



Mental Health in Health Students during Coronavirus Disease-19: Systematic Review

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Abstract

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AIM: This study aims to examine the description of mental health characteristics of health students who conducted studies during the Coronavirus disease (COVID)-19 pandemic.

METHODS: The design of this study used a systematic review approach by collecting several articles from a database that has been selected consisting of Springer, Science Direct, and ProQuest with articles published in 2020. Search for articles was carried out by entering the keyword "mental health AND student AND COVID-19." The search for this article was limited to inclusion criteria and exclusion criteria. The inclusion criteria in this study were health students who were still conducting studies during the COVID-19 pandemic and a cross-sectional study design, while the exclusion criteria were non-health students, only abstracts and books, and letters to the editor.

RESULTS: After a search on the selected database, the results are 677 Springer articles, 556 Science direct articles, and 1348 ProQuest articles. Eleven were removed for duplicates, 446 full texts were reviewed, and eight articles matched inclusion and exclusion criteria. The results of the eight articles that were reviewed showed that the majority of health students reported mental health problems such as anxiety, depression, stress, and another emotional status, where moderate and severe levels of anxiety were experienced by some health students who carried out education during the COVID-19 pandemic.

CONCLUSION: The COVID-19 pandemic has an impact on psychological conditions, especially on health students who are carrying out their education. Students report poor mental health conditions while carrying out home education by learning online during the COVID-19 pandemic.

Introduction

Coronavirus disease (COVID)-19 is a type of disease that attacks humans caused by a new virus called severe acute respiratory syndrome coronavirus-2 [1] where the first case of COVID-19 affecting humans occurred in Wuhan China on December 31, 2019 [2], [3]. The results of studies conducted reported that COVID-19 has an impact on a person's mental health conditions, which include depression, anxiety, and stress [4]. The anxiety that occurs does not only have an impact on society in general but also what is of great concern is anxiety for health workers who treat patients with a diagnosis of COVID-19 in the hospital, one of which is a nurse who reports high levels of anxiety [5], [6]. Besides that, those affected by the COVID-19 outbreak are students who are carrying out education where the results show a fairly high rate of depression that occurs even though there is no significant difference in the level of depression between female students and male students [7]. In addition to the depression rate, another problem that was reported was anxiety that occurred in some students who were carrying out distance learning during this pandemic condition, one of the students who were seriously affected was health students, be it medicine,

nursing, and other health students, they considered the COVID-19 outbreak. -19 This is a serious condition that can have serious consequences if not treated promptly [8]. Nursing students assessed the perceived anxiety due to fear of lack of personal protective equipment and fear of infection when faced with unpredictable environmental conditions [9]. Some concerns even so that health students have good knowledge and sufficient coping mechanisms in responding to the COVID-19 pandemic that has hit almost all countries around the world [10]. Given the importance of discussing the effects of the COVID-19 pandemic that can be experienced by students, especially health students who are the backbone of future health, the aim of this study is to discuss various topics related to psychological pressure on health students during the COVID-19 pandemic.

Methods

Design in this study is a literature study using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guide as a guide to getting articles

as shown in Figure 1 to be reviewed in depth. This study uses the PIO format (Population, Intervention/Exposure, Outcome). P: Health Student, I: COVID-19, O: Mental Health. The database used in this study consisted of three databases, namely Springer, ScienceDirect, and ProQuest. The keywords in this study were Mental Health AND Student Health AND COVID-19. The inclusion criteria in this study were to focus on the mental health of health students during the pandemic, studies using quantitative design methods, English articles, the time span used in this study was between January 2020 and December 2020. The exclusion criteria in this study research with the qualitative design, mental health problems in non-health students, epidemiological research, and a letter to the editor were excluded from the study. Research that meets the criteria is shown in a systematic review table. The contents of the table consist of the author's name, year, country, the design used, population and sample, type of mental health disorder experienced, instruments used, and conclusions.

Results

Total of all searches from the three databases was obtained by the number of 677 Springer articles, 556 Science directed articles, and 1348 ProQuest articles. Eleven were deleted because of duplicates, 446 full-text reviews, and eight articles that match the inclusion and exclusion criteria. Table 1 shows the literature review on mental health in health students in the midst of the COVID-19 pandemic. Eight articles were reviewed and found that most of the health students reported mental health problems such as anxiety, depression, stress,

and other emotional state.

Based on Table 1, the distribution of respondents conducted in Savitsky *et al.*'s study, respondents were dominated by female than a male with a total of 244 health students as respondents [9]. In a study conducted by Pandey *et al.*, it was found that the distribution of female student respondents was more than male students with a total of 83 respondents [11], from a study conducted in China by Huang L *et al.*, it was found that the number of female respondents was more dominant than that of male, with a total of 430 respondents [5]. While the research in the USA by Coughenour *et al* found 194 respondents who were dominated by female than male, the same distribution of respondents was also obtained by the study of Eweida *et al.* in Egypt and Xie *et al.* in China where female respondents were more than male respondents [8], [12].

From the observations obtained that the anxiety level in health students of 42.8% is the level of moderate anxiety with the majority occurring in females than males next is severe anxiety with a percentage of 13.1% dominated also by females as well as mild anxiety. Further results showed that the level of anxiety in healthy students was found to be more in women than men with an average ratio of 5 versus 2 ($p < 0.002$) [11]. The level of depression shown in Table 1, health students who experienced a low level of depression was 25.6% and a severe depression level was 7.3%. In a study by Coughenour *et al* (2020), it was shown that the policy Stay at Home made the level of depression in healthy students increased. Higher than before the policy was implemented (average before: 5.58, and after 9.61) [13]. Pandey *et al.* also found that more depression levels were experienced by female students compared to male students (5 vs. 3, $p = 0.025$) [11]. Not only that, nursing students who were interning at hospitals during the COVID-19 pandemic experienced quite high depression, namely, 62.7% [11]. While study of Xie *et al.* in medical student was found that the level of minimal anxiety 13.29%, moderate 1.24 %, and severe 0.25%. This study also founded that level of depression with minimal 13.74%, moderate 3.58%, and severe 0.90% [8]. Study by Dhahri *et al.* was found that the level of depression in medical and dental students was high, with depressive symptoms felt isolated 63.4%, lack of enjoyment 32.9%, trouble sleeping 41.5%, and hopeless about future 26.2% [14]. Research by Williams *et al.* (2021) was found that paramedicine students have level of anxiety with mild 53 (35.1%), moderate 32 (21.19%), and severe 9 (5.96%) [15].

In Table 1, the results of the study show Xie *et al.*'s that health students who spent more than 3 h focusing on COVID-19 information scored higher on all three subscales than those who focused on COVID-19 for <3 h. The three subscales are avoidance subscale: 1–3 h versus 3 h: $p = 0.024$, intrusion subscale: 1 h versus 3 h: $p < 0.001$, 1–3 h versus 3 h: $p < 0.001$, hyperarousal subscale: 1 h versus 3 h: $p = 0.007$, 1–3 h

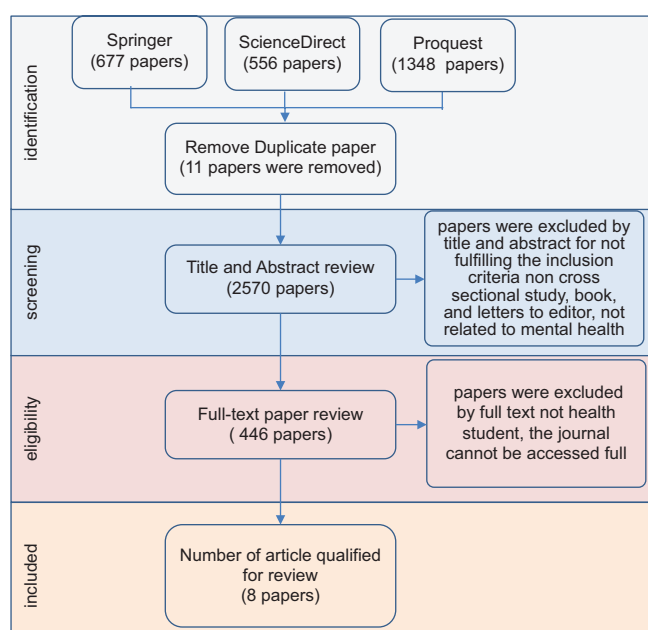


Figure 1: Article search process

Table 1: Systematic review of mental health in health students during COVID-19

Author/year	Country	Study design	Population/sample characteristic	Assesment tools	Mental health			
					Anxiety	Depression	Stress	Emotional respond, etc
Savitsky et al.	Israel	Cross sectional study	1 st year=65 (Female: 89.2%, Male: 10.8%); 2 nd year=61 (F: 86.4%, M: 13.6%), 3 rd year=50 (F: 90%, M: 10%), 4 th year=40 (F: 85%, M: 15%) Total 244 students in the nursing department in the Ashkelon Academic College, Southern District	Anxiety level using The Generalized Anxiety Disorder 7- Item Scale (GAD-7)	Moderate anxiety was 42.8% (30.8% among males and 44.7% among the females) and severe anxiety was 13.1% 0% among males and 14.9% among the females	N/A	N/A	N/A
Pandey et al.	India	Cross-sectional study	83 of medical students and junior doctors of Obstetrics and Gynaecology department are participated, 47 (56.6%) were female and 36 (43.4%) were male	Formal anxiety and depression scores using the GAD-7 and PHQ-9 tools	15/82 (18.3%) had anxiety scores. Females had significantly higher median anxiety (5 vs. 2, P<0.002) than male	21/82 (25.6%) had the lowest possible depression. 6/82 (7.3%) had scores severe depression. Females had higher depression scores (5 vs. 3, P=0.025) than male participants	N/A	N/A
Huang et al.	China	comparative study	The participants' 602 (74.9%) were female, 202 (25.1%) were male. 374 participants (46.5%) were nurses (mean 23.95 ± 1.37 years) and 430 participants (53.5%) were nursing students (mean 19.00 ± 0.84 years)	Emotional Respond the positive and negative emotion (PANAS) scale	Mean (SD) Nurse anxiety: 3.00 (0.94); Nursing College Student: 2.77 (1.14)	N/A	N/A	Mean (SD) Nurse (Fear: 3.16 (0.92); Sadness: 2.84 (0.90); Anger: 2.20 (0.90)). Mean (SD) Nursing College Student (Fear: 2.82 (1.15); Sadness: 2.28 (1.14); Anger: 1.90 (0.96))
Coughenour et al.	USA	Cross-sectional study	Total sample 194, Male: 53 (27.3); Female: 140 (72.2); Transgender 1: (0.5). Class standing: Freshman: 16 (8.2); Sophomore: 26 (13.4); Junior: 64 (33.0); Senior: 48 (274.7); Graduated/other: 40 (20.6)	Patient Health Questionnaire— PHQ-9	N/A	63% of the participants had a worse (higher) PHQ-9 score after the stay-at-home order was issued compared to before its issuance. Mean PHQ-9 score prior to stay-at-home orders of 5.58 compared to a mean post order score of 9.61 (t=9.14, P<0.01)	N/A	N/A
Eweida et al.	Egypt	Cross-sectional descriptive study	Sample of 150 intern-nursing students from 13 pediatric and medical-surgical units at Alexandria University Hospitals. Male: 47 (31.33), Female: 103 (68.67)	General Health Questionnaire (GHQ-12), Middle east respiratory syndrome COVID-19 (MERS-CoV) staff questionnaire	N/A	Most of the intern-nursing students Depressed 62.7%	Intern- nursing students felt under strain 77.3%. Factor causing stress: possibility of getting COVID-19 infection from patients in the hospital and transmitting it to the families (2.89 ± 0.39 and 2.72 ± 0.62); Unavailability of COVID-19 treatment and exposure to the situations, where patients with COVID-19 died in front of them (2.60 ± 0.67 and 2.59 ± 0.68). Factor reducing stress: Protective equipment provided to you by hospital. Clear and Clear guidelines from hospital for infection prevention (2.25 ± 0.81 and 2.09 ± 0.81)	feel worthless (64.7%), felt nervous, scared and angry due to increased workload during COVID-19 outbreak (2.87 ± 0.34 and 2.83 ± 0.42 respectively).Not enjoy their day-to-day activities (63.3%), lost their sense of confidence (60.0%), could not overcome difficulties (56.7%). female students expressed more psychological distress than males (OR=0.17, 95% CI: 0.057–0.49, P=0.001)
Xie et al.	China	Cross-sectional study	2705 undergraduate students were living outside Hubei, and none of them was infected by COVID-19. Medical student: 805 (29.75), Non-Medical: 1900 (70.24%), Male 608 (22.48%), Female: 2097 (77.52)	The Chinese version of the Impact of Event Scale-Revised (IES-R), The Chinese version of the 7-item Generalized Anxiety Disorder Scale (GAD-7), the Chinese version of the depression module of the Patient Health Questionnaire (PHQ-9)	GAD-7: none 85.21%, minimal 13.29%, moderate 1.24%, severe 0.25%; PQH-9: none 81.79%, minimal 13.74%, moderate 3.58%, severe 0.90%	Medical students who spent more than 3 h focusing on COVID-19 had higher scores on all three subscales than those who focused on COVID-19 for less than 3 h (avoidance subscale: 1–3 h versus 3 h: P=0.024, intrusion subscale: 1h versus 3 h: p0.001, 1–3 h versus 3 h: p0.001, hyperarousal subscale: 1h hyperarousal versus 3 h: P=0.007, 1–3 h versus 3 h: P=0.002).	N/A	

(Contd...)

Table 1: (Continued)

Author/ year	Country	Study design	Population/sample characteristic	Assesment tools	Mental health			
					Anxiety	Depression	Stress	Emotional respond, etc
Dhahri <i>et al.</i>	Pakistan	Cross- sectional study	Final year medical and dental students in Pakistan There were a total of 2661 participants who 1753 (65.9%) female while 908 (34.1%) male	The questionnaire was developed, on rating-scales items, psychological symptoms developing symptoms of COVID-19	N/A	Depressive symptoms: Felt isolated 63.4%, lack of enjoyment 32.9%, trouble sleeping 41.5%, and hopeless about future 26.2%	N/A	N/A
Williams <i>et al.</i>	Australia	A convergent mixed method design study	Paramedicine student with total 151 respondents, 74.8% female, 24.8% male	7-item Generalized Anxiety Disorder Scale (GAD-7)	Level of anxiety: Mild: 53 (35.1%), Moderate: 32 (21.19%), Severe: 9 (5.96%)	N/A	N/A	N/A

COVID: Coronavirus disease, CI: Confidence interval.

versus 3 h: $p = 0.002$ [8]. Other emotional status found in health students, especially nursing, were (Table 1), namely: Feeling afraid with the mean (SD): 2.82 (1.15), sadness: 2.28 (1.14), and anger: 1.90 (0.96). Meanwhile, nursing students who were interning at the hospital during the pandemic showed several emotional statuses such as: Feeling worthless (64.7%), not enjoying daily activities (63.3%), losing self-confidence (60.0%), unable to overcome difficulties (56.7%). female students expressed more psychological distress than boys (OR = 0.17, 95% confidence interval [CI]: 0.057–0.49, $p = 0.001$) [12].

Discussion

Based on the results of this study, it can be seen that there are several mental health problems experienced by health students during the COVID-19 pandemic. Mental health disorders include anxiety, depression, stress, and other emotional state. Research conducted by Savitsky *et al.* (2020) shows the percentage of health students who have moderate (42.8%) and severe (13.1%) anxiety disorders [9]. Studied by Williams *et al.* (2021) also found that paramedicine student has level of mild anxiety 53 (35.1%), moderate 32 (21.19%), and severe anxiety 9 (5.96) [15]. During normal conditions or before the COVID-19 pandemic came, even the level of anxiety among health students showed a high enough level [9]. However, with the changing circumstances during the COVID-19 pandemic, it was an added factor that health students experienced anxiety. Thoughts about continuing education in the future and the fear of contracting a virus infection are factors that trigger the level of anxiety among health students during the COVID-19 pandemic [9]. Comparing with study of Huang *et al.* founded that nurse's anxiety more higher than nursing college student [5]. While research conducted by Puci stated that anxiety was very dominant, especially among health workers in Italy, 59.19% were afraid of being infected with COVID-19; besides that health workers reported sleep disturbances with a percentage

of 63.43% [16]. Nurses who treated patients with a diagnosis of COVID-19 in China also felt the same anxiety. The results showed that the psychological disorders that often occurred in nurses were anxiety 40.8% (95% CI: 34.4–47.2%) and depression of 26.4% (95% CI: 20.6–42.2%) [17].

Research by Eweida *et al.* found that nursing students who are currently interns even experience depression, feel under pressure, and feel useless (62.7%; 77.3%, and 64.7%) [12]. In the study by Dhahri *et al.* was also found that the level of depression in medical and dental students were high, with depressive symptoms felt isolated 63.4%, lack of enjoyment 32.9%, trouble sleeping 41.5%, and hopeless about future 26.2% [14]. Xie *et al.* also found that the students experiencing depression from minimal to severe depression [8]. COVID-19 causes health workers such as nurses and health students to express their experiences related to the uncertainty and fatigue felt, especially nurses who directly deal with COVID-19 patients [18]. In Coughenour's *et al.* (2020) study, there was a significant reduction in self-reported minutes of physical activity and worse depression scores in survey participants after stay-at-home orders were issued compared to before the policy was enforced [13]. This is because the COVID-19 pandemic comes on suddenly and is unprecedented and is likely to worsen or cause new mental health and stress-related disorders. As a result, there is a need to adapt and/or cope with the major changes that result. The ability of health students to regulate emotions is needed for this adaptation process so that it can reduce the mental health impact that occurs on health students during the pandemic period [13]. In addition, nursing students are preparing to participate in efforts to reduce the incidence of COVID-19 in their countries by starting to implement health protocols in their respective schools [19].

Good emotional regulation is also needed for students who are interning or senior students in the hospital because the level of mental health disorders and emotional states such as feelings of nervousness, fear, and anger are also very high [12]. This is due to several stress factors such as the possibility of catching COVID-19 from patients in the hospital and passing it to their families, unavailability of COVID-19 treatment,

and exposure to situations where a patient with COVID-19 dies in front of them [12]. Emotional status disorders can also occur due to a lack of personal protective equipment, especially health workers who are directly involved in the hospital [20]. Even so, Eweida *et al.* in his research also explained that there are several factors that can reduce stress, namely: Adequate protective equipment provided by the hospital for students who are interning, clear guidelines, and from the hospital for infection prevention [12]. Others stated that some nurses who carried out tasks in Hubei China conducted by Cui *et al.* 2020 stated that some of these nurses had good coping mechanisms, strong motivation and good levels of knowledge were important factors to reduce the level of stress that was felt [21].

Xie *et al.* in their research found that by focusing too much on information about COVID-19 for more than 3 h, health students can have higher levels of anxiety and depression [8]. Therefore, health students should reduce watching, reading, or hearing information related to COVID-19 in the news which can increase their mental and emotional health problems. Except for some information that has a reliable source for self-protection from the spread of COVID-19 [11]. Mental health disorders that cannot be controlled will lead to a decrease in the quality of life [22]; therefore, the correct source of information will have a psychological impact on someone regarding the current outbreak, this is an important part because of good education related to the COVID outbreak. -19 also contributes to the adaptive response of a person, especially health workers and health students who will become an important part of healthcare workers in the future [23]. Sources of information are a part that can provide positive adherence to both the community and health workers [24]. In addition, online-based information media that can be trusted affect the level of adaptation and reduce the anxiety that can occur to healthy students [25].

Conclusion

The COVID-19 pandemic has become an epidemic that has greatly shocked the world, not only physical health problems affected by this outbreak but also mental health problems, one of which is anxiety, depression, fear, etc. Things like this can happen in all circles of society but the most at risk of health problems are health workers at the hospital both nurses, doctors, radiologists, and other health workers. Recently, a report that focuses on the health problems of students, especially health students, have become a concern where the results of the study showed that during the pandemic, they felt anxiety, depression, and stress. It is hoped that this review literature research will illustrate the mechanisms that must be taken to solve this

problem in the future.

References

- Zhang J, Lu X, Jin Y, Zheng Z. Hospitals' responsibility in response to the threat of infectious disease outbreak in the context of the Coronavirus disease-2019 (COVID-19) pandemic: Implications for low-and middle-income countries. *Glob Health J.* 2020;4(4):113-7. <https://doi.org/10.1016/j.glohj.2020.11.005> PMID:33294250
- World Health Organization. Coronavirus Disease (COVID-19); 2020. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19>. [Last accessed on 2021 Jan 17]. <https://doi.org/10.14293/s2199-1006.1.sor-med.clkmzy.v1>
- Salari N, Khazaie H, Hosseinian-Far A, Ghasemi H, Mohammadi M, Shohaimi S, *et al.* The prevalence of sleep disturbances among physicians and nurses facing the COVID-19 patients: A systematic review and meta-analysis. *Global Health.* 2020;16(1):92. <https://doi.org/10.1186/s12992-020-00620-0> PMID:32993696
- Traunmüller C, Stefitz R, Gaisbachgrabner K, Schwerdtfeger A. Psychological correlates of COVID-19 pandemic in the Austrian population. *BMC Public Health.* 2020;20(1):1395. <https://doi.org/10.1186/s12889-020-09489-5> PMID:32928180
- Huang L, Lei W, Xu F, Liu H, Yu L. Emotional responses and coping strategies in nurses and nursing students during COVID-19 outbreak: A comparative study. *PLoS One.* 2020;15(8):e0237303. <https://doi.org/10.1371/journal.pone.0237303> PMID:32764825
- Milgrom Y, Tal Y, Finestone AS. Comparison of hospital worker anxiety in COVID-19 treating and non-treating hospitals in the same city during the COVID-19 pandemic. *Isr J Health Policy Res.* 2020;9(1):55. <https://doi.org/10.1186/s13584-020-00413-1> PMID:33087169
- Konstantinov V, Berdenova S, Satkangulova G, Reznik A, Isralowitz R. COVID-19 impact on Kazakhstan University student fear, mental health, and substance use. *Int J Ment Health Addict.* 2020;1-7. <https://doi.org/10.1007/s11469-020-00412-y> PMID:33192199
- Xie L, Luo H, Li M, Ge W, Xing B, Miao Q. The immediate psychological effects of Coronavirus Disease 2019 on medical and non-medical students in China. *Int J Public Health.* 2020;65(8):1445-53. <https://doi.org/10.1007/s00038-020-01475-3> PMID:32910208
- Savitsky B, Findling Y, Erel A, Hendel T. Anxiety and coping strategies among nursing students during the COVID-19 pandemic. *Nurse Educ Pract.* 2020;46:102809. <https://doi.org/10.1016/j.nepr.2020.102809> PMID:32679465
- Wang Y, Jing X, Han W, Jing Y, Xu L. Positive and negative affect of university and college students during COVID-19 outbreak: A network-based survey. *Int J Public Health.* 2020;65(8):1437-43. <https://doi.org/10.1007/s00038-020-01483-3> PMID:33063142
- Pandey U, Corbett G, Mohan S, Reagu S, Kumar S, Farrell T, Lindow S. Anxiety, depression and behavioural changes in junior

- doctors and medical students associated with the coronavirus pandemic: A cross-sectional survey. *J Obstet Gynecol India*. 2020;71(1):1-5. <https://doi.org/10.1007/s13224-020-01366-w>
PMid:32989348
12. Eweida RS, Rashwan ZI, Desoky GM, Khonji LM. Mental strain and changes in psychological health hub among intern-nursing students at pediatric and medical-surgical units amid ambience of COVID-19 pandemic: A comprehensive survey. *Nurse Educ Pract*. 2020;49:102915. <https://doi.org/10.1016/j.nepr.2020.102915>
PMid:33227694
 13. Coughenour C, Gakh M, Pharr JR, Bungum T, Jalene S. Changes in depression and physical activity among college students on a diverse campus after a COVID-19 stay-at-home order. *J Community Health*. 2020;1:1-17. <https://doi.org/10.21203/rs.3.rs-70471/v1>
 14. Dhahri AA, Arain SY, Memon AM, Rao A, Mian MA. The psychological impact of COVID-19 on medical education of final year students in Pakistan: A cross-sectional study. *Ann Med Surg (Lond)*. 2020;60:445-50.
PMid:33251004
 15. Williams B, King C, Shannon B, Gosling C. Impact of COVID-19 on paramedicine students: A mixed methods study. *Int Emerg Nurs*. 2021;56:100996. <https://doi.org/10.1016/j.ienj.2021.100996>
PMid:33819846
 16. Puci MV, Nosari G, Loi F, Puci GV, Montomoli C, Ferraro OE. Risk perception and worries among health care workers in the COVID-19 pandemic: Findings from an Italian survey. *Healthcare (Basel)*. 2020;8(4):535. <https://doi.org/10.3390/healthcare8040535>
PMid:33287260
 17. Xiong H, Yi S, Lin Y. The psychological status and self-efficacy of nurses during COVID-19 outbreak: A cross-sectional survey. *Inquiry*. 2020;57:46958020957114. <https://doi.org/10.1177/0046958020957114>
PMid:32900271
 18. Arasli H, Furunes T, Jafari K, Saydam MB, Degirmencioglu Z. Hearing the voices of wingless angels: A critical content analysis of nurses' COVID-19 experiences. *Int J Environ Res Public Health*. 2020;17(22):8484. <https://doi.org/10.3390/ijerph17228484>
PMid:33207740
 19. Lee RLT, West S, Tang ACY, Cheng HY, Chong CYY, Chien WT, et al. A qualitative exploration of the experiences of school nurses during COVID-19 pandemic as the frontline primary health care professionals. *Nurs Outlook [Internet]*. 2020:1-10. Available from: <http://www.sciencedirect.com/science/article/pii/S0029655420307107>
PMid:33541726
 20. Alrubaiee GG, Al-Qalah TA, Al-Aawar MS. Knowledge, attitudes, anxiety, and preventive behaviours towards COVID-19 among health care providers in Yemen: An online cross-sectional survey. *BMC Public Health*. 2020;20(1):1541. <https://doi.org/10.21203/rs.3.rs-32387/v5>
PMid:33050896
 21. Cui S, Zhang L, Yan H, Shi Q, Jiang Y, Wang Q, et al. Experiences and psychological adjustments of nurses who voluntarily supported COVID-19 patients in Hubei Province, China. *Psychol Res Behav Manag*. 2020;13:1135-45. <https://doi.org/10.2147/prbm.s283876>
PMid:33312005
 22. Sansó N, Galiana L, Oliver A, Tomás-Salvá M, Vidal-Blanco G. Predicting professional quality of life and life satisfaction in Spanish nurses: A cross-sectional study. *Int J Environ Res Public Health*. 2020;17(12):4366. <https://doi.org/10.3390/ijerph17124366>
PMid:32570795
 23. de Tantillo L, Christopher R. Implementing the national incident management system at schools of nursing in response to COVID-19. *J Prof Nurs*. 2021;37(2):255-60. <https://doi.org/10.1016/j.profnurs.2020.12.013>
PMid:33867077
 24. Jiménez-Rodríguez D, García MT, García AS, Del Pino FJ, Ponce-Valencia A, Arrogante O. Nurse training in gender-based violence using simulated nursing video consultations during the COVID-19 pandemic: A qualitative study. *Int J Environ Res Public Health*. 2020;17(22):8654. <https://doi.org/10.3390/ijerph17228654>
PMid:33233390
 25. Jackman D, Konkin J, Yonge O, Myrick F, Cockell J. Crisis and continuity: Rural health care students respond to the COVID-19 outbreak. *Nurse Educ Pract*. 2020;48:102892. <https://doi.org/10.1016/j.nepr.2020.10289>
PMid:32980557