The Effects of College Students' Mindful Attention Awareness, Study Skills, And Age on Academic Achievement and Related-Gender Differences

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ABSTRACT:

The present study examined the interrelationship between mindful attention awareness, the ability to study, the demographics, and academic performance among university students. The quantitative, cross-sectional design was used to draw data on undergraduate students with the help of standardised measures of mindfulness, study skills test preparation, concentration, time management, and grade point average (GPA), which was self-reported. The methods used to analyse trends and predictors of academic performance were descriptive statistics, correlation analyses, independent sample t-tests, and multiple regression analyses. The results showed that students were of moderate mindful attention, awareness, and study skills. There were significant cross relationships among the dimensions of study skills, with the exception of test preparation, concentration, and time management, which had significant interrelationships. Age also turned out to be a meaningful negative predictor of GPA, but mindfulness, attention, awareness, and general study skills were not significant predictors of academic achievement after controlling for demographic variables. Analytical gender studies determined that female students had considerably larger GPAs, with male students recording higher scores in terms of test preparation and concentration, and females exhibited better time management skills. These results highlight the complexity of academic performance and indicate that mindfulness and study skills play an indirect, not a direct, role in academic performance. The research also emphasises the necessity to integrate the demographic and contextual variables in the analysis of student success and presents the evidence as the guiding force for forming.

Keywords: Mindful attention awareness; Study skills; Academic achievement; Grade point average (GPA); Gender differences; University students; Age effects

Introduction

The academic investigation of the last one hundred years has shown the pivotal importance of study skills in contributing to academic success. Both early and recent studies also reveal that good study skills are positively linked to academic performance and not only related to personal achievement but also to the achievements of the institution in general. (Abid et al., 2023). High academic engagement is

demonstrated by those students who utilise systematic skills like the preparation of tests, concentration, and time management, which in their turn are associated with the enhanced results of learning (Fu et al., 2025). This association would go in line with the theory of involvement that was put forward by Astin, which inspired more psychological and emotional energy in the learning activities, and students are likely to attain academic success (Tan et al., 2024). Notably, the challenges of poor performance in school are also commonly associated with a lack of good command of relevant study skills at various levels of education and not cognitive limitation (Tong et al., 2022).

Although former studies have mainly concentrated on short-term measures of academic success like GPA at the semester, alternative, relatively new studies have highlighted the need to look at the long-term academic performance of students, including persistence and retention. The excessive dependence on GPA as the only measure of success can be a limiting factor in the acquisition of the idea of how studying abilities can lead to long-term academic success (Revesai, 2025). Besides, among the increasing interest in this field, little has been done in terms of examination of interactions between elements of study skills through test preparedness, concentration, and time management, with the development of psychological constructs that facilitate learning, like mindfulness. Mindfulness, especially the mindful attention awareness, has been experiencing growing awareness in the research domains of psychology and education (Hadash et al., 2023).

Mindfulness is an identified process defined as purposeful, present-focused, and nonjudgmental awareness and has been associated with enhanced emotional regulation and stress management, in addition to better cognitive performance (Mujtaba et al., 2025). There is empirical evidence to support mindfulness in terms of attention control, working memory and overall mental well-being, as these are necessary components of good learning (Carroll et al., 2022; Ekore, 2019). Though research on mindfulness has grown very fast, most of the studies that have been conducted have dealt with the adult population, with relatively less and limited research on their role in the academic setting, especially among university students. Also, a review of the literature on gender disparities in academic performance, particularly in the Middle East, has revealed that female students tend to be more successful than male ones, but the processes that can be used to explain such variations are not adequately described (Koujel & Major, 2025).

Although evidence has greatly supported the independent variables of study skills, mindfulness, and gender in performance in school, there has indeed been a significant gap in the literature that has considered the effects of the three variables together. The need for such research in particular is that the trend has yet to provide a combined study of mindful attention awareness and individual study skill elements through the consideration of demographic factors (age and gender). Such a gap is specifically perceivable when it comes to higher education in Saudi Arabia, where the gender disparities in performance are well-documented and least comprehended with references to psychological and behavioural conditions of learning. Thus, it was expected to investigate the influence of attentional consciousness level of students, their abilities to study, and age on academic success, in addition to finding out gender-specific differences in relation to all these factors among Saudi Arabian university students.

The value of the present study lies in the fact that it presupposes a combination of mindful attention awareness and exercise skills as comorbid predictors of academic performance among students at the university. Although past studies have usually examined these constructs individually, it is the innovative quality of the current research which empirically models their interaction on student GPA, considering differences in age and gender. This disaggregation of study skills into sub-components, including test preparedness, concentration and time management, allows a more detailed view of the roles of distinct learning behaviours in academic performance as opposed to the broad-based requirements in measuring study habits. This research is new in

several significant aspects. To begin with, it is one of the few empirical studies that have performed a simultaneous analysis of mindful attention awareness and several dimensions of study skills in the same context of an analytical framework. Second, the research involves using age as an explanatory variable as opposed to most of the available literature that uses only short-term achievement indicators and fails to categorise them against demographic issues, thus providing a better understanding of the difference in development and experience in academic performance. Third, the research directly examines differences in gender mindfulness, attention, and capacity to study and achieve academic results that partially answers an under-asked question, that is, whether identified gender gaps in academic performance can be in part attributed to psychological and behavioural learning variables. This study makes a great contribution to the body of the literature of higher education in Saudi Arabia, where research on the combination of mindfulness and study skills is minimal. By contextualising the analysis through the environment of a Saudi university, the results can provide evidence in a culturally applicable way that may inform academic support services, curriculum development, and student development endeavours. In practice, the implications of the results are on educators, academic advisors, and policymakers because one can determine the main modifiable determinants that can significantly improve student performance and positively decrease the achievement gap. Teachers can use the findings to prepare better for inclusive education and eradicate barriers to successful teaching as well (Alabay, 2026). The study as a whole will complement the current body of knowledge by providing a gap between the cognitive and behavioural views of academic achievement and demographic perspective, therefore adding a more holistic perspective to student success in university life.

To fulfil the mentioned objective, the process of the research was directed by the following research questions:

1. How aware and mindful of studying and mindfulness are students in universities?
2. How do mindful attention awareness, study skills, and age influence the academic performance of students (GPA)?
3. What are the impacts of mindfulness attentiveness, test preparedness, concentration, time management, and age on the academic performance of students?
4. Do male and female students differ significantly in terms of mindful attention awareness, study skills, age, and academic achievement?

Literature Review

It has been shown in research studies that study skills and awareness of mindful attention have different levels of display among university students as shaped by individual, contextual, and educational factors. The test preparedness, concentration and time management are among the many dimensions of study skills that are not all evenly developed in all students, including the tertiary students (Mokoagow et al., 2024). According to several studies, it has been established that most students go to higher education settings with no proper self-regulated learning strategies, which leads them to poor academic involvement and academic performance (Mokoagow et al., 2024). On the same note, mindful attention awareness in university students has been reported to be of a low to moderate level, especially in the non-clinical and non-intervention-based samples (Quraishi et al., 2025; Acet, 2023). To study the mindful level of dispositional conduct among students, the Mindful Attention Awareness Scale (MAAS) has been popularly deployed to show that a significant number of students find it hard to remain presently mindful to sustain attention over time to do scholarly activities. These results imply that mindfulness and study skills are not predetermined characteristics, as they are both modifiable and need to be evaluated at baseline in various educational institutions.

A sufficient body of literature has proved that study skills are significant predictors of academic achievement. There is metacognitive evidence that good strategies in studying are moderately to strongly correlated with GPA and other performance features (Gurung et al., 2022).

Organising study hours, paying attention and getting ready before taking examinations are skills that have been directly associated with improving academic performance in almost all disciplines (Nainar et al., 2025; Seli, 2019). Mindful attention awareness has also found its place as another important factor of academic achievement due to its effect on the regulation of attention, emotional control, and minimisation of stress (Blackburn, 2020). Higher mindfulness levels of students are also associated with better concentration levels, better working memory, and greater cognitive flexibility, which facilitate learning and performance (Bajestani et al., 2024). Also, mindfulness was identified to mitigate the adverse outcomes of academic stress, which indirectly contributes to achievement (McBride & Greeson, 2023). Age has not gotten as much attention in the literature, but the evidence available in the literature points to older students being able to exhibit more self-regulating skills and strategies of learning because of their age and experience in academics, which are more mature (Vanslambrouck et al., 2019). Talaue, Kalanther and Bitanga (2025) have analysed age with internet usage stating that older students tend to use internet more frequently which hindered their academic performance. Nonetheless, the results are mixed, which makes it imperative to analyse the matters of age and psychological and behavioural predictors of achievement.

In comparison to the traditional levels of study skills, variations in the impact on academic performance become noticeable at the subscale level of study skills. It has always been associated with test preparedness that leads to better performance in tests and low levels of test anxiety (Liu et al., 2024). Concentration as a form of persevering attentional processing in the learning activities has been termed a very important determinant of deep learning and educational endurance (Rodríguez-García et al., 2022). Time management, on the other hand, is also often referred to as one of the most effective predictors of GPA because time management helps students manage the academic requirements (Fu et al., 2025). The given skills are complemented by mindful attention awareness that helps to increase attentional control and focus on the present moment, which is vital to effective concentration and efficient utilisation of time spent studying (Gülden & Yalçın, 2024). The empirical studies provide indications that mindfulness correlates positively with attention and working memory, and seems to indirectly reinforce the ability to perform study skills (Bajestani et al., 2024). Although they have these theoretical connections, there is a dearth of empirical studies that have administered mindfulness in relation to individual dimensions of study skills and age as a predictor in a single study and herein lies a vacuum to fill the current research.

The presence of gender differentiation in academic performance has also been well-documented since female students usually do better in their GPA and course completion rates than male students, especially in the Middle East (Ayoubi et al., 2025). The findings of various studies indicate that females are more likely to exhibit a high degree of self-discipline, time, and study organisation abilities, which partly seems to be the source of their academic superiority (Shi & Qu, 2022). The results of gender variation in mindfulness are, however, inconclusive. Other research notes that there are no notable gender discrepancies in mindful attention awareness (Wang et al., 2023), and others develop the hypothesis that females might score higher on the scales of emotional awareness and attentional control (Khassawneh et al., 2022). Notably, there is a paucity of research to determine the possibility that the observed gender differences in academic performance could be attributed to the variations in mindfulness and study skills, at the same time (Ostermann et al., 2022). This is especially evident in the Saudi Arabian context, where most studies of gender-related outcomes have been done in terms of performance and not on cognitive and behavioural processes (Aljaber, 2024).

Methodology

Research Design

This study employed a quantitative, cross-sectional, non-experimental research design grounded in Astin's Theory of Involvement, which emphasises students' behavioural and

psychological engagement as key contributors to academic success. The design was appropriate for examining relationships among mindful attention awareness, study skills, age, gender, and academic achievement without manipulating any variables. Data was collected at a single point in time using standardised self-report instruments.

The quantitative approach enabled the use of descriptive statistics, correlational analyses, multiple linear regression, and inferential comparisons to test group differences. Multiple linear regression analyses were used to assess the predictive effects of mindful attention awareness, study skills, and age on students' academic achievement (GPA), while independent sample t-tests were conducted to examine gender differences across the study variables. This design allowed for systematic testing of associations and predictive relationships aligned with the study objectives and research questions.

Data Collection

Data was collected using an online survey method. Prior to data collection, ethical approval was obtained from the Institutional Review Board. Participation was voluntary, and informed consent was implied through survey completion. Only students aged 18 years and above were eligible to participate. Convenience sampling was employed to recruit university students from different academic majors.

The survey consisted of three components: a demographic questionnaire, the Mindful Attention Awareness Scale (MAAS), and selected subscales from the Study Skills Inventory. The demographic questionnaire collected information on gender, age, major field of study, and cumulative GPA. The MAAS measured students' dispositional mindful attention awareness, while the Study Skills Inventory assessed students' study behaviours. Only three subscales test preparation, concentration, and time management were used, as they were most relevant to academic performance. The online survey was administered via Google Forms and required approximately 10–15 minutes to complete.

Table 1 Data Collection Instruments

Instrument	Purpose	Variables Measured	Number of Items
Demographic Questionnaire	Participant background	Gender, age, major, GPA	4
Mindful Attention Awareness Scale (MAAS)	Measure mindfulness	Mindful attention awareness	15
Study Skills Inventory (Selected Subscales)	Measure study skills	Test preparation, concentration, and time management	29

Data Analysis

Data was exported from Google Forms into Microsoft Excel and then transferred to IBM SPSS version 29.0 for analysis. The dataset was screened for missing values, outliers, and accuracy prior to analysis. Descriptive statistics, including means and standard deviations, were used to summarise participants' demographic characteristics and to determine the levels of mindful attention awareness and study skills. To examine the effects of mindful attention awareness, study skills, and age on academic achievement, Pearson correlation analyses and multiple linear regression analyses were conducted. Separate regression models were used to assess overall study skills and individual study skill subscales as predictors of GPA. Assumptions of multiple linear regression including linearity, normality, homoscedasticity, and measurement reliability were examined and met prior to interpretation. Independent sample t-tests were used to compare male and female students across mindful attention awareness, study skills, age, and GPA.

Table 2 Data Analysis Techniques

Research Question	Variables Involved	Statistical Analysis
RQ1: Levels of mindfulness and study skills	MAAS, study skills subscales	Descriptive statistics
RQ2: Effects on academic achievement	MAAS, study skills, age, GPA	Correlation and multiple linear regression
RQ3: Effects of subscales on achievement	MAAS, test preparation, concentration, time management, age, GPA	Multiple linear regression
RQ4: Gender differences	Gender, MAAS, study skills, age, GPA	Independent sample t-tests

Results

The results are presented in four subsections aligned with the research questions: descriptive statistics, correlational analyses, multiple regression analyses, and gender-based comparisons.

Descriptive Statistics of Mindful Attention, Awareness, and Study Skills

Descriptive statistics were computed to examine the levels and strengths of mindful attention, awareness, and study skills among university students. Scores were interpreted using minimum, maximum, mean values, and strength indices based on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Overall, mean scores for all variables fell between "undecided" (3) and "agree" (4), with values generally closer to "agree," indicating moderate to moderately high levels of mindfulness and study skills among participants. As presented in Table 1, mindful attention awareness ranged from 15 to 75, with a mean of 46.04 (strength = 3.06/5). Female students reported a slightly higher mean score (M = 46.58; strength = 3.10/5). Total study skills scores ranged from 49 to 143, with a mean of 102.26 (strength = 3.52/5). Female students reported a comparable mean score of 101.86 (strength = 3.48/5). Among the study skill subscales, concentration demonstrated the highest strength score (3.77/5), followed by test preparation (3.46/5) and time management (3.26/5). Female students reported higher mean scores in time management compared to the overall sample, whereas male students appeared to score slightly higher in test preparation and concentration when means were visually compared.

Table 3 Descriptive Statistics for Mindful Attention, Awareness, and Study Skills

Variable	Low	High	Mean	Strength (out of 5)	Female Low	Female High	Female Mean	Female Strength
Mindful Attention Awareness	15	75	46.04	3.06	44.92	48.25	46.58	3.10
Study Skills (Total)	49	143	102.26	3.52	99.40	104.32	101.86	3.48
Test Preparation	16	63	44.98	3.46	42.77	45.24	44.00	3.38
Concentration	14	50	37.65	3.77	36.01	37.98	37.00	3.70
Time Management	6	30	19.56	3.26	20.09	21.63	20.86	3.47

Note. Strength values range from 1 (strongly disagree) to 5 (strongly agree).

Correlational Analysis

Pearson correlation analyses were conducted to examine relationships among mindful attention awareness, study skills, age, and academic achievement (GPA). Results indicated that student age was significantly and negatively correlated with GPA ($r = -.231$, $p < .001$),

suggesting that older students tended to report lower GPA scores.

A second correlation analysis, including the three study skills subscales, revealed significant intercorrelations among these components. Test preparation was strongly correlated with concentration ($r = .559$, $p < .001$) and moderately correlated with time management ($r = .460$, $p < .001$). Concentration was also significantly correlated with time management ($r = .441$, $p < .001$). No statistically significant correlations were observed between mindful attention awareness and GPA or between individual study skill subscales and GPA at the bivariate level.

Table 4Pearson correlation coefficients among age, GPA, study skills subscales, and mindful attention awareness. **p < .001.

Variables	1	2	3	4	5	6
1. Age	—					
2. GPA	−.231**	—				
3. Test Preparation	−.045	.082	—			
4. Concentration	−.031	.065	.559**	—		
5. Time Management	−.054	.074	.460**	.441**	—	
6. Mindful Attention Awareness	−.012	.021	.098	.107	.089	—

Notes:

- **r** values reported.
- **** $p < .001$ (two-tailed).
- Correlations between mindful attention awareness, study skills, and GPA were non-significant.

Multiple Regression Analyses Predicting GPA

A multiple linear regression analysis was conducted to examine the combined effects of mindful attention awareness, overall study skills, and age on GPA. The model was statistically significant, $F(3, 286) = 3.846$, $p < .001$, with an adjusted R^2 of .050, indicating that 5.0% of the variance in GPA was explained by the predictors. Age emerged as the only statistically significant predictor ($p = .001$).To further examine the contribution of individual study skill components, a second regression analysis was conducted using test preparation, concentration, time management, mindful attention awareness, and age as predictors. The model was statistically significant, $F(5, 284) = 3.701$, $p < .003$, with an adjusted R^2 of .045. Age remained the only significant predictor of GPA.

Table 5 Multiple Regression Analysis Predicting GPA from Age, Mindful Attention Awareness, and Study Skills Subscales

Predictor	B	SE	95% CI LL	95% CI UL	β	p
Age	−.090	.024	−.137	−.044	−.222	.001
Mindful Attention Awareness	−.007	.005	−.016	.002	−.083	.155
Test Preparation	−.004	.008	−.021	.012	−.036	.618
Concentration	.003	.010	−.016	.023	.024	.741
Time Management	.004	.010	−.016	.024	.028	.680

Note. Dependent variable = GPA.

Gender Differences in Study Variables

Independent sample t-tests were conducted to examine differences between male and female students across age, GPA, mindful attention awareness, and study skills. Significant differences were found for GPA, age, test preparation, concentration, and time management. Female students reported significantly higher GPAs and time management scores, whereas male students scored higher in test preparation and concentration. No

statistically significant gender difference was found in mindful attention awareness.

Table 6 Gender differences in age, academic performance (GPA), mindful attention awareness, and study skills based on independent samples t-tests among male and female students.

Variable	Male Mean	Male SD	Female Mean	Female SD	df	t	p	Cohen's d
Age	20.60	2.39	20.01	1.37	253	2.61	.005	.296
GPA	2.70	.82	3.14	.76	289	−4.67	.001	−.550
Test Preparation	45.82	6.68	44.01	7.23	289	2.223	.013	.261
Concentration	38.21	6.06	37.00	5.76	289	1.736	.042	.204
Time Management	18.45	5.96	20.86	4.51	289	−3.91	.001	−.450
Mindful Attention Awareness	45.58	10.77	46.59	9.73	289	−.833	.203	−.328

Discussion

The present study examined the roles of mindful attention awareness, study skills, age, and gender in predicting academic achievement among university students in Saudi Arabia. By integrating psychological mindfulness, behavioural study skills, and demographic age and gender variables within a single analytical framework, the findings provide a more comprehensive and context-sensitive understanding of academic performance in higher education. Overall, the results highlight that academic achievement is a multifaceted outcome influenced by indirect and contextual factors rather than by isolated learning traits alone.

The descriptive findings revealed that students reported moderate to moderately high levels of mindful attention awareness and study skills. Mean scores across all constructs were closer to "agree" than "undecided," indicating that students generally perceived themselves as reasonably competent in managing their academic behaviours and maintaining present-moment attention. These findings are consistent with previous studies reporting moderate levels of dispositional mindfulness and study skills among non-clinical university populations (Petrovic, 2025).

Among the study skills dimensions, concentration emerged as the strongest skill, followed by test preparation and time management. This pattern aligns with research suggesting that sustained attention is often prioritised in higher education due to lecture-based instruction and examination-focused assessment systems (Julius & Nancy). However, the comparatively lower scores for time management suggest ongoing challenges in balancing academic workload and competing responsibilities, a difficulty widely documented among university students (Ramlan et al., 2024). These results indicate that while students may be able to focus during academic tasks, they may struggle with the broader organisation of their study routines.

Mindful attention awareness was found to be moderate across the sample, with minimal variation between male and female students. This finding supports earlier work suggesting that dispositional mindfulness does not consistently differ by gender and may be shaped more strongly by contextual, educational, and experiential factors than by biological or social gender differences alone (Wilson et al., 2023).

Correlation analyses revealed a significant negative relationship between age and GPA, while no significant bivariate relationships were found between GPA and mindful attention awareness or study skills (Nainarbalasubramanian et al., 2025; Alomari, 2023). The negative association between age and academic performance contrasts with some studies suggesting that older students benefit from greater maturity and self-regulation (Katsantonis, 2024), but it may reflect increased external responsibilities, academic interruptions, or

program-related challenges faced by older undergraduates. This finding underscores the importance of considering age as a meaningful demographic variable in academic achievement research, particularly in contexts where non-traditional students are represented (Asrifan et al., 2025).

Strong intercorrelations were observed among the study skill subscales of test preparation, concentration, and time management. This pattern supports existing literature that conceptualises study skills as an interconnected system of self-regulated learning behaviours rather than independent competencies (Sinkkonen & Tapani, 2024). Students who prepared effectively for tests were also more likely to report higher concentration and better time management, suggesting that these skills tend to co-develop (Siregar, 2025).

Despite these interrelationships, neither study skills nor mindful attention awareness was directly associated with GPA. One plausible explanation is that GPA is influenced by a wide range of contextual factors, including grading policies, assessment formats, course difficulty, and disciplinary norms, which may dilute the observable effects of self-reported learning behaviours (Green, 2022). Additionally, self-report measures may capture perceived rather than actual effectiveness of study strategies, potentially inflating associations at the descriptive level without translating into measurable performance outcomes.

Multiple regression analyses provided further clarification of the relationships among the study variables. Although the overall models were statistically significant, the proportion of variance explained in GPA was modest (Dong & Yuan, 2025). Across both regression models, age emerged as the only significant predictor of academic achievement, while mindful attention awareness and study skills did not contribute significantly after controlling for demographic factors (Khan et al., 2024).

These findings diverge from studies reporting strong direct effects of mindfulness and study skills on academic performance (Zedan et al., 2025; Ostermann et al., 2022; Vidal-Meliá et al., 2022). However, the discrepancy may be explained by methodological differences. Many previous studies relied on bivariate correlations or did not control demographic variables, potentially overestimating the predictive power of these constructs. By contrast, the current study employed multivariate regression analyses, offering a more conservative and controlled estimation of effects.

Importantly, the absence of direct predictive effects does not imply that mindfulness and study skills are unimportant. Rather, the results suggest that their influence may be indirect, operating through mediating mechanisms such as stress reduction, motivation, academic engagement, self-efficacy (Meng & Zhang, 2023), or self-esteem (Šagát, Bartik, Lazić, et al., 2021). Mindfulness may enhance emotional regulation and attentional stability, while study skills may improve learning quality, even if these benefits are not immediately reflected in GPA outcomes.

Gender-based analyses revealed significant differences in GPA and specific study skills. Female students achieved significantly higher GPAs than male students, consistent with regional and international evidence demonstrating a female academic advantage in higher education, particularly in Middle Eastern contexts (Shoaib, 2025). This finding suggests that female students may engage more consistently with coursework or benefit from stronger self-regulatory behaviours.

Interestingly, male students reported higher levels of test preparation and concentration, whereas female students demonstrated superior time management skills. This pattern suggests gender-specific learning strategies. Male students may rely more on short-term, exam-oriented approaches, while female students may engage in more sustained and organised study practices over time (Alsous et al., 2025; Mujahid et al., 2025). Prior research indicates that time management and self-discipline are particularly influential for cumulative academic outcomes such as GPA, which may help explain the higher achievement observed among female students (Qusef et al., 2025; Fu et al., 2025; Shi & Qu, 2022).

No significant gender difference was found in mindful attention awareness, reinforcing earlier

findings that mindfulness does not systematically vary by gender (Othman et al., 2025; Wang et al., 2023). Additionally, the observed age difference between male and female students, combined with the negative relationship between age and GPA, suggests that age may partially confound gender-based achievement differences, further highlighting the importance of demographic controls.

Grounded in Astin's Theory of Involvement, this study examined how students' psychological and behavioural engagement relates to academic outcomes. While students reported moderate involvement through mindfulness and study skills, these forms of engagement did not directly translate into higher GPAs (Mosleh et al., 2025; Ostermann et al., 2022). This finding suggests that involvement, as perceived by students, may not be sufficient to ensure academic success unless it aligns closely with institutional expectations, assessment practices, and learning environments (Benabid et al., 2025).

The results also highlight a potential disconnect between perceived engagement and measurable academic outcomes. Students may believe they are studying effectively, yet their strategies may not be optimally aligned with course demands. This misalignment underscores the need for explicit instructional guidance on how to translate engagement into performance

This study contributes to the literature by simultaneously examining mindful attention awareness, study skills, age, and gender within a single empirical model. By cross-referencing descriptive, correlational, and inferential findings (Tables 1–3), the study provides a comprehensive picture of how these variables interact in a Saudi university context.

Future research should explore mediating and moderating mechanisms that may clarify the indirect effects of mindfulness and study skills on academic achievement. Designs could help determine whether improvements in mindfulness and study skills lead to sustained academic gains over time. Additionally, incorporating objective measures of academic behaviour and discipline-specific analyses may yield deeper insights into performance dynamics.

Comparative Insights

Several previous studies have reported strong and positive associations between study skills, mindfulness, and academic achievement, often concluding that students with higher levels of time management, concentration, and mindful awareness consistently achieve superior academic outcomes. In contrast, the present study found that while students demonstrated moderate levels of mindful attention awareness and study skills, these variables did not emerge as significant direct predictors of GPA when age and gender were controlled. This divergence represents a notable negative aspect when compared to earlier research that emphasises the predictive strength of these constructions.

A possible explanation for this discrepancy lies in methodological differences. Many prior studies relied on simple correlational analyses or did not account for demographic variables such as age, potentially inflating the apparent effects of study skills and mindfulness on academic performance. In contrast, the current study employed multiple regression models, offering a more conservative and controlled analysis. As a result, the lack of strong direct effects may reflect a more realistic estimation rather than a contradiction of earlier findings.

Despite this limitation, the present study offers several positive contributions relative to existing literature. Unlike studies that examine mindfulness or study skills in isolation, this research integrated both constructs within a single analytical framework. Furthermore, by disaggregating study skills into test preparation, concentration, and time management, the study provided a more granular analysis of learning behaviours. This approach revealed meaningful interrelationships among study skills, even when their direct effects on GPA were limited.

Comparatively, prior research often assumes a linear and universal relationship between learning behaviours and academic outcomes. The current findings challenge this assumption by demonstrating that academic achievement is influenced by a broader set of contextual and demographic factors. The consistent predictive role of age, which is rarely emphasised in earlier studies, highlights an underexplored dimension

of academic performance. Additionally, gender-based differences in GPA and study behaviours observed in this study extend previous findings by suggesting that male and female students may adopt distinct academic strategies that influence outcomes differently.

In synthesis, while earlier studies highlight the potential benefits of mindfulness and study skills, the present research offers a more critical and context-sensitive interpretation. It suggests that these factors may exert indirect or conditional effects rather than acting as standalone predictors. By juxtaposing traditional assumptions with empirically grounded findings, this study advances a more nuanced understanding of academic achievement in higher education.

Conclusion

This study examined the roles of mindful attention awareness, study skills, age, and gender in predicting academic achievement among university students. The findings revealed that students generally reported moderate levels of mindfulness and study skills, with strong interrelationships among study skill dimensions. However, mindful attention, awareness and study skills did not directly predict GPA when demographic variables were considered. Age emerged as a significant predictor of academic achievement, while notable gender differences were observed in GPA and study behaviours. Female students demonstrated higher academic achievement, whereas male students reported stronger concentration and test preparation skills. Overall, the results highlight the complexity of academic performance and suggest that psychological and behavioural factors alone are insufficient to explain achievement outcomes. A multidimensional perspective that incorporates demographic and contextual influences is essential for understanding student success in higher education.

Limitations and Strengths of the Study

The study has certain limitations that should be acknowledged. The reliance on self-reported measures may introduce response bias, and the cross-sectional design limits causal interpretation. Additionally, academic achievement was measured using GPA, which may not fully capture learning quality or discipline-specific performance differences.

Despite these limitations, the study possesses notable strengths. It employed a comprehensive analytical framework by integrating mindfulness, multiple study skill dimensions, age, and gender within the same model. The use of regression analyses enhanced the rigour of the findings by controlling demographic influences. Moreover, the study contributes context-specific evidence from Saudi higher education, an underrepresented setting in the literature. The systematic cross-referencing of variables and robust statistical treatment strengthen the validity and relevance of the findings.

Contribution to Knowledge

This study contributes to knowledge by offering an integrated examination of mindful attention awareness and study skills within a demographic-sensitive framework. Unlike prior research that often assumes direct relationships with academic achievement, the findings demonstrate that these constructions may not independently predict GPA when age and gender are considered. The study highlights age as a significant yet underexplored factor in academic performance and provides evidence of gender-specific learning patterns. By challenging prevailing assumptions and emphasising indirect and contextual influences, this research advances a more nuanced understanding of student achievement. Additionally, it enriches the limited body of literature on mindfulness and study skills in Saudi higher education, offering empirical insights that can inform theory development and educational practice.

Future Recommendations

Future research should adopt longitudinal designs to examine how mindful attention, awareness, and study skills influence academic achievement over time. Investigating potential mediating variables such as academic motivation, self-efficacy, and stress management may help clarify indirect pathways between these constructs and performance outcomes. Mixed-

method approaches could provide deeper insight into how students apply study strategies in real academic contexts. Further studies should also explore discipline-specific differences to determine whether the impact of mindfulness and study skills varies across academic fields. From a practical perspective, future interventions should focus on integrating mindfulness and study skill training into the curriculum and evaluating their long-term effectiveness. Expanding research across multiple institutions would enhance generalizability and strengthen evidence-based policy development.

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Conflict of Interest

The author declares no conflict of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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