



The Role of Emotional Intelligence and Self-Efficacy in Predicting Academic Achievement of Medical Students

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Abstract

Academic achievement among medical students is often measured using the Grade Point Average (GPA), which reflects a student's overall academic performance throughout the course of study. Medical students face substantial academic demands that frequently result in moderate to severe levels of stress. Emotional intelligence, encompassing self-motivation, emotional regulation, empathy, and teamwork, has been shown to influence academic performance, while students with high self-efficacy tend to achieve better academic outcomes. This study aimed to examine the relationships between emotional intelligence, self-efficacy, and GPA, both individually and simultaneously. An analytical observational study with a cross-sectional design was conducted. The participants consisted of 108 medical students from Universitas Muhammadiyah Semarang, selected through purposive sampling. Emotional intelligence was measured using the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF), and self-efficacy was assessed using the Academic Self-Efficacy Scale (TASES). Bivariate analysis was performed using the Mann–Whitney U test, while multivariate analysis was conducted using multinomial logistic regression. The majority of respondents demonstrated high emotional intelligence but low self-efficacy, and most had a high GPA. There was no significant association between emotional intelligence and GPA or between self-efficacy and GPA, and neither variable showed a significant independent effect in the multivariate analysis. However, emotional intelligence and self-efficacy jointly had a significant effect on GPA. In conclusion, emotional intelligence and self-efficacy were not individually associated with GPA; however, together they significantly influenced GPA, although other factors likely also contributed to the academic performance of these medical students.

INTRODUCTION

Medical education is a rigorous program designed to produce competent physicians capable of delivering primary health care services. It consists of two main stages: the undergraduate medical education stage and the professional medical training stage. One of the key indicators of competence during undergraduate medical education is the Grade Point Average (GPA), which reflects a student's overall academic achievement throughout the course of study. GPA serves as a measure of academic performance and learning outcomes and is frequently used as a criterion for graduation and subsequent professional advancement. At the Faculty of Medicine, Universitas Muhammadiyah Semarang, students are required to achieve a minimum GPA of 3.00 to fulfill graduation requirements, underscoring the importance of academic performance in this demanding field.

Medical students face uniquely high academic pressure compared with students in other disciplines. Previous studies have reported that as many as 84.9% of medical students experience moderate to severe stress because of the intensive academic demands of their programs. This academic pressure presents a significant challenge to achieving a high GPA, as stress can impair cognitive functioning, reduce motivation, and negatively affect overall well-being. The ability to manage these pressures effectively is therefore essential for academic success, highlighting the importance of understanding the psychological factors that contribute to student performance (Rani 2025; Rožman et al. 2025; Shengyao et al. 2024).

Emotional intelligence has been identified as a critical factor influencing academic achievement. Goleman defined emotional intelligence as the ability to motivate oneself, overcome frustration, regulate mood, empathize with others, and work collaboratively. Individuals with high emotional intelligence are better equipped to manage stress, establish positive interpersonal relationships, and maximize their cognitive potential. Research has shown that 70.8% of students with high emotional intelligence demonstrate high academic performance, suggesting a strong association between emotional intelligence and academic success. This perspective is consistent with the principles of Q.S. An-Nahl (16):90, which emphasize justice, kindness, and the avoidance of wrongdoing, reflecting the moral and emotional dimensions that contribute to personal and academic excellence.

Self-efficacy, as conceptualized by Bandura, is another critical psychological construct influencing academic performance. Self-efficacy refers to an individual's belief in their ability to complete tasks and achieve goals. Students with high self-efficacy are more likely to persist in the face of challenges, adopt effective learning strategies, and achieve better academic outcomes (Edwin & Widjaja, 2020; Nurmalia et al., 2023). Conversely, individuals with low self-efficacy tend to avoid difficult tasks and may give up easily when confronted with obstacles. Previous research has demonstrated a positive relationship between self-efficacy and academic achievement, with studies indicating that 60.5% of the variance in student achievement can be attributed to self-efficacy levels (Sihaloho, 2018; Gustilawati et al., 2020).

Several recent studies have explored the relationships among emotional intelligence, self-efficacy, and academic performance in medical students. Alvi et al. (2023) employed a correlational design involving medical students and found a significant positive relationship between emotional intelligence and academic performance, suggesting that students with higher emotional intelligence tend to achieve better academic outcomes. Similarly, Chang and Tsai (2022) examined the effects of university students' emotional intelligence, learning motivation, and self-efficacy on academic achievement in online English courses, finding that emotional intelligence and self-efficacy significantly predicted academic outcomes. Furthermore, a 2024 meta-analysis conducted by Andrés et al. [*sitasi ini tidak ditemukan di Daftar Referensi*] confirmed that the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF) demonstrated good reliability (overall Cronbach's $\alpha = 0.86$), although sample type and geographic region were significant moderators, indicating that its predictive performance may vary across different populations.

Despite the growing body of research on emotional intelligence and self-efficacy, several important gaps remain. Most previous studies have been conducted in Western contexts, with relatively limited evidence from Southeast Asian medical student populations. Furthermore, many studies have relied primarily on bivariate analyses that do not adequately

control for potential confounding variables, potentially leading to an overestimation of the relationships between these psychological factors and GPA. A systematic review by Chatila et al. (2023) emphasized that motivation- and emotion-related variables, together with environmental factors such as socioeconomic status and family support, contribute to academic success; however, the specific mechanisms underlying these relationships remain insufficiently understood, particularly in non-individualistic cultural settings. In addition, many previous investigations have used cross-sectional designs that assess emotional intelligence and self-efficacy at a single point in time, limiting the ability to capture the dynamic nature of these psychological characteristics throughout medical education.

The present study addresses these gaps by examining the relationships among emotional intelligence, self-efficacy, and GPA among medical students at Universitas Muhammadiyah Semarang, thereby providing context-specific evidence from Indonesia. This study is novel in its simultaneous assessment of emotional intelligence and self-efficacy using validated instruments, namely the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF) and the Teacher Academic Self-Efficacy Scale (TASES), both of which have been adapted and validated for Indonesian populations. By employing both bivariate and multivariate analyses, this study seeks to provide a more comprehensive understanding of how these psychological factors interact in influencing academic achievement. In addition, the study examines the simultaneous effects of emotional intelligence and self-efficacy on GPA, offering further insight into their combined predictive value.

The primary objective of this study is to examine the relationships among emotional intelligence, self-efficacy, and GPA among medical students, both individually and simultaneously. This research aims to contribute to the existing body of knowledge by providing empirical evidence regarding the role of non-cognitive factors in academic achievement within the context of Indonesian medical education. The findings are expected to have practical implications for medical educators and academic institutions by informing the development of interventions designed to strengthen emotional intelligence and self-efficacy, thereby promoting student success and well-being. Furthermore, this study contributes to the broader discourse on medical student development by highlighting the importance of holistic educational approaches that address both cognitive and non-cognitive dimensions of learning.

METHOD

This study employed a quantitative analytical observational design with a cross-sectional approach. The research was conducted at the Faculty of Medicine, Universitas Muhammadiyah Semarang (FK UNIMUS) between October and November 2024. The study population comprised undergraduate medical students, with 147 students from the 2022 cohort serving as the accessible population. The minimum sample size was calculated using the Slovin formula, resulting in 108 respondents. Participants were selected through purposive sampling based on predetermined inclusion and exclusion criteria.

Eligible participants were 2022 FK UNIMUS medical students who provided informed consent, completed the questionnaires, and had complete academic records. Students who took academic leave or had severe medical or psychological conditions during the study period were excluded. Primary data were collected through self-administered questionnaires, whereas GPA data were obtained from official academic records.

Emotional intelligence was assessed using the Indonesian version of the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF), and self-efficacy was measured using the Indonesian version of the Teacher Academic Self-Efficacy Scale (TASES). Both instruments had previously demonstrated satisfactory validity and reliability in Indonesian populations. Respondents were classified into high and low categories based on the mean score of each instrument. GPA was measured using the cumulative academic performance from semesters 1 to 4.

Data were analyzed using IBM SPSS Statistics version 27. Descriptive statistics were used to summarize participant characteristics and study variables. Differences in GPA according to emotional intelligence and self-efficacy levels were examined using the Mann–Whitney U test. Multinomial logistic regression was subsequently performed to evaluate the simultaneous associations of emotional intelligence and self-efficacy with GPA after confirming that the model assumptions were satisfied. Statistical significance was established at $p < 0.05$. Ethical approval was obtained from the Health Research Ethics Commission of the Faculty of Medicine, Universitas Muhammadiyah Semarang (Ethical Clearance No. 044/EC/KEPK-FK/UNIMUS/2024).

RESULTS AND DISCUSSION

This study employed an analytical observational design with a cross-sectional approach, conducted at the Faculty of Medicine, Universitas Muhammadiyah Semarang (FK UNIMUS) from October 30, 2024 to November 30, 2024. A total of 108 respondents from the FK UNIMUS class of 2022 participated in this study, selected through purposive sampling based on established inclusion and exclusion criteria. Primary data were collected through questionnaire administration measuring emotional intelligence and self-efficacy, while secondary data in the form of GPA transcripts were obtained from the S1 Medical Study Program academic administration.

Table 1. Respondent Characteristics

Features	Frequency (N)	Percentage (%)
Gender		
Male	33	30,6%
Women	75	69,4%
Age		
19	13	12%
20	68	63%
21	21	19,4%
22	5	4,6%
23	1	0,9%
Residence		
Alone	90	83,3%
With Parents	18	16,7%
Non-Academic Activities		
Ya	66	61,1%
No	42	38,9%
Emotional Intelligence <i>Level</i>		
Height	56	51,9%

Features	Frequency (N)	Percentage (%)
Low	52	48,1%
Self-Efficacy Level		
Height	45	41,7%
Low	63	58,3%
GPA		
A	0	0,0%
FROM	51	47,2%
B	48	44,4%
BC	9	8,3%
C	0	0,0%
CD	0	0,0%
D	0	0,0%
E	0	0,0%
Quantity	108	100%

Source: Prepared by the authors based on primary data collected using the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF), The Academic Self-Efficacy Scale (TASES), and GPA records of medical students at Universitas Muhammadiyah Semarang, processed using IBM SPSS Statistics Version 27 (2024).

Based on table 1, this study involved 108 respondents, with the majority being women (69.4%). The age of the respondents ranged from 19-23 years old with the majority of respondents aged 20 years old (63%). Respondents who lived alone reached 83.3%, and 61.1% participated in non-academic activities. The *Emotional Intelligence score* ranged from 96-189, with 51.9% of respondents having a high level of *emotional intelligence*. Meanwhile, self-efficacy scores ranged from 71-120, with 58.3% of respondents having low levels of self-efficacy. The respondents' GPAs ranged from 2.54-3.88, with 47.2% having an AB GPA and 8.3% having a BC GPA.

This study used bivariate analysis to test the difference in average GPA based on the level of *emotional intelligence* and self-efficacy using the Mann Whitney U differential test.

Table 2. Mann Whitney U Differential Test Results

	Emotional Intelligence Level		p-value
	Height (n=56)	Low (n=52)*	
GPA	3,52 ± 0,262	3,46 ± 0,263	0,102
	Self-Efficacy Level		p-value
	Height (n=46)	Low (n=62)	
GPA	3,48 ± 0,251	3,48 ± 0,274	0,578

Source: Prepared by the authors based on primary data analyzed using the Mann–Whitney U test in IBM SPSS Statistics Version 27 (2024).

*=Normally distributed data

Based on table 2, the *p-value results of the GPA difference test based on the level of emotional intelligence* are 0.102, so there is no difference in the average GPA based on the level of *emotional intelligence* ($p\text{-value} > 0.05$). The results of the test also obtained a difference in GPA based on the level of self-efficacy, which is 0.578, so there is no difference in the average GPA based on the level of self-efficacy ($p\text{-value} > 0.05$).

This study used multivariate analysis to test the relationship between simultaneous *emotional intelligence* and self-efficacy with GPA using the Multinomial Logistic Regression Test because there was no mean difference in bivariate analysis. Before being tested, a data assumption test was carried out, namely the Overall test with a *p-value* result = 0.253 and a model significance test with a *p-value* = 0.296. Therefore, the model is feasible to use but there are no independent variables that statistically affect the GPA.

Table 3. Partial and Simultaneous Test Results

Variabel	<i>p-value</i>	<i>R2</i>
<i>Emotional Intelligence</i>	0,195	
Self-Efficacy	0,517	
Model Fit		0,053

Source: Prepared by the authors based on primary data analyzed using Multinomial Logistic Regression in IBM SPSS Statistics Version 27 (2024).

Based on table 3, the relationship between *emotional intelligence* and partial GPA has a *p-value* of 0.195, so there is no *emotional intelligence* that does not affect the GPA partially (*p-value*>0.05). While *Self-Efficacy* with GPA has a *p-value* of 0.517, then Self-Efficacy has no effect on GPA partially (*p-value*>0.05). It was also obtained with an *R2* value of 0.053 which means that independent variables of *emotional intelligence* and self-efficacy affected the GPA simultaneously by 5.3% while 94.7% were influenced by other factors that were not included in this study.

Table 4. Estimation Parameter Test Results

Category: y: IPK		Coefficin B	Forest	<i>p-value</i>	Exp(B)	CI (95%)	
						Lower	Upper
ABa	Intercept	1,113	5,356	0,021*			
	<i>Emotional Intelligence</i>	0,915	1,243	0,265	2,496	0,500	12,461
	Self-Efficacy	0,603	0,434	0,510	1,828	0,303	11,017
Three	Intercept	1,304	7,655	0,006*			
	<i>Emotional Intelligence</i>	0,178	0,046	0,829	1,195	0,236	6,050
	Self-Efficacy	0,928	1,020	0,312	2,528	0,418	15,289
BCb	Intercept	-1,113	5,356	0,021*			
	<i>Emotional Intelligence</i>	-0,915	1,243	0,265	0,401	0,080	2,001
	Self-Efficacy	-0,603	0,434	0,510	0,547	0,091	3,296

Source: Prepared by the authors based on primary data analyzed using Multinomial Logistic Regression in IBM SPSS Statistics Version 27 (2024).

Remarks : a=reference category BC, b=reference category AB, *=significant

Based on table 4, significant intercepts were obtained ($p_{AB}=0.021$, $p_B=0.006$, $p_{BC}=0.021$), indicating a basic influence on GPA without considering *emotional intelligence* and self-efficacy.

In the category of GPA AB with reference BC, the coefficient of *emotional intelligence* ($B = 0.915$, $p = 0.265$, $\text{Exp}(B) = 2.496$) and self-efficacy ($B = 0.603$, $p = 0.510$, $\text{Exp}(B) = 1.828$) was not significant, so there was insufficient statistical evidence to state the relationship between the two variables on the chances of obtaining a GPA AB compared to BC. Similarly, in category B with reference BC, the coefficients of *emotional intelligence* ($B = 0.178$, $p = 0.829$, $\text{Exp}(B) = 1.195$) and self-efficacy ($B = 0.928$, $p = 0.312$, $\text{Exp}(B) = 2.528$) were also not significant. And similarly in the BC category with reference AB, the coefficient of *emotional intelligence* ($B = -0.915$, $p = 0.265$, $\text{Exp}(B) = 0.401$) and self-efficacy ($B = -0.603$, $p = 0.510$, $\text{Exp}(B) = 0.547$) was also insignificant.

In this study, the results were found that there was no average difference between emotional intelligence and GPA ($p\text{-value}>0.05$) and self-efficacy and GPA ($p\text{-value}>0.05$) of UNIMUS Faculty of Medicine students class of 2022. These results are also supported by the acquisition of a partial test that emotional intelligence ($p\text{-value}>0.05$) or self-efficacy ($p\text{-value}>0.05$) do not affect GPA.

The Odds Ratio (OR) value shows that students who have high emotional intelligence have a 2,496 chance (CI 95% 0.500-12,461) of getting an AB GPA compared to students with low emotional intelligence. Meanwhile, students who have high self-efficacy have a 1,828 chance (95% CI 0.303-11.017) to get an AB GPA compared to students with low self-efficacy. However, these results were not significant with $p\text{-values}$ of 0.265 and 0.510, respectively.

The results of the study are supported by statistical analysis that students have natural abilities without being influenced by emotional intelligence and self-efficacy to get an AB GPA. Emotional intelligence and self-efficacy may not be the main factors that affect GPA achievement, because the baseline score (intercept = 0.021; 0.006) is enough to contribute to GPA achievement.

Some of the possibilities that can cause this study to not show a relationship between emotional intelligence or self-efficacy and GPA are due to the factor of a fairly long time span. GPA is the cumulative academic score of students from semester 1 to semester 4, which takes about two years to get the GPA. Meanwhile, emotional intelligence and self-efficacy are assessed at one time in a cross-sectional manner so that the value of emotional intelligence and self-efficacy can change.

The results of this study contradict Goleman and Bandura's theory, which assert that emotional intelligence supporting the ability to excel in educational institutions and communicate in society while high self-efficacy tends to work harder, pursue more challenging goals, and be better at managing time and self (Goleman, 2013; Filippou, 2019). However, the results of this study are supported by Goleman's theory which states that emotional intelligence is a dynamic trait because it can be learned and developed as an individual ages (Goleman, 2024a, 2024b).

This phenomenon can also be explained through the mechanism of neuroplasticity, where the brain is able to adapt through synaptic, structural, and functional reorganization plasticity that plays an important role in learning, memory, and the development of new brain pathways so as to allow individuals to develop their knowledge and skills (Carias, 2023). In addition, self-

efficacy can also be dynamic because it is influenced by factors that can change over time, such as learning motivation and resilience. Thus, the dynamic interaction between these factors causes students' self-efficacy to change throughout the education period (Ajeng et al., 2023; Luthfiyah et al., 2023).

Similar research was also conducted by Livia, that there is an insignificant relationship between emotional intelligence with a GPA whose correlation strength is very weak but has a positive correlation direction (Winengko et al., 2025). Similar results were also obtained by Risnu, that there was no significant relationship between emotional intelligence with a medical student's GPA (Witjaksana et al., 2016). A similar study was also conducted by Edward, that there was no meaningful relationship between self-efficacy and GPA of medical students (Edwin & Widjaja, 2020) and $p\text{-value} > 0.05$. A similar thing was also found in Nursiti's 2019 study, that there was no relationship between self-efficacy and learning achievement (Nursiti et al., 2019).

Based on multivariate analysis, the results were obtained that 5.3% ($R^2 = 0.053$) emotional intelligence and self-efficacy affected GPA and the other 94.7% were influenced by other factors outside of this study. Based on previous research, there are findings that show that the relationship between emotional intelligence and GPA mediated by learning motivation and self-efficacy (Chang & Tsai, 2022). Some of the possibilities for these results are the existence of disruptive variables that are not controlled by researchers such as student characteristics, motivation, learning quality, parental support, facilities and infrastructure ($p\text{-value} < 0.05$) (Žuljević & Buljan, 2022; Chess et al., 2018).

This research is in line with the research conducted by Evi, the results were obtained that emotional intelligence and self-efficacy affected GPA by 23.9% and 76.1% were affected by other variables but neither had a partial effect (Ni'matuzzakiah, 2020). A similar study conducted by Yuhaniz found that emotional intelligence and self-efficacy affected GPA by 19.8% and 80.2% was influenced by other variables and both variables had a positive relationship with GPA partially (Ibrahim, 2021).

Thus, this study provides an overview that emotional intelligence and self-efficacy are not the main factors that directly affect the achievement of students' GPA, but there is a role of other variables that are more dominant. Nevertheless, both factors still have the potential to be developed as part of efforts to improve academic achievement through indirect mechanisms, such as improving motivation and learning quality. Therefore, a holistic approach including the development of non-academic skills and the strengthening of other supporting factors is necessary to encourage maximum academic achievement of students.

CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded that most respondents had high emotional intelligence (51.9%) but low self-efficacy (58.3%). Most respondents achieved an AB GPA (47.2%), followed by a B GPA (44.4%) and a BC GPA (8.3%). The findings indicated no significant association between emotional intelligence and GPA among the 2022 cohort of medical students at the Faculty of Medicine, Universitas Muhammadiyah Semarang ($p > 0.05$), although students with high emotional intelligence had greater odds of obtaining an AB GPA rather than a BC GPA (OR = 2.496, 95% CI: 0.500–12.461). Likewise, no significant association was found between self-efficacy and GPA ($p >$

0.05), although students with high self-efficacy had higher odds of achieving an AB GPA rather than a BC GPA (OR = 1.828, 95% CI: 0.303–11.017). Simultaneously, emotional intelligence and self-efficacy accounted for 5.3% of the variation in GPA, whereas the remaining 94.7% was explained by factors beyond the scope of this study.

The findings suggest several practical implications. Students are encouraged to strengthen their emotional intelligence and self-efficacy as part of broader efforts to support academic achievement. Educational institutions should consider incorporating these psychological factors into student monitoring and mentoring programs, particularly through academic advisors. For the wider community, the findings highlight that emotional intelligence and self-efficacy are important attributes that may contribute to educational success and should be fostered continuously from an early age through support from families and the surrounding environment. Future research should investigate additional determinants of GPA, consider using semester GPA as the outcome variable, and employ culturally appropriate, valid, and reliable instruments for Indonesian populations.

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