

# Stress, adversity quotient, and health behaviors of undergraduate students in a Thai university during COVID-19 outbreak

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## Abstract

**Background:** University students are an essential human resource for national development. Thus, it is important to study the stress, adversity quotient, and health behaviors of these students during the COVID-19 pandemic.

**Objective:** This study aimed to identify stress, adversity quotient, and health behaviors and examine the relationship between these factors in undergraduate students during the COVID-19 outbreak.

**Methods:** The current study was a quantitative study with a cross-sectional design conducted from 27 November to 10 December 2020. A total of 416 undergraduate students in a Thai university were selected using a convenience sampling technique. A questionnaire was used to collect the data on stress, adversity quotient, and health behaviors of undergraduate students during the COVID-19 outbreak. Data were analyzed using mean, standard deviation, and Pearson's Product Moment Correlation Coefficient.

**Results:** This study indicated that stress was at a high level ( $3.54 \pm .53$ ; Mean  $\pm$  SD), adversity quotient was at a high level ( $3.77 \pm .63$ ; Mean  $\pm$  SD), and health behaviors were at a moderate level ( $3.06 \pm .53$ ; Mean  $\pm$  SD). The current study also found that stress and adversity quotient were irrelevant. Stress and health behaviors were negatively correlated with a level of significance of .01 ( $r = -.31$ ), and adversity quotient and health behaviors were positively correlated with a level of significance of .01 ( $r = .051$ ).

**Conclusion:** It is suggested that healthcare providers, families, and professors should consider stress and adversity quotient in developing interventions to promote healthy behaviors in terms of physical and psychological factors in university students.

## Keywords

stress; adversity quotient; health behaviors; COVID-19; outbreak; undergraduate students

In December 2019, the first cases of COVID-19 were found in the city of Wuhan, Hubei Province, China (Hou et al., 2020). Several researchers collected samples from patient's airways and revealed the presence of a novel strain of coronavirus (Tan et al., 2020). The World Health Organization (2020a) announced that the novel coronavirus was considered a pandemic due to its rapid spread. In every region of the world, people infected with

the new coronavirus first developed symptoms of fever and dry cough; after a week, the patient experiences shortness of breath. COVID-19 causes pneumonia and is accompanied by inflammation that may be severe and can lead to internal organ failure (World Health Organization, 2020a). As of June 2020, the COVID-19 patients had increased to more than 6.5 million people infected with the novel coronavirus worldwide, and there had been 380,000

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deaths (World Health Organization, 2020b). Following this outbreak, people around the world have difficulty in living their lives. For example, COVID-19 causes stress, coping, problem-solving, isolation, loneliness, and depression (Amaral-Prado et al., 2020; Kong et al., 2020), which influence students' health behaviors (Xiong et al., 2020). These psychological and emotional issues may affect their study patterns, graduation, and employment status in the future (Ministry of Public Health, 2020).

Currently, universities in Thailand offer a wide range of Thai and international programs for Thai and overseas students, ranging from undergraduate, graduate studies and several short training courses. The COVID-19 pandemic is an important opportunity to manage education in the "new normal" way, a large conceptual shift that must be aligned and connected to the learning of students (Sahu, 2020). COVID-19 brings not only life crisis but also psychological stress - tension, anxiety, sadness, and fear - among the patients, students, and healthcare providers (Song, 2020). To deal with the COVID-19 crisis, Thailand is trying to reduce the pandemic (Din et al., 2020; Ketphan et al., 2020) by hand hygiene, personal and social distancing, wearing masks, early detection of COVID-19, and also the isolation of patients (Malathum & Malathum, 2020; Velavan & Meyer, 2020).

Stress is a physical and psychological response that results from internal or external stimuli (Turner et al., 2020; Wu, Zhang, et al., 2020). It is associated with changes in body systems that affect a person's mental health and behavior, such as palpitations, sweating, dry mouth, and shortness of breath (Impey et al., 2020; Yang et al., 2020). During the COVID-19 pandemic, it is inevitable that a person will be exposed to stress, which is a normal response to the situation of the COVID-19 crisis and can affect different people, including university students who are at risk of mental health problems (Sahu, 2020).

University students are considered significant human resources for national development (Pacnoy et al., 2017; Suksatan, Ruamsook, et al., 2020). Students in health science curriculums will have future responsibilities for providing all aspects of care to patients - physically, mentally, emotionally, socially, and spiritually - in disease prevention and health promotion (Mullan et al., 2017; Suksatan, Choompunuch, et al., 2020). The students also have to collaborate and coordinate with professional colleagues from different professions (Bronstein et al., 2010; Mueanwaja et al., 2018). Therefore, it is the responsibility of higher education institutions to produce graduates with advanced academic and practical knowledge and enable them to become effective professionals in the future (Suksatan, Ruamsook, et al., 2020).

University students report more significant health behaviors and mental health problems, including increased stress levels, than non-students (Savitsky et al., 2020). The COVID-19 outbreak might have serious consequences for university students who are experiencing significant disruptions in teaching and assessment during the mid-and

final-semester exams of their studies. The students might graduate late because of the postponement of examinations. In addition, students will face the severe challenges of the global recession caused by the COVID-19 pandemic. For the above reasons, the study aimed to examine the stress, adversity quotient, and health behavior levels and examine the relationship between these factors influencing undergraduate students during the COVID-19 outbreak.

## Methods

### Study Design

A cross-sectional study was conducted to examine the stress, adversity quotient, and health behaviors of undergraduate students during the COVID-19 outbreak in Thailand.

### Setting and Sample

Undergraduate students were selected from Maharakham University in Thailand. The research was conducted in the first semester of the academic year. This study included undergraduate students aged more than 18 years old, both male and female, studying at the university and registered in the academic year 2020 of Maharakham University in Thailand. Exclusion criteria were students not willing to participate and could not speak or write in the Thai language. This study used the G\*power program (Faul et al., 2007) to calculate the sample size. A total of 416 participants were selected from the target population using a convenience sampling technique.

### Instruments

The questionnaire adapted from reviewing literature and the previous studies were classified into four parts as follows:

The questionnaire on the student's characteristics consisted of 4-item multiple choices and open-ended questions, developed by the researcher, including gender, academic year, currently studying faculties/ colleges, and average monthly income.

*The Coronavirus Stress for Undergraduate Students Scale (CSUSS)* was developed by the researchers. The scale consisted of 15 items. Respondents indicate their choices on a 5-point scale from 1 = low to 5 = most. Total CSUSS scores can range from 15- 75. Higher scores indicate higher stress. Cronbach's alpha coefficient was .84 for the pilot study and .86 for the main study.

*The Coronavirus Adversity Quotient Scale (CAQS)* was developed by the researchers. The scale consisted of 17 items. Participants indicate their choices on a 5-point scale from 1 = low to 5 = most. Total CAQS scores can range from 15- 75. Higher scores indicate a higher adversity quotient. Cronbach's alpha coefficient was .86 for the pilot study and .93 for the main study.

*The Health Behaviors Scale*, developed by the Health Education Division (Health Education Division; Health Service Support Department (2013), consisted of 18 items.

Participants indicate their choices on a 5-point scale from 1 = low to 5 = most. Total CAQS scores can range from 15-75. Higher scores indicate a higher adversity quotient. Cronbach's alpha coefficient was .84 for the pilot study and .82 for the main study.

### Data Collection

Data were collected during 27 November – 10 December 2020. We used a convenience sample of eligible undergraduate students who were willing to participate in the study. Participants were recruited in seven faculties/colleges and within the Mahasarakham University community by collecting the survey and recruitment statement to the students. The participants then signed a consent form, and each student spent around 15-20 minutes completing the self-report questionnaires. The principal investigator (PI) and co-principal investigator (Co-PI) checked all questionnaires, and if an incomplete questionnaire was found, the participant was asked to complete the questionnaire. However, respondents who were not willing to participate could withdraw anytime.

### Data Analysis

Descriptive statistics or IBM® SPSS® version 21 were used to analyze the data and describe the demographic characteristics of the participants. Pearson's Product Moment Correlation Coefficient was conducted to examine

correlations of stress, adversity quotient, and health behavior during COVID-19 outbreak variables. Statistical significance was set at  $<.05$ .

### Ethical Considerations

The present study was approved by the Ethical Committee from Mahasarakham University (IRB No. 297/2563) and the directors of seven faculties/colleges. Each participant received explanations about the study and had their rights protected throughout, including confidentiality and the right to refuse or withdraw from the study. The participants also received information sheets and signed a consent form.

## Results

### Characteristics of the Participants

As shown in Table 1, the majority of the participants were female, 71.90% ( $n = 299$ ), the largest percentage of participants were first-year undergraduate students (43.30%), and the majority of participants were the students in the College of Politics and Governance (25.20%). Most participants lived in the northeast region of Thailand (95.09%), and the majority of monthly household incomes were 330 – 500 US dollars (33.20%). The most common occupation of the custodians of participants was agriculturist (28.40%).

**Table 1** Characteristics of the participants ( $N = 416$ )

Demographic characteristics	N	%
<b>Gender</b>		
Male	117	28.10
Female	299	71.90
<b>Education level (Year)</b>		
First	180	43.30
Second	87	20.90
Thirty	64	15.40
Forth	76	18.30
Fifth	9	2.20
<b>Faculty/College</b>		
Faculty of Education	79	19.00
Faculty of Tourism and Hotel Management	84	20.20
College of Politics and Governance	105	25.20
Faculty Architecture, Urban Design, and Creative Arts	38	9.10
Faculty of Informatics	75	18.00
Faculty of Public Health	25	6.00
Faculty of Nursing	10	2.40
<b>Hometown (region)</b>		
Northeast	387	95.09
Central	14	3.44
South	3	.74
North	2	.49
Eastern	1	.25
<b>Household monthly income (US dollar)</b>		
< 330	68	16.30
330 – 350	139	33.40
350 - 660	79	19.00
660 - 830	29	7.00
830 – 1,000	31	7.50
> 1,000	70	16.80

**Table 1 (Cont.)**

<b>Custodian's occupation</b>		
Civil servant	56	13.50
State employee	12	2.90
Businessperson / trade	91	21.90
Agriculturist	118	28.40
Employment	97	23.30
Unemployment	5	1.20
Other (e.g., prefer not to answer)	37	8.90

**Descriptive Characteristics of the Study Variables**

Based on Table 2, the overall stress of the participants was at a high level ( $3.54 \pm .53$ ; Mean  $\pm$  SD). Table 3 also showed that most undergraduate students during the COVID-19 outbreak experienced an adversity quotient at a high level ( $3.77 \pm .63$ ; Mean  $\pm$  SD). Similarly, the

participants showed high levels of each component of adversity quotient of undergraduate students such as control of obstacles or problems ( $3.64 \pm .70$ ; Mean  $\pm$  SD), cause and responsibility ( $3.68 \pm .63$ ; Mean  $\pm$  SD), impact side ( $3.97 \pm .89$ ; Mean  $\pm$  SD), and durability ( $3.79 \pm .92$ ; Mean  $\pm$  SD).

**Table 2** Descriptive statistics of stress level of undergraduate students (N = 416)

Variable	Mean	SD	Interpretation by mean
Stress level	3.54	.53	High
<b>Overall stress level</b>	<b>3.54</b>	<b>.53</b>	<b>High</b>

**Table 3** Descriptive statistics of adversity quotient of undergraduate students

Variables	Mean	SD	Interpretation by mean
Control of obstacles or problems	3.64	.70	High
Cause and responsibility	3.68	.63	High
Impact side	3.97	.89	High
Durability	3.79	.92	High
<b>Overall</b>	<b>3.77</b>	<b>.63</b>	<b>High</b>

Based on Table 4, it was found that overall health behavior was at a moderate level ( $3.06 \pm .53$ ; Mean  $\pm$  SD). Similarly, the participants showed high levels of behavior of illness and medical treatment ( $2.91 \pm .80$ ; Mean  $\pm$  SD), health-

promoting behavior ( $3.51 \pm .66$ ; Mean  $\pm$  SD), therapeutic behavior, and participatory behavior ( $3.21 \pm .71$ ; Mean  $\pm$  SD).

**Table 4** Descriptive statistics of health behavior of undergraduate students (N = 416)

Health Behavior	Mean	SD	Interpretation by mean
Illness and medical treatment behavior	2.91	.80	Moderate
Health-promoting behavior	3.51	.66	High
Therapeutic behavior	2.75	.74	Moderate
Participatory behavior	3.21	.71	Moderate
<b>Overall</b>	<b>3.06</b>	<b>.53</b>	<b>Moderate</b>

**Factors Explaining Health Behavior of Undergraduate Students**

Based on Table 5, stress ( $r = -.31$ ), adversity quotient ( $r = .51$ ) had statistically significant relationships with health

behaviors ( $p < .001$ ). However, stress had no significant relationship with the adversity quotient.

**Table 5** Correlation Between the Study Variable (N = 416)

Variables	Stress (r)	Adversity quotient (r)	Health behavior (r)
Stress	1.00	- 0.02	- .31**
Adversity quotient		1.00	.51**
Health behavior			1.00

\*\* p-value = .01

## Discussion

This study aimed to examine stress, adversity quotient, and health behaviors and their relationship in undergraduate students during the COVID-19 outbreak. This study found that the overall stress of undergraduate students during the pandemic situation of COVID-19 was at a high level. The findings of this study reinforced previous reports that stress is a factor that negatively and directly correlated with health behavior in undergraduate students (Pellegrini et al., 2020; Wu, Xu, et al., 2020; Ye et al., 2020). In the current study, the participants showed a high-stress level. This result may indicate that students' stress management and health behavior changed under the COVID-19 pandemic. Both Thai and foreign students from various areas have returned to the university. The students may be more prone to COVID-19 infection, stress, and paranoia that can lead to the epidemic or university life. In terms of organizing activities on campus, it is important to limit the number of students and to reduce overcrowded activities. Students experience stress from being in their home even after preventative measures have been taken. However, they are still worried about attending class or travel and the return of the outbreak in a second or third phase of infection. In addition, income loss, parental income impact, government assistance, and the unavailability of a vaccine were concerns and causes of stress (Carroll et al., 2020; Pietrobelli et al., 2020).

The results of this study showed that the adversity quotient of undergraduate students was at a high level. The results are consistent with those of Kurniawan et al. (2020) found that the adversity quotient can contribute to forming a student's career maturity (4.7%). Furthermore, this result is similar to previous studies reporting that the adversity quotient was positively associated with health behavior in undergraduate students (Shek, 2020; Siahna, 2020). Therefore, it is suggested that students were aware of the epidemic in other countries and had taken precautions such as preparing personal protective equipment, consumer products, and pharmaceutical products. Most universities in Thailand had sudden shutdowns to control the COVID-19 situation. Therefore, the university allowed students to return to their domicile and comply with government measures (Imsa-Ard, 2020). When students returned to their homeland, they could spend more time with their families and plan for their daily lives in terms of purchasing consumer products, consumption, and transportation (Loxton et al., 2020). In addition, in Thai society, assistance comes from every corner whenever there is a crisis. Laypersons create several charity boxes or "Pun Sook" in each community nationwide where people can put food, medicines, or other necessities. Anyone can get them without spending any cost (Malathum & Malathum, 2020).

This study found that the level of health behavior in undergraduate students was at a moderate level. The findings of this study are similar to prior international studies, which reported that 36.5% of the participants had positive health behaviors that were associated with

increased engagement such as exercise, sleep, of which 61% were most commonly attributed to more time being available and to stress relief (Knell et al., 2020). Indeed, the findings of this study are similar to several studies that were conducted on other populations and non-communicable diseases, which indicated a moderate level of health behavior (Ounprasertsuk et al., 2020; Suksatan & Ounprasertsuk, 2020). In addition, the adversity quotient refers to a state of serious and continued incumbrance, including the COVID-19 crisis. Several students, particularly undergrad students, encountered hardships at university or society (Tian & Fan, 2014).

This study has several potential limitations. First, the sample size in the seven faculties/colleges was homogeneity of the sample, so the comparison among variables could be ambiguous. Second, participants were recruited and conducted at Mahasarakham University, which may have omitted relevant studies conducted in other universities and other countries. Finally, data collection was based on self-report questionnaires. There is the potential for response bias because the PI and Co-PIs were checking the questionnaires; thus, students might have felt pressured to answer the questions. However, the study also has some strengths. It was the first study in Thailand to study stress, adversity quotient, and health behaviors using performance tests and validated instruments with a large sample of undergraduate students. Furthermore, this study also provided factors associated with the health behaviors of undergraduate students during the COVID-19 pandemic in a Thai university. Future studies might also use the CSUS and CAQS instruments to maintain validity in measuring stress and adversity quotient toward health behaviors in general and is relatively reliable.

## Conclusion

During COVID-19 and its global change, education has been significantly challenged by using online learning for students. The adjustment of students took into account significant factors such as stress, adversity quotient, and health behaviors to overcome barriers during the transition period; these effects have impacted schools around the world and have had some important results on undergraduate students living in Thailand during the COVID-19 outbreak. Interestingly, this study found that the overall stress of undergraduate students during the epidemic situation of COVID-19 was at a high level. It is recommended that nurses, healthcare providers, families, and professors consider these factors in developing interventions to promote healthy behaviors in terms of physical and psychological factors in university students.

### Declaration of Conflicting Interest

The authors declare no conflict of interest.

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### Author Contribution

B.C. and W.S. drafted the article, conducted a review of the literature. J.S., S.K., and A.I. conducted the data and data analysis. B.C. and W.S. contributed to the design and concept, reviewed and revised the manuscript. All authors agreed with the final version of the article.

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### Data Availability Statement

All data generated or analyzed during this study are included in this published article. The data sets of this study are not publicly available due to the information that could compromise the research participants' privacy.

### References

Amaral-Prado, H. M., Borghi, F., Mello, T. M. V. F., & Grassi-Kassisse, D. M. (2020). The impact of confinement in the psychosocial behaviour due COVID-19 among members of a Brazilian university. *The International Journal of Social Psychiatry*. <https://doi.org/10.1177/0020764020971318>

Bronstein, L., Mizrahi, T., Korazim-Körösy, Y., & McPhee, D. (2010). Interdisciplinary collaboration in social work education in the USA, Israel and Canada: Deans' and directors' perspectives. *International Social Work*, 53(4), 457-473. <https://doi.org/10.1177/0020872809358399>

Carroll, N., Sadowski, A., Laila, A., Hruska, V., Nixon, M., Ma, D. W., & Haines, J. (2020). The impact of COVID-19 on health behavior, stress, financial and food security among middle to high income Canadian families with young children. *Nutrients*, 12(8), 2352. <https://doi.org/10.3390/nu12082352>

Din, M., Asghar, M., & Ali, M. (2020). COVID-19 and dengue coepidemics: A double trouble for overburdened health systems in developing countries. *Journal of Medical Virology*. <https://doi.org/10.1002/jmv.26348>

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191. <https://doi.org/10.3758/BF03193146>

Health Education Division; Health Service Support Department. (2013). *Operational guidelines for changing health behavior at provincial level*. Thailand: Health Education Division, Health Service Support Department.

Hou, W., Zhang, W., Jin, R., Liang, L., Xu, B., & Hu, Z. (2020). Risk factors for disease progression in hospitalized patients with COVID-19: A retrospective cohort study. *Infectious Diseases*, 52(7), 498-505. <https://doi.org/10.1080/23744235.2020.1759817>

Impey, B., Gordon, R. P., & Baldwin, D. S. (2020). Anxiety disorders, post-traumatic stress disorder, and obsessive-compulsive disorder. *Medicine*, 48(11), 717-723. <https://doi.org/10.1016/j.mpmed.2020.08.005>

Imsa-ard, P. (2020). Thai university students' perceptions towards the abrupt transition to 'forced' online learning in the COVID-19 situation. *Journal of Education Khon Kaen University* 43(3), 30-44.

Ketphan, O., Juthamane, S., Racal, S. J., & Bunpitaksakun, D. (2020). The mental health care model to support the community during the COVID-19 pandemic in Thailand. *Belitung Nursing Journal*, 6(5), 152-156. <https://doi.org/10.33546/bnj.1193>

Knell, G., Robertson, M. C., Dooley, E. E., Burford, K., & Mendez, K. S. (2020). Health behavior changes during COVID-19 pandemic and subsequent "stay-at-home" orders. *International Journal of Environmental Research and Public Health*, 17(17), 6268. <https://doi.org/10.3390/ijerph17176268>

Kong, X., Kong, F., Zheng, K., Tang, M., Chen, Y., Zhou, J., . . . Dong, Y. (2020). Effect of psychological-behavioral intervention on the depression and anxiety of COVID-19 patients. *Frontiers in Psychiatry*, 11(1241). <https://doi.org/10.3389/fpsy.2020.586355>

Kurniawan, W., Daharnis, D., & Karneli, Y. (2020). Contribution of adversity quotient, self awareness and demographic factors to student career maturity. *International Journal of Research in Counseling and Education*, 4(1), 70-75. <https://doi.org/10.24036/00261za0002>

Loxton, M., Truskett, R., Scarf, B., Sindone, L., Baldry, G., & Zhao, Y. (2020). Consumer behaviour during crises: preliminary research on how coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the media in influencing behaviour. *Journal of Risk and Financial Management*, 13(8), 166. <https://doi.org/10.3390/jrfm13080166>

Malathum, K., & Malathum, P. (2020). The COVID-19 pandemic: What we have learned from Thai experiences. *Pacific Rim International Journal of Nursing Research*, 24(4), 431-435.

Ministry of Public Health. (2020). COVID-19 (EOC-DDC Thailand). Retrieved from <https://ddcportal.ddc.moph.go.th/portal/apps/opsdashboard/index.html#/20f3466e075e45e5946aa87c96e8ad65>

Mueanwaja, O., Romroeng, J., & Suksatan, W. (2018). Factors related to the quality of life of junior nursing students during their nursing practical period. *Journal of Health Science Boromarajonani College of Nursing Sunpasitthiprasong*, 2(1), 12-26.

Mullan, J., Burns, P., Weston, K., McLennan, P., Rich, W., Crowther, S., . . . Osborne, R. H. (2017). Health literacy amongst health professional university students: A study using the health literacy questionnaire. *Education Sciences*, 7(2), 54. <https://doi.org/10.3390/educsci7020054>

Ounprasertsuk, J., Benjanirat, T., Jaroengarmsamer, P., Suksatan, W., Rojanabenjakun, P., Krutchangthong, S., & Chaowai, S. (2020). The application of geographic information system for assessing the risk level of hypertension in Samut Songkhram Province. *Systematic Reviews in Pharmacy*, 11(10), 491-497. <https://doi.org/10.31838/srp.2020.10.73>

Pacnoy, S., Dithprayoon, A., Suksatan, W., & Chotisiri, L. (2017). Factors associated with stress among first-year nursing students Suan Sunundha Rajabhat University. *Journal of Health Science Boromarajonani College of Nursing Sunpasitthiprasong*, 1(3), 46-60.

Pellegrini, C. A., Webster, J., Hahn, K. R., Leblond, T. L., & Unick, J. L. (2020). Relationship between stress and weight management behaviors during the COVID-19 pandemic among those enrolled in an internet program. *Obesity Science & Practice*. <https://doi.org/10.1002/osp4.465>

Pietrobelli, A., Pecoraro, L., Ferruzzi, A., Heo, M., Faith, M., Zoller, T., . . . Heymsfield, S. B. (2020). Effects of COVID-19 lockdown on lifestyle behaviors in children with obesity living in Verona, Italy: A longitudinal study. *Obesity*, 28(8), 1382-1385. <https://doi.org/10.1002/oby.22861>

Sahu, P. (2020). Closure of universities due to Coronavirus disease 2019 (COVID-19): Impact on education and mental health of students and academic staff. *Cureus*, 12(4), e7541-e7541. <https://doi.org/10.7759/cureus.7541>

Savitsky, B., Findling, Y., Erel, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the

- COVID-19 pandemic. *Nurse Education in Practice*, 46, 102809. <https://doi.org/10.1016/j.nepr.2020.102809>
- Shek, D. T. (2020). Chinese adolescent research under COVID-19. *Journal of Adolescent Health*. <https://doi.org/10.1016/j.jadohealth.2020.09.011>
- Siahna, I. (2020). Back to Thailand: Post-graduated patani students' work orientation. *TEMALI: Jurnal Pembangunan Sosial*, 3(2), 362-389. <https://doi.org/10.15575/jt.v3i2.9491>
- Song, M. (2020). Psychological stress responses to COVID-19 and adaptive strategies in China. *World Development*, 136, 105107. <https://doi.org/10.1016/j.worlddev.2020.105107>
- Suksatan, W., Choompunuch, B., & Posai, V. (2020). Factors associated with positive life assets in adolescents: An integrative literature review. *International Journal of Pharmaceutical Research*, 12(4). <https://doi.org/10.31838/ijpr/2020.12.04.630>
- Suksatan, W., & Ounprasertsuk, J. (2020). Health-promoting behaviors and related factors in patients with chronic diseases in a rural community. *Systematic Reviews in Pharmacy*, 11(10), 624-627. <https://doi.org/10.31838/srp.2020.10.93>
- Suksatan, W., Ruamsook, T., & Prabsangob, K. (2020). Factors influencing health literacy of students in health science curriculum: A cross-sectional study. *Indian Journal of Public Health Research & Development*, 11(7), 1469-1474. <https://doi.org/10.37506/ijphrd.v11i7.10303>
- Tan, W., Zhao, X., Ma, X., Wang, W., Niu, P., Xu, W., . . . Wu, G. (2020). A novel coronavirus genome identified in a cluster of pneumonia cases—Wuhan, China 2019– 2020. *China CDC Weekly*, 2(4), 61-62.
- Tian, Y., & Fan, X. (2014). Adversity quotients, environmental variables and career adaptability in student nurses. *Journal of Vocational Behavior*, 85(3), 251-257. <https://doi.org/10.1016/j.jvb.2014.07.006>
- Turner, A. I., Smyth, N., Hall, S. J., Torres, S. J., Hussein, M., Jayasinghe, S. U., . . . Clow, A. J. (2020). Psychological stress reactivity and future health and disease outcomes: A systematic review of prospective evidence. *Psychoneuroendocrinology*, 114, 104599. <https://doi.org/10.1016/j.psyneuen.2020.104599>
- Velavan, T. P., & Meyer, C. G. (2020). The COVID-19 epidemic. *Tropical medicine & international health : TM & IH*, 25(3), 278-280. <https://doi.org/10.1111/tmi.13383>
- World Health Organization. (2020a). Novel coronavirus (2019-nCoV) situation report-71. Retrieved from [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200229-sitrep-71-covid-19.pdf?sfvrsn=849d0665\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200229-sitrep-71-covid-19.pdf?sfvrsn=849d0665_2)
- World Health Organization. (2020b). Novel coronavirus (2019-nCoV) situation report-137. Retrieved from [https://www.who.int/docs/default-source/sri-lankadocuments/20200605-covid-19-sitrep-137.pdf?sfvrsn=a13df572\\_2](https://www.who.int/docs/default-source/sri-lankadocuments/20200605-covid-19-sitrep-137.pdf?sfvrsn=a13df572_2)
- Wu, M., Xu, W., Yao, Y., Zhang, L., Guo, L., Fan, J., & Chen, J. (2020). Mental health status of students' parents during COVID-19 pandemic and its influence factors. *General Psychiatry*, 33(4), e100250. <https://doi.org/10.1136/gpsych-2020-100250>
- Wu, W., Zhang, Y., Wang, P., Zhang, L., Wang, G., Lei, G., . . . Luo, M. (2020). Psychological stress of medical staffs during outbreak of COVID-19 and adjustment strategy. *Journal of Medical Virology*, 92(10), 1962-1970. <https://doi.org/10.1002/jmv.25914>
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., . . . McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55-64. <https://doi.org/10.1016/j.jad.2020.08.001>
- Yang, J., Wahner-Roedler, D. L., Chon, T. Y., & Bauer, B. A. (2020). Integrative medicine treatment in times of pandemic Coronavirus disease? *Medical Acupuncture*. <https://doi.org/10.1089/acu.2020.1441>
- Ye, Z., Yang, X., Zeng, C., Wang, Y., Shen, Z., Li, X., & Lin, D. (2020). Resilience, social support, and coping as mediators between COVID-19-related stressful experiences and acute stress disorder among college students in China. *Applied Psychology: Health and Well-Being*, 1-12. <https://doi.org/10.1111/aphw.12211>

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