

## **THE EFFECTS OF EMOTION REGULATION DIFFICULTIES AND TIME MANAGEMENT ON PROCRASTINATION AMONG UNDERGRADUATE STUDENTS IN UNIVERSITI MALAYSIA SABAH (UMS)**

Jennifer Janius, & \*Balan Rathakrishnan

Faculty of Psychology and Education, Universiti Malaysia Sabah

\*Corresponding email: rbhalan@ums.edu.my

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**Abstract:** Procrastination is considered a serious societal problem and, it is important to study the factors influencing it. Emotion regulation difficulties and time management are considered as the potential predictor of procrastination. However, there are limited number of studies that investigate both variables in examining procrastination. Thus, the present study aimed to investigate the effect of emotion regulation difficulties and time management on procrastination among undergraduate students in UMS. In this study, a survey study with a quantitative approach was applied as the research design. A total of 152 respondents with the inclusion criteria of undergraduate students and full-time students were recruited through snowball sampling method. Each respondent has completed the Pure Procrastination Scale (PPS), Brief version of the Difficulties in Emotion Regulation Scale (DERS-18), and Time Management Questionnaire (TMQ). Pearson correlation analysis revealed that emotion regulation difficulties showed a significant positive relationship with procrastination, while time management showed a significant negative relationship with procrastination. The results of the multiple linear regression analysis revealed that emotion regulation difficulties and time management are significant predictors of procrastination ( $F_{(2,149)} = 78.933, p < .05$ ), whereby emotion regulation difficulties showed a slightly larger contribution to procrastination compared to time management. Overall, the study's finding has helped to fill the gap in the previous study while allowing further understanding on the procrastination phenomenon. The present study also provides guidance for future researchers when examining the effects of emotion regulation difficulties and time management on procrastination.

**Keywords:** Procrastination, Emotion Regulation Difficulties, Time Management, Undergraduate Student

## **INTRODUCTION**

Procrastination is a common phenomenon that exists in our everyday life (Kiser, 2020; Klingsieck, 2013). Moreover, it is most prevalent among the undergraduate student population. A study on procrastination with a sample of 100 students from Universiti Teknologi Malaysia (UTM) found that 67% of the student are categorized as procrastinators while 12% as serious procrastinators (Abu Bakar & Khan, 2016). Also, the study by Baguri et al. (2020) reported that 52.6% of the respondents would sometimes nearly, often or very often procrastinate. The study by Eisenbeck et al. (2019) found that 61.3% out of 442 undergraduate students from the University of Almería in Spain reported having problematic procrastination in at least one of the academic areas. Herdian and Zamal (2021) found that 75.1% out of 305 university students in Indonesia reported higher than moderate levels of procrastination. Similarly, a study on procrastination by Putri Daryani et al. (2021) found that 55.1% of the medical students at Mulawarman University reported higher than average levels of procrastination. These statistics of procrastination among university students in Malaysia and overseas show that there is a high tendency for procrastination to exacerbate in the future. To understand this phenomenon, it is wise to involve university students when examining procrastination.

Klingsieck (2013) has defined procrastination as the unnecessary delay of an intended task that is considered important, despite being aware of the negative consequences of doing so. Several studies had found that procrastination will negatively affect the physical (e.g., Sirois & Tosti, 2012) and psychological well-being (e.g., Stead et al., 2010; Sirois & Tosti, 2012) of a procrastinator. While procrastinators continue to procrastinate on their tasks, their well-being will also exacerbate. It might become harmful to procrastinators in the long term (Ojo, 2019). Based on the information, procrastination could be considered as a serious societal problem. Thus, it is important to study the factors influencing it (Blikra, 2022). Jaffe (2013) suggested that emotion regulation difficulties and time management as the potential factors that widen the intention-action gap, which is considered as central to procrastination (Grund & Fries, 2018).

However, past studies that directly examine emotion regulation and time management as a predictor of procrastination among students are severely lacking. In Malaysia, there is less available literature that explains these

variables in relation to procrastination. The study by Aziz et al. (2017) shows the potential of time management and emotion regulation difficulties to affect procrastination among university students. Aziz et al. (2017) utilized the Relative Important Index (RII) to identify factors of procrastination among undergraduate students at Universiti Utara Malaysia (UUM). They found that the factor of procrastination with the highest agreed score is a self-overwhelming factor. The self-overwhelming factor was found to be the main cause of procrastination habits among second year students. Authors suggest that second-year students tend to do all their tasks at one time to the point that they become overwhelmed when they are unable to finish their work before its due. Meanwhile, the first-year students' procrastination habit was mostly affected by an emotional problem concerned with their adaptation to new environment (Aziz et al., 2017). The final year students were reported to procrastinate due to fear of disapproval or failure (Aziz et al., 2017). These factors somehow relate the procrastination habit with emotion regulation difficulties. Also, the authors highlighted that time management factor affected students' procrastination habit. Based on RII, the factor 'too many works at one time' was in the top three of procrastination's factor among first, second and final year students. Without improper time management, students will procrastinate if they have too many works at one time (Aziz et al., 2017). Unfortunately, they did not further investigate the relationship between these variables.

Also, studies that directly examine the emotion regulation difficulties and time management in relation to procrastination outside of Malaysia are also limited. Few studies relate emotion regulation difficulties with procrastination (e.g., Mohammadi Bytamar et al., 2020). The study by Mohammadi Bytamar et al. (2020) found a significant effect of emotion regulation difficulties on procrastination and they suggested the emotion regulation difficulties as the potential predictor of procrastination. Moreover, some interventions that utilise emotion regulation skills to overcome procrastination show a significant reduction in procrastination behaviour (Schuenemann et al., 2022), such as the study by Eckert et al. (2016). Eckert et al. (2016) found that emotion regulation strategy, specifically the ability to modify aversive emotions, is negatively correlated to procrastination. Based on the result, the author conducted a "two-week web-based intervention promoted emotion-focused strategies to overcome procrastination" (Eckert et al., 2016, p. 15). The intervention

was found to influence the reduction in procrastination levels. Thus, the study concluded that the availability of an adaptive emotion regulation strategy influenced the reduction in procrastination levels. Therefore, it is wise to further examine this factor in relation to procrastination.

Traditionally, procrastination is associated with problems in time management and self-regulation (Wolters et al. in Hailikari et al., 2021). Moreover, some research overseas had studied time management in relation to procrastination (e.g., Irwansyah & Asrida, 2021; Ocak & Boyraz, 2016; van Eerde, 2015). The study by Nordby et al. (2016) found that time management skills significantly contribute to reducing procrastination. Nordby et al. (2016) conducted a study to examine the effect of time management intervention on procrastination among Norwegian students. The authors found that students with high procrastination show a significant reduction in procrastination after the intervention, whereby the reduction was associated with an increase in time management skills. Another study by Hailikari et al. (2021) shows that there is a significant negative correlation between time and effort management skills, and procrastination. The author found that time and effort management skills have a significant influence on procrastination, whereby students with high time and effort management skills reported a low tendency of procrastination. This study supports the notion that time management skills as one of the significant factors in predicting procrastination. In this sense, the time management should be further studied in relation to procrastination.

Individually, the previous studies on emotion regulation and time management in relation to procrastination are limited. Despite the potential that these variables are predictors of procrastination (Jaffe, 2013), less study has been done to examine these variables together. Thus, the objectives of this study are: (1) to investigate the relationship between emotion regulation difficulties and procrastination among undergraduate students in UMS; (2) to investigate the relationship between time management and procrastination among undergraduate students in UMS; (3) to investigate the effect of emotion regulation difficulties and time management on procrastination among undergraduate students in UMS.

Based on the objectives, the hypotheses tested in this study are as follow: (H1) there is a significant positive relationship between emotion regulation

difficulties and procrastination among undergraduate students in UMS; (H2) there is a significant negative relationship between time management and procrastination among undergraduate students in UMS; (H3) emotion regulation difficulties and time management predict procrastination among undergraduate students in UMS.

## **METHODOLOGY**

In this study, a survey study with a quantitative approach was applied as the research design. This research was a cross-sectional study whereby the data was collected from the population of interest at one time (Kumar, 2011). In this study, the collection of data was conducted at the end of the semester. An online, self-administered questionnaire was used to collect data in this study.

### **Sample**

The study sample was obtained through the snowball sampling method, which used a network to select the study sample (Kumar, 2011). By using the snowball sampling method, it will be easier to identify the respondents that matched the inclusion criteria. The inclusion criteria included undergraduate students and full-time students from UMS. A total of 153 respondents completed the research questionnaire. However, one respondent was excluded because the respondent did not meet the inclusion criteria. Thus, the final study sample consists of 152 undergraduate students from UMS.

### **Instrument**

The online questionnaire used in this study consists of four sections which are Section A: Demographic Data, Section B: Pure Procrastination Scale (PPS), Section C: Brief version of the Difficulties in Emotion Regulation Scale (DERS-18), and Section D: Time Management Questionnaire (TMQ). PPS which was developed by Steel (in Kiser, 2020), was used to measure the irrational or dysfunctional part of procrastination among respondents. Respondent rate each of the 12 items on a 7-point Likert scale, with response scale 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7 = strongly agree. Sample items include “I delay making decisions until it’s too late”, “Even after I make a decision I delay acting upon it”, and “I generally delay before starting on work I have to do”. The present

study showed high internal consistency for the total score of PPS (Cronbach's alpha = .914)

DERS-18 was developed by Victor and Klonsky (2016). DERS-18 consists of 18 items divided into six subscales; awareness, clarity, goals, impulse, nonacceptance, and strategies. Respondents rate each item on a 5-point Likert scale, with response scales, 1 = almost never, 2 = sometimes, 3 = about half the time, 4 = most of the time, and 5 = almost always. Sample items include "I pay attention to how I feel", "When I'm upset, I become out of control", and "When I'm upset, I feel guilty for feeling that way". The present study showed high internal consistency for the total score with Cronbach's Alpha value of .904.

TMQ used in this study is validated by Alay and Koçak (2002). TMQ consists of 27 items divided into three factors (time planning, time attitudes, time wasters). TMQ is used to assess respondents' level of time management practices. Respondents rate each item on a 5-point Likert scale, with response scale 1 = never, 2 = infrequently, 3 = sometimes, 4 = frequently, and 5 = always. Sample items include "Do you plan your day before you start it?", "Do you set deadlines for yourself for completing work?", and "Do you continue unprofitable routines or activities?". The present study reported good internal consistency for the total score with Cronbach's alpha = .820

### **Data Analysis**

The data collected were analysed using descriptive statistics and inferential statistics. All data analyses were carried out using the 26th version of IBM SPSS Statistics. Screening and cleaning processes were conducted before the statistical analyses were continued. Descriptive statistics were used to analyse respondents' demographic data (gender, age, year of study, campuses, and faculty) that were collected in this study. Inferential statistics were used to test the hypotheses proposed in this study. The Pearson correlation was used to test the first and the second alternative hypothesis. Before conducting the Pearson correlation analysis, preliminary analyses were carried out to ensure the assumptions of normality, linearity, and homoscedasticity were not violated. Correlation coefficient,  $r = .10$  to  $.29$  indicates weak relationship,  $r = .30$  to  $.49$  indicates medium relationship and  $r = .50$  to  $1.0$  indicates strong relationship between the variables (Cohen in Pallant, 2007). The multiple

linear regression was used to determine the effects of emotion regulation difficulties and time management on the occurrence of procrastination among undergraduate students in UMS. The significance value was used to test the third alternative hypothesis. The preliminary analyses which included the multicollinearity, normality, linearity and homoscedasticity test were run before conducting the multiple linear regression analysis to ensure the assumptions of the analysis were fulfilled (Pallant, 2007).

## RESULTS

### Descriptive Analysis

Table 1 presents the descriptive statistics of the respondents' demographic profile. The age of respondents that participated in this study ranged from 19 to 26 years old ( $M = 22.36$ ,  $SD = 1.03$ ). Most of the respondents are female 72.40%, while male only 27.60%. Majority respondents are from Year 3 (61.80%), followed by Year 2 (17.80%), Year 1 (14.50%), and Year 4 (5.90%). Almost all respondents are from the Kota Kinabalu campus (90.80%). Only a small portion of the respondents come from Labuan (0.70%) and Sandakan (8.60%) campuses. Meanwhile, the faculty breakdown shows that more than half of the respondents are from Faculty of Psychology and Education (FPP) (55.3%), followed by Faculty of Business, Economics and Accountancy (FPEP) (10.5%), Faculty of Science and Natural Resources (FSSA) (7.9%), Faculty of Sustainable Agriculture (FPL) (7.2%), Faculty of Engineering (FKJ) (6.6%), Faculty of Social Sciences and Humanities (FSSK) (4.6%), Faculty of Computing and Informatics (FKI) and Faculty of Medicine and Health Sciences (FPSK) (3.3%), and Faculty of Food Science and Nutrition (FSMP) (1.3%). Out of the ten faculties, no respondent from the Faculty of International Finance Labuan (FKAL) was recorded.

Table 1: Descriptive Statistics of Respondents' Demographic Profile ( $N = 152$ )

Demographics	<i>N</i>	%	<i>M</i>	<i>SD</i>
Age	152	100	22.36	1.03
Gender				
Male	42	27.6		
Female	110	72.4		
Year of Study				
1	22	14.5		
2	27	17.8		
3	94	61.8		
4	9	5.9		

Campus		
Kota Kinabalu	138	90.8
Labuan	1	0.7
Sandakan	13	8.6
Faculty		
FKI	5	3.3
FKJ	10	6.6
FPEP	16	10.5
FPL	11	7.2
FPP	84	55.3
FPSK	5	3.3
FSMP	2	1.3
FSSA	12	7.9
FSSK	7	4.6

### Inferential Analysis

Pearson correlation analysis was conducted to test the first and second alternative hypothesis in this study. Before conducting the Pearson correlation analysis, preliminary analyses which include the analysis for normality, linearity, and homoscedasticity, were conducted first. The analyses proved no violation of assumptions of normality, linearity, and homoscedasticity on the data. Pearson correlation analysis on the emotion regulation difficulties and procrastination showed a significant and strong positive correlation,  $r(152) = .589, p < .05$ . Therefore, the alternative hypothesis that stated there is a significant positive relationship between emotion regulation difficulties and procrastination among undergraduate students in UMS is accepted. The result of Pearson correlation analysis on the time management and procrastination showed a significant and strong negative correlation,  $r(152) = -.551, p < .05$ . Therefore, the alternative hypothesis that stated there is a significant negative relationship between time management and procrastination among undergraduate students at UMS is accepted.

Table 2: Multiple Linear Regression Analysis on The Effect of DERS-18 and TMQ on PPS

Predictor	B	t	Sig. t
DERS-18	.476	8.039	.000
TMQ	-.425	-7.172	.000
$R^2$	.514		
F	78.933		
Sig. F	.000		

Multiple linear regression analysis was conducted to investigate the effect of emotion regulation difficulties and time management on procrastination

among undergraduate students at UMS. Before conducting the multiple linear regression analysis, preliminary analyses which include the analysis for multicollinearity, normality, linearity, and homoscedasticity, were conducted first to ensure the assumptions of regression analysis are not violated. Multicollinearity was diagnosed using the value of Tolerance and VIF. The multicollinearity assumption was not violated, as the diagnostic showed a Tolerance value that is higher than .10 and a VIF value that is smaller than 10. Moreover, the correlation coefficients of .266 indicated a weak correlation between the independent variables (emotion regulation difficulties and time management). Normality, linearity, and homoscedasticity were diagnosed by inspecting the Normal P-P Plot of Regression Standardized Residual (see Figure 1). Figure 1 showed a linear relationship between the variables, whereby the plots approximately form a straight diagonal line. The diagnostic indicated no violation of the assumptions of normality, linearity, and homoscedasticity. In short, no violation of assumptions ensured the multiple linear regression analysis was conducted without problems.

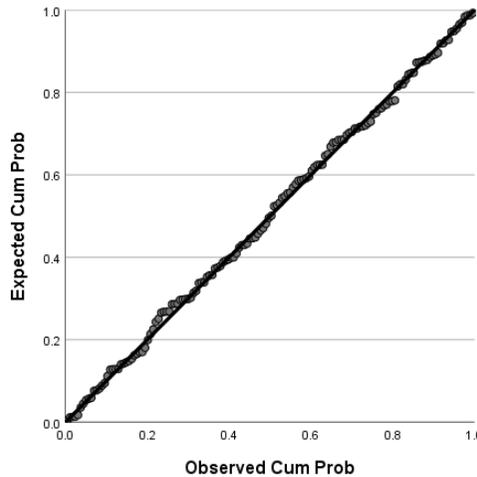


Figure 1: Normal P-P Plot of Regression Standardized Residual

The analysis, as presented in Table 2, shows that the regression model which include the emotion regulation difficulties and time management significantly explains 51.4% of the total variance in procrastination ( $F_{(2,149)} = 78.933, p < .05$ ). Emotion regulation difficulties have a

significant, positive effects on the procrastination among undergraduate students in UMS ( $B = .476, p < .05$ ). Beta coefficient of .476 shows that the increased of each score in emotion regulation difficulties will increased the student's procrastination score by .476. Meanwhile, time management has a significant, negative effects on the procrastination among undergraduate students in UMS ( $B = -.425, p < .05$ ). This shows that student's procrastination score decreases by .425 with the increased of each score in time management. The slightly higher beta coefficient for emotion regulation difficulties (.476) than the beta coefficient for time management (.425) revealed that emotion regulation difficulties are slightly better in explaining procrastination. Nevertheless, the alternative hypothesis 3 is accepted in this study.

## **DISCUSSION**

The present study found a significant and strong positive relationship between emotion regulation difficulties and procrastination among undergraduate students at UMS. These findings are in line with the findings yielded from the study by Mohammadi Bytamar et al. (2020), whereby the emotion regulation difficulties also showed a significant positive correlation with procrastination. However, the present study reported a stronger relationship between emotion regulation difficulties and procrastination compared to the study by Mohammadi Bytamar et al. (2020).

Similar findings were found by Eckert et al. (2016) in their study on the availability of adaptive emotion regulation strategies and procrastination. Eckert et al. (2016) found that the adaptive emotion regulation strategy and procrastination were negatively correlated. Even though the study investigated the adaptive part of the emotion regulation variables, and not the maladaptive part such as the emotion regulation difficulties, the findings were found to support the findings of the present study. By wise, the increased adaptive emotion regulation strategy indicates lower difficulties in emotion regulation. Thus, the study by Eckert et al. (2016) supported the findings of the present study on the relationship between emotion regulation difficulties and procrastination.

Due to the limited amount of literature that examined the relationship between emotion regulation difficulties and procrastination, the current findings could not be discussed in a more detailed manner. Moreover, the

study by Mohammadi Bytamar et al. (2020) and Eckert et al. (2016) were both conducted with academic procrastination as the focus. Meanwhile, the present study did not necessarily focus on academic-related activities in examining procrastination. Even though the present and the previous study share a similarity in terms of the target population to study, it is still possible that some changes in the findings might occur, when the focus in the present study was shifted to academic procrastination instead. Nevertheless, the present study has proven that emotion regulation difficulties and procrastination are correlated significantly.

Also, the present study found a significant and strong negative relationship between time management and procrastination among undergraduate students at UMS. This finding is quite similar to the study by Hailikari et al. (2021), whereby they found a significant negative correlation between procrastination and time and effort management skills. Hailikari et al. (2021) also reported that time and effort management skills have the strongest correlation with procrastination among the variables that were examined in their study.

Even though the present study shows similar findings to the study by Hailikari et al. (2021) on the relationship between time management and procrastination, some matters needed to be considered. First, the time-related variable in the previous study is somehow different from the variable examined in the present study. Note that, they examined the time and effort management skills while the present study only focused on time management skills. Hailikari et al. (2021) aim to measure the student's ability to set goals, and ability to manage and use the time to achieve those goals.

The present study might not measure students' ability to set goals directly, however, the instrument used to measure time management in this study has included items that are directed towards the ability to set goals. For example, the item "Do you set deadlines for yourself for completing work?" and the item "Do you have a set of goals for the entire quarter?". Thus, even though the time-related variables between both studies are different, this could justify that the differences are not total. Thus, the findings of the study by Hailikari et al. (2021) might be valid in supporting the findings of the present study. However, the information provided was not enough to further discuss the findings of the present study.

Nevertheless, the existence of a significant and strong correlation between time management and procrastination shows that these variables are related.

Analysis of multiple linear regression revealed that the model built based on these variables significantly explains 51.4% of the variance in procrastination. While there is no available literature to support the findings of explained variance by the model in this study, several studies supported that, individually, emotion regulation difficulties and time management are significant in predicting procrastination. The study by Mohammadi Bytamar et al. (2020) found that emotion regulation difficulties significantly predict procrastination. When emotion regulation difficulties are included in a model with anxiety and depression, the total variance explained by the model increases by 7% compared to the model with only anxiety and depression. Moreover, emotion regulation difficulties showed a significantly high contribution in explaining procrastination.

The study by Irwansyah and Asrida (2021) found that time management has a significant effect on procrastination. In the regression model based on two variables, time management and peers, time management showed a higher contribution in explaining procrastination compared to peers. Another study that reported a similar finding is the study by Nordby et al. (2016). Nordby et al. conducted a brief intervention program for procrastination, which was based on time management skills and motivation. Analysis of the changes in procrastination score after completing the intervention shows that time management contributes more to the changes compared to motivation.

Although both variables showed a significant contribution to procrastination, the emotion regulation difficulties showed a slightly larger contribution in explaining procrastination, when other variables in the model are held constant. This finding is not surprising, since many works of literature on procrastination have cited emotion-related construct when explaining the procrastination phenomenon (e.g., Blikra, 2022; Diotaiuti et al., 2021; Eckert et al., 2016; Rebetz et al., 2015; Svartdal et al., 2018). Moreover, this finding is in line with the mood regulation models of procrastination (Sirois & Pychyl, 2013). According to this model, people procrastinate because they were unable to control the impulse to regulate

unpleasant emotions when they were faced with an aversive task or condition (Sirois & Pychyl, 2013).

Being said that, the removal of unpleasant moods by procrastinating might negatively reinforce the behaviour (Eckert et al., 2016), thus becoming the main strategy to deal with unpleasant emotions (Sirois & Pychyl, 2013). If the strategy was used repeatedly to regulate the unpleasant emotion, it might become habitual. In another word, they might automatically procrastinate every time they experienced unpleasant emotions. Therefore, instead of regulating their emotion, they choose to avoid them by procrastinating. In this context, time management skill might not be enough to counter the impulse to procrastinate, which justify why the contribution of emotion regulation difficulties was larger compared to time management. As cited by Jaffe (2013), “a poor concept of time may exacerbate the problem, but the inability to manage emotions seems to be its very foundation” (para. 3).

In short, emotion regulation difficulties and time management are significant in predicting procrastination, as reported by previous studies. Although the findings of the present study show similarity with the previous studies, they could not be discussed thoroughly due to the limited amount of literature on this topic. Without a doubt, the research on procrastination is abundant, but the study that examined procrastination with emotion regulation difficulties and time management is still lacking. Therefore, it is difficult to justify the validity of the study findings in comparison with the other studies. Despite the limitation, the present study was able to answer all the questions proposed.

## **CONCLUSION**

In this study, the effects of emotion regulation difficulties and time management on procrastination among undergraduate students in UMS were investigated. An important finding of the present study is the existence of statistically significant effects of emotion regulation difficulties and time management on procrastination. The finding has helped to fill the gap in the previous study on this topic. This study also helps in guiding the future researchers to conduct more studies on procrastination in relation to emotion regulation difficulties and time management. Other than that, the finding of this study could be used to design and develop certain intervention programs to overcome

procrastination. So that in the future, there will be more effective intervention programs available to help treat people's procrastination behaviour.

Therefore, this information should be used wisely to further understand the procrastination phenomenon, as there are still some people that have this misconception that procrastination is the same as laziness (Reardon, 2021; Saulsman & Nathan, 2008). To understand the procrastination phenomenon, future study should thoroughly examine the procrastination in relation to emotion regulation difficulties and time management, as well as other potential predictors of this phenomenon.

### **Limitation and Recommendation**

Even though the findings of the present study are significant, some limitations need to be addressed. The first limitation is the fact that the intensity of procrastination was measured during the end of the semester whereby the procrastination is at the lowest rate. It is possible that the irrational delay could not be captured thoroughly in this study. Therefore, to prevent such limitation in the future study, the study should be conducted within the semester, This is because students dealt with assignments deadline most of the time within the semester. Therefore, the irrational delay might be captured thoroughly if it was measured within the semester. Moreover, it will help to study the concepts in a more complete picture (Galanakis et al., 2020).

The second limitation is the design of the study. The present study adapts the cross-sectional design whereby the data was collected from the population of interest at one time (Kumar, 2011). To gain further understanding of the causal relationship between the independent and dependent variables, the changes in the dependent variable that was caused by the independent variable should be examined. The analysis of correlation and prediction was not enough to justify the effects of emotion regulation difficulties and time management on procrastination. To do that, the study must be conducted using the longitudinal design. Thus, the finding on the effects of emotion regulation difficulties and time management and time management could be further justified.

The method of data collection is one of the limitations of this study. The present study only uses a self-administered questionnaire to collect data.

This instrument has high tendency to cause unreliable results. This is because some respondents did not answer the questionnaire honestly. Other than that, using a self-administered questionnaire might cause different respondents to interpret the questions differently according to their interpretation. This is due to the absence of researchers to help respondent to interpret the meaning of the questions (de Leeuw, 2008; Kumar, 2011; Munn & Drever, 1990). Therefore, the future studies should apply other methods for data collection, such as interviews, observations, and others. The information collected from this method will add to the information collected through the survey. Moreover, procrastination is behavioural (Blikra, 2022). Thus, using the observation method might capture the behavioural aspect of procrastination that could not be measured through a survey.

Lastly, the findings of the study might not be generalised to the student population since the study sample was collected using the snowball sampling method. Thus, the study sample was small and imbalanced in gender. Moreover, the present study only focuses on undergraduate students and only involve student from UMS. Thus, the study sample is not representative of the population. Being said that, future studies should use a random sampling method to collect data to obtain larger and more balanced samples. The study sample should also involve students from different education levels (such as high school, master's, or doctorate students) and other public universities in Malaysia. Thus, the study sample would be more representative of the population.

### **Informed Consent Statement**

All participants had granted their consent to this study.

### **Conflict of Interest**

The authors declared no conflict of interest.

### **Ethics Statement**

The study was done compliance with the ethical guidelines approved by the Universiti Malaysia Sabah.

### **Author's Contribution**

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Conceptualization, Resources, Jennifer Janius, & Balan Rathakrishnan; Formal analysis, Methodology, Writing, Jennifer Janius; Project administration Supervision, Visualization, editing, Balan Rathakrishnan.

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### **Data Availability Statement**

All data is available upon request.

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