College students' academic stress during the Covid-19 pandemic: The influence of hardiness, coping strategy, social support, and demographic factors

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ABSTRACT

Several research results show that during the COVID-19 pandemic, academic stress experienced by college students increased. They experience changes in how they learn, have difficulty staying focused, and are unproductive during the covid-19 pandemic. This study tests factors influencing college students' academic stress during the covid-19 pandemic. We hypothesized that hardiness, coping strategy, social support, and demographic factors influence academic stress. The sampling technique employed a non-probability sampling technique with a purposive sampling type, with the criteria for college students in Jabodetabek who did distance learning during Covid-19 Pandemic. Three hundred-six participants met the research criteria. Data were collected by academic stress and hardiness scales and; adapting the interpersonal support evaluation list and coping styles scale. Validation of the research instrument using confirmatory factor analysis (CFA) through Lisrel 8.8 software. Hypothesis testing using multiple regression with SPSS software version 20.0. Hardiness, coping strategy (problem-focused-coping and emotional-focused-coping), social support (tangible, appraisal, self-esteem, and belonging)- and demographic factors (gender, level of study) have a significant effect on college student's academic stress during the covid-19 pandemic (r^2=28.2%, p<.001). Variables that have a significant effect on academic stress are emotional-focused-coping (B=0.361, p<.001), self-esteem-support (B=0.117, p<.050), belonging-support (B=-0.271, p<.001) and gender (B=6.885, p<.001). Academic stress is influenced by hardiness, coping strategies, social support, and demographic factors. College students' academic stress will decrease if students get social support in the form of self-esteem-support and belonging support. The use of highly emotional-focused coping strategies will increase academic stress.

1. Introduction

One of the policies during the COVID-19 pandemic in the field of education was the implementation of distance learning. There are several problems in implementing distance learning, causing students to have difficulty concentrating and understanding the material provided, inadequate internet networks, and high internet quota requirements [1]. This condition is thought to be related to the level of stress experienced by students. The research results [2]

show that students who take distance learning experience high stress. This finding is in line with other research, which shows that during the covid-19 pandemic, students experience anxiety regarding academics [3]. Students experience academic stress levels that are in the high category [4–8].

Academic stress is a painful condition or condition experienced by individuals due to academic demands that require adjustment beyond everyday habits [9]. High academic stress and exceeding the individual's capacity can impact headaches, weight loss, difficulty sleeping, unhealthy lifestyles, decreased academic performance and achievement, and impaired ability to learn, memorize and get good grades [10–13]. Reactions to stress include physical reactions, emotional feelings, specific behavior, and tend to think about stressful events [9]. Academic stress has two dimensions: the source (stressor) and the reaction to the stressor. Sources of stress are frustration, conflict, pressure from the surrounding environment, disruptive changes, and the tendency to demand oneself to conform to self-expectations.

Students' academic stress levels are influenced by internal factors (self) and external factors [14,15]. Internal factors included adaptation ability, resiliency, lack of understanding and response to problems, locus of control, self-efficacy, hardiness, optimism, achievement motivation, and procrastination. External factors include relationships with family members, teachers, friends, financial support, parental social support, involvement with schools and communities, family background and environment, parental care, college burden, and socioeconomic status, which influence academic stress. Sarafino and Smith [16] revealed that individual reactions to stress differ from psychological and social factors: social support, personal control, personality, and type A and type B behavioral patterns. Lin and Chen [17] revealed that academic stress is related to stress from teachers, results, tests, studying in group stress, peer stress, time management stress, and self-inflicted stress. Other factors that influence stress are demographic factors such as age, gender, physical ability, ethnicity, level of study, study program, grades, coursework, and examination load [6,10,18].

This study examines internal factors such as hardiness and coping strategy, external factors in the form of social support, demographic factors in gender and socioeconomic status. and self-inflicted stress. Other factors that influence stress are demographic factors such as age, gender, physical ability, ethnicity, level of study, study program, grades, coursework, and examination load [6,10,18]. This study examines internal factors such as hardiness and coping strategy, external factors in the form of social support, demographic factors in gender and socioeconomic status. and self-inflicted stress. Kobasa [19] defines hardiness as a personality that acts as a source of resistance in the face of stressful events. Hardiness personality consists of three characteristics: control, commitment, and challenge. Individuals with hardy personalities feel involved in every activity, believe they can influence a situation and like challenges that occur in life, and see change as a positive thing [20]. Research shows hardiness significantly contributes to academic stress [21–25]. Hardiness personality can help reduce a person's perceived stress [15,16,26].

A coping strategy is a constantly changing cognitive and behavioral effort to age external and internal demands judged to overburden or exceed the person's resources [27]. Coping strategy is divided into two, namely problem-focused coping and emotion-focused coping [27]. Coping Strategy is an effort to manage demands considered too burdensome. These efforts can be problem-focused coping, where individuals think carefully when stressed and act appropriately to solve less. Emotion-focused coping is where individuals tend to daydream, separate themselves when under stress, build positive thinking when in trouble, blame

themselves, keep things to themselves, and do certain activities to reduce tension due to stress [27,28]. The results showed that problem-focused coping significantly affected students' academic stress [29,30]. Another finding shows that emotion-focused coping significantly affects student academic stress [29,31].

Social Support is the availability of various resources from interpersonal ties, such as getting material assistance (tangible support) and having someone to talk to. Share problems (appraisal support), get favorable comparisons with others (self-esteem support), and have someone who can be invited to do something together (belonging support) (32). High social support can protect a person from pathology caused by stress. The results showed that social support negatively correlated with academic stress (33–35). When someone has interpersonal ties, such as getting material assistance (tangible support) and having someone to talk to share problems regarding academic problems, it might lower stress.

Demographic factors can also affect academic stress, such as age, gender, physical ability, ethnicity, year of study, program, grades, coursework, and examination load [6,10,18]. Several research results show that gender affects students' academic stress levels [19, 4, 37]. Another study revealed no significant differences between male and female students' academic stress levels and perceptions of academic stressors [13,36]. Another demographic factor that is interesting to test is his student's level of study. The level of study is how long a student has been studying in college. Several studies have shown that level of study contributes significantly to perceived stress among college students [18,37,38]. Some studies show that final-year students report higher academic stress than junior and middle-year students [18,37]. Other studies show that first-year students have significantly higher stress levels than students in other years [3]). These findings reflect differences in research findings, making them enjoyable to review, especially during the COVID-19 pandemic.

This study examines the effect of hardiness, coping strategy, social support, and demographic factors on students during the COVID-19 pandemic, jointly or partially. Previous studies were conducted partially only on one of these variables or students but not during a COVID-19 pandemic. We hypothesized that during Covid-19 Pandemic, college students could minimize their academic stress through a high level of hardiness (as hardiness can help reduce a person's perceived stress [15,16,26], high level of problem-focused coping (as problem-focused coping significantly affected students' academic stress [29,31], high level of emotion-focused coping (as emotion-focused coping significantly affects student academic stress [29,31], high level of social support. Additionally, in demographic factors, we hypothesized gender and level of study might influence college students' academic stress

2. Method

This study uses a quantitative approach, with the research design in the form of correlational methods, e. I analyze the connection between factors by assessing multiple variables for everyone involved [39]. This study aims to examine the contribution of all independent variables of the study to the dependent variable but does not see a cause-and-effect relationship. The population in this study were undergraduate students from universities in Greater Jakarta. The population criteria are (1) being active in college, (2) being in the first year to the fourth year of lectures, and (3) having attended distance learning for at least one semester. In this study, sampling was carried out using a non-probability sampling technique in the form of convenience sampling, one group of samples is chosen by selecting readily available individuals [39].

The minimum number of research samples based on g*power version 3.1 for this research is 114 participants. The research sample was obtained through the flyer about the call respondent. Research flyers are distributed via social media such as WhatsApp, Instagram, and Facebook. The research sample filled out the questionnaire via the google form link on the research flyer. We collected data from Wednesday, March 17, 2021, to Tuesday, March 30, 2021, and there were 306 people who participated in this study. Table 1 describes the characteristics of the participants of this study.

Table 1. Characteristics of research participants

Variable	Frequency	Percentage
Gender		
Man	51	17%
Woman	255	83%
Age		
18	28	9.2%
19	41	13.4%
20	44	14.4%
21	128	41.8%
22	52	16.9%
23	10	3.3%
24	1	0.3%
25	2	0.7%
College Home Town		
Jakarta	88	28.8%
Bogor	1	0.3%
Depok	18	5.9%
Tangerang	9	2.9%
Bekasi	2	0.7%
South Tangerang	188	61.4%
Study Level		
First (Semester 2)	47	15.4%
Second (Semester 4)	54	17.6%
Third (Semester 6)	33	10.8%
Fourth (Semester 8)	172	56.2%

Table 1 shows that most research participants were women aged 21 years from universities in South Tangerang, and the year of study was in the fourth year (semester 8). The variables of this study include academic stress (dependent variable/DV), hardiness, coping strategy, social and gender support, and year of study (independent variable/IV). This study uses an academic stress scale based on the academic stress theory of Gadzella (9) to ensure the context and characteristics of the research participants felt. The total number of items totaled 36, comprising 25 items for the stressor dimension and 11 for the type of reaction to stressor dimensions. The scale is made using a Likert model scale, with four choices, namely never (1), rarely (2), often (3), and always (4). An example of a question item for stressors is "I am frustrated when I take online lectures." An example of a reaction item to stress is "When I'm stressed, I have a headache." The results of the CFA test on the academic stress scale show that the construct validity test for academic stress uses a one-factor approach to 36 items. Based on the results of the CFA analysis obtained, a model that does not fit ($\chi^{2 (594, N=306)}$=4689.96; p=.0000<.001; RMSEA=0.015). After modification, the model is found to fit ($\chi^{2 (367, N=306)}$=407.35; p=.07183>.050; RMSEA=0.019). Three items are insignificant (t-value <1.96), namely items 5, 15, and 25. These items were not included in the subsequent analysis.

This study uses a hardiness scale based on Kobasa's theory of hardiness [20], which consists of three dimensions: commitment, control, and challenge. This measuring instrument consists of 15 items using a four-point Likert scale, namely Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). An example of a commitment item is "I work hard in every activity I do." An example of a control item is "The success achieved depends on my effort." An example of a challenge item is "something that goes beyond the plan is very troublesome." The construct validity test for hardiness used a one-factor approach to 15 items. Based on the results of the CFA analysis obtained, a model that does not fit ($x^{2\,(90,\,N=306)}$=571.69; p=.0000<.001; RMSEA=.132). After modification, the model is found to fit ($x^{2\,(65,\,N=306)}$=82.29; p=.07252>.050; RMSEA=.030). Six items are insignificant (t-value < 1.96, and the coefficient factor score is negatively charged), namely items 2, 3, 8, 9, 13, and 14. These items were not included in the subsequent data analysis.

Coping strategy scale using problem focus and emotional focus coping scales adapted and modified from the Ways of Coping Scale Student Sample (Revised) compiled by Folkman & Lazarus [27]. Modifications were made to the problem-focus coping scale plus one item to 12 questions. On the emotional focus, the coping scale was reduced by two items for each indicator so that there were 12 questions. This scale uses a four-point Likert model scale format, namely Never (1), Rarely (2), Often (3), and Always (4). An example of a problem focus coping item is "I come up with several solutions for each problem." The construct validity test for problem-focused coping used a one-factor approach to 12 items. Based on the results of the CFA analysis obtained, a model that does not fit ($x^{2\,(54,\,N=306)}$=470.09; p=.0000<.001; RMSEA=.159). After modification, the model is found to fit ($x^{2\,(34,\,N=306)}$=46.68; p=.07232>.050; RMSEA=.035). One item is insignificant (t-value <1.96), namely, item 5. This item was not included in the subsequent analysis.

An example of an emotional focus coping item is "when I face a problem, I change into a better person." The construct validity test for emotion-focused coping used a one-factor approach to 12 items. Based on the results of the CFA analysis obtained, a model that does not fit ($x^{2\,(54,\,N=306)}$=615.04; p=.0000<.001; RMSEA=.185). After modification, the model is found to fit ($x^{2\,(32,\,N=306)}$=45.17; p=.06129>.050; RMSEA=.037). Two items are insignificant (t-value < 1.96, and the coefficient is negatively charged), namely items 17 and 18. These items were not included in the subsequent analysis.

This study used the social support scale to modify the short version of the Interpersonal Support Evaluation List (ISEL) scale created by Cohen & Hoberman [32]. Modifications are made by selecting, translating, and adjusting items according to the research theme. The modified social support scale has a total of 20 items. This scale uses a four-point Likert model assessment (Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). Examples of tangible support items are "I know someone who will lend money for my personal needs. (such as college needs)". The construct validity test for tangible support uses a one-factor approach to 5 items. Based on the results of the CFA analysis, the model does not fit ($x^{2\,(5,\,N=306)}$=83.05; p=.0000<.001; RMSEA=.226). After modification, the model is found to fit ($x^{2\,(2,\,N=306)}$=.45; p=.79846>.050; RMSEA=.000. There is one item that is not significant (t-value < 1.96, and the coefficient are negatively charged), namely item number 4. This item is not included in the following analysis.

An example of an appraisal support item is "I know someone who makes me comfortable talking about my college problems." The construct validity test for appraisal support uses a one-factor approach to 5 items. Based on the results of the CFA analysis obtained, a model that does not fit ($x^{2\,(5,\,N=306)}$=44.96; p=.0000<.001; RMSEA=.162). After modification, the fit model ($x^{2\,(4,\,N=306)}$=6.45; p=.16806>.050; RMSEA=.045). All items are valid (t-value >

1.96, and the score factor coefficient is positively charged), and all items are included for further analysis. An example of a self-esteem support item is "Most of my friends think I'm smart." The construct validity test for self-esteem support uses a one-factor approach to 5 items. Based on the results of the CFA analysis obtained, a model that does not fit ($x^{2\ (5,\ N=306)}$=151.19; p=.0000<.001; RMSEA=.310). After modification, the fit model ($x^{2\ (4,\ N=306)}$=1.78; p=.77599>.050; RMSEA=.000). Two items are not significant (t-value < 1.96 and the coefficient are negatively charged), namely items 17 and 19. These two items were not included in the subsequent analysis.

An example of a belonging support item is "I am often not invited to do things with other people." The construct validity test for belonging support uses a one-factor approach to 5 items. Based on the results of the CFA analysis obtained, a fit model ($x^{2\ (5,\ N=306)}$=3.87; p=.56756>.050; RMSEA=.000). All items are significant (t-value > 1.96, and the coefficient is positively charged). Data analysis was conducted to test the measurement instrument's validity and the research hypothesis. The technique of testing the validity of the measuring instrument uses confirmatory factor analysis (CFA) with the help of Lisrel software version 8.7. The hypothesis testing technique uses multiple regression with the help of SPSS version 25 software. The procedure in this study was carried out in several stages. The first stage concerns problem identification, theory determination, and measurement instruments. The second stage is compiling the measurement instrument to the instrument following the research theme. The third stage is the data collected through the google form distributed through social media (Whatsapp, Instagram, and Facebook) from March 17, 2021, to March 30, 2021. The fourth stage is the analysis of the research data obtained.

3. Results and Discussion

3.1 Results

Before the analysis, the raw score from the research data is converted into a factor score which will be transformed into a t-score. All raw scores on each variable are intended to have the same scale, making it easier for researchers to compare research scores. Table 2 shows the results of the descriptive analysis for the mean, minimum value, maximum value, and standard deviation of each variable.

Table 2. Mean, Minimum, Maximum, and standard deviation of research variables

Variable	N	Minimum	Maximum	mean	Standard deviation
Academic Stress	306	12.41	69.24	50.0002	9.62485
Hardiness	306	27.59	63.41	49.9998	8.85815
Problem Focus Coping	306	19.21	63.96	50.0001	9.21141
Emotional Focus Coping	306	26.08	65.26	500000	8.20519
Tangible Support	306	27.88	60.41	50.0007	9.23849
Appraisal Support	306	31.50	64.98	500000	9.23148
Self-Esteem Support	306	21.44	62.23	49.9993	9.11967
Belongingness Support	306	27.76	63.83	50.0001	8.67951

Table 2 shows that academic stress has the lowest minimum value and the highest maximum value. Tangible support has the highest minimum value and the lowest maximum value. Table 3 shows the number of research participants based on categorization.

Table 3. Categorization of research variables

Variables	Low f(/%)	Currently f(/%)	Tall f(/%)
Academic Stress	41 (13.4)	216 (70.6)	49 (16)
Hardiness	55 (18)	185 (60.4)	66 (21.6)
Problem Focus Coping	42 (13.7)	198 (64.7)	66 (21.6)
Emotional Focus Coping	45 (14.7)	207 (67.6)	54 (17.6)
Tangible Support	54 (17.6)	170 (55.6)	82 (26.8)
Appraisal Support	53 (19)	198 (63.7)	58 (19)
Self-Esteem Support	56 (18.3)	193 (53.3)	87 (28.4)
Belongingness Support	46 (15)	205 (67)	55 (18)

Table 3 shows that students' academic stress levels tend to be high (f=46 (16%). Students' hardiness also tends to be high, and they tend to use more problem focus coping than emotional-focus coping. The perceived social support also tends to be high except for belongingness support. The hypothesis test results show that academic stress can be explained jointly by hardiness, problem-focus coping, emotional focus coping, tangible support, appraisal support, self-esteem support, belongingness support, gender, and a study rate of 28.2% ($p < .001$). The contribution of each of these variables can be seen in table 4.

Table 4. Regression test results of research variables

Variable	B	T	P
Hardiness	-108	-1,579	.115
Problem Focus Coping	.115	1,642	.102
Emotional Focus Coping	.361	5.665	.000
Tangible Support	-.049	-.916	.360
Appraisal Support	.032	.535	.593
Self-Esteem Support	.117	2002	.046
Belongingness Support	-.271	-4.108	.000
Gender	6.885	5.323	.000
Level of Study	.289	.692	.490

Description: *p<.050; **p<.010;***p<.001

Table 4 shows that the variables that have a significant contribution are emotional focus coping (B=.361; p<.001); self-esteem support (B=.117; p<.050); Belongingness support (B=-.271; p<.001); and gender (B=6.885; p<.001). Hardiness, problem-focused coping, tangible support, appraisal support, and level study variables do not significantly contribute. Table 5 shows the results of the statistical test of the effect of each variable partially.

Table 5. The proportion of variance test results

Variable	R2	R2 Change	P Change
Hardiness	.001	.001	.652
Problem Focus Coping	.025	.024	.006 **
Emotional Focus Coping	.156	.131	.000 ***
Tangible Support	.162	.007	.120
Appraisal Support	.163	.001	.660
Self-Esteem Support	.174	.011	.049 *
Belongingness Support	.211	.037	.000 ***

Variable	R2	R2 Change	P Change
Gender	.281	.070	.000 ***
Hardiness	.282	.001	.490
Level of Study	.282	.001	.490

Description: *p<.050; **p<.010;***p<.001

Table 5 shows that the variable that has the largest and most significant contribution is emotional focus coping. Hardiness, appraisal support, and study level are the variables with the most minor and insignificant contributions.

3.2 Discussion

The results showed that the variables of hardiness, coping strategy (problem-focused coping, emotion-focused coping), social support (tangible support, appraisal support, self-esteem support, belonging support), and demographic factors (gender and level of study) have a contribution of 28.2% to the level of academic stress. These variables can explain the varying levels of student academic stress during the COVID-19 pandemic. The variables that have a significant contribution are emotion-focused coping, self-esteem support, belonging support, and gender. In contrast, the variables that do not significantly contribute are hardiness, problems-focused coping, tangible support, appraisal support, and level study.

Previous findings have shown that personality hardiness negatively affects academic stress levels [22]. The findings in this study indicate that the influence of personality hardiness in a negative direction on academic stress is relatively small. The participants of this study have a personality that tends to be low, but the level of academic stress tends to be high. This reflects that the attitude of commitment, control, and challenge that is owned is not strong enough to reduce the level of academic stress experienced during the COVID-19 pandemic. Meaning that hardiness personality is not enough to overcome the academic stress experienced during the covid-19 pandemic; other variables are needed to help overcome academic stress.

The findings in this study indicate that the emotion-focused coping variable significantly affects students' academic stress levels during the COVID-19 pandemic in a positive direction, which means that the higher the student's use of emotion-focused coping, the higher the level of academic stress they experience. In line with the findings of Crego and colleagues [40], emotional-focused coping positively affected stress levels. Heiman and Kariv [29] also stated that the greater the level of academic stress experienced, the more individuals tend to manage stress using emotion-oriented coping strategies. Hill [31] explains that emotionally react is probably the first and most frequently used reaction to stress. Emotion-focused coping is a coping strategy that focuses on dealing with emotions caused by stressful events. Emotional responses, especially negative ones, are more likely to increase stress than decrease it.

Coping strategies focusing on emotions, such as releasing negative emotions, can increase academic stress [40]. This is seen in the students who were participants in this study; they tended to use high emotional-focused coping with high-stress levels. The findings in the research of Dada and his colleagues [41] show that students' coping strategies are mostly emotional-focused. Emotional responses, especially negative ones, are more likely to increase stress than decrease it. Coping strategies focusing on emotions, such as releasing negative emotions, can increase academic stress [40]. This is seen in the students who were participants in this study; they tended to use high emotional-focused coping with high-stress levels. The findings in the research of Dada and his colleagues [41] show that students' coping strategies are mostly emotional-focused. Emotional responses, especially negative ones, are more likely to increase stress than decrease it. Coping strategies focusing on emotions, such as releasing negative emotions, can increase academic stress [40]. As seen in the students who were participants in this study, they tended to use high emotional-focused coping with high-stress levels. The findings in the research of Dada and his colleagues [41] show that students' coping strategies are primarily emotional-focused. They tend to use more emotional-focused coping with high levels of stress.

The findings in this study indicate that the problem-focused coping variable does not significantly affect students' academic stress levels during the COVID-19 pandemic, in contrast to the findings of previous studies, which showed that rational coping strategies such as problem-focused coping negatively affect academic stress [29,30,40]. Problem-focused coping is used more often when individuals assess that stressful situations can be changed (30). Individuals who use problem-focused coping seek to identify the problems that cause them to experience stress and then outline strategies for overcoming those problems [31]. Students who participated in this study used more emotion-focused coping than problem-focused coping,

The statistical analysis results in this study indicate that the self-esteem support variable significantly influences students' academic stress levels with a positive coefficient direction. The higher the student's self-esteem support, the higher the academic stress. This finding differs from previous research, which states that self-esteem support has a significant negative effect [34]. Self-esteem support is support in the form of favorable comparisons with others. Self-esteem support makes individuals see themselves as better than others. This can cause self-esteem support that is received to not function as a stress buffer so that instead of reducing and increasing student academic stress; this is not following the results of research by Patil and colleagues [34], which stated that self-esteem support had a significant negative effect where the higher the self-esteem support, the lower the academic stress.

The belonging support variable significantly affects students' academic stress levels with a negative coefficient direction. That is, the higher the student's belonging support, the lower the level of academic stress. Belonging support is support in the form of the availability of someone who can be invited to do something together. Someone who can be invited to do something together can make an individual not feel alone and believe that there are other people he can rely on. An increased sense of belonging and solidarity leads to a positive mood.

The tangible support variable does not significantly affect academic stress, presumably because material or direct assistance support is considered less effective. The effectiveness of various sources of support cannot be separated from the context and situation at hand. Support from interpersonal relationships can serve as a stress buffer only when the support resources match the stressors. The material assistance obtained may be provided mainly by parents in a stable manner, so it does not affect the stress felt by students [32]. This is in line with the results of a study by Patil and colleagues [34], which stated that the availability of material assets might not significantly affect the academic stress people face.

The appraisal support variable also does not significantly affect academic stress. This reflects that the availability of someone who can be invited to talk about the problem and the information received is less able to overcome or help the problems faced. This finding differs from previous studies results, which showed that appraisal support had a significant negative effect [34]. This study suspected that this support is not considered support, as stated by Sarafino and Smith [17]. If the support received is not assessed as support, it is unlikely that the assistance will play a role in reducing the perceived stress.

Gender variables on demographic factors significantly influence students' academic stress levels during the COVID-19 pandemic with a positive coefficient direction, which means there is a significant difference between the levels of academic stress of female and male students during the COVID-19 pandemic. This finding aligns with previous studies' results, which showed that gender affects students' academic stress levels [4,18,42]. This study shows that the average stress score of students is greater than that of students. This study also supports Calaguas (36) revealed that female students experience higher academic stress than male students. Female students are suspected to be more emotional and sensitive to what is happening around them.

The study level variable did not significantly affect students' academic stress levels during the COVID-19 pandemic. There is no significant difference between students' academic stress levels in the first, second, third, and fourth study years during the COVID-19 pandemic. This may be because both students in the first to the fourth year tend to face the same difficulties and pressures during online lectures during the COVID-19 pandemic, so there is no significant difference between stress levels. This is not in line with the results of previous studies, which showed that the year of study had a significant effect on student academic stress [18,37,38].

Based on the categorization of the research variable scores, it was found that most students during the COVID-19 pandemic experienced academic stress in the high category of 16%. This result differs from previous research results, which stated that student academic stress during the COVID-19 pandemic tends to be in the high category of 30.6%-96% [2–8]. The explanation may be because previous studies' results were taken in early to mid-2020, while this research was conducted in early 2021. Students may have started to adjust to academic situations and online lectures, resulting in a decrease in academic stress levels. This follows research from Maulana dan Iswari [43], which states that students adapt to various mechanisms over time so that stress-related hormone levels gradually return to normal

The results of this study indicate that hardiness does not contribute significantly to academic stress. This reflects that during the Covid-19 pandemic, the hardiness of personality contributed little to academic stress. It is possible that the factor that contributed most was the ability to adapt, considering that during the Covid-19 pandemic, many changes occurred. Therefore, further research on academic stress with the independent variable adaptability can be carried out. Another possibility is that a hardiness personality does not contribute directly but must be through another variable or maybe as a moderator variable. This can be considered for further research

One of the limitations of this study is that the research sample used is not representative of each year of study and the city of origin of the university, which causes uneven distribution of respondents so that it cannot generalize the study results. Second, the distribution of questionnaires conducted online causes researchers to be unable to monitor the condition of research respondents, thus allowing for unfavorable environmental conditions or errors in filling out of the reach of researchers. Third, the researcher does not limit the research sample based on the faculty so that the research sample becomes inhomogeneous.

4. Conclusion

The results of this study indicate that hardiness, a coping strategy (includes problem-focused coping and emotional-focused coping), social support (includes tangible, appraisal, self-esteem, and belonging support), hardiness and demographic factors (gender and level of study) together contribute to student academic stress during the covid-19 pandemic. Furthermore, the dimension that significantly influences student stress levels during the covid-19 pandemic is emotional-focused coping, self-esteem support, belonging support, and gender. This study shows the importance of using appropriate coping strategies and social support to reduce academic stress. The implication is that students need to be trained to use appropriate adaptive coping strategies and have social support to reduce academic stress levels. However, this study has some limitations, one of which is the sample selection technique, namely convenience sampling. It is necessary to be careful in generalizing the results of this study.

Author contributions

The authors confirm contribution to the paper as follows: study conception and design: Sumiati and Sakiinah; data collection: Sakiinah; analysis and interpretation of result: Sumiati, Sakiinah and Latifa; Draft manuscript preparation: Sumiati; and review the results and approved the final version of the manuscript: Sumiati and Latifa

Disclosure statement

The authors report no potential conflicts of interest.

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