

ORIGINAL ARTICLE

What Determines Student Resilience During the COVID-19 Pandemic?

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ABSTRACT

Introduction: The COVID-19 pandemic has shifted more than 4,500 higher education institutions in Indonesia to the new era of digitalization. Higher students must adapt to the new life where learning and social interaction abruptly move to the virtual world. This sudden change could initiate unpleasant or counterproductive circumstances for students to perform well in their studies. This study analyzes the determinants of student resilience during the COVID-19 pandemic. We also analyzed any self-leadership behaviours determining student resilience. **Methods:** We cross-sectionally surveyed sophomores of the Public Health Bachelor Program in Airlangga University about their experiences during this unprecedented time. Two hundred sixty-three students responded to the survey. We used the student's characteristics and how this pandemic affected their life to predict their resilience. Brief Resilience Scale and Revised Self-Leadership Questionnaire were applied to measure our two main variables in this study. Multiple linear regression was performed to identify the determinants of students' resilience. **Results:** Residing in disadvantaged regions and experiencing impacts of the COVID-19 pandemic did not determine the students' resilience. Students' age was the single determinant of resilience when self-leadership was not included in the analysis ($p < 0.1$; $\beta = -0.0714$). Constructive thought pattern strategies were likely to determine their resilience ($p < 0.01$; $\beta = 0.225$). **Conclusion:** Constructive thought pattern strategies determined students' resilience during the COVID-19 pandemic. The COVID-19 pandemic must be seen as a beneficial developmental experience for students. Student support centres in higher education institutions are needed to assist students in reaching adulthood.

Keywords: Higher education, Student resilience, Self-leadership, COVID-19, Quality education

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INTRODUCTION

World Health Organization (WHO) was declared Coronavirus disease (COVID-19) as a pandemic in March 2020 (1). COVID-19 is an infectious disease infecting the human respiratory tract caused by a novel coronavirus that could be transmitted through respiratory droplets, aerosol transmission, and contaminated surfaces (2). As of March 7, 2021, COVID-19 has infected more than 116 million people globally (3), including Indonesia. The first COVID-19 case in Indonesia was reported on March 2, 2020 (4). Due to various modes of transmission, COVID-19 spread rapidly in the country. As of March 7, 2021, Indonesia has the highest COVID-19 case in the

Southeast Asia region (1.3 million COVID-19 cases)(3). In response to the surging number of COVID-19 cases in the country, all social activities were restricted to prevent and control COVID-19 transmission, including learning activities. On March 16 2020, the Director-General of Higher Education of Indonesia's Ministry of Education and Culture required all higher education institutions to shift face-to-face learning to online learning (5).

The sudden change in the delivery of learning activities is highly likely to burden students. Most of them are likely to struggle in adapting to online learning due to the unfamiliarity of the new learning method. A survey conducted by Universitas Gajah Mada found that around 33,1% of higher students struggled to understand learning material online (6). Pre-existing inequality in the quality of education and socio-economic are also highly likely to exacerbate students' access to a high quality of online learning (7,8). In addition to challenges in adapting to

new learning methods, the pandemic could negatively affect students' wellbeing. They are prone to mental health problems since they will likely lose the emotional and social support available on campus. Several studies found that students experienced increased stress levels during the COVID-19 pandemic (9–12).

It is crucial to address students' emotional distress since they are in a high-risk group of mental health disorders. Many mental illnesses occur for the first time at age 12-24 years old (13), and they could continue into adulthood (14). Experiencing mental illness could lead to disability, stigma and discrimination, leading to severe mental illness and premature death (13). Students' resilience has been discovered as one of the factors maintaining students' mental health (15). The concept of resilience describes how a person can resist illness, adapt, and thrive (16). It shows the ability to bounce back or recover from stress which resulted from their illness, adaptation, and thriving, which they faced (15–17). Resilience is commonly observed in students to capture their challenges in reaching adulthood (18,19). The student's resilience could minimize the effects from COVID-19-related stressful experiences to acute stress disorder among university students(15). However, how Indonesian students cope with the COVID-19 pandemic has not been documented yet. This study aims to identify the determinants of Indonesian students' resilience during the COVID-19 pandemic.

MATERIALS AND METHODS

Study area and population

Faculty of Public Health Universitas Airlangga has two campuses located in Surabaya and Banyuwangi district, East Java Province. There are 1,096 undergraduate students, and 287 (26.2%) are sophomores. A cross-sectional study design was used. We surveyed sophomores of the Public Health Bachelor Program of Airlangga University in Indonesia about their experiences during the implementation of study at home policy during the COVID-19 pandemic. The sophomores are the same group of respondents since they spent a semester of offline lecturing before the pandemic before they abruptly studied in the online mode that must bring a shocking condition in their early life of higher students. The survey was conducted in the second semester of study at home policy implemented in Indonesia. We shared the survey link to the student's forum on the first day of their fourth semester from 22 to February 27 2021. We used Google form to build surveys. Before

the participants proceeded to the questionnaire pages, they were required to consent by clicking on the "I agree" button. By the end of the survey, 263 respondents participated in the survey.

Variable

The COVID-19 pandemic leads to a disruptive and abrupt change in student life. The student resilience variable in this study is defined as the student's ability to bounce back from any mental breakdown resulting from the COVID-19 pandemic. We used the Brief Resilience Scale (16) (mean=3.257; sd=0.444; Cronbach's α =0.5691) to measure students' resilience. We used students' age, gender, living regions, COVID-19 impact, and self-leadership behaviour to analyze student resilience determinants. This study identified self-leadership behaviour using the Revised Self-Leadership Questionnaire (20) (mean=138.76; sd=14.25; Cronbach's α =0.8830). There are three self-leadership behaviours identified through this questionnaire, i.e., behaviour-focused strategies, natural reward strategies, and constructive thought pattern strategies.

Data analysis

Data were analyzed using Stata. Multiple linear regression was carried out to analyze the determinant of student resilience. For the base model, we used the student's age, gender, and whether they live in a disadvantaged area of Indonesia or not. The COVID-19 context is included as a variable in the first model by adding whether the students or their family was infected and/or socially impacted by the COVID-19. Three behaviours of self-leadership are included in the third model. Finally, we included all independent variables jointly on the student's resilience. For each model, the p-values are used to determine whether the relationships observed in the sample exist. We used the coefficient p-values to understand the strength of each variable in the model.

ETHICAL CLEARANCE

This study is part of the "The Impact of the COVID-19 Pandemic to Higher Student" project. This study was approved by the Research Ethics Committee of Institut Ilmu Kesehatan Bhakti Wiyata with certificate number 92/PP2M-KE/I/2021.

RESULT

In total, 263 students responded to the survey. We described the respondent's characteristics in Table 1.

Table I: Respondent's characteristics

Respondent's characteristics	N	mean or %	sd
Age (years)	263	19.57	0.655
gender			
male	32	12.2%	
female	231	87.8%	
Live in underdeveloped region			
yes	10	13.9%	
no	253	96.2%	
Infected by COVID-19 (their self or their any family member)			
yes	39	14.8%	
no	224	85.2%	
socially impacted by COVID-19			
yes	208	79.1%	
no	55	20.9%	
Self-leadership scores:			
behavior-focused strategies	263	3.952	0.429
natural reward strategies	263	3.852	0.658
constructive thought pattern strategies	263	4.014	0.501
Self-resilience score	263	3.257	0.444

Most of the sophomores in this study were female. We identified a small proportion of sophomores residing in the underdeveloped region of Indonesia. The number of COVID-19 infections in our respondents was relatively high, which 14.8% of the respondents stated that they or their family members ever transmitted by the COVID-19. The number of respondents experiencing the social impact of the COVID-19 pandemic was significantly higher than the number of COVID-19 infections; 79.1% of the respondents reported that they or their family faced a complex condition COVID-19 pandemic. Table 1 also presented the score of self-leadership behaviours and self-resilience.

We developed a multiple regression model to analyze self-resilience determinants among these sophomores based on these respondents' characteristics.

Table II: Multiple linier regression

VARIABLES	(1)	(2)	(3)	(4)
	Base model	Model 1	Model 2	Model 3
age	-0.0714*	-0.0718*	-0.0589	-0.0596
	(0.0424)	(0.0428)	(0.0413)	(0.0417)
male	0.0603	0.0603	0.121	0.121
	(0.0843)	(0.0847)	(0.0840)	(0.0843)
live in underdeveloped region	-0.0608	-0.0594	-0.0206	-0.0186
	(0.144)	(0.145)	(0.141)	(0.142)
infected by COVID-19		-0.00601		-0.0164
		(0.0776)		(0.0756)

CONTINUE

Table II: Multiple linier regression (cont.)

VARIABLES	(1)	(2)	(3)	(4)
	Base model	Model 1	Model 2	Model 3
socially impacted by COVID-19		-0.00416		-0.00416
		(0.0683)		(0.0666)
behavior-focused strategies			0.000149	0.00113
			(0.0843)	(0.0848)
natural reward strategies			0.00804	0.00756
			(0.0509)	(0.0512)
constructive thought pattern strategies			0.225***	0.225***
			(0.0667)	(0.0671)
Constant	4.649***	4.661***	3.462***	3.478***
	(0.828)	(0.844)	(0.872)	(0.885)
Observations	263	263	263	263
R-squared	0.013	0.013	0.077	0.078
Standard errors in parentheses				
*** p<0.01, ** p<0.05, *p<0.1				

For the base model, we analyzed the students' age, gender, and whether they live in a disadvantaged area of Indonesia or not. Of the three variables, students' age was the only significant determinant for the self-resilience score. The coefficient p-values for age is negative, which could be understood that younger students have better resilience.

Then, we developed a second model by including variable related to COVID-19 context, whether the students or their family was infected and/or socially impacted by the COVID-19, in the analysis. We found that students' age remained a significant determinant for the self-resilience score while being infected with COVID-19 and socially impacted with COVID-19 did not determine the resilience. The third model replaced the COVID-19's context variables with three self-leadership variables: how they should behave or give self-rewards when they can accomplish something and/or think constructively. Of these three self-leadership behaviours, how students occupy a constructive thought pattern strategy was the only determinant for the students' resilience. We found that students' age did not determine their resilience, but their way of thinking was more likely to contribute to their resilience. Finally, we analyzed all independent variables jointly on the student's resilience. Our final model consistently

showed that the self-leadership thought pattern was the primary determinant affecting students' resilience.

DISCUSSION

To our knowledge, this is the first study examining determinants of Indonesian university students' resilience during the COVID-19 pandemic. Due to the COVID-19 pandemic, the changing environment has impacted university students' development in their academic life and their growing process to be adults (21).

In our first model, we found that age is crucial to predicting students' resilience during the pandemic. It shows that younger students tend to have stronger resilience. It is pretty different from the previous study, which found that older individuals are more resilient than young ones—however, the young ones are more resilient on social support (18). In COVID-19 and prolonged remote learning, social support has a more dominant role for the population (22).

Our study found that constructive thought pattern was associated with students' ability to bounce back in the event of adversity. This finding is consistent with some studies in the education system (23,24) and the non-education system (17,25,26). This behaviour increases individual, team, and organization performance (24,25,27). An individual with a constructive thought pattern commonly identifies and replaces any dysfunctional beliefs and assumptions, mental imagery, and positive self-talk (28).

The individual can adapt constructive or destructive thought patterns, which affect their emotional and behavioural state and reactions (29). This behaviour enables individuals to confront dysfunctional, irrational beliefs and assumptions with more constructive thought processes (30). They are resilient leaders who possess favourable characteristics which always believe in a prospective future and estimate failure (19). Individuals can determine how their mindset in dealing with a situation. In times of adversity, they can focus on the opportunity of the adversity as a barrier. People who can do this like this mean using an optimistic mindset to create opportunities to overcome any difficulties that might hinder achieving their goals. Individual thought patterns influence behaviour and results (31). Likewise, the COVID-19 pandemic is seen as a challenge to adapt to the new life (32). In this case, students need to have a constructive thinking pattern, which can view the COVID-19 pandemic as their opportunity to be successful future leaders.

Constructive thought patterns are also characterized by self-talk. Individuals covertly tell themselves and perform any self-evaluations to strengthen themselves. Optimistic self-talk indicates emotional intelligence, which helps mediate resilience and achievement motivation (17).

Optimistic self-talk leads an individual to use emotions to create a productive coping process and release more positive vibes during stressful conditions (33). Any developmental experiences determine resiliency (34). Hence, the COVID-19 must be seen as a developmental experience for this generation Z student to be more resilient.

Finally, being open-minded to accept current conditions is a crucial element of resilience (35). It is related to the last constructive thought patterns on mental imagery. It symbolizes and covers the cognitive creation of a developmental experience. Likely, a sudden change of online learning mode is an actual task that envisions students to advance their actual performance. Only students with an open-minded perspective of this actual task will own a constructive thought pattern.

CONCLUSION

The COVID-19 pandemic is a developmental experience for the higher student to become adults. Since this pandemic is complex for students to adapt to steep online learning and social isolation, a constructive mindset is needed to ensure student resilience. Constructive thought pattern strategies are the only significant determinant for student resilience. Students are encouraged to have an optimistic and open-minded mindset with positive self-talk to bounce back in the event of adversity. It shows the importance of why student support centres in higher education institutions should provide counselling for students with a diagnosed mental health condition and students who have new challenges in their time in reaching adulthood.

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REFERENCES

1. World Health Organization. WHO announces COVID-19 outbreak a pandemic [Internet]. World Health Organization. 2020 [cited 2020 Jul 7]. Available from: <https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic>
2. World Health Organization. Transmission of SARS-CoV-2: implications for infection prevention precautions [Internet]. World Health Organization; 2020 [cited 2020 Jul 24]. Available from: <https://>

- www.who.int/publications-detail-redirect/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations
3. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard [Internet]. World Health Organization. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/table>
 4. The Government of Indonesia. COVID-19 data in Indonesia [Internet]. COVID-19 Indonesia. 2020 [cited 2020 Aug 15]. Available from: <https://covid19.go.id/peta-sebaran>
 5. Ministry of Education and Culture of Indonesia. Circular letter of Director General of Higher Education of Ministry of Education and Culture of Indonesia No. 1/2020 about prevention and control of COVID-19 transmission in higher education [Internet]. Ministry of Education and Culture of Indonesia; 2021. Available from: https://covid19.hukumonline.com/wp-content/uploads/2020/04/surat_edaran_direktur_jenderal_pendidikan_tinggi_nomor_1_tahun_2020-2.pdf
 6. Hastanto I. Suka Duka Belajar Jarak Jauh Karena Corona Buat Guru dan Dosen di Indonesia [Internet]. VICE. 2020 [cited 2021 Mar 11]. Available from: <https://www.vice.com/id/article/pke8ak/suka-duka-belajar-jarak-jauh-karena-corona-buat-guru-dan-dosen-di-indonesia>
 7. Muttaqin T. Determinants of Unequal Access to and Quality of Education in Indonesia. *IJDP*. 2018 Mar 26;2(1):1–23.
 8. Azzizah Y. Socio-Economic Factors on Indonesia Education Disparity. *International Education Studies*. 2015;8(12):13.
 9. Sun S, Goldberg SB, Lin D, Qiao S, Operario D. Psychiatric symptoms, risk, and protective factors among university students in quarantine during the COVID-19 pandemic in China. *Globalization and Health*. 2021 Jan 25;17(1):15.
 10. Harries AJ, Lee C, Jones L, Rodriguez RM, Davis JA, Boysen-Osborn M, et al. Effects of the COVID-19 pandemic on medical students: a multicenter quantitative study. *BMC Medical Education*. 2021 Jan 6;21(1):14.
 11. Kochuvilayil T, Fernandez RS, Moxham LJ, Lord H, Alomari A, Hunt L, et al. COVID-19: Knowledge, anxiety, academic concerns and preventative behaviours among Australian and Indian undergraduate nursing students: A cross-sectional study. *Journal of Clinical Nursing*. 2021;30(5–6):882–91.
 12. Gallagher HL, Doherty AZ, Obonyo M. International student experiences in Queensland during COVID-19: International Social Work [Internet]. 2020 Aug 20 [cited 2021 Mar 20]; Available from: <https://journals.sagepub.com/doi/10.1177/0020872820949621>
 13. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. *Lancet*. 2007 Apr 14;369(9569):1302–13.
 14. Costello EJ, Foley DL, Angold A. 10-Year Research Update Review: The Epidemiology of Child and Adolescent Psychiatric Disorders: II. Developmental Epidemiology. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2006 Jan;45(1):8–25.
 15. Ye Z, Yang X, Zeng C, Wang Y, Shen Z, Li X, et al. 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*. 2020;12(4):1074–94.
 16. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: Assessing the ability to bounce back. *Int J Behav Med*. 2008 Sep;15(3):194–200.
 17. Magnano P, Craparo G, Paolillo A. Resilience and emotional intelligence: which role in achievement motivation. *Int j psychol res*. 2016 Jan 1;9(1):9–20.
 18. Gooding PA, Hurst A, Johnson J, Tarrier N. Psychological resilience in young and older adults: Resilience in the young and the older adults. *Int J Geriatr Psychiatry*. 2012 Mar;27(3):262–70.
 19. Southwick FS, Martini BL, Charney DS, Southwick SM. Leadership and Resilience. In: Marques J, Dhiman S, editors. *Leadership Today* [Internet]. Cham: Springer International Publishing; 2017 [cited 2021 Mar 22]. p. 315–33. (Springer Texts in Business and Economics). Available from: http://link.springer.com/10.1007/978-3-319-31036-7_18
 20. Houghton JD, Neck CP. The revised self-leadership questionnaire: Testing a hierarchical factor structure for self-leadership. *Journal of Managerial Psychology*. 2002 Dec 1;17(8):672–91.
 21. Nisa DF, Putri NK. How is The Coronavirus Outbreak Affecting The Daily Lives of University Students? *JKL*. 2020 Sep 30;12(1si):137.
 22. Wirawan GBS, Taroreh TAP, Arthaningsih DAAD, Loka MADP, Mahardika NMA, Januraga PP. Economic insecurity and stress as determinants of COVID-19 preventive behaviour in Denpasar. *JAKI*. 2021 Nov 28;9(2):124.
 23. Offutt MS. An Examination of the Characteristic, Resilience, and Leadership Practices in Public School Elementary Principals [Internet] [EdD]. West Virginia University Libraries; 2011 [cited 2021 Mar 22]. Available from: <https://researchrepository.wvu.edu/etd/3039>
 24. Besuner PL. Leadership Attributes and Behaviors as Predictors of Organizational Resilience in Academic Health Care Systems. Walden University; 2016.
 25. Harland L, Harrison W, Jones JR, Reiter-Palmon R. Leadership Behaviors and Subordinate Resilience. *Journal of Leadership & Organizational Studies*. 2005 Jan;11(2):2–14.

26. Kotzaj M. The influence of psychological capital, self-leadership, and mindfulness on work engagement. *South African Journal of Psychology*. 2018 Jun;48(2):279–92.
27. Anwar A, Abid G, Waqas A. Authentic Leadership and Creativity: Moderated Meditation Model of Resilience and Hope in the Health Sector. *EJIHPE*. 2019 Jul 17;10(1):18–29.
28. Manz CC, Neck CP. Inner Leadership: Creating Productive Thought Patterns. *The Executive*. 1991;5(3):87–95.
29. M Manz C, Neck C. *Mastering Self-Leadership: Empowering Yourself for Personal Excellence*, Second Edition. [electronic resource] [Internet]. 2nd edition. Prentice Hall; 1998 [cited 2021 Mar 22]. (Safari Books Online). Available from: <https://search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=cat00006a&AN=melb.b7245279&site=eds-live&scope=site&custid=s2775460>
30. du Toit H. Core beliefs as predictors of mental toughness amongst competitive adolescent tennis players. University of the Free State; 2014 Jun.
31. Neck CP, Manz CC. Thought self-leadership: the impact of mental strategies training on employee cognition, behavior, and affect. *Journal of Organizational Behavior*. 1996;17(5):445–67.
32. Aristovnik A, Keržič D, Rav elj D, Tomažević N, Umek L. Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective. *Sustainability*. 2020 Jan;12(20):8438.
33. Jagger O, Lewith G. Building resilience through leadership. *InnovAiT*. 2016 Jun;9(6):347–54.
34. Howard CS, Irving JA. The impact of obstacles defined by developmental antecedents on resilience in leadership formation. In: *Management Research Review*. Las Vegas: Emerald Group Publishing; 2014. p. 466–78. (5; vol. 37).
35. Jha AP, Denkova E, Zanesco AP, Witkin JE, Rooks J, Rogers SL. Does mindfulness training help working memory' work' better? *Current Opinion in Psychology*. 2019 Aug 1;28:273–8.