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Relationship Between the Use of Coping Strategies and Academic Procrastination in Undergraduate Medical Students: A Cross-Sectional Study

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ABSTRACT

Medical education is widely recognized for its demanding nature, which often causes significant stress among students. This pressure stems from multiple aspects of the learning process, including the need to assimilate extensive and complex medical knowledge and meet rigorous academic expectations. Without effective coping mechanisms, these stressors can trigger academic procrastination among medical students. This study investigated the relationship between coping strategies and academic procrastination in preclinical medical students. Conducted in April 2023 at the Faculty of Medicine, University of Mataram, this cross-sectional study involved 202 students in grades 2, 4, and 6. Data were collected using stratified random sampling, the Brief COPE instrument, and an Academic Procrastination Questionnaire, all of which were validated for reliability. Statistical analysis using SPSS version 21 included Chi-square tests to explore the relationship between coping strategies and procrastination levels. The findings revealed a significant relationship ($p = 0.019$) between coping strategies and academic procrastination. Problem-focused coping, particularly planning and active coping, received the highest scores, reflecting a constructive approach to addressing educational challenges. The most common procrastination behaviors were delaying the start of a task and difficulty in managing time, which were likely influenced by the complexity of the task and student disinterest. Effective coping strategies have been found to increase motivation, improve time utilization, and enhance task focus, reducing the likelihood of academic procrastination. These insights highlight the importance of developing adaptive coping mechanisms among medical students to mitigate stress and optimize academic performance during their formative years of education.

Keywords: *Coping strategies, Academic procrastination, Preclinical students*

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INTRODUCTION

Medical education is notorious for its high levels of stress (1), often stemming from students' inability to plan and implement coping strategies throughout their education. Many sources of stress for medical students, if not managed using effective coping strategies, can lead to increased stress and anxiety (2,3).

Research has shown that procrastination increases students' workload, causing a decrease in life satisfaction. This pressure stems from multiple aspects of the learning process, including the need to assimilate extensive and complex medical knowledge and meet rigorous academic expectations. This can negatively impact their academic performance and may even lead to unprofessional behavior during training (4,5). For example, Steel (2007) found that students who procrastinate often experience higher levels of stress and lower overall well-being. Similarly, Sirois (2013) concluded that procrastination is associated with poor mental health outcomes, including depression and anxiety, which further exacerbate stress levels in medical students (6,7).

When an individual's workload surpasses their available resources, coping strategies are essential for managing internal and external demands (8,9). There are two primary types of coping strategies: 1) problem-focused coping (directly addressing the source of stress and resolving the issue) and 2) emotion-focused coping (managing emotional responses to stress by avoiding problems, engaging in other activities, and seeking social support) (4). Asmid (2022) found that coping abilities account for 26.38% of the variance in procrastination behavior among students in the Faculty of Teacher Training and Education. Thus, lower stress-coping abilities in students are associated with a higher tendency to engage in academic procrastination (10).

Academic procrastination refers to a delay in starting or completing academic tasks, such as studying lecture materials and preparing for exams. Procrastination among students is a significant issue that requires attention due to its negative impact on the student environment. Hayat (2020) has revealed that 29% of medical students at Shiraz University experienced academic delays, and 47% reported that moderate levels of academic delays caused numerous problems and reduced their academic performance (11). Stress and a lack of effective coping skills can lead individuals to procrastinate on academic assignments, intensifying their stress levels. This creates a cycle in which procrastination exacerbates stress, potentially evolving into a persistent issue if not adequately addressed (12).

To date, there is a notable scarcity of research examining the relationship between coping strategies and academic procrastination among students, particularly in medical education. The existing literature has predominantly focused on general student populations or has addressed these variables in isolation. This lack of targeted investigation creates a significant gap in understanding how medical students, who face unique stressors and hectic academic schedules, utilize coping mechanisms to manage procrastination. Limited research has explored how medical students employ specific coping strategies, such as problem-focused coping, emotion-focused coping, and avoidance strategies, to mitigate procrastination. Additionally, the most effective coping strategies in this unique academic context remain unclear.

The author addresses these gaps by analyzing the relationship between coping strategies and academic procrastination among medical students. This research explores the interaction among these variables and identifies the specific characteristics of academic procrastination prevalent among medical students. Furthermore, the study determines the coping strategies most frequently and effectively used to combat procrastination.

This study intends to provide insights into the development of targeted interventions and support systems designed to enhance the academic performance and well-being of medical students. This, in turn, could contribute to more effective medical education practices.

METHODS

Study Design

This cross-sectional study was conducted in April 2023 at the Faculty of Medicine, Mataram University, a leading state university located in Mataram, the capital city of West Nusa Tenggara Province, Indonesia. The Mataram University Faculty of Medicine is renowned for its rigorous academic program and diverse student body, making it an ideal setting for examining the relationship between coping strategies and academic procrastination among medical students. This study was approved by the Research Ethics Committee of the Faculty of Medicine, Mataram University (No. 089/UN18. F8/ETIK/2023).

Participant

The research sample was obtained using stratified random sampling from a population of 423 first-to third-year undergraduate medical students at Mataram University. This grouping allowed us to examine how the different cohorts managed their academic challenges over time. The required sample size was calculated using Isaac and Michael's formula (Figure 1) with a 5% error rate, which is commonly used in educational research to ensure a representative sample. It considers the population size, desired confidence level, and acceptable margin of error and provides a statistically robust method to ensure that the sample accurately represents the population. Therefore, the minimum sample size based on the formula was 201.55, which was rounded up to 202 participants and divided into 73 first-year, 69 second-year, and 60 third-year students. These results were obtained based on the formula for the population size of each class divided by the total population size and multiplied by the minimum sample size.

S = sample size
λ^2 (for a 5% significance level) = 3.841
N = population size (423 people)
P = Q = 0.5
$d^2 = (5\%)^2 = 0.0025$

Calculation:

$$S = \frac{\lambda^2 . N . P. Q}{d^2 (N - 1) + \lambda^2 . P . Q} = \frac{3,841.423.0,5.0,5}{0,0025.422+3,841.0,5.0,5} = \frac{406,18575}{2,01525} = 201,55$$

Figure 1: Calculation formula for Isaac and Michael.

Instrument

Data were collected using the Brief COPE questionnaire, which comprises 28 items divided into 14 subscales. A reliability test conducted by Jayusman (2018) showed a Cronbach's alpha coefficient of 0.778, indicating good reliability (14). Participants rated their responses using a four-point Likert scale: 4

for "very often," 3 for "often," 2 for "rarely," and 1 for "never." Additionally, the Academic Procrastination Questionnaire developed by Ahmaini (2010) contains 35 items and four subscales, with a high reliability score of 0.92 (15). Participants used a four-point Likert scale to indicate their responses: 4 for "strongly agree," 3 for "agree," 2 for "disagree," and 1 for "strongly disagree." This approach ensured that the instruments were reliable and valid for assessing coping strategies and academic procrastination.

Researchers used email and WhatsApp to consult with expert reviewers and SPSS version 21 to validate the selected content and items. An expert review of the Brief COPE and Academic Procrastination Questionnaire instruments was conducted by ten experts who were lecturers in the Master of Medical Education program at the University of Indonesia. These experts were selected based on their qualifications and extensive backgrounds in the questionnaire subjects. They evaluated each item using a 1–4 rating scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = very relevant).

The Content Validity Index (CVI) was calculated, including the Item-level Content Validity Index (I-CVI), which assessed the individual relevance of each item. For the coping strategies instrument, all items achieved an I-CVI >0.78—none of the items needed to be excluded. The instrument also demonstrated strong reliability with a Cronbach's alpha value of 0.954. For the academic procrastination instrument, the validation results revealed that two out of 35 items did not meet the criteria, leaving 33 valid items with an I-CVI >0.78 and a Cronbach's alpha value of 0.968. These findings confirmed the high validity and reliability of the instruments in assessing coping strategies and academic procrastination.

After preparing the research instruments, a questionnaire was distributed to the participants using Google Forms. Respondents were provided with a brief explanation of the study and asked to provide informed consent. The researchers ensured the confidentiality of the respondents' identities and information throughout the process.

Data Analysis

The collected data were analyzed descriptively and analytically using SPSS version 21. The results are presented in tables and narrative formats. The Chi-square test was employed to examine the relationship between the use of coping strategies and the level of academic procrastination.

RESULT

Online questionnaires were distributed to 202 students based on the randomization results (Table 1).

Table 1: Characteristic research subject

Variable	Student year						Total	
	Year 1		Year 2		Year 3			
	n	%	n	%	n	%	n	%
Number of Students	73	36.1	69	34.2	60	29.7	202	100
Gender								
Male	21	35.6	22	37.3	16	27.1	59	100
Female	53	37.1	47	32.9	44	30.8	143	100

Age (in year)								
<20	71	74.7	22	23.2	2	2.1	95	100
≥20	2	1.9	47	43.9	58	54.2	107	100

Table 2: Average scores for aspects of use coping strategies

Aspect		Mean (SD) Year 1 n=73		Year 2 n=69		Year 3 n=60		Mean Total (SD)	
Problem Focused Coping	Active Coping	3.09 (0.57)	3.15 (0.62)	3.09 (0.64)	3.03 (0.69)	3.15 (0.57)	3.14 (0.65)	3.11 (0.60)	3.01 (0.62)
	Planning	3.26 (0.68)		.09 (0.81		.23 (0.71		3.20 (0.63)	
	Use of instrumental support	3.09 (0.60)		.91 (0.63		.03 (0.67		3.01 (0.63)	
	Venting	2.86 (0.74)		.72 (0.79		.91 (0.73		2.83 (0.75)	
	Self-distraction	3.03 (0.64)		.07 (0.65		.10 (0.57		3.07 (0.54)	
	Denial	2.40 (0.78)		.18 (0.76		.13 (0.77		2.25 (0.76)	
	Substance use	1.21 (0.57)		.06 (0.29		.13 (0.43		1.13 (0.45)	
Emotion Focused Coping	Use of emotional support	2.93 (0.68)	2.72 (0.66)	.81 (0.65	2.60 (0.65)	.75 (0.68	2.70 (0.64)	2.84 (0.67)	2.70 (0.65)
	Behavioral disengagement	1.91 (0.67)		.68 (0.65		.77 (0.69		1.79 (0.66)	
	Positive reframing	3.25 (0.57)		.09 (0.64		.27 (0.64		3.20 (0.62)	
	Humor	2.90 (0.74)		.76 (0.80		.01 (0.69		2.88 (0.72)	
	Acceptance	3.31 (0.63)		.13 (0.58		.36 (0.53		3.26 (0.59)	
	Religion	3.53 (0.60)		.56 (0.59		.55 (0.63		3.55 (0.60)	
	Self-blame	2.55 (0.68)		.49 (0.83		.75 (0.70		2.91 (0.75)	

Table 2 shows that problem-focused coping had the highest average score, with an overall average of 3.01. Within this category, planning scored the highest at 3.20, followed by active coping at 3.11. For first-year students, planning received the highest average score (3.26). In the second year, active coping

and planning had the same average score of 3.09. Finally, for third-year students, planning had the highest average value of 3.23.

Table 3: Average scores for the characteristics of Academic Procrastination

Aspect	Mean (SD) Year 1 n=73	Year 2 n=69	Year 3 n = 60	Mean Total (SD)
Delays in starting or completing work on the task at hand.	2.58 (0.68)	2.51 (0.66)	2.40 (0.67)	2.55 (0.62)
Delay in doing assignments	2.31 (0.64)	2.24 (0.62)	2.29 (0.63)	2.27 (0.58)
The time gap between plans and actual performance in carrying out tasks	2.47 (0.63)	2.45 (0.62)	2.52 (0.63)	2.47 (0.58)
The tendency to do other activities that are seen as bringing more entertainment and pleasure	2.23 (0.58)	2.20 (0.56)	2.36 (0.61)	2.25 (0.56)

Table 3 illustrates the characteristics of academic procrastination among students. In the first and second years, the highest average scores were observed for delays in starting or completing tasks, with scores of 2.58 and 2.51, respectively. For third-year students, the highest average score (2.52) was recorded for the time gap between planned and actual task performance.

Conversely, the lowest average scores in the first and second years were related to the tendency to engage in more entertaining activities, with scores of 2.23 and 2.20, respectively. In the third year, the lowest average score (2.29) was observed for delays in assignment completion.

Table 4: Test of the relationship between use of coping strategies and academic procrastination

		Academic Procrastination Low N	%	high N	%	Total	p value	OR (95% CI)
Coping Strategy	Low	41	30.1	95	69.9	136	0.019[cs]	0.487(0.266 - 0.894)
	high	31	47.0	35	53.0	66		reference
Total		72	100	130	100	202		

Note: cs) Chi Square Test

Table 4 shows the statistical analysis that revealed a significant association between coping strategies and academic procrastination among undergraduate medical students at the Faculty of Medicine, Mataram University ($p = 0.019$). The odds ratio (OR) was 0.487 (95% CI: 0.266–0.894)—students with higher coping strategies had significantly lower odds of experiencing high levels of academic procrastination. For better interpretation, the reciprocal of the OR ($1/0.487 \approx 2.05$) suggests that students with low coping strategies were approximately twice as likely to exhibit high academic procrastination compared to those with effective coping mechanisms. These findings highlight the critical role of coping strategies in mitigating academic procrastination among medical students.

DISCUSSION

This study explored the relationship between coping strategies and academic procrastination, identifying common procrastination behaviors and effective coping methods. The study found that the students frequently employed problem-focused coping strategies, particularly planning and active approaches. Notably, students with lower coping abilities tended to exhibit higher levels of academic procrastination. These findings align with those of previous studies that show a negative correlation between coping strategies and academic procrastination, highlighting the importance of effective coping mechanisms in reducing procrastination among medical students. Thus, developing strong coping skills can be a proactive way to minimize academic procrastination, potentially enhancing students' academic performance and overall well-being (16,17).

Planning strategies—a crucial aspect of problem-focused coping—are often adopted by students to address academic challenges effectively. According to Babicka-Wirkus (2021), planning, acceptance, and seeking social support are the dominant coping strategies among Polish students due to their constructive nature (18). These strategies empower students to overcome academic obstacles methodically by identifying the underlying problems. This process allows them to determine the required resources, formulate structured action plans and priorities, and calculate the optimal time to perform the planned actions. Through planning strategies, students enhance their problem-solving abilities and time management skills, optimizing their learning efforts. This proactive approach helps overcome existing obstacles and fosters a mindset conducive to continued academic success (19).

The research results showed that active coping was widely used, consistent with previous studies indicating that active coping significantly improves the psychological well-being of male students by engaging in problem-solving and coping strategies to find effective solutions (20). This approach includes proactive steps such as acquiring new skills and seeking social support from friends, family, mentors, or support groups. By actively addressing these challenges, students can enhance their resilience and emotional strength, leading to improved mental health and overall well-being. This proactive approach enables students to navigate academic and personal challenges more effectively, leading to a positive environment for personal growth and academic success (20,21). In this study, active coping was commonly used; however, sex differences in coping strategies should also be considered. Future research should examine whether male and female students approach active coping differently and how this affects their well-being and academic performance. Sex-related factors may influence how students use coping strategies, leading to different outcomes.

Religious coping emerged as the most frequently used strategy in this study, in line with the research by Francis et al. (2019), who showed that University of Malaya medical students rely more on positive religious coping than on negative coping. Additional studies support the idea that positive religious and

spiritual coping skills help students manage stress (22). In everyday life, students often face challenges and pressures that affect their mental and emotional well-being. Religious coping is particularly important in Indonesia, a country with a predominantly religious population. Cultural and social emphasis on religious practices and values provide a strong foundation for students to gain strength and resilience when faced with difficulties. Therefore, the religious aspect of coping strategies helps overcome stress and reflects the social and cultural support that enables individuals to navigate challenges (23).

Substance use-related coping strategies were the least commonly reported approaches in this study. However, it is important to consider the possibility of underreporting or unwillingness to report such behaviors, as individuals may feel reluctant to disclose substance use because of social stigma or fear of judgment. This may explain the lower frequencies observed in this study. For instance, a study by Melaku (2015) on medical students at Jimma University, Ethiopia, found that 9.5% of students smoked, with 90% reporting stress-related symptoms and using smoking to cope with the pressure they faced (24). The prevalence of substance use may vary across different regions or institutions; therefore, further research in diverse contexts may yield different results. Excessive use of substances, including cigarettes, can lead to dependence and cause various physical and mental health issues. Substance use can negatively affect social functioning and lead to legal problems. Therefore, it is crucial to develop healthier coping strategies to help individuals manage stress more productively. By replacing substance use with more positive coping methods, individuals can enhance their mental and emotional resilience when dealing with stress (25).

In this study, the form of academic procrastination that most often occurs is delaying the start or completing assignments and the time difference between planning and realization. According to Steel (2007) and Sirois (2013), academic procrastination occurs when there is a significant difference between planning and task performance. Contributing factors include complexity, difficulty, and lack of interest in academic assignments (6,7). Unrealistic time perceptions, such as the underestimation of the time required to complete a task, also contribute to this problem (26).

The use of effective coping strategies can reduce students' procrastination levels. When students implement these strategies, they tend to have higher motivation, better time management, and increased focus on completing assignments. This helped them avoid academic delays. Several factors may influence the effectiveness of coping strategies in reducing procrastination. For example, social support from friends, family and teachers can provide motivation and encouragement, making it easier for students to stay on track. Perceived self-control is another important factor; students who believe they have control over their actions are more likely to manage their time effectively and resist the urge to procrastinate. Additionally, the ability to regulate emotions is crucial. Students who manage their stress and emotions well are less likely to be overwhelmed by their assignments and are more likely to complete them on time (27).

Overall, a combination of effective coping strategies and moderating factors, such as social support, self-control, and emotional regulation, can significantly reduce academic procrastination in students. Future researchers should focus on the individual factors that are more significant in influencing the use of coping strategies and academic procrastination using qualitative or mixed research methods.

Effective coping strategies can significantly reduce academic procrastination by enhancing motivation, time management, and focus, which help students complete assignments on time. Their effectiveness is influenced by factors such as social support from friends, family, or teachers, who provide motivation and encouragement, and perceived self-control, where students with a stronger sense of control are better at

managing their time and resisting procrastination. Emotional regulation is also crucialbecause students who can manage stress and emotions are less likely to feel overwhelmed by their tasks. (29) Future research should explore the individual factors that influence these strategies using qualitative or mixed methods to deepen our understanding and improve interventions.

The advantage of this study is that it provides a clear picture of which coping strategies and academic procrastination behaviors students use often and rarely. This can help lecturers better understand and support student welfare. However, this study has some limitations. The data were collected only once—they did not account for changes in coping strategies and academic procrastination over time. Without considering long-term aspects, this research cannot provide a complete understanding of how these behaviors evolve in students.

CONCLUSION

The findings of this study suggest practical applications for education, including integrating problem-focused strategies, such as planning and active approaches, into student programs to enhance time management and well-being. Religious coping emphasizes the need for culturally aligned stress management support, particularly in highly religious contexts. Institutions should also address academic procrastination through curriculum adjustments, such as time management modules and reduced assignment complexity, while discouraging substance-based coping through awareness programs. The implementation of these strategies can improve students' academic performance, resilience, and psychological health.

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