

Undergraduate Students' Stress Level during the Spread of COVID-19 Situation

Kuantean Wongchantra¹, Prayoon Wongchantra², Uraiwan Praimee², Kannika Sookngam², Suparat Ongon²,
Likhit Junkaew², Phanadda Ritsumdaeng², Surasak Kaeongam² & Thongchai Pronyusri²

¹ Srimahasarakham Nursing College, Faculty of Nursing, Praboromarajhanok Institute, Mahasarakham, Thailand

² Faculty of Environment and Resource Studies, Mahasarakham University, Mahasarakham, Thailand

Correspondence: Prayoon Wongchantra, Faculty of Environment and Resource Studies, Mahasarakham University, Mahasarakham, Thailand. E-mail: prayoon_nam@yahoo.co.th

Received: February 19, 2022

Accepted: March 8, 2022

Online Published: March 10, 2022

doi:10.5430/ijhe.v11n5p1

URL: <https://doi.org/10.5430/ijhe.v11n5p1>

Abstract

This study aims to study and compare stress level during the COVID-19 situation of undergraduate students with different gender and year levels. The sample were 276 undergraduate students in the 2nd semester of the academic year 2020, being selected by voluntary sampling. The tool was the stress level in the situation of the Coronavirus disease 2019 measurement form with online system Google form. The frequency, percentage, mean, standard deviation, including hypothesis testing using One-Way ANOVA were analyzed as the statistics. The finding showed that: 1) Undergraduate students' stress level during the COVID-19 situation, almost of 118 students was a high level of stress, representing 42.75%, followed by severe level of stress, 107 students, representing 38.77%. The moderate level of stress was 45 students, representing 16.30%, and the low level of stress was 6 students, representing for 2.17%. 2) There was statistically significant different of stress level during the COVID-19 situation of students with different gender ($p < .05$). Female students' stress level was higher than male students. There was no different of stress level during the COVID-19 situation of students with different year levels.

Keywords: stress level, COVID-19, undergraduate students, gender, year levels

1. Introduction

The COVID-19 was first detected in Wuhan, Hubei province, China which found evidence of human-to-human transmission. Later, the number of patients increased in mid-January 2020 and have found confirmed patients in countries in the world. Until on March 11, 2020, the World Health Organization has declared COVID-19 a pandemic with rapidly increasing number of patients and deaths. The mortality rate from the disease is approximately 4.60 %. The most common symptoms of COVID-19 are fever, fatigue and dry cough. Some patients may experience aches and pains, stuffy nose, runny nose, sore throat, or diarrhea. These symptoms are usually not severe. But it is reported that about 1 in 6 people exposed to COVID-19 is severely ill and has trouble breathing. Most of the patients with severe symptoms were the elderly and those with underlying diseases such as diabetes, heart disease, and the incubation period. (From exposure to the virus until symptoms appear) between 2-14 days (Kritchakanthorn Suwannaphan, 2020).

The impact of COVID-19 during an escalating outbreak or even this latest outbreak. Many countries need to close their places to prevent the spread including academy. Although some educational institutions use online teaching measures instead. In which Dhawan (2020) discusses the coronavirus disease 2019 (COVID-19) impact to educational institutions, especially college, university, schools around the world. Massive epidemic affects the education system, increase the workload of teachers and staff, make university and schools have to close to prevent the spread and use online teaching measures instead. But in such emergency situations, online teaching may not be as intense as it is in the classroom or some educational institutions may not be able to teach at all. Whether it's because of the student or instructor, it affects students who have to switch to online learning. Causing some students to have problems from interrupted learning to the unpreparedness of their parents. Computer equipment shortages, access to the internet, excessive screen time, lack of interaction with friends because students have to stay at home, lack of

reviewing lessons for a long time, knowledge may be lost. Finally, it is causing stress for both students and teachers. As a result, students have a decrease in learning. Jitendra Singh et al. (2021) noted that the coronavirus disease 2019 (COVID-19) pandemic changed the landscape of higher education and blended studying. Teachers had to adjust due to their inexperience in teaching online. During the academic year 2/2019, Mahasarakham University was affected by the COVID-19 situation. There are many students, teachers, staff and people around the university infected with the virus. Students must stop studying onsite and wait for policies and measures from the university. Therefore, there was a policy from the university administrators to provide online teaching and learning, except for practical courses. And has announced various preventive measures, causing students to have to adjust in many ways. Whether it is the surrounding environment, social status, economy, family and friends including personal relationships with different levels of people and self-expectations, family and from other persons. All of these things are factors that encourage students to become more stressed.

Therefore, the researcher expects that undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University will be affected resulting in stress. Which may be caused by various factors and different levels of stress. Therefore, the researcher wants to study the undergraduate students' stress levels during the spread of COVID-19 situation. In order to obtain basic information for prevention and reduction of stress for students. Therefore, the researcher has studied the levels of stress during the COVID-19 situation among students of different gender and year levels. And to serve as a guideline for studying and developing effective stress management methods in the future.

2. Method

2.1 Research Conceptual Framework

Research on undergraduate students' stress level during the spread of COVID-19 situation, there are steps to study as follows: phase 1, the creation and quality of research tools, such as the COVID-19 stress measurement form. And tool quality finding by experts to determine the consistency of tools and try out with 30 students. Phase 2, data collection with the sample, 1-4 year, 276 students in the 2nd semester of the academic year 2020, were selected by voluntary sampling. And analyzed the stress level of students during the spread of the COVID-19 (As shown in Figure 1).

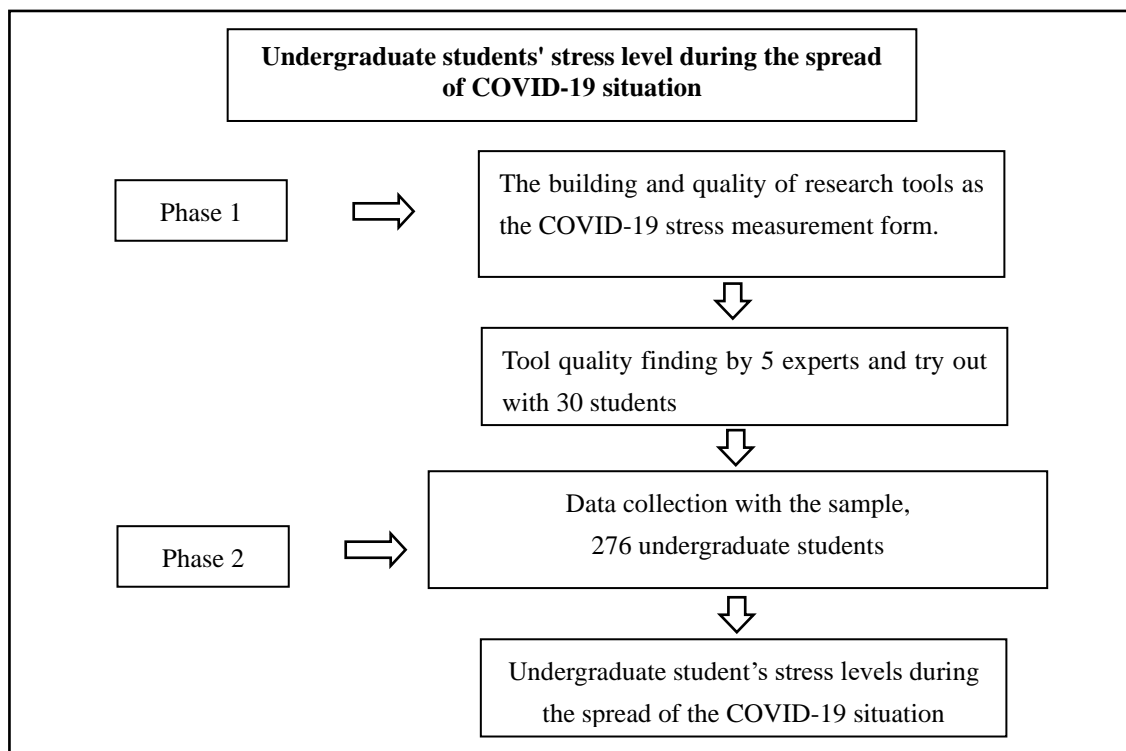


Figure 1. Research conceptual framework

2.2 The Sample

329 undergraduate students in years 1-4 in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University in the 2nd semester of the academic year 2020 were used as the population in this research.

276 undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University in the 2nd semester of the academic year 2020, which were derived from volunteer sampling were used as the sample.

2.3 The Variables

The students' gender and year levels were used as the independent variables.

The undergraduate students' stress levels during the spread of the COVID-19 situation were used as the dependent variables.

2.4 Checking the Research Tools' Quality

Undergraduate students' stress level during the spread of the COVID-19 situation, there is a tool used to collect information, namely, the undergraduate students' stress levels during the spread of the COVID-19 measurement form, online measurement Google form with the steps to create and find the tool' quality.

2.4.1 Study principles and methods for creating an undergraduate students' stress level during the spread of the COVID-19 measurement form to review the theories, concepts and many researches as a guideline for creating a stress level during the spread of the COVID-19 measurement form.

2.4.2 Create undergraduate students' stress level during the spread of the COVID-19 measurement form. The researcher modified the stress level measurement model of the Department of Mental Health (SPST - 20), there are 20 items. It was a multiple choice test with 5 levels: 1 means not stressed, 2 means slightly stressed, 3 means moderately stressed, 4 means very stressed, and 5 means feeling extremely stressed by choosing to answer questions with the most correctness and truth. Interpretation of stress levels use criteria according to the Department of Mental Health as follows: average score 0-23 means that you are stressed at a low level; average score 24-41 means that you are stressed at a moderate level; average score 42-61 means that you are stressed at a high level; score of 62 or higher means that you stressed at an extremely level.

2.4.3 Bring the created an undergraduate students' stress level during the spread of the COVID-19 measurement form sent to experts to consider the consistency of tools, indicated that it was an IOC value of 1.00 and the validity was 3.91, showed that the measurement form was the most appropriate level, it can be used to collect data.

2.4.4 Improve the undergraduate students' stress level during the spread of the COVID-19 measurement form according to expert recommendations. Then, try out with 30 undergraduate students to find the difficulty, individual value of authority and the confidence of the whole version, found that: the authority of all questions was to classify each item in the applicable level, i.e., between 0.20-0.70 while the whole confidence value was found to be 0.879, indicating that all questions were higher confidence than the criterion and could be used for data collection.

2.5 Data Collection

Data collection was conducted with 276 undergraduate students being the sample which were derived from voluntary sampling by using the online questionnaire Google form which collected data from December 2020 to March 2021.

2.6 Data Analysis Statistics

2.6.1 The mean, percentage, frequency and standard deviation were analyzed as the basic statistics.

2.6.2 Statistics for testing the efficiency of the tool were the Index of item Objective Congruence (IOC), the suitability of measurement form, the discriminant power of measurement form and the confidence value.

2.6.3 One-Way ANOVA was used as statistics test results and hypotheses at the .05 level of statistical significance.

3. Results

The results of the undergraduate students' stress level during the spread of the COVID-19 situation be summarized as follows:

3.1 It showed that almost of the undergraduate students' level of stress was a high of 118 students, representing 42.75%, followed by extremely stress of 107 students, representing for 38.77%. The stress level was moderate of 45 students, representing for 16.30%, and the stress level was at a low level of 6 students, representing for 2.17% (As

shown in Figure 2).

When studying the stress level of undergraduate students during the COVID-19 situation, classified by item, it was found that the undergraduate students had the high stress level, which was fear about the impact of vaccination from the government (\bar{x} =3.54), followed by the family with no income Not enough money to spend due to the COVID-19 pandemic (\bar{x} =3.50), concerned about the current increased number of infections (\bar{x} =3.34) and the undergraduate students had the least stress level, i.e. headache, abdominal pain from stressful condition ,stress from the COVID-19 epidemic (\bar{x} =2.16).

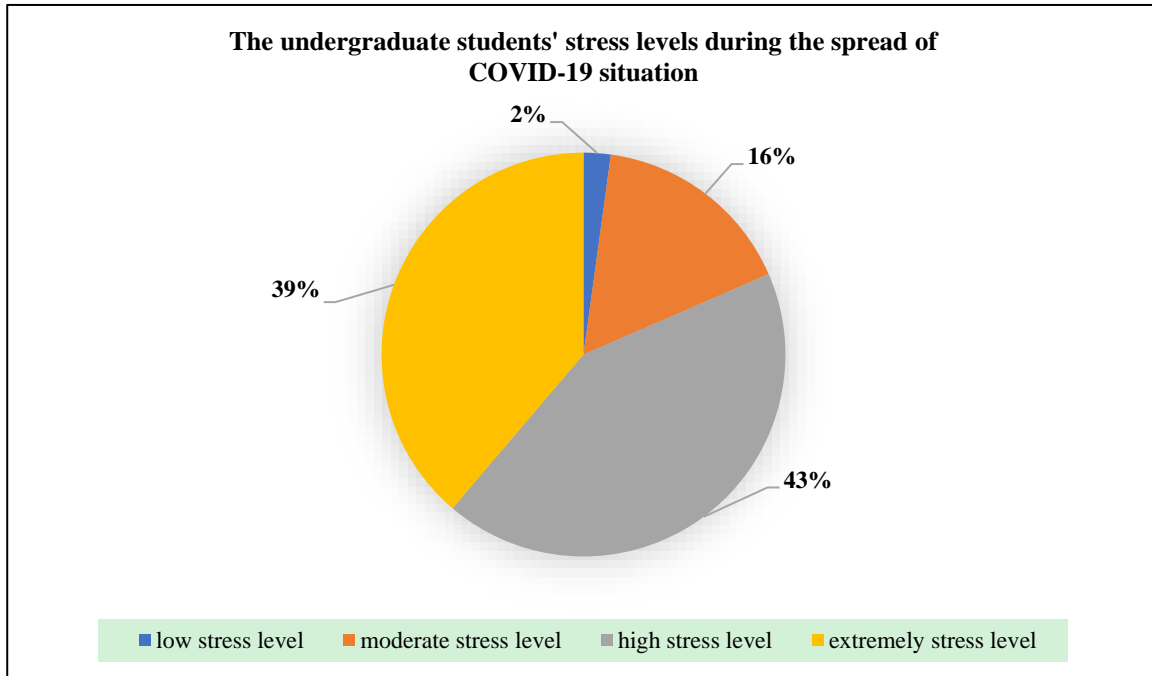


Figure 2. Chart showing of the undergraduate students' stress levels during the spread of COVID-19 situation

3.2 The results of the comparison of stress level during the COVID-19 situation of students with different gender and year levels.

It showed that there was statistically significance different of stress level during the COVID-19 situation of students with different gender ($p < .05$). When analyzing the stress level, it was found that female' stress levels during the COVID-19 situation were higher than male.

It was found that there were no different of stress levels during the COVID-19 situation of students with different year levels. (As shown in Table 1-2).

Table 1. One-way covariance of stress levels during the COVID-19 situation of students with different gender and year levels by One-Way ANOVA

Independent Variable	Dependent Variable	SS	df	MS	f	p
gender	Stress levels during	3.147	1	3.147	4.639	0.032*
year levels	the COVID-19 situation	1.364	3	0.455	0.659	0.578

* Statistically significant .05

Table 2. The comparison of stress level during the COVID-19 situation of undergraduate students with different gender.

Gender	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
male	2.725	.089	2.549	2.901
female	2.956	.060	2.839	3.073

4. Discussion

4.1 The finding of the undergraduate students' stress levels during the spread of COVID-19 situation, showed that almost of the undergraduate students' level of stress was high. This may be a consequence of Maha Sarakham province has been declared a maximum control area due to the spread of the COVID-19 situation. As a result, the university announced online learning to reduce the risk. Students must study at home or dormitory without meeting teachers or friends. When there is a problem or doubt about studying, there may be concern. In which Department of Mental Health (2005) describes stress as any event or condition that causes difficulty in making decisions. Anxiety about the uncertainty of the situation or a feeling of fear of danger that will happen. Stress is a stressful state in a person when something threatens it. It creates a physical, mental, emotional, social and spiritual imbalance of the person including the physical and mental development of the person. In other words, stress is a defense mechanism that occurs when external threats interfere (Oraphan Lueboonthawatchai, 2002). In addition, stress is a state of emotion or feeling that occurs when a person is faced with a problem and feels pressured, uncomfortable, disturbed, afraid, anxious, and oppressed. When a person perceives or assesses those problems as mentally threatening or potentially harmful to the body, the state of mind-body balance is impaired (Srichan Pornjirasilp, 2014). And Christiaan H. Vinkers et al. (2020) discussed the epidemic of the 2019 novel coronavirus SARS-CoV-2, cause the coronavirus disease 2019 is a global public health emergency with multifaceted severe consequences for people's lives and their mental health. This is consistent with the findings of Hakime Aslan and Hatice Pekince (2020) found that nursing students were moderately stressed about the COVID-19 epidemic. And Deemah A. AlAteeq, Sumayah Aljhani and Dalal AlEesa (2020), studied the stress of students in virtual classrooms during the COVID-19 outbreak in Saudi Arabia, it was found that more than half of the participants surveyed were stressed at the moderate level, accounting for 55%. While 30.2% had high levels. And Jiraporn Sappavirawong et al. (2016) found that half of nursing students had high levels of stress. The cause of stress comes from learning activities. And Jutharat Satirapanya (2016) found that the students' level of stress was a high. And consistent with the findings of Kritapat Fuekfon et al. (2018) found that overall, it's at a moderate level. And Hena Yasmin et al. (2020) found that the students' stress was concerned, there are plenty of reasons which can cause stress in a student's life, some of these are; mismatch between the student and the teacher which can raise tension and cause stress.

The undergraduate students' stress level during the COVID-19 situation, classified by item. It was found that the undergraduate students had the high stress level, which was fear about the impact of vaccination from the government ($\bar{x}=3.54$), followed by the family with no income Not enough money to spend due to the COVID-19 pandemic ($\bar{x}=3.50$), concerned about the current increased number of infections ($\bar{x}=3.34$). And the undergraduate students had the least stress level, i.e. headache, abdominal pain from stressful condition, stress from the COVID-19 epidemic ($\bar{x}=2.16$). This is a result of undergraduate students' perceptions of social media that present negative news from vaccination. Therefore, causing stress from uncertainty. In which Department of Mental Health (2005) that mentioned the cause of stress that it is caused by a mental state, needs, fears, and changing situations in life getting sick chronic illnesses, etc. And Thanyarat Chantarasena (2012) mentioned that people's stress will increase from consuming news from the media, especially the heartbreaking news of escaping from problems or escaping stress. This is consistent with the findings of Chadapha Prasertsong et al. (2021) found that nursing students had increased stress in online learning from the COVID-19 situation. And Nattapicha Khunsantipong et al. (2020) studied factors associated with stress among Thai traditional medicine students in Eastern Thailand, it was found that most of the students had extremely stress, accounting for 68.66%. The main stress factor of students is social aspect, i.e. not having enough time to relax. And the aspect of learning, including the inability to clearly understand the contents of the course and the schedule for each week is not appropriate. And Apinya Ing-art et al. (2020) found that students had a high level of concern in every aspect. The number one concern was the dimensions of the economy and finances, followed by education and concerns arising from the epidemic situation of the coronavirus disease 2019.

4.2 The results of the comparison of stress level during the COVID-19 situation of different gender and year levels students.

4.2.1 The effects of the comparison of stress levels during the COVID-19 situation of students with different gender using One-Way ANOVA showed that there was statistically significance different of stress levels during the COVID-19 situation of students with different gender. When analyzing the stress level, it was found that female had higher stress level during the COVID-19 situation than male. This may be a consequence of females being more sensitive than males. When an event or situation occurs or changes dramatically, it results in more intense feelings of fear, anxiety, and uneasiness. According to the concept of Wallace and Mc Donald (1987), has classified the causes of stress into 2 causes: endogenous stressor, which is the stress caused by the person itself, such as the physical structure, physiologic, level of development and learning, pain, thoughts, dreams and expectations, etc. and

exogenous stressor are stress arising from the environment, society and interpersonal relationships. Phong Hardan (1997) said that stress is caused by different causes, such as stress due to disappointment, stressed due to being pressured by time, stressed due to overwork, stressed because too much intention, stressed due to problems at work, stress due to suppression, stressed due to sudden changes, stress due to family conditions and stress due to personal circumstances. And Supani Saritwanich (2009) mentioned the causes of stress, namely personality problems, change in life, personal problems, family problems, financial problems and gender differences. All of these factors affect stress. This is consistent with the findings of Lorena García-Fernández et al. (2020) found that females experience more severe symptoms of anxiety, depression, and stress than males. And XiaoXiao et al. (2020) studied the psychological impact of healthcare workers in China during the COVID-19 pneumonia epidemic, it was found that females experience higher levels of stress than males. And Marie Dahlin, Nils Joneborg and Bo Runeson (2005) studied the stress and depression of medical students, it was found that gender differences influenced stress levels among medical students, in which females have higher levels of stress than males. And Sudkanung Plangpongphan et al. (2017) found that Thai nursing students and Mojokerto Jombang, East Java Islands, Indonesia, males and females were significant differences in stress levels ($p < 0.05$).

4.2.2 The effects of the comparison of stress levels during the COVID-19 situation of students with different year levels, showed there were no different of stress levels during the COVID-19 situation of undergraduate students with different year levels. This may be due to the fact that the university has announced online learning to reduce the risk for students at the same time in every year and in all faculties. Therefore, the year level does not affect the stress level of the students. Department of Mental Health (1997) said that adolescents in the higher education system are the age with the development of thought processes especially the abstract thinking must be adjusted to suit the age range between adolescents and adults. Sriruen Kaewkangwan (2006) mentioned that the mental health of Thai adolescents is becoming a public health and social problem that should be given attention. Because stress among adolescents has a high level of stress and tends to increase. And Suchitra Leungamornlert (2003) discussed the current economic and global changes affecting their living and psychological problems, especially stress, that tend to increase. Especially adolescents who have grown and transformed into adults both physically and mentally. This is consistent with the finding of Hamza Mohammad Abdulghani (2008) studies stress and depression in medicine: a cross-sectional study at a medical college in Saudi Arabia, it was found that there were no different of stress of students with different grade level. And Jiraporn Sappavirawong et al. (2016) studied stress, stress management and the need for assistance from nursing students, showed that there were no different of stress of students with different grade level. And Jutharat Satirapanya (2016) showed that the students had high levels of stress and the students in different years had no difference in stress. And Saowaluk Minan and Napassorn Khumthanom (2010) studied a study of the differences in stress and stress management methods from year 1-4 undergraduate students in Business Management and English, Faculty of Management Science, Silpakorn University, Phetchaburi Information Campus, showed that undergraduate students with different year level were no different of stress.

Acknowledgements

This research project was financially supported by Mahasarakham University. This research was successfully completed thanks to the great kindness and help from the Srimahasarakham Nursing College, Praboromarajhanok Institute, Maha Sarakham, Thailand.

References

- Apinya Ingard, Natthaporn Karnjanapoomi & Pornphan Sheoychitra. (2020). Undergraduate Students' Anxiety during the Coronavirus Disease Epidemic in 2019. *MUT Journal of Business Administration*, 17(2), July–December, 94-113.
- Chadapha Prasertsong, Jarinwan Saenghiranrattana & Pornchana Kladkaew. (2021). The factor related to stress of online learning due to the COVID-19 situation among nursing students. *Journal of Somdet Chaopraya Institute of Psychiatry*, 15(1), March, 14-28.
- Christiaan H. Vinkers, Therese van Amelsvoort, Jonathan I Bisson, Igor Branchi, John F. Cryan, Katharina
- Deemah A. AlAteeq, Sumayah Aljhani & Dalal AlEesa. (2020). Perceived stress among students in virtual classrooms during the COVID-19 outbreak in KSA. *Taibah University Journal of Medical Sciences*, 15(5), October, 398-403. <https://doi.org/10.2098/geronb/gbaa120>.
- Department of Mental Health. (1997). *Stress and mental health of Thai people*. Ministry of Public Health: Bangkok.
- Department of Mental Health. (2005). *Self-relieving guide for teenagers*. Ministry of Public Health. 1st edition, The War Veterans Organization's Publisher.

- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>.
- Domschke, Mirko Manchia, Luisa Pinto, Dominique de Quervain, Mathias V. Schmidt and Nic van der.
- Hakime Aslan & Hatice Pekince. (2020). Nursing students' views on the COVID 19 pandemic and their perceived stress levels. *Perspectives in psychiatric*, 695-701. <https://doi.org/10.1111/ppc.12597>
- Hamza Mohammad Abdulghani. (2008). Stress and depression among medical students: a cross sectional study ATA Medical College in Saudi Arabia. *Pak J Med Sci.*, 24(1), January-March, 12-17. <https://doi.org/10.1093/geronb/gbaa120>.
- Hena Yasmin, Salman Khalil & Ramsha Mazhar. (2020). Covid 19: stress management among students and its impact on their effective learning. *International Technology and Education Journal*, 4(2), December, 65-74.
- Jiraporn Sappavirawong, Matchima Dammee, Chanjira Nimsuwan, Chutima Mud Adam, Suparat La-Eadkarn & Suchawadee Sophon. (2016). Stress, Causes of Stress, Stress Management and the Need to Supports Nursing Students. *Journal of Nursing and Education*, 9(3), July-September, 36-50.
- Jitendra Singh, Keely Steele & Lovely Singh. (2021). Combining the best of online and face-to-face learning: hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, 50(2), 140-171. <https://doi.org/10.1177/00472395211047865>.
- Jutharat Satirapanya. (2016). *The stress of undergraduate students*. Master thesis Chulalongkorn University.
- Kritchakanthorn Suwannaphan. (2020). Factors related to stress on infectious disease outbreaks Coronavirus disease 2019 (COVID-19) of students of the Faculty of Public Health and Allied Health Sciences, Praboromarajchanok Institute. *Journal of Health Science Research*, 14(2), May–August, 138-148.
- Krittapat Fuekfon, Premrudee Sriwichai, Surangkana Chairinkham & Paphatchaya Thanyapansin. (2018). Stress and factors related to stress of nursing students regarding the first clinical nursing practice. *Nursing Public Health and Education Journal*, 19(1), January - April, 161-182.
- Lorena García-Fernández, Verónica Romero-Ferreiro, Sergio Padilla & Pedro David López-Roldán. (2020). Gender differences in emotional response to the COVID-19 outbreak in Spain. *Brain and Behavior*, 11(345), January, 1-5. <https://doi.org/10.1002/brb3.1934>.
- Marie Dahlin, Nils Joneborg & Bo Runeson. (2005). Stress and depression among medical students: a cross-sectional study. *Medical Education*, 39(6), June, 594-604. <https://doi.org/10.1111/j.1365-2929.2005.02176.x>
- Natthaphitcha Khunsantiphong, Saowaluck Chantasean, Apinya Chuangtaisong, Nunnaphat Chatchawal, Chantaraporn Meethongsan & Sangchai Muipong. (2020). Factors Associated with Stress among Thai Traditional Medicine Students in Eastern Thailand. *Thai Journal of Public Health and Health Sciences: TJPHS*, 3(3), September-December, 52-63.
- Oraphan Lueboonthawatchai. (2002). *Mental Health and Psychiatric Nursing*. Bangkok: Darn Sutha Printing.
- Phong Hardan. (1997). *Introduction to Industrial and Organizational Psychology*. Bangkok: Center for additional media.
- Saowaluk Minan & Napassorn Khumthanom. (2010). *A study of the differences in stress and stress management methods from year 1-4 students in Business Management and English*. Faculty of Management Science, Silpakorn University, Phetchaburi Information Campus. Bachelor's degree of Business Management and English Languages. Silpakorn University.
- Srichan Pornjirasilp. (2014). *Stress and how to deal with stress*. Department of Pharmacology, Faculty of Pharmacy. Mahidol University.
- Sriruen Kaewkangwan. (2006). *Developmental Psychology of Life at All Ages, Volume 2, Adolescents and Elderly*. Bangkok: Thammasat University.
- Suchitra Leungamornlert. (2003). *Developmental Psychology*. Bangkok: Thai Wattana Panich Publisher.
- Sudkanung Plangpongphan, Wilaiporn Khamwong, Tantawan Yamboonruang, Dwiharini Puspitaningsih and Budi Prasetyo. (2017). Stress levels in nursing students in Thailand, Mojokerto and Jombang district, East Java Indonesia. *Journal of Health Science Research*.11(1), January–June, 43-51.
- Supani Saritwanich. (2009). *Modern organizational behavior: concepts and theories*. (7th edition). Bangkok:

Thammasat University.

Thanyarat Chantarasena. (2012). *Stress of first year undergraduate students, Srinakharinwivot University*. Higher Education Program, Srinakharinwirot University.

Wallace & Mc Donald, J. (1987). Living with Stress. *Nursing Time*, 74(11), 457-458. <https://doi.org/10.1007/BF00446110>

Wee. (2020). Stress resilience during the coronavirus pandemic. *European Neuropsychopharmacology*, 35, 12-16. <https://doi.org/10.1016/j.euroneuro.2020.05.003>.

XiaoXiao, Xiaobin Zhua, Shuai Fua, Yugang Hub, Xiaoning Lia & Jinsong Xiaoaand. (2020). Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. *Journal of Affective Disorders*, 274, 405-410. <https://doi.org/10.1016/j.jad.2020.05.081>.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).