Predictors of Stress Level Toward COVID-19 Delta Variant Among Healthcare Workers

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ABSTRACT

The occurrence of new variants has increased the number of COVID-19 patient cases again and impacted the mental health conditions of health workers on duty at the hospital. This study aims to analyze the relationship between risk factors such as age, gender, resilience, and self-efficacy with the level of stress experienced by health workers. This study used a cross-sectional design and was conducted in December 2021 involving 113 health workers of Royal Prima Medan Hospital. The Spearman Rank test was used to analyze the relationship between the predictors and the stress level of health workers (α = 0.05). The analysis showed that the majority of health workers experienced mild stress (67.30%). Rank Spearman test results showed that age (p=0.049; r=0.185), gender (p=0.016; r=0.227), resilience (p=0.000; r= -0.557), and self-efficacy (p=0.000; r=0.343) were significantly associated with the level of stress experienced by health workers. Management needs to pay attention to workload, a safe work environment, and provide training so that health workers can manage and minimize the risk of work stress while providing health services to COVID-19 patients.

ABSTRAK

Kemunculan varian baru enyebabkan peningkatan kembali jumlah kasus pasien COVID-19 dan berdampak pada kondisi mental petugas kesehatan yang bertugas pada rumah sakit. Studi ini bertujuan untuk menganalisis hubungan faktor risiko seperti umur, jenis kelamin, resiliensi, dan self efficacy dengan tingkat stres yang dialami petugas. Studi ini menggunakan desain cross-sectional dan dilaksanakan pada bulan Desember 2021 dengan melibatkan sebanyak 113 tenaga kesehatan Rumah Sakit Royal Prima Medan. Uji Rank Spearman digunakan untuk menganalisis hubungan antara pediktor dengan tingkat stres tenaga kesehatan (α= 0,05). Dari hasil analisis menunjukkan mayoritas tenaga kesehatan mengalami stres ringan (67,30%). Hasil uji Rank Spearman menunjukkan bahwa usia (p=0,049; r=0,185), jenis kelamin (p=0,016; r=0,227), resiliensi (p=0,000; r= -0,557), dan self efficacy (p=0,000; r=0,343) berhubungan signifikan dengan tingkat stres yang dialami tenaga kesehatan. Pihak manajemen perlu memerhatikan beban kerja, lingkungan kerja yang aman, dan memberikan pelatihan agar petugas kesehatan mampu mengelola dan meminimalisir resiko stres kerja selama memberikan pelayanan kesehatan pada pasien COVID-19.

INTRODUCTION

Since the declaration of COVID-19 as a pandemic by the WHO, governments in various countries have organised policies in response to stop the spread of the coronavirus from spreading further (Djalante et al., 2020; Rampal et al., 2020). Although the spread of COVID-19 has begun to be controlled and vaccinations have been carried out in various countries, the emergence of the B.1.617.2 (delta) variant has led to a faster surge in new cases because this variant is more contagious (Shiehzadegan et al., 2021; Zhan et al., 2022). The high surge in cases has made health workers in hospitals face heavy workloads and long shifts due to having to treat infected patients (Billings et al., 2021; Razu et al., 2021). This situation causes stress in health workers (De Kock et al., 2021; Shi et al., 2022).

Various studies have reported psychological problems that have plagued health workers since the beginning of the outbreak. There is anxiety about contracting and infecting family members, depression and insomnia experienced by health workers (Choudhury et al., 2020; De Kock et al., 2021; Ghaleb et al., 2021; Hayat et al., 2021; Søvold et al., 2021). A study in China reported a lack of psychological support for healthcare workers due to inadequate planning, few experienced psychologists and psychiatrists, and a lack of communication between hospitals and mental health institutions (Duan & Zhu, 2020). Psychological disorders can interfere with thoughts, emotions, actions or behaviour in daily life, leading to decreased productivity and vulnerability to COVID-19 infection (Pedrosa et al., 2020). Individual psychological responses to the pandemic play an important role in adherence to pandemic response protocols and how to cope with the threat of disease spread (Cullen et al., 2020).

In this study we focused on several factors such as sociodemographics (age and gender), resilience and self-efficacy and their contribution to stress levels among health workers. Several studies reported that sociodemographic factors contribute to stress levels in the workplace (Ezenwaji et al., 2019; Minahan et al., 2021). Literature suggests that a person's resilience is related to the amount of psychological distress they can face. Resilience is defined as the ability to adapt and change or bounce back in the face of challenges (Fletcher & Sarkar, 2013). A systematic review concluded that the resilience of health workers is related to psychological health during the COVID-19 pandemic (Labrague, 2021). Meanwhile, self-efficacy relates to a person's belief in their ability to master conditions and situations (Ebrahimi Belil et al., 2018). When a person has positive beliefs, it results in increased motivation and perseverance and an increased likelihood of rejecting negative thoughts about one's own abilities. Previous studies have linked this factor to stress levels in health workers and concluded there is a link between the two (Shahrour & Dardas, 2020; Vagni et al., 2020). Identifying risk factors for stress may help formulate better strategies to address mental health issues in healthcare workers.

METHOD

Participant characteristics and research design

A total of 113 health workers were recruited to participate in this study. All subjects were health workers working at Royal Prima Medan Hospital. The hospital is a referral hospital for COVID-19 patient care for North Sumatra and surrounding areas. This study used a cross-sectional design and was conducted in December 2021.

Sampling procedures

The study population was 113 health workers consisting of specialist doctors, nurses, radiographers, and laboratory analysts. All of them were used as the study sample (total sampling). All were given a brief explanation of the study and signed an informed consent form.

Measures

To collect data, a questionnaire was used to fill in subject data (sociodemographic data), a resilience questionnaire, and a self-efficacy questionnaire. Sociodemographic data consisted of subject code, age, gender and profession. The resilience questionnaire contains 14 questions with the answer response referring to the assessment: Appropriate (S) = 3, Less Appropriate (KS) = 2, Not Appropriate (TS) = 1. Meanwhile, to measure self-efficacy, 15 questions were given with a rating scale: Work stress variable was measured using a Likert scale questionnaire with 16 question items, and calculated according to a scale that ranges from 1 = Never, 2 = Rarely, 3 = Sometimes, and 4 = Often.

Data analysis

Data analysis begins with presenting the frequency distribution of each research variable which aims to see how much the proportion of variables. Furthermore, the Spearman's Rank Correlation Test was used to identify the relationship between age, gender, resilience and self-efficacy with the stress level of health workers (α = 0.05).

RESULTS AND DISCUSSION

The univariate analysis showed that the majority of subjects in this study were nurses (39.82%) and doctors (33.63%). Based on age, most respondents were >25 years old (80.50%). The majority of subjects were female (61.10%). The distribution of resilience showed that the majority of subjects had a high level of resilience (45.10%). The majority of subjects had self efficacy at a moderate level (80.50%). For stress levels, none of the subjects experienced severe stress conditions, the majority of subjects experienced low stress conditions (67.30%).

Tabel 1
Characteristics of Respondents (n=113)

Characteristics	n	%
Profession		
Doctor	38	33,63
Nurse	45	39,82
Midwife	11	9,73
Pharmacist	7	6,19
Laboratory Technician	6	5,31
Radiographer	6	5,31
Age		
≤ 25 years	42	37,20
> 25 years	71	62,80
Gender		
Male	55	48,70
Female	58	51,30
Resilience		

Low	27	23,90
Moderate	47	41,60
High	39	34,50
Self efficacy		
Low	-	-
Moderate	91	80,50
High	22	19,50
Stres		
Low	76	67,30
Moderate	37	32,70
High	-	-

Source: Primary Data, 2022

Next, we conducted the Spearman Rank test to identify the relationship between age, gender, resilience and self-efficacy with the stress level of health workers. The results showed that all predictors were significantly associated with the level of stress experienced by health workers.

Tabel 2.
Spearman′s Rank Test Results

Relationship	n	p value	r
Age with stress level	113	0,049	0,185
Gender with stress level	113	0,016	0,227
Resilience with stress level	113	0,000	-0,557
Self efficacy with stress level	113	0,000	0,343

Source: Primary Data, 2022

In table 2, it can be seen that the correlation coefficient value on the relationship between age and stress level is 0.185 and it can be interpreted that the correlation between the two variables is positive and has a very low correlation strength. It can be said that the older the age, the more at risk to experience stress. This finding is consistent with previous studies (Ngoc et al., 2020; Odonkor & Adams, 2021; Stanetic & Tesanovic, 2013). Literature states that as individuals age, more changes occur in various systems in the body. This leads to increased susceptibility to various diseases (El Chakhtoura et al., 2017). However, a study found that age had no effect on health workers' stress levels due to experience. Younger health workers tend not to be experts in managing work-related stress (Couarraze et al., 2021). This experience should be very useful especially in dealing with stressors that occur in the work environment. Research shows that older respondents show lower levels of anxiety and worry even though this age group is reported to be at risk, especially for disease (Gamonal-Limcaoco et al., 2022).

Statistical tests showed that gender had a very low correlation coefficient and a positive value. Similar to previous studies that reported that women are more at risk of physical and emotional exhaustion (Huang et al., 2019; Purvanova & Muros, 2010). High work demands in health services during the COVID-19 pandemic put great pressure on health workers so that good emotional management is needed (Billings et al., 2021). Women have a tendency to get tired quickly so that work stress is more experienced by women (Artz et al., 2022). In another study, it was reported that predictors of work stress in female workers were also due to differences in treatment in career promotions and incentive amounts compared to male workers (De Paola & Scoppa, 2015).

Resilience has a strong correlation coefficient but has a negative value (unidirectional relationship) in this study.

Workers who feel job stress are important to have resilience to achieve professional quality of life. Workers who are able to perform resilience mean that they are able to reduce feelings of stress in their work. Resilience is a formation of self-protection mechanisms against psychosocial processes and is supported by positive adaptations (Eshel et al., 2018; Smith et al., 2018). Yi-Frazier et al. (2022) found the average score of health workers in their study had low resilience scores during the COVID-19 pandemic. In fulfilling work demands, health workers do not always serve with a comfortable work situation. The surge in COVID-19 patients and prevention protocol policies such as the use of PPE can cause discomfort when providing services. In this stressful situation, resilience is needed so that health workers can still serve optimally.

The study results show that self efficacy has a sufficient correlation coefficient and a positive value. Individuals who have high self efficacy, indirectly have motivation and even ambition in their work. In contrast, if self efficacy is low, the lack of support from oneself or the environment makes individuals feel burdened and even become stressed in doing their work. Self efficacy allows a person to have confidence in being able to control difficult situations (Snyder et al., 2021). Consistent with previous studies, self efficacy contributes importantly to the mental health of health workers who are on the frontline during the COVID-19 pandemic (Mei et al., 2022; Xiong et al., 2020).

Strategies are needed to reduce and even overcome the psychological problems experienced by health workers while providing services during the COVID-19 pandemic. Hospital management needs to pay attention to the workload of health workers, increasing the number of staff is highly recommended (Odonkor & Adams, 2021). To increase the confidence of health workers can be done by creating a safe work environment while handling COVID-19 patients (Najjuka et al., 2022). Training to deal with crisis situations such as a pandemic is needed so that officers are more mentally prepared (Bidzan et al., 2020).

LIMITATION OF THE STUDY

This study has limitations. The design used and the collection of data through questionnaires have reporting bias because subjects can answer anonymously without any control. To limit bias, incomplete or questionable answers were omitted. This study also only involved subjects from one hospital, making it difficult to generalise the results.

CONCLUSIONS AND SUGGESTIONS

The health workers involved in this study were predominantly female and the majority were over 25 years old. Most health workers had good resilience and self-efficacy although 67.30% of health workers experienced low stress. The test results showed that predictors (age, gender, resilience, and self efficacy) were significantly associated with the level of stress experienced by health workers. Management needs to pay attention to workload, a safe work environment, and provide training so that health workers are able to manage and minimise the risk of work stress while providing health services to COVID-19 patients.

ETHICAL CONSIDERATIONS

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Conflict of Interest Statement

The authors declare no conflicts of interest.

REFERENCES

Artz, B., Kaya, I., & Kaya, O. (2022). Gender role perspectives and job burnout. *Review of Economics of the Household*, *20*(2), 447–470. https://doi.org/10.1007/s11150-021-09579-2

Bidzan, M., Bidzan-Bluma, I., Szulman-Wardal, A., Stueck, M., & Bidzan, M. (2020). Does Self-Efficacy and Emotional Control Protect Hospital Staff From COVID-19 Anxiety and PTSD Symptoms? Psychological Functioning of Hospital Staff After the Announcement of COVID-19 Coronavirus Pandemic. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.552583

Billings, J., Ching, B. C. F., Gkofa, V., Greene, T., & Bloomfield, M. (2021). Experiences of frontline healthcare workers and their views about support during COVID-19 and previous pandemics: a systematic review and qualitative meta-synthesis. *BMC Health Services Research*, *21*(1), 923. https://doi.org/10.1186/s12913-021-06917-z

Choudhury, T., Debski, M., Wiper, A., Abdelrahman, A., Wild, S., Chalil, S., More, R., Goode, G., Patel, B., & Abdelaziz, H. K. (2020). COVID-19 Pandemic: Looking After the Mental Health of Our Healthcare Workers. *Journal of Occupational & Environmental Medicine*, *62*(7), e373–e376. https://doi.org/10.1097/JOM.0000000000001907

Couarraze, S., Delamarre, L., Marhar, F., Quach, B., Jiao, J., Avilés Dorlhiac, R., Saadaoui, F., Liu, A. S.-I., Dubuis, B., Antunes, S., Andant, N., Pereira, B., Ugbolue, U. C., Baker, J. S., Clinchamps, M., & Dutheil, F. (2021). The major worldwide stress of healthcare professionals during the first wave of the COVID-19 pandemic – the international COVISTRESS survey. *PLOS ONE*, *16*(10), e0257840. https://doi.org/10.1371/journal.pone.0257840

Cullen, W., Gulati, G., & Kelly, B. D. (2020). Mental health in the COVID-19 pandemic. *QJM: An International Journal of Medicine*, *113*(5), 311–312. https://doi.org/10.1093/qjmed/hcaa110

De Kock, J. H., Latham, H. A., Leslie, S. J., Grindle, M., Munoz, S.-A., Ellis, L., Polson, R., & O'Malley, C. M. (2021). A rapid review of the impact of COVID-19 on the mental health of healthcare workers: implications for supporting psychological well-being. *BMC Public Health*, *21*(1), 104. https://doi.org/10.1186/s12889-020-10070-3

De Paola, M., & Scoppa, V. (2015). Gender Discrimination and Evaluators' Gender: Evidence from Italian Academia. *Economica*, *82*(325), 162–188. https://econpapers.repec.org/RePEc:bla:econom:v:82:y:2015:i:325:p:162-188

Djalante, R., Lassa, J., Setiamarga, D., Sudjatma, A., Indrawan, M., Haryanto, B., Mahfud, C., Sinapoy, M. S., Djalante, S., Rafliana, I., Gunawan, L. A., Surtiari, G. A. K., & Warsilah, H. (2020). Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020. *Progress in Disaster Science*, *6*, 100091. https://doi.org/10.1016/j.pdisas.2020.100091

Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *The Lancet Psychiatry*, *7*(4), 300–302. https://doi.org/10.1016/S2215-0366(20)30073-0

Ebrahimi Belil, F., Alhani, F., Ebadi, A., & Kazemnejad, A. (2018). Self-Efficacy of People with Chronic Conditions: A Qualitative Directed Content Analysis. *Journal of Clinical Medicine*, *7*(11), 411. https://doi.org/10.3390/jcm7110411

El Chakhtoura, N. G., Bonomo, R. A., & Jump, R. L. P. (2017). Influence of Aging and Environment on Presentation of Infection in Older Adults. *Infectious Disease Clinics of North America*, *31*(4), 593–608. https://doi.org/10.1016/j.idc.2017.07.017

Eshel, Y., Kimhi, S., Lahad, M., Leykin, D., & Goroshit, M. (2018). Risk Factors as Major Determinants of Resilience: A Replication Study. *Community Mental Health Journal*, *54*(8), 1228–1238. https://doi.org/10.1007/s10597-018-0263-7

Ezenwaji, I. O., Eseadi, C., Okide, C. C., Nwosu, N. C., Ugwoke, S. C., Ololo, K. O., Oforka, T. O., & Oboegbulem, A. I. (2019). Work-related stress, burnout, and related sociodemographic factors among nurses. *Medicine*, *98*(3), e13889. https://doi.org/10.1097/MD.0000000000013889

Fletcher, D., & Sarkar, M. (2013). Psychological Resilience. *European Psychologist*, *18*(1), 12–23. https://doi.org/10.1027/1016-9040/a000124

Gamonal-Limcaoco, S., Montero-Mateos, E., Lozano-López, M. T., Maciá-Casas, A., Matías-Fernández, J., & Roncero, C. (2022). Perceived stress in different countries at the beginning of the coronavirus pandemic. *The International Journal of Psychiatry in Medicine*, *57*(4), 309–322. https://doi.org/10.1177/00912174211033710

Ghaleb, Y., Lami, F., Al Nsour, M., Rashak, H. A., Samy, S., Khader, Y. S., Al Serouri, A., BahaaEldin, H., Afifi, S., Elfadul, M., Ikram, A., Akhtar, H., Hussein, A. M., Barkia, A., Hakim, H., Taha, H. A., Hijjo, Y., Kamal, E., Ahmed, A. Y., … Ramzi, S. R. (2021). Mental health impacts of COVID-19 on healthcare workers in the Eastern Mediterranean Region: a multi-country study. *Journal of Public Health*, *43*(Supplement_3), iii34–iii42. https://doi.org/10.1093/pubmed/fdab321

Hayat, K., Arshed, M., Fiaz, I., Afreen, U., Khan, F. U., Khan, T. A., Kadirhaz, M., Shukar, S., Saeed, A., Gill, M. R., & Fang, Y. (2021). Impact of COVID-19 on the Mental Health of Healthcare Workers: A Cross-Sectional Study From Pakistan. *Frontiers in Public Health*, *9*. https://doi.org/10.3389/fpubh.2021.603602

Huang, S.-L., Li, R.-H., Fang, S.-Y., & Tang, F.-C. (2019). Well-Being: Its Relationship with Work-to-Family Conflict and Burnout among Males and Females. *International Journal of Environmental Research and Public Health*, *16*(13), 2291. https://doi.org/10.3390/ijerph16132291

Labrague, L. J. (2021). Psychological resilience, coping behaviours and social support among health care workers during the COVID-19 pandemic: A systematic review of quantitative studies. *Journal of Nursing Management*, *29*(7), 1893–1905. https://doi.org/10.1111/jonm.13336

Mei, X., Wang, H., Wang, X., Wu, X., Wu, J., & Ye, Z. (2022). Associations among neuroticism, self-efficacy, resilience and psychological distress in freshman nursing students: a cross-sectional study in China. *BMJ Open*, *12*(6), e059704. https://doi.org/10.1136/bmjopen-2021-059704

Minahan, J., Falzarano, F., Yazdani, N., & Siedlecki, K. L. (2021). The COVID-19 Pandemic and Psychosocial Outcomes Across Age Through the Stress and Coping Framework. *The Gerontologist*, *61*(2), 228–239. https://doi.org/10.1093/geront/gnaa205

Najjuka, S. M., Ngabirano, T. D., Balizzakiwa, T., Nabadda, R., Kaggwa, M. M., Kateete, D. P., Kalungi, S., Beyeza-Kashesya, J., & Kiguli, S. (2022). Health Care Workers' Perceived Self-Efficacy to Manage COVID-19 Patients in Central Uganda: A Cross-Sectional Study. *Risk Management and Healthcare Policy*, *Volume 15*, 1253–1270. https://doi.org/10.2147/RMHP.S356410

Ngoc, A. N., Thanh, X. L. T., Thi, H. Le, Tuan, A. V., & Van, T. N. (2020). Occupational Stress Among Health Worker in a National Dermatology Hospital in Vietnam, 2018. *Frontiers in Psychiatry*, *10*. https://doi.org/10.3389/fpsyt.2019.00950

Odonkor, S. T., & Adams, S. (2021). Predictors of stress and associated factors among healthcare workers in Western Ghana. *Heliyon*, *7*(6), e07223. https://doi.org/10.1016/j.heliyon.2021.e07223

Pedrosa, A. L., Bitencourt, L., Fróes, A. C. F., Cazumbá, M. L. B., Campos, R. G. B., de Brito, S. B. C. S., & Simões e Silva, A. C. (2020). Emotional, Behavioral, and Psychological Impact of the COVID-19 Pandemic. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.566212

Purvanova, R. K., & Muros, J. P. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior*, *77*(2), 168–185. https://doi.org/10.1016/j.jvb.2010.04.006

Rampal, L., Liew, B. S., Choolani, M., Ganasegeran, K., Pramanick, A., Vallibhakara, S. A., Tejativaddhana, P., & Hoe, V. C. (2020). Battling COVID-19 pandemic waves in six South-East Asian countries: A real-time consensus review. *The Medical Journal of Malaysia*, *75*(6), 613–625. http://www.ncbi.nlm.nih.gov/pubmed/33219168

Razu, S. R., Yasmin, T., Arif, T. B., Islam, M. S., Islam, S. M. S., Gesesew, H. A., & Ward, P. (2021). Challenges Faced by Healthcare Professionals During the COVID-19 Pandemic: A Qualitative Inquiry From Bangladesh. *Frontiers in Public Health*, *9*. https://doi.org/10.3389/fpubh.2021.647315

Shahrour, G., & Dardas, L. A. (2020). Acute stress disorder, coping self-efficacy and subsequent psychological distress among nurses amid COVID-19. *Journal of Nursing Management*, *28*(7), 1686–1695. https://doi.org/10.1111/jonm.13124

Shi, L., Xu, R. H., Xia, Y., Chen, D., & Wang, D. (2022). The Impact of COVID-19-Related Work Stress on the Mental Health of Primary Healthcare Workers: The Mediating Effects of Social Support and Resilience. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.800183

Shiehzadegan, S., Alaghemand, N., Fox, M., & Venketaraman, V. (2021). Analysis of the Delta Variant B.1.617.2 COVID-19. *Clinics and Practice*, *11*(4), 778–784. https://doi.org/10.3390/clinpract11040093

Smith, B., Shatté, A., Perlman, A., Siers, M., & Lynch, W. D. (2018). Improvements in Resilience, Stress, and Somatic Symptoms Following Online Resilience Training. *Journal of Occupational & Environmental Medicine*, *60*(1), 1–5. https://doi.org/10.1097/JOM.0000000000001142

Snyder, C. R., Lopez, S. J., Edwards, L. M., & Marques, S. C. (Eds.). (2021). *The Oxford Handbook of Positive Psychology*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199396511.001.0001

Søvold, L. E., Naslund, J. A., Kousoulis, A. A., Saxena, S., Qoronfleh, M. W., Grobler, C., & Münter, L. (2021). Prioritizing the Mental Health and Well-Being of Healthcare Workers: An Urgent Global Public Health Priority. *Frontiers in Public Health*, *9*. https://doi.org/10.3389/fpubh.2021.679397

Stanetic, K., & Tesanovic, G. (2013). Influence of age and length of service on the level of stress and burnout syndrome. *Medicinski Pregled*, *66*(3–4), 153–162. https://doi.org/10.2298/MPNS1304153S

Vagni, M., Maiorano, T., Giostra, V., & Pajardi, D. (2020). Coping With COVID-19: Emergency Stress, Secondary Trauma and Self-Efficacy in Healthcare and Emergency Workers in Italy. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.566912

Xiong, H., Yi, S., & Lin, Y. (2020). The Psychological Status and Self-Efficacy of Nurses During COVID-19 Outbreak: A Cross-Sectional Survey. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, *57*, 004695802095711. https://doi.org/10.1177/0046958020957114

Yi-Frazier, J. P., O'Donnell, M. B., Adhikari, E. A., Zhou, C., Bradford, M. C., Garcia-Perez, S., Shipman, K. J., Hurtado, S. E., Junkins, C. C., O'Daffer, A., & Rosenberg, A. R. (2022). Assessment of Resilience Training for Hospital Employees in the Era of COVID-19. *JAMA Network Open*, *5*(7), e2220677. https://doi.org/10.1001/jamanetworkopen.2022.20677

Zhan, Y., Yin, H., & Yin, J.-Y. (2022). B.1.617.2 (Delta) Variant of SARS-CoV-2: features, transmission and potential strategies. *International Journal of Biological Sciences*, *18*(5), 1844–1851. https://doi.org/10.7150/ijbs.66881