

What is factor contributing to medical student learning anxiety during COVID-19 pandemic? A systematic review

Amin Aji Budiman, Retno Lestari, Laily Yuliatun

School of Nursing, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia

Article Info

Article history:

Received May 15, 2021

Revised Aug 15, 2021

Accepted Aug 27, 2021

Keywords:

Age

Anxiety

College students

COVID-19

External factor

Gender

Knowledge

ABSTRACT

Changes in education aspects increase the risks for mental and emotional disorders on students during the COVID-19 pandemic. This article aimed to discover the factors are contributing to medical students' learning anxiety during the COVID-19. A systematic review was written based on scientific article identification on three databases of Science Direct, PubMed NCBI, and EBSCO using terms of anxiety, factors, students, and COVID-19. The authors selected and analyzed using PRISMA based on predetermined inclusion and exclusion criteria. The studies obtain from several electronic databases revealed 519 research articles and a total of 20 articles to be analyzed. The internal factor of student anxiety during COVID-19 pandemic is age, gender, and lack of knowledge. The external factor is high academic loads with online learning methods, area restrictions/lockdown, physical activities, and socio-economic status changes. Knowing the factors that affect medical student anxiety during the pandemic could prevent further mental and emotional disorders and achieve optimal health.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Retno Lestari

School of Nursing

Faculty of Medicine

Universitas Brawijaya

Jl. Puncak Dieng, Kunci, Kalisongo, Kec. Dau, Malang 65151 East Java, Indonesia

Email: retno.lestari.fk@ub.ac.id

1. INTRODUCTION

WHO announced that the coronavirus (COVID-19) is the fifth virus categorized as a pandemic worldwide [1]. COVID-19 virus was first reported in Wuhan, China, and spread worldwide in March 2020 [1]. COVID-19 is easily transmitted from a close distance or physical contact [2]. COVID-19 strikes humans to cause respiratory and digestive tract diseases with varied severity degrees [3]. The COVID-19 pandemic causes global deaths and poses psychological stress indirectly to positive confirmed people and healthy individuals and changes psychological, social, and financial consequences [4], [5].

Other impacts of the COVID-19 pandemic are physical health problems, psychological health problems, death, and financial crises in society [6]-[8]. Lockdowns in many parts globally indirectly affect global conditions such as the cessation of services and industrial production processes, changes in the socioeconomic status of people due to job losses, business bankruptcy, and drastic changes in the education system [9], [10]. The government's massive effort to prevent the spread of COVID-19 is the postponement of schools, including colleges and universities, where students are asked to stay at home and study from home and isolate themselves for long periods by using learning methods that are quite common because they have never been done before such as learning methods by online. This can increase mood stress [11]. Mental health problems are becoming increasingly common among students. Relevant research shows that about half

of students have moderate stress-related mental health problems, including anxiety and depression [12]. Based on several studies that have been conducted, it is stated that student groups are prone to problems of emotional disturbance and stress. This also happened to clinical practice which should have been carried out directly to patients, was finally postponed or even abolished, this made students feel worried about the competency skills that would be obtained during the lecture period, where students felt they did not get any expertise because they did not do clinical practice directly. Changes in learning methods in the education system will certainly affect the overall quality of education towards the results to be achieved.

More than 1.5 billion students worldwide are affected by school shutdowns due to the COVID-19 pandemic [13]. Previous studies suggest that many factors may affect learning student: emotional, mental, and physical [14]. The health emergency due to the COVID-19 pandemic indirectly affects college students' psychological disorders, such as anxiety, fear, and concerns [8]. Anxiety is defined as anxious feelings causing discomfort or fear accompanied by a response [15]. From study findings regarding the COVID-19 pandemic in China, it is discovered that the pandemic was significantly related to anxiety and depression occurrence on college students [8]-[11].

Another research from Khan *et al.* [16] reported that 33.28% of students experienced mild to severe anxiety. In addition to this, anxiety affects social relationships between peers and learning performance. Many prevention attempts had been administered to suppress and prevent psychological disorders like anxiety in people during the pandemic era especially students. Therefore, this study is intended to summarize various factors causing medical students' anxiety in the pandemic era. Finding the factors that influence mental anxiety disorders in students during the pandemic could optimize prevention efforts for medical students so that they do not experience mental and emotional disorders, as well as improving their learning performance during pandemics.

2. RESEARCH METHOD

2.1. Search strategy

A systematic review was comprehensively conducted to select articles discussing factors affecting college students' anxiety during the COVID-19 pandemic. Articles were sourced from Science Direct, PubMed NCIJBI, and EBSCO. The search used keywords with a Boolean search like "Anxiety" AND "Factors" AND "Students College" AND "Learning during pandemic", AND "COVID-19" to obtain relevant articles according to study objectives.

2.2. Selection criteria

Scientific article search was limited with inclusion criteria of online published articles were: (i) The research over the last five years (2015-2020); (ii) The research studies regarding factors causing anxiety on college students during the COVID-19 pandemic era; (iii) Articles with full-text of scientific review and original research. The data-based literature search was systematically reviewed to obtain empirical evidence regarding factors affecting college students' anxiety during the COVID-19 pandemic era. Exclusion criteria are: (i) Articles that did not use the English language, and (ii) Articles related to anxiety outside of students.

2.3. Data extraction

The studies obtain from several electronic databases revealed 519 research articles. After removing duplicates, 459 articles were also reviewed based on the full text of the article. Finally, 20 articles from databases were previously identified. The preferred reporting items for systematic reviews method (PRISMA) were applied, and below is the PRISMA flow chart of this current study as shown in Figure 1.

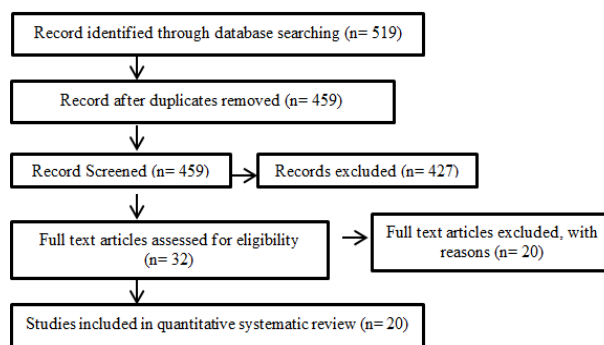


Figure 1. PRISMA flow diagram identified studies for literature identification

3. RESULTS AND DISCUSSION

The article searching conducted by using several keywords. Then found the number of search results using keyword Anxiety, Factors, Students, and COVID-19 is 519 relevant articles from three databases, i.e., Science Direct (420), EBSCO (48), and PubMed (51). We identified 32 articles for a full-text selection to assess their feasibility. Then, we discovered 20 articles that matched the predetermined inclusion criteria and feasible to be reviewed were following the guidelines of Joanna Briggs Institute (JBI). Prisma flow chart for literature identification as shown in Figure 1, while Table 1 and Figure 2 demonstrate the summary of the study results included in this article. Table 1 shows the summary findings of selected studies.

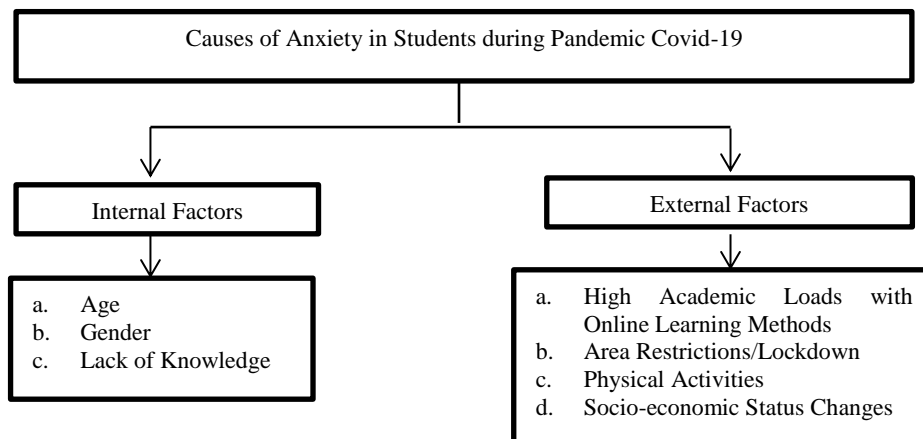


Figure 2. Summary of selected studies (n=20)

Table 1. Summary of selected studies (n=20)

No	Study reference	Findings
1	Khan <i>et al.</i> [16]	Socio-economic status changes. Ages >25 years experienced a higher psychological impact during the pandemic, and males were more susceptible to mental health disorders
2	Jiang [17]	The lack of students' knowledge regarding COVID-19 because it appertained as a new disease
3	Li <i>et al.</i> [18]	Dense learning curriculum and learning method changes
4	Chi <i>et al.</i> [19]	Interpersonal relations, knowing that closes people were quarantined, posed negative thoughts upon themselves and their surroundings.
5	Torun &Torun [20]	Socio-economic status changes where there were decreased families' incomes during the quarantine period.
6	Su <i>et al.</i> [21]	The lack of knowledge and insights regarding pandemic diseases and in compliance against prevention measures.
7	Romero <i>et al.</i> [22]	Physical activities are restricted by lockdowns as an attempt to prevent disease transmission during the pandemic.
8	Zhang <i>et al.</i> [23]	The lack of knowledge regarding the COVID-19 pandemic where information was only obtained from social media with no verification of truth
9	Chen <i>et al.</i> [24]	Changes in the limited life order and related to the continuity of education
10	Odriozola <i>et al.</i> [25]	Limitation of social activities through lockdown, where students are asked to stay at home during the pandemic period
11	Akdeniz <i>et al.</i> [26]	Changing learning methods, and lack of knowledge related to COVID-19 because it is a new disease
12	Jungmann & Witthoft [27]	Lack of knowledge regarding the COVID-19 pandemic and excessive media notifications regarding COVID-19
13	Huang <i>et al.</i> [28]	Anxiety about contracting the disease due to a large number of people around them being infected, and the lack of knowledge regarding COVID-19, Females were more prone to experience anxiety related to feelings.
14	Wang <i>et al.</i> [29]	Lack of knowledge regarding the symptoms of confirmed COVID-19 because the symptoms are fluctuating and common
15	Wu <i>et al.</i> [30]	Lack of knowledge related to COVID-19, where the information obtained is only from social media, and only provides information related to the increasing incidence and death rate
16	Kecejevic <i>et al.</i> [31]	The high academic load demands using online learning methods and knowledge that can only be obtained from social media
17	Martinez <i>et al.</i> [32]	A long period of quarantine
18	Lin <i>et al.</i> [33]	Quarantine and losing family members due to COVID-19
19	Hasan & Bao [34]	Changes in learning methods using e-learning and anxiety of losing the academic year due to COVID-19
20	Cao <i>et al.</i> [35]	Social distancing by maintaining distance, the influence of COVID-19 on student academics

Mental health is the key focus to be considered during the health crisis period to achieve an optimal health condition. Based on literature studies conducted by the authors, learning anxiety perceived by medical students during the COVID-19 pandemic era was caused by several factors.

3.1. Internal factors of learning anxiety

During the critical period, young people were reported to be more susceptible to experience mental health disorders. They were more likely to feel anxious than other age groups [16], [36], [37]. Youths perceived their mental health worsen during the pandemic due to the social restriction, i.e., lockdown implemented by the government to prevent the COVID-19 spread [38].

Another study asserted that ages more than 25 years were also prone to anxiety disorders associated with jobs. It was reported that unemployed college students were more susceptible to experience mental health disorders [39]. At the stage of adulthood where he begins to know his life goals, interact well with the family, able to cope with emotional pressure due to changes in him due to a situation. and considers his social life to be meaningful, and has the value of being the guide to his life [40]. Coping mechanisms both personal ability and social support such as less communicative, poor interpersonal relationships between individuals, families, groups, and society, less involvement in social interaction/peer groups, there is a conflict of cultural values, the pandemic COVID-19 that requires students to study and activities at home triggers the emergence of anxiety. The limited interaction between individuals, families, and groups triggers anxiety felt by students [41].

The second internal factor of student learning anxiety is gender, females were reported to be more vulnerable in experiencing mental health disorders during the pandemic [38]. Females were more concerned about inner experiences and self-perception; hence, they could not regulate their emotions well and were more sensitive to a condition [28]. Another study from Sun *et al.* [21] stated that males were more susceptible to anxiety because of workloads, responsibilities to the family, and not utilizing the available mental health services [21]. Females reported experiencing higher anxiety than men, There is evidence that female students complain more and male students are reported to experience symptoms of excessive medical and psychological conditions [42]. Quantitative data illustrates how the COVID-19 pandemic has caused educational, economic, and environmental pressures affecting medical student anxiety and well-being [13]. Females tend to suffer more mental problems than men for two reasons. There are differences in physiological states between females and men (such as genetic susceptibility, hormone levels, and cortisol,) which are reflected emotionally and behaviorally indicated [12]. For example in responding to stress, both females and men have different responses as a consequence of their different sensitivities to events. Females are reported to be more prone to stress and pain than men, so are more likely to experience greater sadness and anxiety. Furthermore, traditional concepts of masculinity and femininity can influence their attitudes and behaviors towards life experiences. Masculinity exhibits traits such as individualism, and assertiveness, while femininity manifests in compassion, compassion, and sensitivity to the needs of others [12], [43]. Females are more likely to experience threshold personality disorder characterized by unstable emotions [12], [44].

COVID-19 disease is appertained as a new disease with common symptoms, easily transmitted, extensive, and has an unclear disease mechanism and treatment [17], [21], [45]. Lack of knowledge and false information will result in inappropriate prevention and treatment attempts [46]. This pandemic situation is expressed as an information pandemic. It is a condition where students should learn and add knowledge regarding COVID-19 that indirectly affects their mental health [47]. During the lockdown period, students received information mostly from television or social media [48]. Prevention measures tend to be implemented by people with better knowledge regarding diseases [49]. The lack of knowledge and insight condition regarding pandemic diseases is associated with incompliance with prevention measures [21], thereby causing extensive anxiety of being infected with the virus due to the abundant amount of infected people [28] or a person that falls sick [50]. Students should improve their cognitive abilities and prevention measures to minimize anxiety [21]. Many deaths were caused by the COVID-19 virus globally [17]. This virus is easily transmitted within close distance or physical contact [2]. It strikes humans and causing respiratory and digestive tract diseases with varied severity degrees [3]. The death number due to COVID-19 recorded in 25 August 2021 was 4,448,352 people [51].

3.2. External factors of learning anxiety

Medical students have been experiencing academic hindrance since the beginning of the COVID-19 pandemic, high academic loads with online learning methods. They were struggling with academic assignments and learning using the online system [31]. It is particularly experienced by students on their second year and end-year associated with anxiety of losing their academic year and extending their semesters [34]. There was an ineffectiveness of online distance learning during the COVID-19 pandemic. It is because this learning method has never been employed before [47]-[50], [52]. Anxiety felt due to pandemic COVID-19 related to the state of

technology also makes students feel anxious, where students feel a limitation related to the validity of existing signals because learning is done online and tranquility in learning in each student's place [13].

Online learning methods during the COVID-19 pandemic has both advantages and disadvantages. The benefit of online learning is related to time and cost effectiveness, safety, comfort, and increased active participation. On the other hand, the disadvantages of online learning refer to the fact that it creates a lot of distraction, inability to stay focused, too much workloads and tasks, and poor internet connectivity, as well as lack of social support [53]. Online learning shapes students' character to be more passive, less creative, and productive due to limited space in learning where learning using application media [54]. After that, the next problem is the realization of face-to-face learning methods, as students are already used to using online learning methods [55].

Health students as a prospective health worker who will be required to have high expertise and knowledge as a provision when working later. These skills and knowledge are obtained from clinical practice. During the pandemic, clinical practices are largely delayed or not even performed. Clinical practice is a platform that provides opportunities for students to apply theoretical knowledge gained while studying into real practice in patients in hospitals. Anxiety often occurs in students related to clinical practice because of different things that have never been or rarely done, and also laboratory practices that should be done directly are not implemented because it is not allowed for educational institutions to conduct face-to-face learning.

In addition, changes in learning models during the COVID-19 pandemic have consequences on results achieved without careful preparation [55]. Equalization of the quality of education during the pandemic becomes difficult to equalize. For schools in urban areas, with the availability of good internet network facilities, the ownership of gadgets or laptops in each student is certainly felt evenly for all students. Students can also still access through existing internet cafes, so of course online-based learning model is not an issue. Different things may be felt by schools in areas where the area has difficulty in accessing the internet network, such as in the city of the sub-district internet network that is available and can still be utilized. But not all students who attend school in the sub-district are domiciled in the sub-district, there are times when the residence spreads in the corners of the village that the internet network is unstable. So that the model of online-based distance learning with internet technology becomes difficult to apply to the maximum.

Lockdowns in many parts globally indirectly affected drastic changes in the education system [9], [10]. The lockdown policy was aimed to prevent the virus spread and save lives by working and learning from home [50]. The government implemented lockdown for a rather long period and restricted access to learning environments. Students were perceived to be harmed due to institutions' shutdown during the COVID-19 outbreak [14]. It indirectly caused anxiety for college students.

The transmission prevention measure in a large-scale implementation by the government is the school postponement, including colleges and universities, where college students are asked to stay at home and learn from home and isolate themselves for a long time. It might increase mood stress [11]. Due to the continuously increasing transmission number, the government implemented restriction measures such as physical activity restriction, social distancing, avoiding crowded places or public facilities, travel restrictions, and quarantine for all arrivals from abroad [53]. Students were advised to stay at home to prevent infection and transmission. Students perceived restriction, uncertainty towards the disease, and boredom [18].

The last external factor of student anxiety is socio-economic status. The COVID-19 pandemic affects not only physical health but also psychological health, which caused an economic crisis in society [6]–[8]. The socio-economic status change occurs when the revenue decline due to the COVID-19 outbreak causes problems in occupations [56]. Income source loss also made medical students anxious regarding their financial conditions against the high cost of college [11], [57] that continues to increase; hence, requiring more costs in practice [58], [59]. This anxiety was perceived by students from low-income families [20]. Online learning methods that use data packages as a medium require students to often buy internet networks, this makes student spending become increasing, this is strongly felt by students who have not worked or who have worked, in addition, it also makes the learning process does not run optimally because there is no focus bias on the learning process, especially for students who study samba work. Tackling the issues of learning anxiety among medical students is important specifically for students in clinical practice so they do not feel worried about their competency skills. Furthermore, they may face challenges that can cause hindrances during online learning.

4. CONCLUSION

Maintaining a healthy physical and mental condition is essential during the pandemic to achieve optimal health conditions. Mental health is a priority consideration during times of health crisis. The internal factor of student learning anxiety during the COVID-19 pandemic is age, gender, and lack of knowledge.

Hance, the external factor is high academic loads with online learning methods, area restrictions/lockdown, physical activities, and socio-economic status changes. Internal and external factors greatly influence the anxiety felt by students during the pandemic.

Understanding the factors that affect anxiety from internal and external sources reduces the risk of further mental health depletion by implementing effective, efficient, and comprehensive preventive measures. There need to be adjustments that must be made among students to reduce perceived anxiety, including providing more information related to anxiety and COVID-19.

ACKNOWLEDGEMENTS

The authors would thank to the School of Nursing, Faculty of Medicine, Universitas Brawijaya for the support along this study.

REFERENCES

- [1] Y. C. Liu, R. L. Kuo, and S. R. Shih, "COVID-19: The first documented coronavirus pandemic in history," *Biomedical Journal*, vol. 43, no. 4, pp. 328-333, 2020, doi: 10.1016/j.bj.2020.04.007.
- [2] S. Meggiolaro and F. Ongaro, "Family contexts and adolescents' emotional status," *Journal of Youth Studies*, vol. 17, no. 10, pp. 1306-1329, 2014, doi: 10.1080/13676261.2014.918246.
- [3] F. Robson *et al.*, "Coronavirus RNA proofreading: molecular basis and therapeutic targeting," *Molecular Cell*, vol. 79, no. 5, pp. 710-727, 2020, doi: 10.1016/j.molcel.2020.07.027.
- [4] A. H. Khan, M. S. Sultana, S. Hossain, M. T. Hasan, H. U. Ahmed, and M. T. Sikder, "The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study," *Journal Affect. Disorder*, vol. 277, pp. 121-128, 2020, doi: 10.1016/j.jad.2020.07.135.
- [5] C. Sohrabi *et al.*, "World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19)," *International Journal of Surgery*, vol. 76, pp. 71-76, 2020, doi: 10.1016/j.ijssu.2020.02.034.
- [6] W.J. McKibbin and R. Fernando, "The Global Macroeconomic Impacts of COVID-19: Seven Scenarios," *SSRN Electron Journal*, 2020, doi: 10.2139/ssrn.3547729.
- [7] A. Fiorillo and P. Gorwood, "The consequences of the COVID-19 pandemic on mental health and implications for clinical practice," *Europe Psychiatry*, vol. 63, no. 1, 2020, doi: 10.1192/j.eurpsy.2020.35.
- [8] W. Cao *et al.*, "The psychological impact of the COVID-19 epidemic on college students in China," *Psychiatry Research*, vol. 287, 2020, doi: 10.1016/j.psychres.2020.112934.
- [9] S. Ebrahim, Q. A. Ahmed, E. Gozzer, P. Schlagenhauf, and Z. A. Memish, "Covid-19 and community mitigation strategies in a pandemic," *The BMJ*, vol. 368, no. March, pp. 1-2, 2020, doi: 10.1136/bmj.m1066.
- [10] S.M. Akula and J. A. McCubrey, "Where are we with understanding of COVID-19?," *Advances in Biological Regulation*, vol. 78, no. June, 2020, doi: 10.1016/j.jbior.2020.100738.
- [11] Z.H. Wang *et al.*, "Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study," *Journal of Affective Disorder*, vol. 275, no. 1023, pp. 188-193, 2020, doi: 10.1016/j.jad.2020.06.034.
- [12] W. Gao, S. Ping, and X. Liu, "Gender differences in depression, anxiety, and stress among college students: A longitudinal study from China," *Journal of Affective Disorder*, vol. 263, no. 5, pp. 292-300, 2020, doi: 10.1016/j.jad.2019.11.121.
- [13] IAU, "COVID-19: Higher Education challenges and responses. International Association of Universities The Global Voice of Higher Education," 2020, [Online]. Available: <https://www.iau-aiu.net/Covid-19-Higher-Education-challenges-and-responses>.
- [14] R. Citra, R. A. Syakurah, and E. Roflin "Determinants of medical students' empathy during clinical rotation," *International Journal Public Health Science*, vol. 10, no. 3, pp. 629-637, 2021, doi: 10.11591/ijphs.v10i3.20747
- [15] J. Chang, Y. Ji, Y. Li, H. Pan, and P. Su, "Prevalence of anxiety symptom and depressive symptom among college students during COVID-19 pandemic: A meta-analysis," *Journal of Affective Disorders*, vol. 292, no. January, pp. 242-254, 2021, doi: 10.1016/j.jad.2021.05.109.
- [16] A.H. Khan, M. S. Sultana, S. Hossain, M. T. Hasan, H. U. Ahmed, and M. T. Sikder, "The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study," *Journal Affective Disorder*, vol. 277, pp. 121-128, 2020, doi: 10.1016/j.jad.2020.07.135,
- [17] R. Jiang, "Knowledge, Attitudes and Mental Health of University Students during the COVID-19 Pandemic in China," *Children and Youth Services Review*, vol. 119, 2020, doi: 10.1016/j.childyouth.2020.105494.
- [18] H. Y. Li, H. Cao, D. Y. P. Leung, and Y. W. Mak, "The Psychological Impacts of a COVID-19 Outbreak on College Students in China: A Longitudinal Study," *International Journal and Environmental Research and Public Health*, vol. 17, no. 11, pp. 1-11, Jun. 2020, doi: 10.3390/ijerph17113933.
- [19] X. Chi *et al.*, "Prevalence and Psychosocial Correlates of Mental Health Outcomes Among Chinese College Students During the Coronavirus Disease (COVID-19) Pandemic," *Frontiers in Psychiatry*, vol. 11, no. 803, pp. 1-9, 2020, doi: 10.3389/fpsy.2020.00803.
- [20] F. Torun and S. D. Torun, "The psychological impact of the COVID-19 pandemic on medical students in Turkey," *Pakistan Journal Medical of Sciences*, vol. 36, no. 6, pp. 1355-1359, Sep. 2020, doi: 10.12669/pjms.36.6.2985.

- [21] Y. Sun, D. Wang, Z. Han, J. Gao, S. Zhu, and H. Zhang, "Disease Prevention Knowledge, Anxiety, and Professional Identity during COVID-19 Pandemic in Nursing Students in Zhengzhou, China," *Journal Korean Academy of Nursing*, vol. 50, no. 4, pp. 533–540, 2020, doi: 10.4040/jkan.20125.
- [22] C. Romero *et al.*, "Physical Activity and Sedentary Lifestyle in University Students: Changes during Confinement Due to the COVID-19 Pandemic," *International Journal of Environmental Research and Public Health*, vol. 17, no. 18, Sep. 2020, doi: 10.3390/ijerph17186567.
- [23] Y. Zhang *et al.*, "Emotional 'inflection point' in public health emergencies with the 2019 new coronavirus pneumonia (NCP) in China," *Journal Affective Disorder*, vol. 276, pp. 797–803, Nov. 2020, doi: 10.3390/ijerph17186567.
- [24] R. Chen *et al.*, "Mental health status and change in living rhythms among college students in China during the COVID-19 pandemic: A large-scale survey," *Journal Psychosomatic Research*, vol. 137, 2020, doi: 10.1016/j.jpsychores.2020.110219.
- [25] P. Odriozola-González, Á. Planchuelo-Gómez, M. J. Iruiria, and R. de Luis-García, "Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university," *Psychiatry Research*, vol. 290, no. May, 2020, doi: 10.1016/j.psychres.2020.113108.
- [26] G. Akdeniz, M. Kavakci, M. Gozugok, S. Yalcinkaya, A. Kucukay, and B. Sahutogullari, "A Survey of Attitudes, Anxiety Status, and Protective Behaviors of the University Students During the COVID-19 Outbreak in Turkey," *Frontiers Psychiatry*, vol. 11, no. 695, pp. 1-9, 2020, doi: 10.3389/fpsyt.2020.00695.
- [27] S.M. Jungmann and M. Witthöft, "Health anxiety, cyberchondria, and coping in the current COVID-19 pandemic: Which factors are related to coronavirus anxiety?," *Journal Anxiety Disorder*, vol. 73, 2020, doi: 10.1016/j.janxdis.2020.102239.
- [28] L. Huang, W. Lei, F. Xu, H. Liu, and L. Yu, "Emotional responses and coping strategies in nurses and nursing students during COVID-19 outbreak: A comparative study," *Journal PLoS One*, vol. 15, no. 8, pp. 1-12, Aug. 2020, doi: 10.1371/journal.pone.0237303.
- [29] Z.H. Wang *et al.*, "Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study," *Journal Affective Disorder*, vol. 275, pp. 188–193, 2020, doi: 10.1016/j.jad.2020.06.034.
- [30] S. Wu *et al.*, "The mental state and risk factors of Chinese medical staff and medical students in early stages of the COVID-19 epidemic," *Comprehensive Psychiatry*, vol. 102, 2020, doi: 10.1016/j.comppsy.2020.152202.
- [31] A. Kecojevic, C. H. Basch, M. Sullivan, and N. K. Davi, "The impact of the COVID-19 epidemic on mental health of undergraduate students in New Jersey, cross-sectional study," *Journal PLoS One*, vol. 15, no. 9, Sep. 2020.
- [32] M. Martínez *et al.*, "The fear of COVID-19 scale: Validation in spanish university students," *Psychiatry Research*, vol. 293, p. 113350, Aug. 2020, doi: 10.1016/j.psychres.2020.113350.
- [33] Y. Lin, *et al.*, "Influence of mass and social media on psychobehavioral responses among medical students during the downward trend of COVID-19 in Fujian, China: Cross-sectional study," *Journal of Medical Internet Research*, vol. 22, no. 7, pp. 1–11, 2020, doi: 10.2196/19982.
- [34] N. Hasan and Y. Bao, "Impact of 'e-Learning crack-up' perception on psychological distress among college students during COVID-19 pandemic: A mediating role of 'fear of academic year loss,'" *Children and Youth Services Review*, vol. 118, p. 105355, 2020, doi: 10.1016/j.childyouth.2020.105355.
- [35] W. Cao *et al.*, "The psychological impact of the COVID-19 epidemic on college students in China," *Psychiatry Research*, vol. 287, p. 112934, 2020, doi: 10.1016/j.psychres.2020.112934.
- [36] H. Mazarina, N. Purborini, and H. Chang, "Mediating effect of resilience on association among stress, depression, and anxiety in Indonesian nursing students," *Journal of Professional Nursing*, vol. 37, no. 4, pp. 706–713, 2021, doi: 10.1016/j.profnurs.2021.04.004.
- [37] J. Lopez *et al.*, "Psychological Well-Being among Older Adults during the Covid-19 Outbreak: A Comparative Study of the Young-Old and the Old-Old Adults," *International Psychogeriatric*, vol. 32, no. 11, pp. 1365–1370, 2020, doi: 10.1017/S1041610220000964.
- [38] Y. Minds, "Coronavirus: Impact on young people with mental health needs," 2020. [Online]. Available: <https://www.youngminds.org.uk/about-us/reports-and-impact/coronavirus-impact-on-young-people-with-mental-health-needs>. (Accessed Feb. 17, 2021).
- [39] C. Pieh, S. Budimir, and T. Probst, "The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria," *Journal Psychosomatic Research*, vol. 136, p. 110186, Sep. 2020.
- [40] H. Ma and C. Miller, "Trapped in a Double Bind: Chinese Overseas Student Anxiety during the COVID-19 Pandemic Trapped in a Double Bind: Chinese Overseas Student Anxiety during the COVID-19 Pandemic," *Health Communication*, pp. 1–8, 2020, doi: 10.1080/10410236.2020.1775439.
- [41] G. Stuart, *Prinsip Dan Praktik Keperawatan Kesehatan Jiwa Stuart*. Philadelphia: Elsevier Mosby, 2016.
- [42] M. Nazir *et al.*, "A quantitative study of test anxiety and its influencing factors among medical and dental students," *Journal of Taibah University Medical Sciences*, vol. 16, no. 2, pp. 253–259, 2021, doi: 10.1016/j.jtumed.2020.12.014.
- [43] P. Gibson, E. H. Baker, and A. N. Milner, "The role of sex, gender, and education on depressive symptoms among young adults in the United States," *Journal Affective Disorder*, vol. 189, pp. 306–313, 2016, doi: 10.1016/j.jad.2015.08.067.

- [44] S. Keng *et al.*, “Construct validity of the mclean screening instrument for borderline personality disorder in two singaporean samples,” *Journal of Personality Disorder*, vol. 33, no. 4, pp. 450–469, 2019, doi: 10.1521/pedi_2018_32_352.
- [45] S. Tasnim *et al.*, “Impact of rumors or misinformation on coronavirus disease (COVID-19) in social media,” *Journal of Preventive Medicine and Public Health*, pp. 171–174, 2020, doi: 10.1521/pedi_2018_32_352.
- [46] A. Aharon, A. Ruban, and I. Dubovi, “Knowledge and information credibility evaluation strategies regarding COVID-19: A cross-sectional study,” *Nursing Outlook*, vol. 69, no. 1, pp. 22–31, 2020, doi: 10.1016/j.outlook.2020.09.001.
- [47] X. Xie, Z. Zang, and J. M. Ponzoc, “The information impact of network media, the psychological reaction to the COVID-19 pandemic, and online knowledge acquisition: Evidence from Chinese college students,” *Journal of Innovation and Knowledge*, vol. 1, pp. 13–23, 2016, doi: 10.1016/j.jik.2020.10.005.
- [48] J. Santiago and A. Santos, “Knowledge, attitude and practices of the University students about COVID-19 during the Luzon lockdown in the Philippines,” *International Journal Public Health Science (IJPHS)*, vol. 10, no. 3, 2020, doi: 10.11591/ijphs.v10i3.20844.
- [49] K. Fuller *et al.*, “A Paradigm Shift in US Experiential Pharmacy Education Accelerated by the COVID-19 Pandemic,” *American Journal of Pharmaceutical Education*, vol. 84, no. 6, pp. 692–696, 2020, doi: 10.5688/ajpe8149.
- [50] D. Roy *et al.*, “Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic,” *Asian Journal Psychiatry*, vol. 51, no. April, p. 102083, 2020, doi: 10.1016/j.ajp.2020.102083.
- [51] World Health Organization, “WHO Coronavirus (COVID-19) Dashboard,” [Online]. Available: <https://covid19.who.int> (accessed Aug. 26, 2021).
- [52] R. Fairlie and P. Loyalka, “Schooling and Covid-19: lessons from recent research on EdTech,” *npj Science of Learning*, vol. 5, no. 1, pp. 1–2, 2020, doi: 10.1038/s41539-020-00072-6.
- [53] M. Maqableh and M. Alia, “Evaluation online learning of undergraduate students under lockdown amidst COVID-19 Pandemic: The online learning experience and students’ satisfaction,” *Children and Youth Services Review*, vol. 128, no. January, 2021, doi: 10.1016/j.childyouth.2021.106160.
- [54] M. Yıldırım and A. Güler, “Positivity explains how COVID-19 perceived risk increases death distress and reduces happiness,” *Personality and Individual Differences*, vol. 168, p. 110347, 2021, doi: 10.1016/j.paid.2020.110347.
- [55] T. L. P. Agusti, N. Arkhaesi, A. Riansari, and R. Hapsari, “Knowledge, attitudes, and practices of Indonesian medical and non-medical undergraduate students toward COVID-19,” *International Journal Public Health Science (IJPHS)*, vol. 10, no 3, 2020, doi: 10.11591/ijphs.v10i3.20784.
- [56] J. Xiong *et al.*, “Impact of COVID-19 pandemic on mental health in the general population: A systematic review,” *Journal Affective Disorder*, vol. 277, no. July, pp. 55–64, 2020, doi: 10.1016/j.jad.2020.08.001.
- [57] T. Elmer, K. Mephram, and C. Stadtfeld, “Students under lockdown: Comparisons of students’ social networks and mental health before and during the COVID-19 crisis in Switzerland,” *Journal PLoS One*, vol. 15, no. 7, p. e0236337, 2020, doi: 10.1371/journal.pone.0236337.
- [58] L. Ginocchio and A. B. Rosenkrantz, “Exploring Which Medical Schools Cost the Most: An Assessment of Medical School Characteristics Associated With School Tuition,” *Current Problem in Diagnostic Radiology*, vol. 49, no. 2, pp. 85–88, 2020, doi: 10.1067/j.cpradiol.2019.06.009.
- [59] D. Copeland, “Paying for nursing student clinical placements, ethical considerations,” *Journal of Professional Nursing*, vol. 36, no. 5, pp. 330–333, 2020, doi: 10.1016/j.profnurs.2020.01.008.