

# Certain Stress is Good: A Quantitative Study of Stress and Academic Performance during Covid-19

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**Abstract** - The associations between stress, coping, and the academic performance had been examined for many years. This study reassesses those associations in a specified period of the Covid-19 pandemic since it transforms education methods in an instant and is suspected to influence the associations. This research aims to determine the relationship of stress to perceived academic performance and GPA with coping strategies (emotion-focused and problem-focused) as moderators.

Regression analysis of 321 Business and Management students showed that stress had a positive and significant effect on perceived academic performance ( $R=0,441$ ;  $p<0,05$ ) and accounted for 19,4% perceived academic performance variance. Coping strategies had moderating effects in that relationship ( $p<0,05$ ) and problem-focused coping was found to be stronger. Finally, stress and coping strategies were not associated with GPA.

The result implies that stress and coping strategies as moderators were affecting students' performance perception but not their actual performance (GPA). Further research for external factors such as lecturers and peers is recommended. This research could contribute to help the students' stress management, thereby increasing academic performance and well-being.

**Keywords** - Academic Performance, Business and Management Students, Coping, Covid-19, Stress

## I. INTRODUCTION

Surveys and studies reported a decreasing trend of students' academic performance during the Covid-19 pandemic [1]–[3]. To improve the situation, several studies investigated factors that suspected to influence academic performance which resulted in stress [4]–[6]. Stress during the Covid-19 will naturally occur since it transformed the learning and teaching method in instant. Research [7] also found that stress among the students worsen than the usual trend during the pandemic.

The current study about stress and academic performance is not reach the final answer yet. Some researches stated that they are related [8], [9], but the other stated the opposites [10] which leaves a gap in this field. Plausible explanations are the existence of coping strategies and the Yerkes-Dodson law. Thus, this study reassesses those associations with consideration of coping strategies during the Covid-19 period.

This research is used business and management students as samples since the major needs frequent group discussion, projects, and skill practicing such as

leadership which can effectively done offline [11]. This research aims fill the gap in the body of knowledge by understanding students' stress level, examining the relationship of stress and academic performance with coping strategies as moderator. The aims are derived into three research questions:

1. How is the stress level of the Business and Management students during the Covid-19 pandemic?
2. Is there any impact of stress during the Covid-19 pandemic on the academic performance (GPA) and perceived academic performance of the Business and Management students?
3. What are the coping strategies that statistical significantly moderating stress and its impact on academic performance (GPA) and perceived academic performance of Business and Management students during the Covid-19 pandemic?

## A. Literature Review

### 1) Academic performance and Stress

The transactional stress model stated that stress relies on the individual assessment, which implies that a perception plays a critical role in the process [12]. How individual perceived an event will decide how they react in term of stress. The reaction will decide the outcome of a stress. Theoretically, a stress will influence the behavior thereby influence performance.

The prior researches were trying to identify and confirm the theory of the stress effect on performance, especially among higher education students who borne many expectations and workloads [8], [9], [13]. Some study stated that it is related [6], [9], [14], but the other stated the opposites [15]–[17]. Thus, a more comprehensive study is developed.

The notion of performance then divided into the actual performance and the perceived performance. The perceived academic performance needed since the GPA cannot be used to measure all elements of performance itself: learner efficacy, learner ownership and responsibility, levels of learner knowledge, learning process methodology, forms of knowledge, cognitive, social, affective, learning-to-learn experience, cooperative learning, active learning, life challenges, and making the right choices [18]. The perceived academic performance may or not related to actual performance and also stress, which will be tested in this study [19].

**H<sub>01</sub>**. There is no relationship between stress and perceived academic performance of Business and Management students during the Covid-19 pandemic.

**H<sub>02</sub>**. There is no relationship between stress and GPA of Business and Management students during the Covid-19 pandemic.

## 2) Coping Strategies

Coping strategies is strategies to deal with stress in order to return the person back to homeostasis [12]. Coping strategies usage relies heavily on personal factor. Thus, it varied among people. There are 14 types of coping strategies, such as self-distraction and self-blame, which often divided into certain categories such as emotion-focused and problem-focused [20].

Coping strategies are suspected to be the answer of why the result of stress and academic performance studies were diverse as it can change the individual reaction toward stress [12]. Therefore, they are suspected to alter or moderate the relationship of stress and academic performance which will be tested in this study [15]–[17].

**H<sub>03</sub>**. There is no moderating relationship of coping strategies to the perceived academic performance of Business and Management students during the Covid-19 pandemic.

**H<sub>04</sub>**. There is no moderating relationship of coping strategies to GPA of Business and Management students during the Covid-19 pandemic.

## II. METHODOLOGY

### A. Research Design

Stress, coping strategies, and academic performance measured with stress and coping inventory. Assessment for academic performance executed by measuring the actual performance and perceived academic performance with questionnaires designed by researcher.

### B. Instruments

Perceived Stress Scale-10 (PSS-10) which measure stress based on its unpredictability, uncontrollability, and overload is used to measure the students' stress level. Actual academic performance measured by GPA and questionnaire designed by researcher based on Elger's Theory of Performance used to measure the perceived academic performance. Coping Strategies of the students is measured with the BRIEF Cope which is a 28-item questions to identify the students' tendency to use 14 coping styles [20]. All of the instruments passed the construct validity and internal consistency reliability test with  $0.411 \leq R \leq 0.753$  and  $0.769 \leq \alpha \leq 0.907$ .

### C. Participants

Business and management students (n=321) were asked to finish the questionnaire. The demographic profile of respondents is displayed in Table I.

TABLE I  
DEMOGRAPHIC PROFILE

| Demographic         | n   | %     |
|---------------------|-----|-------|
| Gender              |     |       |
| Male                | 190 | 59.19 |
| Female              | 131 | 40.81 |
| Age                 |     |       |
| Below 19            | 4   | 1.24  |
| 19                  | 53  | 16.52 |
| 20                  | 72  | 22.43 |
| 21                  | 112 | 34.7  |
| 22                  | 68  | 21.18 |
| More than 22        | 13  | 3.94  |
| Year of Entry       |     |       |
| Below 2017          | 13  | 4.05  |
| 2017                | 130 | 40.5  |
| 2018                | 61  | 19    |
| 2019                | 66  | 20.56 |
| 2020                | 51  | 15.89 |
| Activities          |     |       |
| Student association | 98  | 30.53 |
| Employed            | 63  | 19.63 |
| Social association  | 30  | 9.35  |
| Other               | 4   | 0.93  |
| No activities       | 126 | 39.25 |

### D. Data Analysis

This study uses  $\alpha$  of 0.05. Regression analyses were run to find out relationship of stress with GPA and perceived academic performance. Regression analyses was chosen since the researcher also wants to examine how strong the relationship between the variables. Furthermore, moderated regression analyses were used to seek moderation relationship of both coping strategies. Due to finding significant relationship of stress and perceived academic performance, regression analyses done for each of perceived academic performance dimension. In addition, due to the findings that problem-focused coping is more significant, a regression analyses for each of problem-focused coping types done.

This research ran 2 types of models independently for simple regression:

- 1) Model A: stress (predictor); perceived academic performance (outcome).
- 2) Model B: stress (predictor); GPA (outcome).

For the moderated regression analyses, this research independently ran 4 models:

- 1) Model 1: Stress (predictor); perceived academic performance (outcome); problem-focused coping (moderator).
- 2) Model 2: Stress (predictor); perceived academic performance (outcome); emotion-focused coping (moderator).

- 3) Model 3: Stress (predictor); GPA (outcome); problem-focused coping (moderator).
- 4) Model 4: Stress (predictor); GPA (outcome); emotion-focused coping (moderator).

### III. RESULTS

#### A. Stress Level

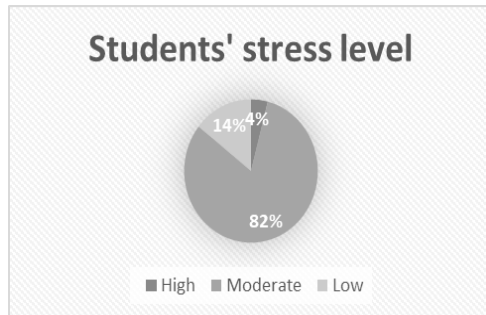


Fig. 1. Students' Stress Level

Figure 1 showed that most of the students' stress is in moderate level. This finding is not aligned with prior research which stated that the business and management students stress level is on high level [21]. As the pandemic found to increase the stress level of the students [7], the study shows different result. The plausible explanation for this is that the period of measuring the stress level is in May to April 2020 when the pandemic had occurred for approximately half a year and the students already adapted to the new environment.

Considering gender, the stress among the females found to be slightly higher than males. The average stress of females is 20.145 and male is 19.647. This is a phenomenon which often found in other studies [16], [17], [22]. The plausible reason is the Indonesian conservative social construct that pushes the males to face the stressors and females tend to have lack of freedom which resulted in them keeping their emotions.

#### B. Stress and Perceived Academic Performance

TABLE II  
COEFFICIENT OF DETERMINATION ANALYSIS

| Regression | R <sup>2</sup> | p     |
|------------|----------------|-------|
| Model A    | 0.194          | 0.000 |
| Model 1    | 0.350          |       |
| Model 2    | 0.390          |       |

Table II shows the result for Model A that stress, without moderators, is significantly influence the perceived academic performance ( $p < 0.05$ ). It is accountable for 19,4% of the variance of perceived academic performance.

Adding coping strategies can increase the model ability to explain the perceived academic performance variance by 16% to 20%. The model with emotion-focused coping is giving 4% greater increase than the

problem-focused model in the Model A's ability to explain perceived academic performance variance.

TABLE III  
MODEL 1 MODERATED REGRESSION RESULT

| Variable                 | Unstandardized Coefficients |            | Standardized Coefficients |        | Sig.  |
|--------------------------|-----------------------------|------------|---------------------------|--------|-------|
|                          | B                           | Std. Error | Beta                      | t      |       |
| (Constant)               | 44.526                      | 12.412     |                           | 3.587  | 0.000 |
| Stress                   | -0.480                      | 0.351      | -0.431                    | -1.365 | 0.173 |
| Problem-focused          | -0.210                      | 0.335      | -0.171                    | -0.625 | 0.532 |
| (Stress*Problem-focused) | 0.021                       | 0.009      | 1.091                     | 2.213  | 0.028 |

From the Table III, the stress and problem-focused coping both negative and insignificant in predicting the perceived academic performance ( $p = 0.173$ ,  $p = 0.532$ , respectively). However, the moderating relationship is positively significant in predicting the perceived academic performance ( $p = 0.028$ ). The interaction is also found that even though the magnitude of the interaction is low in the model (0.010) but it is the most important contributor to explain the perceived academic performance variance (standardized coefficients Beta=1.091).

TABLE IV  
MODEL 2 MODERATED REGRESSION RESULT

| Variable                 | Unstandardized Coefficients |            | Standardized Coefficients |        | Sig.  |
|--------------------------|-----------------------------|------------|---------------------------|--------|-------|
|                          | B                           | Std. Error | Beta                      | t      |       |
| (Constant)               | 40.805                      | 11.081     |                           | 3.682  | 0.000 |
| Stress                   | -0.539                      | 0.319      | -0.484                    | -1.687 | 0.093 |
| Emotion-focused          | 0.013                       | 0.166      | 0.019                     | 0.080  | 0.937 |
| (Stress*Emotion-focused) | 0.010                       | 0.005      | 1.009                     | 2.214  | 0.028 |

Table IV implies that interaction of stress moderated by emotion-focused coping have a significant and positive direction to the perceived academic performance ( $p = 0.028$ ). Both of the stress and emotion-focused coping individually are not significantly influence the perceived academic performance ( $p = 0.093$ ,  $p = 0.937$ , respectively). Among stress, emotion-focused coping, and the interaction, the interaction of stress and emotion-focused coping is the most important contributor to the perceived academic performance variance (standardized coefficients Beta = 1.009).

Both of the result shows that both categories of coping strategies are the most important contributor and the most significant factor. By comparing the standardized coefficients beta of both problem-focused coping and emotion-focused coping (1.091 and 1.009, respectively), the problem-focused coping was found to be the stronger category. This result implies that the problem-focused coping as moderator will have bigger impact in influencing the relationship of stress and perceived academic performance.

### C. Stress and GPA

TABLE V  
COEFFICIENT OF DETERMINATION ANALYSIS

| Regression | R <sup>2</sup> | p     |
|------------|----------------|-------|
| Model B    | 0.003          | 0.372 |
| Model 3    | 0.054          |       |
| Model 4    | 0.068          |       |

Table V shows the result for Model B that stress, without moderators, is insignificantly influence the perceived academic performance ( $p=0.372$ ). It is accountable for only 0,3% of the variance of GPA.

Adding coping strategies can increase the model ability to explain the GPA variance, but only by 5% to 6%. The model with emotion-focused coping is giving 1% greater increase than the problem-focused model in the Model B's ability to explain GPA variance.

These result shows that the model is not ideal to be used to predict GPA as it only describes small variance of the GPA with insignificant influence.

TABLE VI  
MODEL 3 MODERATED REGRESSION RESULT

| Variable                 | Unstandardized Coefficients |            | Standardized Coefficients |        | Sig.  |
|--------------------------|-----------------------------|------------|---------------------------|--------|-------|
|                          | B                           | Std. Error | Beta                      | t      |       |
| (Constant)               | 2.337                       | 0.712      |                           | 3.282  | 0.001 |
| Stress                   | 0.016                       | 0.020      | 0.297                     | 0.776  | 0.438 |
| Problem-focused          | 0.032                       | 0.019      | 0.548                     | 1.649  | 0.100 |
| (Stress*Problem-focused) | 0.000                       | 0.001      | 0.557                     | -0.931 | 0.353 |

From the Table VI, the stress and problem-focused coping both positive and insignificant in predicting the GPA ( $p=0.438$ ,  $p=0.100$ , respectively). The moderating relationship is also found to be insignificant in predicting the GPA ( $p=0.353$ ) and contributes to almost nothing in the model (Beta=0.000). The constant model is found to be more reliable to be used as it is significant ( $p=0.001$ ).

TABLE VII  
MODEL 4 MODERATED REGRESSION RESULT

| Variable                 | Unstandardized Coefficients |            | Standardized Coefficients |        | Sig.  |
|--------------------------|-----------------------------|------------|---------------------------|--------|-------|
|                          | B                           | Std. Error | Beta                      | t      |       |
| (Constant)               | 1.987                       | 0.650      |                           | 3.282  | 0.002 |
| Stress                   | 0.022                       | 0.019      | 0.424                     | 0.776  | 0.234 |
| Emotion-focused          | 0.025                       | 0.010      | 0.738                     | 1.649  | 0.012 |
| (Stress*Emotion-focused) | 0.000                       | 0.000      | 0.557                     | -0.881 | 0.121 |

Table VII implies that interaction of stress moderated by emotion-focused coping have an insignificant influence to the GPA ( $p=0.121$ ). It also gave almost nothing influence in the model (Beta=0.000).

Stress is also not significantly influencing the GPA ( $p=0.234$ ). However, the emotion-focused coping found to be significant and positively influence the GPA ( $p=0.012$ ). The constant model seems to be more reliable to be used as it is significant ( $p=0.002$ ).

This result implies that both models are not suitable to use to predict GPA. The moderating interaction of any categories of coping strategies in the models are not existed.

### D. Further Analysis

After the initial analysis, due to the interesting result, the researcher decides to run further analysis for the perceived academic performance and problem-focused coping to generate deeper understanding.

TABLE VIII  
PERCEIVED ACADEMIC PERFORMANCE ASPECTS ANALYSIS

| Aspects                      | Significance | Status      |
|------------------------------|--------------|-------------|
| Efficacy                     | 0.381        | -           |
| Ownership and Responsibility | 0.342        | -           |
| Level of Knowledge           | 0.039        | Significant |
| Learning Methodology         | 0.106        | -           |
| Forms of knowledge           | 0.277        | -           |
| Cognitive                    | 0.545        | -           |
| Social                       | 0.515        | -           |
| Affective                    | 0.036        | Significant |
| Immersion                    | 0.551        | -           |
| Cooperative Learning         | 0.045        | Significant |
| Active Learning              | 0.098        | -           |
| Life Challenges              | 0.567        | -           |
| Making Right Decision        | 0.554        | -           |

Table VIII shows the 13 aspects of perceived academic performance which are tested in this analysis. Significant factors which are influenced by stress and problem-focused coping as moderators are level of knowledge of the students ( $p=0.039$ ), affective skill ( $p=0.036$ ), and cooperative learning ( $p=0.045$ ). This means that the relationship of stress, moderated by problem-focused coping, is specifically significant influencing how the students view their depth knowledge after learning in class, their emotional maturity during facing challenges and persisting, and their capability to identify and adapt suitable learning practices when working with their peers. Combining with the findings before, with the same level of stress, the more students experienced challenges, the greater achievement they perceived in terms of knowledge, emotional capability, and cooperative learning.

TABLE IX  
PROBLEM-FOCUSED COPING TYPES ANALYSIS

| Problem-focused Strategies | Significance | Status      |
|----------------------------|--------------|-------------|
| Active Coping              | 0.052        | -           |
| Planning                   | 0.102        | -           |
| Instrumental Support       | 0.515        | -           |
| Self-distraction           | 0.018        | Significant |

Table IX shows the 5 types of problem-focused coping which are tested in this analysis. There is only one significant type that is moderating the relationship of stress and perceived academic performance, Self-distraction ( $p=0.018$ ). This means that the more behavior of distracting self, with the same stress level, found to make the students think that they did well in their university.

#### IV. DISCUSSION

Stress among students affected the students' perception of performance only. It affects their internal assessment but not necessarily predict their actual performance. This finding corresponds with previous research [23] but contrast with other research [14]. The researcher presume plausible explanation is that there are factors outside the students that influence them, such as studying period, lecturer quality, and the studying process quality [24]–[26].

There is a positive relationship of stress and perceived academic performance. The finding corresponds with prior research [27]. Yerkes-Dodson Law can be used to explain the result. Since most of the samples is in moderate stress levels, which according to the theory is in peak point of pressure, it will affect performance positively. It means that the stress level is sufficient to motivate the students in facing difficulties but not high enough to overpressure them.

This study also showed that both of coping strategies are significant moderators in the relationship between stress and perceived academic performance. Prior researches about perceived academic performance were examining its relationship with family structure, substance use, and suicide risk [19], [28]. Thus, the knowledge of the relationship between stress and perceived academic performance is currently limited. However, prior research implies that a stress in manageable level can increase healthy coping usage and generate improvement in students' academic well-being [29].

Moderating relationship of both coping strategies with stress and GPA is not found. This findings is in opposite with preceding research [30]. Referring to the statement of coping as moderating variable [31], there is a possibility that coping in this relationship is not independent. There is another factor such as socio-cultural, emotional, cognitive, and physical that influence the coping strategies [32].

Problem-focused coping is found to be more effective moderator. This finding is aligned with preceding study [30], [33]. Self-distraction is found to be most significant type. The researcher presumes that the result is possible since self-distraction allows the students to create distance and spare time to replenish their energy before they will come back to solve the problem. It also makes the

students do other productive activities rather than pondering and get stuck in the problem.

Based on perceived academic performance aspects analysis, there are 3 significant aspects influenced by stress and problem-focused coping: knowledge level, affective, and cooperative learning aspects. From the finding, the researcher conclude that the stress moderated by problem-focused coping influence the student's perception on how high their effort to acquire certain level of knowledge during the learning process, their emotional capability when encountering difficulties and persisting, and their ability to adapt best learning practices during working with teammates.

#### V. CONCLUSION

In this study, stress is found to positively influence how the students view of their academic performance, instead of their actual performance which is GPA. Coping strategies also found to moderate that relationship positively, especially the self-distraction coping. This study also confirming that perceived academic performance is worth to be studied to gather more comprehensive result of academic performance as it is explaining different part of performance besides GPA.

Therefore, the researcher suggests the business schools to consider the stress and stressors among the students. Since problem-focused coping found to be a stronger moderator than the emotion-focused one to influence perceived academic performance, the students can start to learn and utilize problem-focused coping strategies. For academic institutions, providing counselors and stress management workshops are suggested to promote stress management education for the students. Creating mentoring groups or buddy program can also be another method to monitor the students' academic and mental well-being over time. Last but not least, increasing awareness of the students about stress and coping strategies through campaigns or students' event is also recommended for preventive actions.

For future researcher who has interest to carry on this study, since the study found that stress is not the main factor in predicting academic performance, the researcher recommends to include some external variables such as learning environment and social environment into the model and examine its relationship with the students' performance.

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