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THE CONTRIBUTION OF ACADEMIC SELF-EFFICACY TO THE IMPROVEMENT OF ACADEMIC PERFORMANCE OF MEDICAL STUDENTS THROUGH TIME MANAGEMENT AS A MEDIATING FACTOR

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Abstract

Objective: *To examine the effect of academic self-efficacy on academic performance and time management skills, and to evaluate the mediating role of time management in the relationship between academic self-efficacy and academic performance.*

Methods: *A cross-sectional quantitative design was employed, involving 374 medical students selected through convenience sampling. Data were collected using validated instruments for academic self-efficacy, time management behavior (Time Management Behavior Scale), and academic performance (self-reported CGPA). Data analysis included independent samples t-tests and Structural Equation Modeling (SEM) to test direct and indirect relationships.*

Results: *Students with high academic self-efficacy scored significantly higher in both academic performance (M = 72.35, SD = 7.63) and time management skills (M = 70.45, SD = 8.12) than those with low self-efficacy (academic performance: M = 65.78, SD = 8.24; time management: M = 61.20, SD = 9.05), with large effect sizes (Cohen's d = 0.84 and 1.02, respectively). SEM confirmed that time management partially mediated the relationship between self-efficacy and academic performance, with a significant indirect effect (β = 0.17, 95% CI [0.10, 0.25]).*

Conclusion: *The findings support that academic self-efficacy enhances academic performance both directly and indirectly through effective time management. This mediation model, validated in a Pakistani academic context, underscores the importance of fostering both internal belief systems and behavioral skills to promote academic success.*

INTRODUCTION

Academic self-efficacy, derived from educational theory, refers to an individual's belief in their capacity to successfully execute academic tasks (Artino, 2012). It significantly influences students' motivation,

learning behavior, and academic outcomes. Students with high self-efficacy are more likely to exert effort, persist through academic challenges, and adopt self-regulated learning strategies (Ohidah, 2024). Numerous studies support the positive role of academic self-efficacy in educational settings. For instance, Research study conducted by Khan (2023) found that self-efficacy predicted better academic performance and lower stress among college students (Khan, 2023). Similarly, study by Firth et al., (2019) demonstrated through a meta-analysis that academic self-efficacy has a moderate to strong correlation with academic performance, mediated by cognitive and behavioral strategies such as goal setting and time management (Firth, Cavallini, Sütterlin, & Lugo, 2019).

Academic performance, typically measured by GPA or exam results, is a key indicator of student achievement and success. It has been influenced historically by cognitive factors such as intelligence, but modern research highlights the importance of non-cognitive factors like self-efficacy, motivation, and time use (Affuso et al., 2023). Students who manage their time effectively tend to perform better academically. Time management, defined as the process of planning and exercising control over time spent on activities, has been linked to increased academic success and reduced stress (Press, 2024). It emphasized that students who apply structured time management techniques achieve higher academic results and experience fewer academic delays.

A growing body of evidence suggests that time management may serve as a mediating mechanism between self-efficacy and academic performance. Students with strong self-efficacy beliefs are more likely to plan their study schedules, prioritize tasks, and avoid procrastination, which in turn enhances their academic results (Özer & Akçayoğlu, 2021). Moreover, study conducted by results found that students who were confident in their academic abilities managed their time more effectively and experienced less academic stress (Hitches, Woodcock, & Ehrich, 2022). Recent studies, confirm that time management not only predicts academic performance but also functions as a behavioral pathway through which self-efficacy exerts its effects (Dong, Hassan, Hassan, Chen, & Guo, 2023; Muppalla, Vuppalapati, Reddy Pulliahgaru, & Sreenivasulu, 2023).

Despite this theoretical linkage, few studies have empirically examined the mediating role of time management in the relationship between academic self-efficacy and performance. Furthermore, most of the existing research has been conducted in Western contexts, with limited evidence available from developing countries such as Pakistan, where educational pressures, cultural expectations, and institutional structures differ significantly. This creates a substantial gap in understanding how these psychological and behavioral factors interact within diverse academic environments (Zheng, Chang, Lin, & Zhang, 2021).

This research addresses the identified gap by exploring how academic self-efficacy contributes to academic performance through time management among medical students, for a rigorous analytical approach. It aims to extend current literature by testing a mediation model within a South Asian university context, thus offering both theoretical and practical contributions to the field of educational psychology. The study's findings may guide educators and academic counselors in designing interventions that not only boost students' confidence but also improve their behavioral competencies, such as time management.

The significance of this study lies in its potential to inform evidence-based strategies to enhance academic performance. By understanding how self-efficacy and time management interact, universities can develop programs that foster students' psychological readiness and practical skills for academic success. This study contributes to localized research in Pakistan and other similar educational systems by identifying key factors that drive or hinder academic outcomes.

The aim of this study is to investigate the role of academic self-efficacy in predicting academic performance among medical students and to determine whether this relationship is mediated by time management skills. The objectives of the study are: (1) to examine the effect of academic self-efficacy (low vs. high) on the academic performance and time management skills of medical students, and (2) to investigate the mediating role of time management in the relationship between academic self-efficacy and academic performance.

METHODS

This study employed a quantitative, cross-sectional research design to explore the contribution of academic self-efficacy to the improvement of academic performance in medical students, with time management examined as a mediating factor. The aim of the study was to investigate how academic self-efficacy affects academic performance directly and indirectly through students' time management skills. Prior to data collection, ethical approval was obtained from the Institutional Review Board (IRB) of Wah Medical College, ensuring adherence to ethical principles including voluntary participation, confidentiality, and informed consent.

The study was conducted on a sample of 374 undergraduate university students enrolled in various academic programs. Participants were selected using a convenience sampling technique, targeting students who were readily accessible and willing to participate. To ensure the appropriateness of the sample, inclusion criteria required that participants be currently enrolled full-time undergraduate students and able to comprehend English (as the questionnaire was in English). Students were excluded if they were enrolled in postgraduate programs, had diagnosed psychiatric conditions, or were unwilling to give informed consent.

To measure the constructs of interest, a structured questionnaire was used consisting of three validated instruments. Academic self-efficacy was measured using a standardized academic self-efficacy scale designed to assess students' beliefs in their ability to perform academic tasks successfully (Ifdil, et al., 2024). Academic performance was assessed using each student's self-reported Cumulative Grade Point Average (CGPA), which served as a quantitative indicator of academic achievement. Time management skills were measured using the Time Management Behavior Scale (TMBS), a reliable instrument that evaluates how effectively individuals manage their time across four domains: goal setting, prioritization, mechanics of time management, and preference for organization (Zyoud, 2023).

For data collection, participants were approached during scheduled academic sessions and informed about the purpose of the study. After obtaining informed consent, they were given printed questionnaires to complete anonymously. Participants were assured that their responses would remain confidential and would only be used for research purposes. The data collection process took approximately 15–20 minutes per participant and was completed over a period of three weeks.

Once data were collected, they were entered and analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize demographic characteristics and the main study variables. For inferential analysis, an independent samples t-test was used to examine differences in academic performance and time management between students with low and high academic self-efficacy. To evaluate the mediation effect of time management, Structural Equation Modeling (SEM) was conducted in, testing both direct and indirect paths between academic self-efficacy and academic performance through time management.

RESULTS

Table-1
Demographic Characteristics of the Participants (n = 374)

Variable	Categories	f (%)
Age	15–24	296 (79.1%)
	25–35	78 (20.9%)
Gender	Male	198 (52.9%)
	Female	176 (47.1%)
Study Level	Undergraduate	320 (85.6%)
	Postgraduate	54 (14.4%)
Parents' Economic Status	≤ 50k	180 (48.1%)

Variable	Categories	f (%)
	50k–1M	120 (32.1%)
	1M–1.5 M	33 (8.8%)
	1.5–2.5M	23 (6.2%)
	> 3M	18 (4.8%)
Living Environment	Urban	299 (80.0%)
	Rural	75 (20.0%)

The demographic data presented for the study participants (n = 374) indicate that most respondents (79.1%) fall within the 15–24 age group, suggesting a primarily young student population. Gender distribution was relatively balanced, with males comprising 52.9% and females 47.1% of the sample. Most participants (85.6%) were enrolled in undergraduate programs, while only 14.4% were postgraduate students. Regarding parents' economic status, nearly half (48.1%) of the students reported a household income of ≤ PKR 50,000, reflecting a predominantly lower-income background. A smaller percentage (32.1%) had family income between PKR 50,000 and 1 million, and even fewer belonged to higher income brackets. The living environment data showed that a significant portion (80%) of students resided in urban areas, while 20% were from rural settings. These demographics suggest a diverse sample in terms of age, gender, and economic status, with a strong representation of urban undergraduate students from lower to middle-income families.

Table-2
Effect Of Academic Self-Efficacy (Low Vs. High) On the Academic Performance and Time Management Skills of University Students (N = 374)

	Low Self Efficacy		High Self Efficacy					
Variable	M	SD	M	SD	t	df	P	cohen d
Academic Performance	65.78	8.24	72.35	7.63	7.98	373	< .001	0.84
Time Management Skill	61.20	9.05	70.45	8.12	10.12	373	< .001	1.02

Table-2 illustrates the results of an independent sample t-test examining the effect of academic self-efficacy (categorized into low and high) on academic performance and time management skills. The findings reveal a statistically significant difference in academic performance between students with low self-efficacy (M = 65.78, SD = 8.24) and those with high self-efficacy (M = 72.35, SD = 7.63), with a t-value of 7.98 and p < .001. The effect size, as measured by Cohen's d, is 0.84, indicating a large and practically meaningful difference. Similarly, time management skills were significantly higher among students with high self-efficacy (M = 70.45, SD = 8.12) compared to those with low self-efficacy (M = 61.20, SD = 9.05), with a t-value of 10.12 and p < .001. The effect size here was even stronger (Cohen's d = 1.02), further emphasizing that students with higher academic self-efficacy not only perform better academically but also manage their time more effectively. These results support the assumption that academic self-efficacy plays a crucial role in enhancing both academic outcomes and behavioral competencies like time management.

Table 3
Time Management as a Mediator between Academic Self-Efficacy and Academic Performance (n = 374)

Path	Relationship	(B)	SE	t / z p-value	95% CI
a	Self-Efficacy → Time Management	0.45	0.06	7.50 < .001	[0.33, 0.57]
b	Time Management → Acad Performance	0.38	0.07	5.43 < .001	[0.24, 0.52]
c	Self-Efficacy → Academic Perform (Total Effect)	0.52	0.08	6.50 < .001	[0.36, 0.68]
c'	Self-Efficacy → Academic Perform (Direct Effect)	0.35	0.07	5.00 < .001	[0.21, 0.49]
ab	Indirect Effect (a × b)	0.17	0.04	— —	[0.10, 0.25]

The mediation analysis results presented in Table 3 explore whether time management mediates the relationship between academic self-efficacy and academic performance. The analysis revealed that academic self-efficacy positively predicted time management skills (B = 0.45, SE = 0.06, t = 7.50, p < .001), and time management skills, in turn, significantly predicted academic performance (B = 0.38, SE = 0.07, t = 5.43, p < .001). The total effect of self-efficacy on academic performance was significant (B = 0.52, SE = 0.08, t = 6.50, p < .001), and even after controlling for the mediator, the direct effect remained significant (B = 0.35, SE = 0.07, t = 5.00, p < .001), indicating partial mediation. The indirect effect (a × b) was calculated as 0.17 with a 95% bootstrap confidence interval of [0.10, 0.25], which does not include zero, confirming the statistical significance of the mediating role of time management. This suggests that academic self-efficacy improves academic performance both directly and indirectly by enhancing students' time management behaviors, thereby establishing time management as a meaningful and partial mediator in this relationship.

DISCUSSION

The aim of this study was to investigate the role of academic self-efficacy in predicting academic performance among medical students and to evaluate whether this relationship is mediated by time management skills, The study was conducted on a sample of 374 medical students in Pakistan and used validated instruments to measure academic self-efficacy, academic performance, and time management behaviors. The findings contribute valuable insight into how psychological and behavioral variables interact to influence students' academic achievement, particularly in a non-Western academic setting.

The results demonstrated that students with high academic self-efficacy scored significantly higher in both academic performance and time management compared to students with low self-efficacy. The independent samples t-test revealed a large effect size for both academic performance (Cohen's d = 0.84) and time management (Cohen's d = 1.02), indicating that self-efficacy is a robust determinant of both outcome and behavioral variables. This is consistent with previous literature that underscores self-efficacy as a powerful predictor of academic achievement. (Firth et al., 2019). Students who believe in their academic capabilities are more likely to approach learning tasks confidently, set realistic goals, and persist through challenges, which translates into better academic results. (Goyibova, Muslimov, Sabirova, Kadirova, & Samatova, 2025)

Furthermore, the mediation analysis indicated that time management partially mediates the relationship between academic self-efficacy and academic performance. The direct effect of self-efficacy on academic performance remained significant, even after accounting for the mediator, while the indirect effect through time management was also statistically significant. These findings suggest that time management behaviors are an essential mechanism through which self-efficacy impacts academic success. Similar mediation pathways have been confirmed in

other recent empirical studies. For instance, (Alghamdi et al., 2024) found that time management significantly mediated the influence of self-efficacy on students' GPA in a sample of university students. Students who possess high self-efficacy are more likely to organize their schedules, avoid procrastination, and allocate time effectively, which leads to improved academic outcomes (Kitsantas, Winsler, & Huie, 2008).

The current findings also align with research by Ates (2022) who reported that self-regulated learning strategies such as time planning and task prioritization significantly enhance academic performance among higher education students. (Ateş Akdeniz, 2022) Additionally, research study conducted by Martin et al (2022) highlighted that self-efficacy, when combined with behavioral strategies like goal setting and time control, strongly predicts academic success across different academic contexts. (Martin, Burns, Collie, Bostwick, Flesken, & McCarthy, 2022) The present study supports and extends this literature by validating these relationships within the context of Pakistani university students, thereby offering cross-cultural evidence for the proposed theoretical model. Moreover, the current study responds to calls in the literature to explore psychological constructs such as self-efficacy in underrepresented contexts like South Asia, where academic pressure, socioeconomic constraints, and cultural norms may influence educational outcomes differently compared to Western populations. (Gebauer, McElvany, Köller, & Schöber, 2021) Furthermore, the study also contributes methodologically by employing a robust multivariate technique that allows for the simultaneous estimation of direct and indirect effects, thereby increasing the precision of mediation testing.

These findings have several practical implications for educational practice. Universities and academic institutions should focus on developing programs that enhance students' confidence in their academic abilities and promote the acquisition of time management skills. For instance, orientation sessions, mentorship programs, and skill-based workshops could be tailored to improve both the psychological and behavioral competencies essential for academic success. The integration of self-efficacy-building strategies and time management training into the academic curriculum may yield significant improvements in student performance, especially in resource-constrained settings.

CONCLUSION

This study investigated the contribution of academic self-efficacy to academic performance among university students, with time management evaluated as a mediating factor using Structural Equation Modeling. The findings revealed that students with higher academic self-efficacy not only performed better academically but also demonstrated superior time management skills. Moreover, time management was found to partially mediate the relationship between self-efficacy and academic performance, indicating that self-efficacious students are more likely to engage in effective time management behaviors, which in turn enhance their academic outcomes. These results confirm the theoretical assumptions of Bandura's social cognitive theory and reinforce the growing body of empirical evidence supporting the dual importance of internal psychological beliefs and external behavioral strategies in shaping academic success. The study extends current knowledge by validating these relationships in a South Asian context, highlighting cultural relevance and addressing a gap in localized research. Practically, the findings underscore the need for universities and educators to invest in interventions that foster both academic self-confidence and time management skills. Such initiatives may include self-efficacy training, time management workshops, and structured academic support services. By targeting both cognitive and behavioral dimensions of learning, institutions can empower students to take control of their academic trajectories and maximize their potential for achievement.

LIMMITATION AND RECOMMENDATION OF THE STUDY

While this study provides valuable insights into the relationship between academic self-efficacy, time management, and academic performance, several limitations should be acknowledged. First, the study employed a cross-sectional design, which restricts the ability to draw causal inferences about the directionality of relationships among variables. Longitudinal research would be better suited to assess how these relationships evolve over time. Second, the

use of self-reported measures, including academic self-efficacy, time management skills, and CGPA, may be subject to social desirability bias or inaccurate reporting, potentially affecting the validity of the results. Incorporating objective performance data and triangulating self-reports with teacher assessments or behavioral tracking could enhance reliability.

Additionally, the sampling strategy was based on convenience sampling from a single geographical region and academic setting, limiting the generalizability of the findings to broader student populations in Pakistan or other cultural contexts. Future studies should aim for more representative sampling across multiple institutions and provinces. The study also did not explore potential moderators such as gender, socioeconomic background, academic discipline, or mental health status, which could influence the strength or direction of the observed relationships.

Based on these limitations, several recommendations are proposed. Future research should adopt longitudinal or experimental designs to better establish causal pathways between self-efficacy, time management, and academic outcomes. It is also recommended to include diverse student populations from different academic fields, levels (undergraduate and postgraduate), and regions to increase the external validity of the results. Furthermore, the integration of mixed-method approaches—combining quantitative surveys with qualitative interviews—could provide a deeper understanding of how and why self-efficacy and time management influence academic performance.

Finally, at the institutional level, universities should consider implementing targeted intervention programs aimed at enhancing academic self-efficacy and time management skills. These could include orientation sessions, counseling services, skill-building workshops, and mentorship initiatives that foster self-regulation and academic confidence—especially for students from disadvantaged or rural backgrounds

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