

Adverse Childhood Experiences and Academic Procrastination in Emerging Adult Students: The Mediating Effect of Self-Regulation

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ABSTRACT

Academic procrastination has been investigated for its relationship with low self-regulation, which is most likely influenced by adverse childhood experiences (ACEs). This quantitative study utilized a survey and cross-sectional approach to explore the role of self-regulation in mediating the connection between ACEs and academic procrastination in emerging adult students. A convenience sample of 253 Indonesian students (Mage=20.40; SDage=1.518; Nfemale=97.1%) was obtained. The measurements included the Indonesian version of the Adverse Childhood Experiences Questionnaire (ACE-Q), the short version of the Self-Regulation Questionnaire (SSRQ), and the Academic Procrastination Scale. Statistical analysis was conducted using SPSS version 26. Of all the participants, 74.3% reported experiencing at least one ACE. Although bivariate correlation analysis revealed a relationship between the variables, hypothesis testing through path analysis indicated that ACE did not have a direct effect on academic procrastination ($B=0.871$, $SE=0.576$, $\beta=0.080$; $p > 0.05$), except when mediated by self-regulation (Sobel Statistic Test results: $Z=4.51$; $p < 0.001$). This study highlights the importance of understanding the severity of ACEs in addressing poor self-regulation and mitigating academic procrastination among emerging adult students. Future studies may consider examining different types of ACEs, various aspects of self-regulation, and the role of sex.

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INTRODUCTION

Procrastination is a common issue observed in various communities. It refers to individuals' intentional delay in task completion (Steel, 2007). Research on this phenomenon has been conducted over the years, often among employees with diverse job descriptions and demands, such as general employees in companies with job performance (Adityas & Hadi, 2022), women workers experiencing role conflict (Hapsari & Budiani, 2019), and women workers experiencing role conflict (Fahmawanti et al., 2020).

Academic procrastination is also widely observed and is a root cause of issues among undergraduate students resulting from task delays (Husain et al., 2023). Previous research by Steel (2007) revealed that approximately 80% to 95% of students engage in procrastination, with around 50% consistently experiencing problematic procrastination. Interestingly, Steel (2007) pointed out that students prone to procrastination are aware of the negative effects of their behavior. Research explains that procrastination directly and indirectly impacts individuals' well-being (Balkis & Duru, 2016). Furthermore, evidence has been found linking academic procrastination to significant issues in the academic domain, including academic dishonesty (Prasetyo & Handayani, 2019), low learning satisfaction, and dropout intentions (Scheunemann et al., 2022), as well as threatening mental health issues such as suicidal behavior (Gómez-Romero et al., 2020).

Besides its consequences for academic and mental health issues, academic procrastination is also a concern in religious life. Previous evidence has shown that low levels of academic procrastination reflect a person's high religiosity and vice versa (Hayyinah, 2004). The more religious a person is, the less likely they are to procrastinate on academic tasks. From an Islamic perspective, procrastination fundamentally deviates from the essence of learning as an act of worship. Learning as worship should be undertaken earnestly and with good intentions to enhance knowledge, skills, and character beneficial to oneself, society, and religion (Basri, 2017).

Contrary to the expected conditions for learning according to an Islamic perspective, academic procrastination reflects a lack of responsibility, discipline, and maturity in dealing with tasks. This condition contradicts religious values emphasizing responsibility, discipline, and maturity (Basri, 2017). Academic procrastination, such as task delays, discourages Muslims (Hayyinah, 2004). Consequently, Hayyinah (2004) added that academic procrastination can negatively impact the development and enhancement of the capacities and potential of individuals in the community.

Academic procrastination is prevalent among undergraduate students in Indonesia. A study conducted by Gultom et al. (2018) among medical students at a university in Indonesia revealed that 49.4% of 158 participants exhibited a relatively high level of procrastination. Gultom et al. (2018) also noted that the prevalence of procrastination in the sample could lead to issues at a rate of 49.5%.

A recent study by Fitriyanti et al. (2021) on medical students found that 69% of 245 participants exhibited procrastination. Among those, 42.5% fell into the moderate category, 26.1% in the high category, and 0.4% in the very high category. Another study in Indonesia involving 286 students majoring in education sciences from various public and private universities indicated that 39.5% of the overall sample fell into the high procrastination category (Miswanto, 2022).

Undergraduate students generally belong to the emerging adulthood developmental phase, which occurs between 18 and 25 (Santrock, 2016; Tanner & Arnett, 2016). This period is characterized by unique qualities and developmental challenges (Ediati et al., 2020). In emerging adulthood, individuals experience tasks and crises inherent to this phase. This period is a time of exploration, where individuals have various possibilities and opportunities to try new ways of life (Arnett, 2006; Furstenberg et al., 2005). However, individuals in this phase are neither adolescents nor fully functioning adults. Rather, it is a transitional period where individuals can explore different opportunities before assuming adult roles and responsibilities (Papalia et al., 2009). Emerging adulthood individuals pursuing higher education must navigate student status and increasing academic demands throughout their study period.

Academic procrastination in students is a complex phenomenon influenced by various external and internal factors. External factors that encourage academic procrastination include task characteristics (Wang et al., 2021) and the university environment (Visser et al., 2018). On the other hand, internal factors, such as personal characteristics, also play a crucial role. Some students may have personal traits that make them more prone to procrastination, although this can vary among individuals. One prominent personal characteristic is self-regulation. Balkis & Duru (2016) argued that poor self-regulation is displayed through procrastination behavior, and college students are no exception. College is a distinct educational period with unique demands compared to primary and secondary education, which can contribute to students' tendency to delay assignments due to poor self-regulation (Ford, 2014).

In a preliminary study, a researcher (referred to as J) found that J had a history of no more than two adverse childhood experiences (ACEs). J was working on a thesis and expressed anxiety related to his procrastination tendencies. J, a 9th-semester student, identified several triggers for his procrastination behavior, including worry and fear before working on the thesis, a lack of support from a supervisor, fear of the future, and perceiving the thesis as a difficult task. J also acknowledged not having a clear goal to complete his thesis, contributing to his continued procrastination promptly. Despite this, J recognized the importance of self-regulation in overcoming academic procrastination tendencies.

Self-regulation refers to an individual's ability to control impulsive responses and manage cognitive, emotional, and behavioral aspects (Booth et al., 2018). Neal

and Carey (2005) previously defined self-regulation as an individual's ability to set goals and control impulses. They stated that self-regulation skills enable individuals to align their behavior with their goal orientation and delay instant gratification for desired outcomes. Self-regulation also intersects with emotional intelligence, allowing individuals to face various demands and achieve their goals (Papalia et al., 2009). Good self-regulation is positively associated with students' self-adjustment and can enhance their success in learning, leading to personal achievement (Arum & Khoirunnisa, 2021).

On the other hand, poor self-regulation among students can contribute to academic stress, procrastination, and decreased learning achievement (Nurchayani et al., 2020; Purba & Yulianto, 2019; Fajriani et al., 2021). Notably, the consequences of procrastination behavior on individual well-being are of interest. Balkis and Duru (2016) added that self-regulation plays a curative role in the psychological functioning of students.

Furthermore, the ability to self-regulate, which impacts academic procrastination, is greatly influenced by adverse childhood experiences (ACEs). Research by Pasha-Zaidi et al. (2020) demonstrated a negative relationship between ACEs and self-regulation in college students. ACEs encompass various negative experiences in childhood, such as experiencing emotional, physical, and sexual abuse, emotional and physical neglect, witnessing violence, experiencing domestic stress, living with family members who consume alcohol or drugs, and residing in a violent environment (World Health Organization, 2020). ACEs in an individual's life have been shown to contribute to prolonged stress, which can be detrimental to brain development and other body systems from childhood to adulthood (Frodl & O'Keane, 2013). Additionally, research on the relationship between ACEs and self-regulation in adolescents suggests that increased exposure to trauma is associated with lower self-regulation (Lackner et al., 2018).

The description provided above suggests that there may be an indirect relationship between adverse childhood experiences (ACE) and academic procrastination mediated by self-regulation. Previous research by Tahani et al. (2021) has explored this relationship. Recent research by Ma and Chen (2022) has further confirmed that ACE contributes to the emergence of academic procrastination through the mediation of self-regulation. Their study conducted on university students in China revealed that positive self-regulation, specifically time management, acted as a mediator between childhood psychological maltreatment (a type of ACE) and academic procrastination. Ma and Chen (2022) also explained that childhood psychological maltreatment is believed to influence the development of student's personal characteristics and coping mechanisms, leading to a tendency to procrastinate as a way of defying parental expectations or protecting themselves from perceived threats.

Based on the information provided above, undergraduate students in Indonesia still exhibit high levels of academic procrastination. However, on the flip side,

the consequences of procrastination can be detrimental to individuals in various aspects of life, including academic performance, intrapsychic conditions, and even from a religious standpoint. Furthermore, self-regulation has been shown to influence academic procrastination, and ACE is believed to impact self-regulation. Therefore, a conceptual relationship exists between ACE and academic procrastination mediated by self-regulation. However, empirical evidence for this relationship is scarce, particularly in Indonesia. Therefore, this study aims to empirically test this relationship by examining the mediating effect of self-regulation on the relationship between ACE and academic procrastination. The researcher hypothesizes that self-regulation mediates the relationship between ACE and academic procrastination, with ACE negatively affecting self-regulation, which negatively affects academic procrastination. Figure 1 illustrates the conceptual framework of the studied variables.



Figure 1. Framework of Research Variables

METHODS

This study used a quantitative survey to examine the relationship between ACEs (adverse childhood experiences) and academic procrastination in emerging adult students. The data was collected through psychological questionnaires using a cross-sectional approach. The study population consisted of undergraduate students aged 18-25 (Tanner & Arnett, 2016). Convenience sampling was employed, including all participants who met the population criteria. 253 students (M-age = 20.40; SD-age = 1.52; N-female = 97.1%) voluntarily completed the online survey. The majority of participants were from social sciences and humanities disciplines (67.1%), in their second and third years of study (24.9% and 24.1%, respectively), and had a cumulative grade point average (GPA) above 3.5 (on a scale of 4; 72.7%). For more detailed data, please refer to Table 1.

Table 1. Demographic Data of Research Participants

Demographic Variables	n	(%)
Gender		
Male	21	8,3
Female	232	91,7
Major		
Science	83	32,9
Social & Humanities	170	67,1
Year of Study		
First Year	47	18,6
Second Year	63	24,9
Third Year	61	24,1
Fourth Year	58	22,9
≥ Fifth Year	24	9,6
GPA (scale of 4.00)		
<3.0	7	2,8
3.0-3.5	56	22,1
>3.5	184	72,7
Unknown	6	2,4
Cumulative ACEs		
0	65	25,7
1	63	24,9
2	44	17,4
3	34	13,4
≥ 4	47	18,6

Note: N=253

Research Procedure and Ethical Considerations

The convenience sampling technique was employed to recruit participants for this study. Online survey flyers were circulated through social media platforms such as WhatsApp, Instagram, Twitter, and LINE. The online survey was accessible for approximately one month, from March 17 to April 21, 2022. Prospective participants were required to meet specific qualifications: between 18 and 25 and currently pursuing undergraduate education. If they met these criteria, they could voluntarily complete the survey using the provided link. The ethical standards of the study were in line with the 1975 Declaration of Helsinki, revised in 2000 (WMA, 2022), which included providing research explanations. Prospective participants provided informed consent before proceeding with the survey.

Measurement

A set of demographic questions was posed to participants, including age, gender, major, study year, and GPA. The history of adverse childhood experiences (ACEs) was measured using the Adverse Childhood Experiences Questionnaire

(ACE-Q) by Felitti et al. (1998), consisting of 11 items categorized into three groups: (1) abuse (including emotional, physical, and sexual), (2) neglect (including emotional and physical), and (3) household dysfunction (indicated by witnessing domestic violence, living with substance abuse, having a family member with mental health disorders, experiencing divorce and parental death, and family member imprisonment). Participants were asked to respond to questions about the types of childhood difficulties they may have faced during the first 18 years of life. Responses were binary, with "yes" scored as "1" and "no" as "0." Kaloeti et al. (2019) adapted the ACE-Q into Indonesian and used it in a student population with a reliability coefficient (Alpha) 0.75. The participants' total scores ranged from 0 to 11.

Self-regulation in this study was measured using a brief version of the Self-Regulation Questionnaire (SSRQ) by Neal and Carey (2005), adapted into Bahasa Indonesia by Sawitri & Dewi (2018), with a reliability coefficient (Alpha) of 0.89. The questionnaire consists of 21 items, with 10 items measuring goal-directed behavior and 11 measuring delaying gratification for long-term benefits (impulse control). Participants were asked to rate the extent to which statements best described themselves, ranging from a score of 1 (representing "very inappropriate") to 6 (representing "very appropriate"). Scores were applied to favorable items and vice versa for unfavorable items. The participants' total scores ranged from 21 to 126.

Academic procrastination was measured using the Academic Procrastination Scale developed by Rahmandani (2017) based on aspects by Schouwenburg (1995) and tested on a student population with a reliability coefficient (Alpha) of 0.927. The scale consists of 41 items measuring the delay in starting or completing tasks, slow performance, laziness in academic tasks, the gap between planned and actual performance, and engagement in other more enjoyable activities than doing tasks. Participants were asked to choose one of four response options indicating the extent to which statements described themselves, ranging from "very inappropriate" to "very appropriate." Scores were assigned consecutively from 1 to 4 for favorable items and vice versa for unfavorable items. The participant's total score ranged from 41 to 164.

Data Analysis

This study conducted descriptive data analysis to provide an overview of the characteristics and qualifications of the participants. Bivariate Pearson correlation tests were used to examine the relationships between the variables being studied. The mediating effect of self-regulation on the relationship between ACE and academic procrastination was assessed using path analysis and multiple regression analysis. Assumption tests were performed before the analysis to ensure data normality and the absence of multicollinearity. The Statistical Package for the Social Sciences (SPSS) version 26 was used for all data analysis in this study. Finally, the significance of the mediation effect in the path analysis was assessed using the Sobel test.

RESULTS AND DISCUSSION

This study aims to investigate the role of self-regulation as a mediator in the relationship between adverse childhood experiences (ACE) and academic procrastination. The researchers hypothesize that self-regulation mediates ACE and academic procrastination in students. The following description presents the results of the path analysis using multiple regression analysis, initially examining the prevalence of ACE and the bivariate correlations between variables.

Prevalence of ACEs

Table 2 displays the prevalence of adverse childhood experiences (ACEs), revealing that 74.3% of the total participants have encountered at least one form of ACE. Among the participants, the most frequently reported category of ACE is abuse (46.2%), followed by household dysfunction (44.7%) and neglect (41%). The specific types of ACE most commonly reported within each category are emotional abuse (36.0%), emotional neglect (40.3%), and living with a family member with a mental disorder (25.3%). Conversely, the least commonly reported types of ACE in each category are sexual abuse (13.4%), physical neglect (6.7%), and imprisonment of a family member (2.0%).

Table 2. Prevalence of ACEs

ACEs Categories	n (%)	n Male (%)	n Female (%)
All categories*)	188 (74,3)	14 (66,7)	174 (75,0)
Abuse	117 (46,2)	8 (38,1)	109 (47,0)
Emotional	91 (36,0)	7 (33,3)	84 (36,2)
Physical	50 (19,8)	5 (23,8)	45 (19,4)
Sexual	34 (13,4)	3 (14,3)	31 (13,4)
Neglect	104 (41,1)	7 (33,3)	97 (41,8)
Emotional	102 (40,3)	7 (33,3)	95 (40,9)
Physical	17 (6,7)	2 (9,5)	15 (6,5)
Household Dysfunction	113 (44,7)	9 (42,9)	104 (44,8)
Parental separation/divorce	41 (16,2)	3 (14,3)	38 (16,4)
Domestic violence	20 (7,9)	1 (4,8)	19 (8,2)
Substance abuse	11 (4,4)	2 (9,5)	9 (3,9)
Mental illness	64 (25,3)	5 (23,8)	59 (25,4)
Incarcerated member	5 (2,0)	2 (9,5)	3 (1,3)
Parental death	39 (15,4)	0 (0,0)	39 (16,8)

*) Having at least 1 ACEs; the denominator for the percentage of n is n-total=253; the denominator for the percentage of n (males) is n-male total=21; the denominator for the percentage of n (females) is n-female total=232

Females (75% of the total female sample) tend to experience more ACEs than males (66.7% of the total male sample). Additionally, within each ACE category (abuse, neglect, and household dysfunction), the percentage of occurrences among females is consistently higher than that among males. However, there are

specific types of ACEs that males tend to experience more frequently, including physical abuse (23.8%), sexual abuse (14.3%), physical neglect (9.5%), substance abuse in the family (9.5%), and imprisonment of a family member (9.5%). Detailed information regarding the prevalence of each type of ACE occurrence, both overall and based on gender, can be found in Table 2.

Bivariate Correlation between Variables

Table 3 presents the results of the Pearson bivariate correlation test and descriptive statistics for all variables. It was found that all relationships between variables were statistically significant. ACE negatively correlates with self-regulation with an r of -0.299 ($p < 0.001$). There is also a negative relationship between self-regulation and academic procrastination, with an r of -0.601 ($p < 0.001$). Meanwhile, ACE and academic procrastination show a positive relationship with an r of 0.252 ($p < 0.001$). According to Akoglu (2018), the correlation coefficient between ACE and self-regulation and academic procrastination falls into the weak category, while the correlation between self-regulation and academic procrastination falls into the moderate-strong category. Table 3 also displays the empirical mean of ACE below its hypothetical mean, the empirical mean of self-regulation above its hypothetical mean, and the empirical mean of academic procrastination approaching its hypothetical mean. Meanwhile, all empirical standard deviations are below their hypothetical standard deviations.

Table 3. Bivariate Pearson Correlation Coefficients among Variables

Variable	1	2	3
1. Adverse Childhood Experiences	1		
2. Self-Regulation	$-0,299^{***}$	1	
3. Academic Procrastination	$0,252^{***}$	$-0,601^{***}$	1
Hypothetical Minimum Score	0	21	40
Hypothetical Maximum Score	11	126	164
Empirical Minimum Score	0	43	50
Empirical Maximum Score	8	121	149
Hypothetical Mean	5,5	73,5	102
Hypothetical Standard Deviation	1,83	17,7	20,67
Empirical Mean	1,87	78,53	102,92
Empirical Standard Deviation	1,723	15,233	18,828

***) correlation is significant at the 0.001 level (2-tailed)

Path Analysis

Figure 2 presents the results of the path analysis to test the hypothesis in this study, which posits indirect effects of the independent variable ACE on the dependent variable academic procrastination through the intervening variable self-regulation. The results indicate a direct and significantly negative effect of

ACE on self-regulation ($B=-2.641$, $SE=0.533$, $\beta=-0.299$; $p < 0.001$), as well as a direct and significantly negative effect of self-regulation on procrastination ($B=-0.713$, $SE=0.065$, $\beta=-0.577$; $p < 0.001$). By including self-regulation as an intervening variable, the previously obtained bivariate correlation between ACE and academic procrastination no longer applies. There is no direct effect of ACE on academic procrastination ($B=0.871$, $SE=0.576$, $\beta=0.080$; $p > 0.05$) except through the mediation of self-regulation (Sobel Test Statistic result: $Z=4.51$; $p < 0.001$).

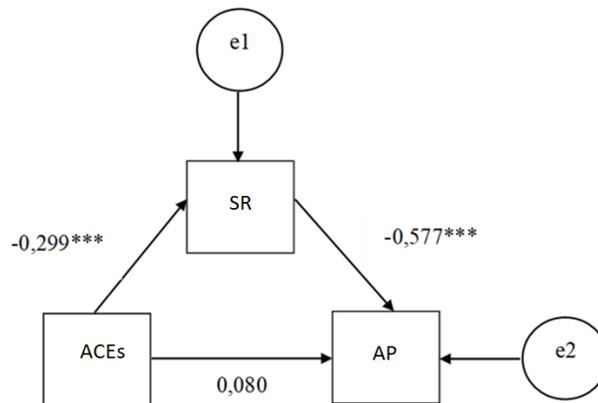


Figure 2. Results of Hypothesis Testing for Mediation Using Path Analysis

Note: All numerical data in the figure represent β (beta) coefficients (standardized coefficients Beta); ACE = Adverse Childhood Experiences; RD = Regulasi Diri, Self-Regulation; PA = Prokrastinasi Akademik, Academic Procrastination; ***) $p < 0,001$

The results of the bivariate correlation between Adverse Childhood Experiences (ACE) and academic procrastination suggest a positive relationship, consistent with a previous study by Ma and Chen (2022). This previous study found a positive correlation between childhood emotional abuse, a form of ACE, and academic procrastination in college students. However, when considering self-regulation as a mediator, the results of this study reveal that ACE does not directly affect academic procrastination but operates through self-regulation. In other words, the more ACE someone experiences, their self-regulation worsens, leading to increased academic procrastination. On the other hand, fewer ACE experiences are linked to better self-regulation and lower tendencies for academic procrastination. These findings align with the literature review conducted by Tahani et al. (2021), which explored the three variables (ACE, self-regulation, and academic procrastination). The review showed that ACE was negatively correlated with self-regulation (Pasha-Zaidi et al., 2020; Rollins & Crandall, 2021), and low self-regulation predicted academic procrastination in students (Strunk & Steele, 2011). The research successfully confirms the hypotheses in this study.

The role of toxic stress can help explain how an increase in ACE impacts poor self-regulation. Stress is a normal part of life experienced during childhood. However, when a child experiences repetitive, prolonged, or cumulative stress,

it stops being a learning tool and becomes detrimental to development due to a lack of tolerance and maladaptation (Lawson & Quinn, 2013). This repetitive, prolonged, and cumulative pressure aligns with the nature of ACE, as it has become ingrained in the caregiving system since childhood.

Toxic stress refers to a maladaptive and dysregulated stress response that occurs in individuals who have experienced prolonged or severe life difficulties early in life (Nelson et al., 2020). This stress disrupts an individual's stress levels and coping abilities, leading to heightened reactivity to normal environmental changes and stressors. As a result, self-regulation becomes more challenging to achieve (Murray et al., 2015). Children rely on adults to help them develop self-regulation skills (Murray et al., 2015), but their surrounding environment may not always fulfill this role. Individuals who have experienced toxic stress are at risk of disrupted brain architecture development and other organ systems, which increases their lifelong vulnerability to physical and mental disorders. However, self-regulation is crucial in long-term functioning across various psychological, social, academic, and health-related domains. Poor self-regulation is associated with significant social issues such as drug use, mental health problems like depression, and health issues like obesity and physical diseases (Robson et al., 2020). These issues align with the various problems that can arise as a result of adverse childhood experiences (ACE) (Hughes et al., 2017).

As mentioned earlier, poor self-regulation skills also affect long-term academic functioning. The inadequate self-regulation of emerging adult students can hinder their ability to manage various stimuli, including emotions, thoughts, behaviors, strengths, and resources. This vulnerability to poor self-regulation makes individuals more likely to engage in academic procrastination, which refers to the intentional delay of tasks. Loeffler et al. (2019) cited Zimmerman's three-stage self-regulation model and emphasized the connection between poor self-regulation and academic procrastination. Procrastination is associated with almost all components of Zimmerman's self-regulation model, except for goal-setting. Although procrastinating individuals can set goals, they struggle to follow through with their intentions. This difficulty in translating intentions into goal-directed behavior forms the basis for Loeffler et al. (2019) consideration of developing self-regulation interventions that align intentions and behaviors, thereby reducing procrastination. Some methods they suggest include using electronic diaries and providing regular feedback. On the other hand, rather than achieving their goals, students who procrastinate are more prone to developing new mental health issues such as substance abuse and physical health risks. Previous research, particularly on individuals with a history of adverse childhood experiences (ACE), indicates a correlation between poor self-regulation skills and an increased likelihood of excessive alcohol consumption and risky sexual behavior (Song & Qian, 2020).

This study highlights the importance of self-regulation for students to prevent academic procrastination. Improved self-regulation and low levels of

procrastination facilitate smooth learning progress (Fitriya & Lukmawati, 2016). However, the research findings indicate that the quality of self-regulation and the effectiveness of self-regulation improvement programs (whether individual, group, or community-based) offered by practitioners and higher education institutions should consider the varying degrees of ACE experiences. This study provides a broad overview of ACE histories but does not deeply explore how each category or type of ACE impacts self-regulation and its relationship to academic procrastination. Furthermore, goal-setting and impulse control are highlighted as important aspects of self-regulation specifically connected to academic procrastination.

Further research is needed to gain a more comprehensive understanding of how specific ACE categories and self-regulation aspects, either independently or collectively, influence these dynamics. Additionally, there is a disparity in the number of male and female participants in this study. Moreover, there are indications of gender-based differences in ACE occurrences, which may have implications for hypothesis testing. Future research should aim for a more balanced gender distribution among participants or explore the moderating effects of gender.

CONCLUSIONS

The results confirmed the hypothesis that self-regulation mediated the relationship between adverse childhood experiences (ACE) and academic procrastination in students. Additionally, an increase in ACEs was associated with worsened self-regulation in students, leading to an increased tendency for academic procrastination. On the other hand, a decrease in ACEs was associated with improved self-regulation in students, decreasing the tendency for academic procrastination. However, this study has a limitation in that it did not specifically explore how each category or type of ACE contributes to self-regulation and its influence on academic procrastination. The researchers also did not consider differences in demographic characteristics, such as gender, field of education, or study period, as well as differences in aspects of self-regulation, such as goal setting and impulse control.

Practitioners or higher education institutions are essential in providing mental health services, both individual and group, for students. It suggests considering the severity of ACE when understanding students with poor self-regulation and assisting them in addressing their academic problems, particularly procrastination. Future researchers may adopt a more contextual approach, considering specific categories or types of ACE, demographic differences (such as gender, field of education, or study period), and examining whether aspects of self-regulation, such as goal setting and impulse control, mediate differently. By considering differences based on demographic data and comparing equal samples, such as male and female genders, bias due to differences can be minimized.

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