophthalmologists in India. Indian J Ophthalmol. 2020;68(6):994-8.
14. Faraj TA. STRESS LEVELS REGARDING COVID-19 PANDEMIC AMONG NURSING STUDENTS AT UNIVERSITY OF SULAIMANI, KURDISTAN REGION, IRAQ. Wiad Lek. 2022;75(4 pt 1):809-13.
15. Braz-José C, Morais Caldas I, de Azevedo Á, Pereira ML. Stress, anxiety and depression in dental students: Impact of severe acute respiratory syndrome-coronavirus 2 pandemic. Eur J Dent Educ. 2023;27(3):700-6.
16. Wilkes TC, Lewis T, Paget M, Holm J, Brager N, Bulloch A, et al. Wellbeing and mental health amongst medical students in Canada. Int J Soc Psychiatry. 2022;68(6):1283-8.
17. Moosa IA. The effectiveness of social distancing in containing Covid-19. Applied economics. 2020;52(58):6292-305.
18. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The lancet. 2020;395(10227):912-20.
19. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, 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. International journal of environmental research and public health. 2020;17(5):1729.
20. Zurlo MC, Cattaneo Della Volta MF, Vallone F. COVID-19 student stress questionnaire: development and validation of a questionnaire to evaluate students' stressors related to the coronavirus pandemic lockdown. Frontiers in psychology. 2020;11:576758.
21. Algarni FS. Gender differences in scores of anxiety and depression among physical therapy students of Saudi Arabia: A cross-sectional study. International Journal of Physiotherapy and Research. 2020;8(4):3537-46.
22. AlAteeq DA, Aljhani S, AlEesa D. Perceived stress among students in virtual classrooms during the COVID-19 outbreak in KSA. Journal of Taibah University Medical Sciences. 2020;15(5):398-403.