

## The Mediating Role of Grit in the Relationship among Health Behaviors, Internet Addiction, Emotional Intelligence, and Academic Burnout in Adolescents

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### Abstract

**Background:** Adolescence is a critical developmental stage marked by significant emotional, psychological, and academic changes. Academic burnout has become increasingly common in this age group due to academic pressure, lifestyle changes, and excessive digital media use. While health behaviors, internet addiction, and emotional intelligence are recognized as important psychosocial determinants of academic adjustment, the underlying mechanisms of their impact on academic burnout remain unclear. This study aimed to examine the mediating role of grit a trait representing perseverance and passion for long-term goals in the relationship between academic burnout and these psychosocial predictors in adolescents.

**Method:** This cross-sectional study employed a convenience sampling technique to recruit 281 adolescents (149 boys and 132 girls), aged 14 to 18 years ( $M = 17.09$ ,  $SD = 1.26$ ), from public and private colleges in Rawalpindi and Islamabad. Participants completed validated self-report measures assessing academic burnout, emotional intelligence, grit, internet addiction, and health behaviors. Correlation and mediation analyses were used to explore direct and indirect associations among variables.

**Results:** Academic burnout showed a significant positive correlation with internet addiction and emotional intelligence, and a significant negative correlation with grit and health behaviors. Mediation analyses revealed that grit significantly mediated the relationship between internet addiction and academic burnout, suggesting that higher grit levels weaken the negative impact of internet addiction. Similarly, grit partially mediated the effects of emotional intelligence and health behaviors on academic burnout, indicating that adolescents with stronger grit reported lower burnout despite high digital engagement or moderate emotional competencies.

**Conclusions:** Findings support the role of grit as a protective psychological factor, emphasizing its potential in school-based interventions aimed at reducing academic burnout and enhancing adolescent resilience.

**Keywords:** Academic burnout, adolescents, grit, emotional intelligence, internet addiction, health behaviors, mediation.

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## Background

Academic burnout among adolescents is a prevalent psychological condition marked by emotional exhaustion, reduced academic efficacy, and a growing sense of detachment from educational pursuits. This issue has garnered increasing attention due to its adverse effects on students' mental health and academic performance (Teuber, Webel, & Seifert, 2020). Academic burnout extends beyond general fatigue and is conceptualized as a multidimensional construct comprising three core components: (1) emotional exhaustion—feelings of being emotionally depleted and overwhelmed by academic demands; (2) depersonalization a cynical and detached attitude toward academic responsibilities; and (3) reduced personal accomplishment a diminished sense of competence and success in academic tasks. Together, these dimensions contribute to decreased motivation, disengagement from learning, and impaired educational outcomes.

These dimensions collectively contribute to a significant decline in students' academic motivation and engagement (Salovey & Mayer, 2023). Consequently, academic burnout has emerged as a critical issue among adolescents, characterized by emotional fatigue, diminished academic efficacy, and a sense of detachment from school-related activities. This phenomenon has been associated with a range of individual-level factors, including health-related behaviors, internet addiction, emotional intelligence, and perseverance. Understanding the interplay among these variables is essential for developing targeted and effective interventions to mitigate academic burnout. This concern is particularly pressing during adolescence—a developmental stage marked by heightened psychological, cognitive, and emotional changes—where burnout not only impairs academic achievement but also has detrimental effects on mental health and overall well-being. While earlier research predominantly emphasized institutional stressors and environmental demands, recent empirical evidence has shifted focus toward the pivotal role of personal factors, such as problematic internet use, deficits in emotional intelligence, low grit, and poor health behaviors, in increasing adolescents' susceptibility to academic burnout (Salmela-Aro, Kiuru, & Vuori, 2022). This shift underscores the importance of integrating personal and behavioral dimensions into burnout prevention frameworks for youth populations.

Adolescence is a vital development phase characterized by major shifts in social, cognitive, and emotional areas. This period often comes with increased academic pressures, rendering adolescents particularly susceptible to academic burnout, which manifests as emotional exhaustion, reduced academic effectiveness, and self-doubt. Understanding the personal factors that either contribute to or lessen academic burnout is crucial for fostering both academic achievement and overall well-being in adolescents (Metzner, Wichmann, & Mays, 2020). Health behaviors, which encompass sleep patterns, physical activity, and nutrition, play a significant role in influencing adolescents' academic success and overall well-being. Poor health behaviors have been associated with increased levels of academic burnout. For instance, inadequate sleep and insufficient physical activity can lead to fatigue and lower concentration, exacerbating burnout symptoms. Conversely, engaging in regular physical activity and maintaining healthy

sleep habits have been shown to reduce stress and improve academic performance. Recent studies emphasize the importance of encouraging healthy lifestyle choices among adolescents as a strategy for preventing academic burnout (Biswas et al., 2015; Kantomaa et al., 2013).

The prevalent internet use among adolescents raises concerns about its potential role in fostering academic burnout. Internet addiction, characterized by compulsive and excessive engagement with online activities, can lead to negative academic consequences. Research has shown a correlation between internet addiction and decreased academic performance, elevated stress levels, and an increased occurrence of academic burnout. According to the displacement hypothesis, excessive internet use takes away time that could be spent on academic activities, ultimately resulting in lower academic achievement and heightened burnout. Recent studies have provided evidence supporting this connection, highlighting an urgent need for interventions aimed at addressing internet addiction in adolescents (Shaw et al., 2015).

Physical activity, diet, and sleep quality are some of the health behaviors that play an essential part in sustaining adolescents' emotional and cognitive balance. Reduced attention span, fatigue, and increased susceptibility to stress have been connected to poor health behaviors. This may result in the intensification of burnout symptoms. Particularly among adolescents, the digital era witnessed a marked increase in internet addiction. Reduced academic engagement, disrupted sleep routines, and intensified emotional dysregulation caused by excessive internet usage are key factors in burnout (Khoshakhlagh & Faramarzi, 2023). The internet is a frequently used coping mechanism by adolescents against academic stress, yet it only amplifies emotional exhaustion and disengagement (Siah et al., 2020).

Physical activity, nutrition, and the quality of sleep are vital health behaviors that significantly contribute to maintaining adolescents' emotional and cognitive equilibrium. Unhealthy behaviors have been linked to shorter attention spans, fatigue, and increased vulnerability to stress, which can amplify burnout symptoms. In today's digital age, there has been a noticeable increase in internet addiction among adolescents. Factors like lower academic involvement, disrupted sleep patterns, and increased emotional dysregulation from excessive internet use greatly contribute to burnout (Khoshakhlagh & Faramarzi, 2023). While the internet often acts as a coping strategy for adolescents confronting academic stress, it tends to worsen feelings of emotional fatigue and disengagement (Siah et al., 2020).

Emotional intelligence (EI) the ability to recognize, comprehend, manage, and effectively express emotions—has been recognized as a crucial protective factor against academic burnout. Individuals with high levels of EI can manage stress effectively, control their emotions, and foster positive relationships, all of which act as shields against burnout. Recent studies show that adolescents with higher EI experience reduced academic burnout and improved psychological well-being (Wang et al., 2023). For example, a research project by Salovey and Mayer (2023) found a negative relationship between EI and burnout symptoms among high school students. These results emphasize the significance of encouraging EI in educational environments

to enhance resilience and lessen burnout.

Moreover, elevated emotional intelligence is linked to better stress management, efficient interpersonal interactions, and improved emotional regulation, all of which help protect against academic burnout (Molero Jurado et al., 2021; Fernández et al., 2022). Adolescents with heightened emotional intelligence (EI) are more capable of handling academic difficulties and sustaining their psychological health, thereby lowering the chances of academic burnout. A critical component of academic burnout, emotional exhaustion, can be alleviated by an individual's ability to utilize adaptive coping techniques, foster healthier relationships, and demonstrate increased emotional control (El Idrissi & El Otmani, 2024). Recent studies focusing on nursing education students have indicated a significant reduction in academic burnout among those with high emotional intelligence. The findings highlight that, amid the psychological demands of academic life, such as stressful educational settings, EI plays a protective role (El Idrissi & El Otmani, 2024).

Balanced nutrition, adequate sleep, steering clear of substance misuse, and engaging in physical activity are recognized health behaviors that serve as protective factors against academic burnout. Symptoms of burnout can be exacerbated by unhealthy lifestyle choices, which are linked to heightened stress, fatigue, and diminished cognitive functioning (Naz et al., 2023). In today's digital age, particularly among young people, internet addiction has emerged as a growing concern. Social isolation, emotional instability, and disrupted sleep patterns, all linked to excessive and unregulated internet use, heighten the risk of academic burnout (Kausar et al., 2022; Wang et al., 2023). Furthermore, internet addiction may undermine emotional intelligence (EI)—the capability to recognize, understand, and manage emotions—thereby impairing emotional resilience. A low EI has been correlated with an increased vulnerability to academic stressors and ineffective stress management (Khatoon et al., 2023; Zhang & Li, 2023).

In addition, considering the protective factors, grit, defined as the persistence and passion for pursuing long-term objectives, has been suggested as a mediator in the connection between various factors and academic burnout. Young people who exhibit high levels of grit are more likely to endure challenges and stay motivated, which can mitigate stress effects and avert burnout. Recent studies have confirmed grit's mediating function, indicating it can soften the impact of stressors on academic performance (Gyamfi & Lai, 2020). For example, research by Duckworth et al. (2022) demonstrated that grit mediated the relationship between academic stress and burnout in college students. These results imply that fostering grit could serve as an effective approach for diminishing academic burnout.

Grit represents the determination and ongoing passion directed toward long-term ambitions, considered vital for academic achievement and resilience (Duckworth et al., 2007). Adolescents displaying grit can navigate academic difficulties without yielding to emotional fatigue. Grit can also counteract feelings of inefficacy and disengagement associated with academic burnout by fostering a sense of commitment and purpose (Duckworth, 2016). Importantly, grit can mediate the relationship between academic burnout and personal factors. For instance, the negative effects of internet addiction on well-being and academic success can be

alleviated through grit (Siah et al., 2020). Likewise, adolescents with higher emotional intelligence may utilize grit to guide their constructive emotional responses toward consistent academic effort (Saeed et al., 2022). This research provides a comprehensive understanding of how young people convert behavioral and emotional characteristics into academic resilience by examining grit as a moderating factor. Despite facing academic pressure, adolescents with elevated levels of grit show a decreased likelihood of burnout, as they can maintain motivation and confront challenges (Siah et al., 2022). When considered together, these individual elements form a complex network of interconnected influences that either decrease or increase the chances of academic burnout among adolescents. To better understand how to develop targeted support systems and interventions in familial and academic environments, we must grasp the individual and collective impacts of these factors (Jumat et al., 2020).

Grit has gained significant attention in the field of educational psychology as a means to foster academic resilience. By enabling students to persist through academic difficulties without succumbing to emotional fatigue or disengagement, grit serves as a protective factor against burnout in adolescents. Typically, extended stress related to school is a primary contributor to academic burnout (Siah et al., 2022). However, even in the face of fatigue and challenges, students maintain their motivation and effort when they possess higher levels of grit. The ability to "stick with it" fosters intrinsic motivation and a sense of purpose, which helps alleviate burnout. A recent study by Siah et al. (2022) noted that in adolescents, grit—particularly its perseverance component—plays a moderating role in the relationship between internet addiction and behavioral inhibition/approach systems, which indirectly influence academic burnout. The findings suggest that when students exhibit high levels of grit, their likelihood of being distracted by excessive internet use diminishes, allowing them to sustain academic engagement (Aqeel et al., 2024).

Similarly, a study conducted by Salmela-Aro and colleagues (2022) found that among high school students, grit was linked to greater academic engagement and reduced emotional fatigue. Furthermore, the research indicated that grit directly counters burnout, acting as both a motivational driver and a resilience factor. Thus, to reduce academic burnout and enhance student well-being, it is essential to cultivate grit through mentoring, goal-setting strategies, and educational interventions (Xu et al., 2022). Specifically, among students, adverse psychological outcomes—such as compromised academic performance, vulnerability to academic burnout, and emotional fatigue—stem from internet addiction. As digital dependency in educational contexts continues to rise, the need to identify personal traits that may alleviate the negative effects of internet addiction is gaining traction. Grit, with its characteristics of perseverance and passion for long-term goals, is a likely factor in mitigating this issue. Recent findings indicate that adolescents with elevated levels of grit show greater resilience against the negative impacts of internet addiction. Such individuals display enhanced motivation, improved self-control, and greater dedication to their goals, which serve as a buffer against patterns of academic disengagement and emotional exhaustion resulting from excessive internet use (Singh & Chukkali, 2021).

Research has shown that male adolescents are more

prone to internet addiction than females. This is linked to higher rates of emotional and behavioral difficulties. For instance, research on Pakistani adolescents revealed that boys exhibited greater levels of internet addiction and emotional behavioral issues compared to girls (El-Gazar et al., 2024; Kausar, Mazhar, & Sonia, 2022). Gender differences in emotional intelligence indicate that females tend to score higher than males. This trend has been observed across different age groups and cultures. One study found that among young individuals, women demonstrated greater emotional intelligence compared to men. Such differences influence how adolescents cope with academic stress and their vulnerability to burnout (Karniol, Grosz, & Schorr, 2003).

In addition to emotional intelligence, grit—defined as sustained passion and perseverance for long-term goals—also demonstrates gender-based variation. A study involving university students found that males exhibited higher grit scores compared to their female counterparts, influencing their approach to academic challenges and their vulnerability to burnout (Adeeb, Ghani, & Hillaluddin, 2023). The complex interplay between health behaviors, emotional intelligence, internet addiction, and grit contributes to gender differences in academic burnout. Males may be more prone to burnout due to elevated levels of grit and internet addiction, while females, who tend to score higher on emotional intelligence, may possess a protective buffer—though this advantage can be compromised by excessive internet usage.

To effectively address academic burnout in adolescents, it is essential to consider multiple factors, including emotional intelligence, grit, internet use, and health behaviors. Enhancing emotional intelligence, fostering grit, promoting healthy lifestyle habits, and regulating internet usage are all critical strategies that can reduce the risk of burnout and support adolescents' academic and personal development.

This study is grounded in the Job Demand-Resource (JD-R) Model, which posits that burnout arises from an imbalance between demands (e.g., academic stress) and available personal resources (e.g., emotional intelligence and grit) (Salmela-Aro & Upadaya, 2012). In adolescents, high academic pressure can lead to emotional exhaustion, while personal strengths such as grit and emotional intelligence may serve to mitigate these effects. This research explores how internet addiction, emotional intelligence, health behaviors, and grit interact to influence academic burnout.

The central aim of this study is to examine the emotional and academic challenges faced by adolescents. Specifically, the study investigates the predictive role of internet addiction, emotional intelligence, health behaviors, and grit in academic burnout, as well as the mediating role of grit. The results are expected to inform educators, psychologists, and parents in developing targeted strategies to reduce academic burnout and enhance adolescent resilience. Promoting emotional intelligence and healthy habits, while managing internet use, is essential for creating a holistic foundation for adolescent well-being and academic success.

## Method

### Research design

A quantitative, cross-sectional research design was used. Data were collected through standardized survey instruments assessing internet addiction, emotional intelligence, health behaviors, grit, and academic burnout in adolescents.

### Objectives

based on the literature, the objectives of this study are:

1. To investigate the association among grit, health behaviors, internet addiction, emotional intelligence and academic burnout in adolescents.
2. To examine the mediating effect of grit in the relationship among health behaviors, internet addiction, emotional intelligence and academic burnout in adolescents.
3. To explore gender differences in personal factors (internet addiction, emotional intelligence, health behaviors, grit) and academic burnout in adolescents.

### Hypotheses

1. Internet addiction will be positively associated with academic burnout in adolescents.
2. Health behaviors, emotional intelligence, and grit will be negatively associated with academic burnout in adolescents.
3. Grit will mediate the relationship between internet addiction and academic burnout in adolescents.
4. Male adolescents will exhibit higher levels of internet addiction, academic burnout and grit than female adolescents.
5. Female adolescents will demonstrate higher levels of emotional intelligence, and healthier behavior, than male adolescents.

### Sample

The present study included a sample of 281 adolescents, comprising 149 boys and 132 girls, with ages ranging from 14 to 18 years (Mean = 17.09, SD = 1.26). Participants were selected using a convenience sampling technique. Data collection was carried out by visiting various public and private colleges located in Rawalpindi and Islamabad. Participants were included in the study if they met the following criteria: they were currently enrolled in intermediate-level education (FA/FSc) or in the first semester of an undergraduate program, and they were able to read and understand either English or Urdu, the languages in which the study instruments were administered. Students were excluded from participation if they were enrolled in postgraduate programs or reported any form of cognitive, sensory, or physical disability that might interfere with their ability to comprehend or complete the questionnaires. All ethical considerations were followed, and informed consent was obtained from each participant prior to data collection.

**Table 1**

*Mean, Standard Deviation, Frequency, and Percentage along Demographic Variables (N = 281)*

Demographics	<i>f</i> (%)	<i>M</i> ( <i>SD</i> )
Age	14-18years	17.09(1.26)
Gender		1.47(.50)
Male students	149(53)	
Female students	132(47)	
City/Province		1.46(.50)
Rawalpindi/Punjab	150(53)	
Islamabad/Federal	131(47)	
Are you satisfied with your education?		1.33(.47)
Yes	188(66.9)	
No	93(33.1)	

*Note:* *f* = frequency; % = percentage

Table 1 summarizes the demographic characteristics of the sample (N = 281). Participants were aged 14–18 years (M = 17.09, SD = 1.26), with 53% males and 47% females. Geographically, 53% were from Rawalpindi and 47% from Islamabad. Regarding educational satisfaction, 66.9% reported being satisfied, while 33.1% were not. These demographics provide context for interpreting the study's main variables.

## Instruments

### Chen Internet Addiction Scale (CIAS)

The Chen Internet Addiction Scale (CIAS), developed by Chen et al. (2003), is a 26-item self-report measure designed to assess the severity of internet addiction. The scale evaluates five core dimensions: tolerance, interpersonal and health problems, time management difficulties, compulsive internet use, and withdrawal symptoms. Each item is rated on a 4-point Likert scale, with higher scores indicating greater levels of addiction. The CIAS demonstrates strong internal consistency, with Cronbach's alpha values ranging from 0.79 to 0.93 (Ko et al., 2009).

### Health Behavior Checklist (HBC)

The Health Behavior Checklist (Hampson et al., 2019) is a 16-item scale used to measure engagement in positive health behaviors (e.g., sleep hygiene, nutrition, exercise). Responses are recorded on a 5-point Likert scale ranging from 1 ("Not at all like me") to 5 ("Very much like me"). Higher scores reflect greater adherence to health-promoting behaviors. The scale demonstrates high reliability, with a reported Cronbach's alpha of 0.89.

### Wong and Law Emotional Intelligence Scale (WLEIS)

The WLEIS (Wong & Law, 2002) is a 16-item self-report instrument assessing emotional intelligence across four domains: self-emotion appraisal (SEA), others' emotion appraisal (OEA), use of emotion (UOE), and regulation of emotion (ROE). Each domain comprises four items, scored on a 5-point Likert scale. The scale shows good internal consistency, with subscale alphas ranging from 0.80 to 0.84, and overall composite reliability between 0.86 and 0.90

(Khan, 2019).

### Short Grit Scale (Grit-S)

The Grit-S, developed by Duckworth and Quinn (2009), is an 8-item scale measuring two facets of grit: consistency of interest and perseverance of effort. Items are rated on a 5-point Likert scale, with negatively worded items reverse-coded. The scale has demonstrated strong internal reliability, with overall Cronbach's alpha of 0.89, and subscale alphas of 0.87 (consistency) and 0.88 (perseverance).

### Burnout Assessment Tool (BAT)

The BAT, developed by Schaufeli, De Witte, and Desart (2020), consists of 32 items evaluating six dimensions of burnout: exhaustion, mental distance, emotional impairment, cognitive impairment, psychological complaints, and psychosomatic complaints. Each item is rated on a 5-point frequency scale. The total scale has a Cronbach's alpha of 0.92, with subscale reliabilities ranging from 0.85 to 0.88.

### Procedure

This study received ethical approval from the Ethical Review Board of the Department of Applied Psychology, National University of Modern Languages (NUML), and was conducted in accordance with APA 7th Edition ethical guidelines. The data for this study were collected from adolescents enrolled in public colleges across Rawalpindi and Islamabad. A convenience sampling strategy was adopted to reach participants who were readily accessible. Prior to initiating the data collection process, formal permission was obtained from the respective college administrations. All participants were informed about the nature, aims, and procedures of the study in clear and understandable terms. Participation was entirely voluntary, and written informed consent was secured from each participant before they proceeded with the study. They were assured that their personal information would remain confidential and anonymous, and that the data would be used exclusively for academic research. Ethical approval for the study was granted by the Institutional Review Board of the researchers' affiliated university. Following data collection, the responses were analyzed using IBM SPSS Statistics. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were computed to summarize the demographic characteristics of the participants. To explore gender-based differences in key study variables such as internet addiction, emotional intelligence, health behaviors, grit, and academic burnout, independent sample t-tests were conducted. Pearson product-moment correlation was used to examine the relationships among the continuous variables. Additionally, mediation analysis was conducted using the SPSS to investigate whether grit served as a mediator between internet addiction and academic burnout. All statistical tests were interpreted using a significance level of  $p < .05$ .

## Results

As presented in Table 2, academic burnout exhibited a significant positive correlation with health behaviors, internet addiction, and emotional intelligence, and a significant negative correlation with grit. The positive association between health behaviors and academic burnout suggests that, contrary to typical expectations, adolescents reporting higher engagement in health-promoting behaviors

**Table 2**

*Correlation matrix among grit, health behaviors, internet addiction, emotional intelligence and academic burnout in adolescents (N = 281)*

Variables	1	2	3	4	5
1. Health Behaviors	-	.25**	.32**	.09	.15**
2. Internet Addiction		-	.14*	-.33**	.52**
3. Emotional Intelligence			-	.19**	.11*
4. Grit				-	-.31**
5. Academic Burnout					-

Note. \* $p < .05$ . \*\* $p < .01$ .

**Table 3**

*Mean, standard deviation, and t-values for gender differences in grit, health behaviors, internet addiction, emotional intelligence, and academic burnout among adolescents (N = 281)*

Variable	Boys	Girls	$t$ (279)	$p$	95% CI		Cohen's $d$
	( $n = 149$ )	( $n = 132$ )			LL	UL	
	$M$ (SD)	$M$ (SD)					
HB	55.71(9.13)	54.39(11.21)	1.08	.006	-1.07	3.70	.12
IA	59.13(14.79)	63.17(20.56)	-1.90	.000	-8.21	.13	.22
EI	59.78(8.95)	61.91(11.05)	-1.78	.005	-4.48	.22	.21
Grit	25.35(3.77)	25.43(3.63)	-.18	.587	-.95	.78	-
AB	92.18(20.38)	102.91(20.52)	-4.39	.623	-15.53	-5.91	-

Note. HB = Health Behaviors; IA = Internet Addiction; EI = Emotional Intelligence; AB = Academic Burnout.

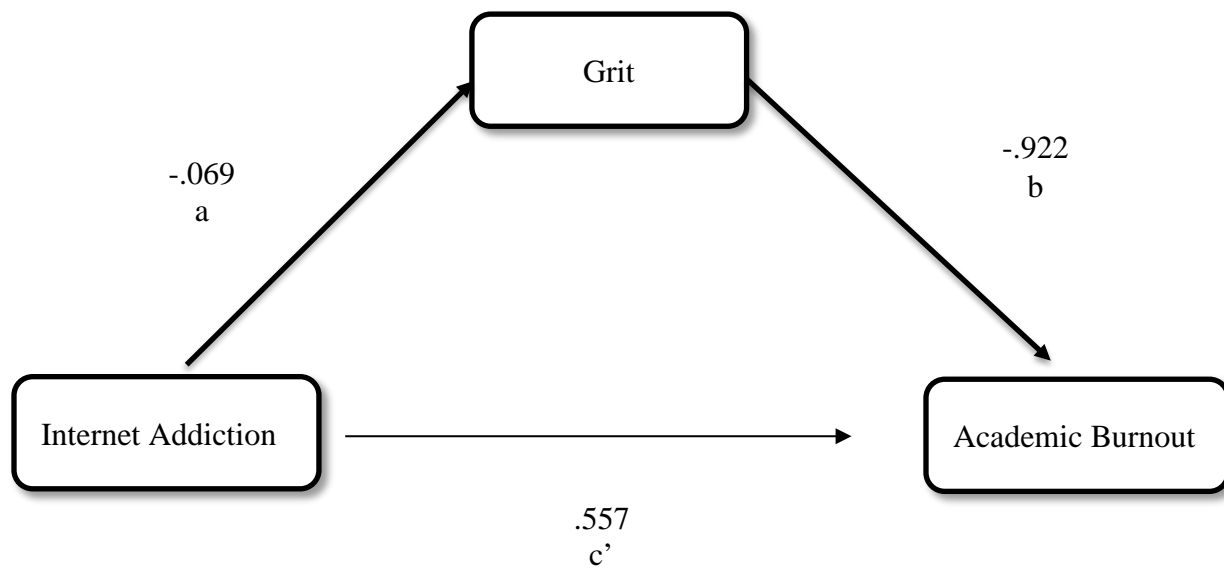
**Table 4**

*The Mediating role of grit in the relationship between internet addiction and academic burnout among adolescents (N = 281)*

		M (Grit)				Y (Academic Burnout)			
Antecedents		<i>B</i>	<i>SE</i>	<i>p</i>	$\beta$	<i>B</i>	<i>SE</i>	<i>p</i>	$\beta$
X (IA)	<i>a</i>	-.069	.012	.000	-.330	<i>c'</i>	.557	.063	.000
M (Grit)						<i>b</i>	-.922	.304	.003
		<i>R</i> <sup>2</sup>	.109			<i>R</i> <sup>2</sup>	.298		
		<i>F</i> (1,279) = 34.122, <i>p</i> < .001				<i>F</i> (2, 278) = 58.867, <i>p</i> < .001			

**Figure 1**

*The mediation model illustrating the role of grit in the relationship between internet addiction and academic burnout among adolescents.*



also reported higher levels of academic burnout. Furthermore, the positive correlation between internet addiction and academic burnout supports the notion that increased problematic internet use is linked with elevated burnout levels. Similarly, emotional intelligence demonstrated a positive association with academic burnout, indicating that individuals with greater emotional awareness and regulation may experience higher academic strain, possibly due to increased emotional sensitivity or over-engagement. In contrast, grit was negatively associated with academic burnout, implying that higher levels of perseverance and sustained effort serve as a protective factor against burnout. Based on these findings, Hypothesis 1 stating that internet addiction is positively associated with academic burnout is supported. However, Hypothesis 2 proposing that health behaviors and emotional intelligence are negatively associated with academic burnout is only partially supported, given the unexpected positive correlations observed.

Results presented in Table 3 indicate statistically significant gender differences in health behaviors, internet addiction, and emotional intelligence among adolescents. Male participants reported higher engagement in health behaviors ( $M = 55.71$ ,  $SD = 9.13$ ) compared to female participants ( $M = 54.39$ ,  $SD = 11.21$ ),  $t(279) = 1.08$ ,  $p = .006$ , Cohen's  $d = 0.12$ . Conversely, female adolescents exhibited significantly higher levels of internet addiction ( $M = 63.17$ ,  $SD = 20.56$ ) than males ( $M = 59.13$ ,  $SD = 14.79$ ),  $t(279) = -1.90$ ,  $p < .001$ , Cohen's  $d = 0.22$ . Emotional intelligence was also significantly higher among girls ( $M = 61.91$ ,  $SD = 11.05$ ) relative to boys ( $M = 59.78$ ,  $SD = 8.95$ ),  $t(279) = -1.78$ ,  $p = .005$ , Cohen's  $d = 0.21$ . No significant gender differences were observed in grit or academic burnout.

### Mediation Analysis

As illustrated in Figure 1 & table 4, a simple mediation model was tested to examine whether grit mediates the relationship between internet addiction (predictor) and academic burnout (outcome) among adolescents. Mediation was assessed using ordinary least squares path analysis. The analysis involved two regression equations: the first regressed grit on internet addiction to estimate path  $a$ , and the second regressed academic burnout on both internet addiction and grit to estimate paths  $b$  and  $c'$  (direct effect). Results indicated a significant negative association between internet addiction and grit (path  $a = -0.069$ ), and a significant negative association between grit and academic burnout (path  $b = -0.922$ ). The indirect effect ( $ab = 0.063$ ) was tested using 5,000 bootstrap samples, and the 95% bias-corrected bootstrap confidence interval did not include zero ( $CI = 0.023$  to  $0.111$ ), confirming a significant mediating effect. These findings support the hypothesis that grit partially mediates the relationship between internet addiction and academic burnout in adolescents.

### Discussion

The present study aimed to investigate the associations among internet addiction, health behaviors, emotional intelligence, grit, and academic burnout in adolescents, along with examining the mediating role of grit and gender differences across these variables. The findings provide partial to strong support for the proposed hypotheses and highlight complex interactions among psychosocial and behavioral variables influencing academic burnout.

Hypothesis 1, which posited that internet addiction would be positively associated with academic burnout, was supported by the results. This finding aligns with prior literature indicating that excessive internet use, particularly for non-academic purposes, may serve as a maladaptive coping mechanism, leading to increased emotional exhaustion, procrastination, academic disengagement, and sleep disturbances—all of which contribute to academic burnout (Cao et al., 2021; Kuss & Griffiths, 2017). The compulsive nature of internet use may undermine academic priorities, fostering a cycle where burnout reinforces further dependence on digital technologies as a temporary escape from academic stress.

Hypothesis 2, which predicted negative associations between academic burnout and health behaviors, emotional intelligence, and grit, received partial support. Grit was found to be inversely correlated with academic burnout, consistent with previous research suggesting that perseverance and sustained passion for long-term goals enhance students' ability to manage stress and persist through academic challenges (Salmela-Aro et al., 2017). However, the associations between health behaviors and emotional intelligence with burnout were positive rather than negative, contrary to expectations. These findings might reflect context-specific factors within high-performing adolescent groups, where engagement in healthy behaviors and emotional attunement may coincide with elevated academic demands and internalized pressure to succeed. As Zhao et al. (2021) argue, students may uphold rigid self-care routines or emotionally overinvest in academic and interpersonal expectations, leading to heightened vulnerability to burnout despite otherwise adaptive behaviors.

Regarding Hypothesis 3, the results confirmed that grit significantly mediated the relationship between internet addiction and academic burnout. This suggests that higher levels of grit may buffer the detrimental effects of internet addiction on academic functioning. Adolescents with stronger perseverance and goal commitment may be more resilient to the dysregulating influence of excessive internet use, maintaining academic focus and psychological stability despite distractions (Duckworth et al., 2007). This mediational pathway highlights grit as a potential target for interventions aimed at reducing burnout risk in technology-driven educational environments.

Hypothesis 4, which proposed that male adolescents would report higher levels of internet addiction, academic burnout, and grit than females, was partially supported. Males demonstrated significantly higher levels of internet addiction and grit, consistent with gender-based behavioral trends suggesting greater online engagement and perseverance in goal-directed tasks among boys (Kuss et al., 2013; Credé et al., 2017). However, the gender difference in academic burnout was less pronounced, suggesting that while boys may be more digitally engaged and gritty, burnout manifests across genders, potentially through different pathways or stressors.

Finally, Hypothesis 5 was supported, with female adolescents scoring higher on emotional intelligence and health behaviors than their male counterparts. These results align with existing findings that females generally exhibit greater emotional awareness, empathy, and regulation (Liu et al., 2020), as well as higher adherence to health-promoting

routines such as balanced diets, hygiene, and sleep hygiene (Viner et al., 2012). Such patterns may reflect sociocultural norms emphasizing emotional and self-care competencies in girls during adolescence.

### **Novel contribution**

This study enhances understanding of adolescent academic burnout by highlighting the mediating role of grit in the relationship between internet addiction, emotional intelligence, health behaviors, and burnout. It shows that while internet addiction increases burnout risk, protective traits like grit and emotional intelligence reduce this risk. Practically, the findings support integrating grit-building and emotional regulation strategies into educational and clinical interventions to reduce academic stress and improve student resilience. The research employs a robust multi-variable mediation model, using validated tools and advanced statistical techniques to explore direct and indirect effects. This approach strengthens the reliability and depth of the analysis, offering a comprehensive view of how individual traits influence academic burnout.

### **Limitations and Future Directions**

Despite its contributions, this research has several limitations. Firstly, reliance on self-reported measures may introduce social desirability bias or inaccuracies in self-assessment. Secondly, the cross-sectional design (if relevant) restricts the ability to infer causation; future longitudinal studies should be pursued to establish temporal relationships. Furthermore, cultural influences affecting grit, internet usage, or emotional intelligence were not fully accounted for, which may constrain the findings' generalizability across various cultural settings. Future studies should investigate intervention-based research, incorporate qualitative methods for deeper understanding, and explore potential moderating variables such as gender, socioeconomic status, or parental involvement. Finally, the convenience-based sampling method may limit the generalizability of the results beyond the specific demographic investigated.

### **Conclusion**

The research underscores the intricate relationship between health behaviors, internet addiction, and emotional intelligence in influencing academic burnout in teenagers, with grit identified as a fundamental mediating factor. Boosting grit may serve as a protective measure, alleviating burnout and fostering academic resilience. These results lay the groundwork for comprehensive interventions focused on emotional regulation, behavioral changes, and persistence training within school programs, ultimately aiding in healthier developmental paths for adolescents. This study provides essential insights into the various factors contributing to academic burnout in teenagers by exploring the influences of health behaviors, internet addiction, and emotional intelligence, while highlighting grit as a

significant mediating factor. The findings indicate that positive health behaviors and greater emotional intelligence correlate with reduced levels of academic burnout, while internet addiction is linked to heightened burnout. Notably, grit plays a mediating role in these dynamics, suggesting that adolescents with higher levels of grit are more capable of managing negative influences and maintaining academic resilience. The implications of this study are both theoretical and practical. From a theoretical perspective, it enhances the understanding of grit as a psychological shield in the stress-burnout continuum, emphasizing its importance in educational environments. On a practical level, the results stress the importance of integrated interventions that encourage healthy lifestyle choices, responsible internet usage, emotional skills development, and perseverance. Future investigations should expand on these insights by utilizing longitudinal approaches to determine causality and examine developmental patterns over time. Broadening the sample to encompass various cultural and socioeconomic backgrounds will improve the findings' applicability. Additionally, employing objective assessments of health habits and internet engagement can enhance the accuracy of the data. Ultimately, this research advocates for a comprehensive strategy concerning adolescent mental health and academic achievement, urging educators, clinicians, and policymakers to emphasize grit and emotional regulation in youth development initiatives.

### **Ethical Consideration**

The study was approved by Department of Applied Psychology, National University of Modern Languages (NUML), Islamabad, Pakistan. Consent Form was taken before taking data and participants were asked to take voluntary participation.

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### **Availability of data and materials**

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

### **Authors' contributions/Author details**

This article is extracted from the PhD thesis of Kashmala Zaman, conducted under the supervision of Professor Dr. Tanvir Akhtar.

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## References

- Adeeb, M., Ghani, M. A., & Hillaluddin, A. H. (2023). Grit and mental health of postgraduate students: The gender perspective. *Journal for ReAttach Therapy and Developmental Diversities*, 6(7), 1013–1019. <https://doi.org/10.53555/jrtdd.v6i7s.369>
- Aqeel, M., Rehna, T., Akhtar, R., & Abbas, J. (2024). Evaluating the psychometric properties of the Multidimensional Externalising Behaviour Disorders Inventory in Pakistani truant students. *Psychological and Personality Research*, 14(2), 9–21. <https://doi.org/10.33989/2226-4078.2024.2.09>
- Biswas, A., Oh, P., Faulkner, G., Bajaj, R., Silver, M., Mitchell, M., & Alter, D. (2015). Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: A systematic review and meta-analysis. *Annals of Internal Medicine*, 162(2), 123–132. <https://doi.org/10.7326/M14-1651>
- Cao, Y., Liu, X., & Liu, L. (2021). The relationship between internet addiction and academic burnout in college students. *Psychology Research*, 32(3), 209–220. <https://doi.org/10.1080/01973533.2021.1885347>
- Chen, S.-H., Weng, L.-J., & Su, Y.-J. (2003). Development of a Chinese Internet Addiction Scale and Its Psychometric Study. *Chinese Journal of Psychology*, 45, 279–294. <https://doi.org/10.1037/t44491-000>
- Duckworth, A. L. (2016). *Grit: The power of passion and perseverance* (1st ed.). United States: Scribner.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087–1101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2022). Grit and academic achievement: A meta-analysis. *Journal of Educational Psychology*, 114(3), 453–472.
- El Idrissi, M., & El Otmani, M. (2024). Impact of emotional intelligence on academic burnout among master students in pedagogy of nursing sciences and health techniques in Morocco, 2019: A cross-sectional study. *Journal of Education and Health Promotion*, 13, 116.
- El-Gazar, H. E., Ali, A. M., Shawer, M., Serag, R. M., & Zoromba, M. A. (2024). Decent work and nurses' work ability: A cross-sectional study of the mediating effects of perceived insider status and psychological well-being. *International Journal of Nursing Studies Advances*, 8, 100283
- Fernández, O., Ramos, E., & Goñi, E. (2022). Mediating role of emotional intelligence in the relationship between anxiety sensitivity and academic burnout in adolescents. *International Journal of Environmental Research and Public Health*, 20(1), 572. <https://doi.org/10.3390/ijerph200100572>
- Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ* (1st ed.). United States: Bantam Books.
- Gyamfi, G., & Lai, Y. (2020). Beyond Motivation: Investigating Thai English Major Students' Grit. *PASAA: Journal of Language Teaching and Learning in Thailand*, 60, 60–96. <https://eric.ed.gov/?id=EJ1279846>
- Hampson, S. E., Edmonds, G. W., & Goldberg, L. R. (2019). The health behavior checklist: factor structure in community samples and validity of a revised good health practices scale. *Journal of Health Psychology*, 24, 1103–1109. doi: 10.1177/1359105316687629
- Jumat, M. R., Chow, P. K., Jr, Arulanandam, J. C., Lai, S. H., Hwang, N. C. H., Iqbal, J., Mok, M. U. S., Rapisarda, A., Velkey, J. M., Engle, D. L., & Compton, S. (2020). Grit protects medical students from burnout: A longitudinal study. *BMC Medical Education*, 20, 266. <https://doi.org/10.1186/s12909-020-02191-5>
- Karniol, R., Grosz, E., & Schorr, I. (2003). Caring, Gender Role Orientation, and Volunteering. *Sex Roles*, 49(1-2), 11–19. <http://dx.doi.org/10.1023/A:1023953401662>
- Kausar, N., Mazhar, M., & Sonia. (2022). Internet addiction and emotional behavioral problems among adolescents. *Pakistan Journal of Social Research*, 4(1), 621–628. <https://doi.org/10.52567/pjsr.v4i1.928>
- Khatoon, R., Tabassum, M., & Khan, I. (2023). Role of internet addiction disorder in emotional intelligence among university students. *The International Journal of Indian Psychology*, 11(3), 1014–1019. <https://doi.org/10.25215/1103.118>
- Khoshakhlagh, H., & Faramarzi, S. (2023). Investigating the mediating role of emotional intelligence in the relationship between internet addiction and mental health among university students. *BMC Public Health*, 23(1), 1410. <https://doi.org/10.1186/s12889-023-16355-7>
- Kantomaa, M., Stamatakis, E., Kankaanpää, A., Kaakinen, M., Rodriguez, A., Taanila, A., Timo, A., Marjo-Riitta, J., & Tammelin, T. (2013). Physical activity and obesity mediate the association between childhood motor function and adolescents' academic achievement. *Proceedings of the National Academy of Sciences of the United States of America*, 110(5), 1917–1922. <https://doi.org/10.1073/pnas.1214574110>
- Kuss, D. J., & Griffiths, M. D. (2017). Internet addiction and academic performance: A meta-analysis of the evidence. *Journal of Behavioral Addictions*, 6(4), 228–245. <https://doi.org/10.1556/2006.6.2017.046>
- Liu, Q., Zhang, J., & Wang, W. (2020). Emotional intelligence and academic burnout in university students: The mediating role of academic stress. *Personality and Individual Differences*, 157, 109742. <https://doi.org/10.1016/j.paid.2019.109742>
- Metzner, F., Wichmann, M. L., & Mays, D. (2020). Educational transition outcomes of children and adolescents with clinically relevant emotional or behavioural disorders: Results of a systematic review. *British Journal of Special Education*, 47(1), 1–28. <https://doi.org/10.1111/1467-8578.12297>
- Molero Jurado, M. D. M., Pérez-Fuentes, M. D. C., Martos Martínez, Á., Barragán Martín, A. B., Simón Márquez, M. D. M., & Gázquez Linares, J. J. (2021). Emotional intelligence as a mediator in the relationship between academic performance and burnout in high school students. *PLoS ONE*, 16(6), e0253552. <https://doi.org/10.1371/journal.pone.0253552>
- Naz, F., Hidayatullah, A., & Shagufta, N. (2023). Internet addiction: Predictor of disturbed emotion regulation, sleep quality, and general health in university students. *FWU Journal of Social Sciences*, 17(2), 78–89. <https://doi.org/10.51709/FWU.JSS.172.06>
- Saeed, W., Zafar, N., & Hanif, R. (2022). Relationship of emotional intelligence and academic burnout with mediating effect of self-efficacy among university students. *Journal of*

- Professional and Applied Psychology*, 3(2), 428–436. <https://doi.org/10.52223/jpap.20220302.06>
- Salmela-Aro K, & Upadaya K (2012) The Schoolwork Engagement Inventory. *European Journal of Psychological Assessment*, 28, 60–67. <https://doi.org/10.1027/1015-5759/a000091>
- Salmela-Aro, K., Kiuru, N., Leskinen, E., & Nurmi, J. E. (2017). Burnout and engagement in university students: Profiles of well-being and their predictors. *European Journal of Psychological Assessment*, 33(1), 43–50. <https://doi.org/10.1027/1015-5759/a000346>
- Salmela-Aro, K., Kiuru, N., & Vuori, J. (2022). Grit and engagement in high school: Longitudinal associations with academic burnout. *European Journal of Psychology of Education*, 37(1), 123–141. <https://doi.org/10.1007/s10212-021-00552-7>
- Salovey, P., & Mayer, J. D. (2023). Emotional intelligence and academic success. *Journal of Personality and Social Psychology*, 125(1), 1–15.
- Schaufeli, W.B., De Witte, H. & Desart, S. (2020). *Manual Burnout Assessment Tool (BAT) – Version 2.0*. KU Leuven, Belgium: Unpublished internal report.
- Shaw, S, Gomes, P., Polotskaia, A., & Jankowska, A. (2015). The relationship between student health and academic performance: Implications for school psychologists. *School Psychology International*, 36(2), 115–134. <https://doi.org/10.1177/0143034314565425>
- Siah, P. C., Dobson, E., Dawson, V., et al. (2022). Grit Perseverance, Not Passion, Moderates the Association Between Behavioral Inhibition/Approach System and Internet Addiction in Adolescents. *Frontiers in Psychology*, 13, 973895.
- Siah, P. C., Dobson, E., Dawson, V., & Zaw, M. (2020). Social media addiction and academic adjustment: The mediating or moderating effect of grit personality. *International Journal of Psychology and Educational Studies*, 7(3), 143–151. <https://doi.org/10.17220/ijpes.2020.03.013>
- Singh, S., & Chukkali, S. (2021). Development and validation of multidimensional scale of grit. *Cogent Psychology*, 8(1), 1–21. <https://doi.org/10.1080/23311908.2021.1923166>
- Teuber, Z., Mer, J., Webel, L., & Seifert, A. (2020a). Burnout and engagement: A pilot study on the transfer of the job demands resources model into the German school context. *Prevention und Gesundheitsförderung*, 15(3), 269–274. <https://doi.org/10.1007/s11553-019-00752-1>
- Wang, Z., Li, X., & Li, X. (2023). Investigating the mediating role of emotional intelligence in the relationship between internet addiction and mental health among university students. *Frontiers in Public Health*, 11, 1157852. <https://doi.org/10.3389/fpubh.2023.1157852>
- Wong, C. S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly*, 13(3), 243–274. [https://doi.org/10.1016/S1048-9843\(02\)00099-1](https://doi.org/10.1016/S1048-9843(02)00099-1)
- Xu, D. D., Lok, K. I., Liu, H. Z., Cao, X. L., An, F. R., Hall, B. J., Ungvari, G. S., Lei, S. M., & Xiang, Y. T. (2020). Internet addiction among adolescents in Macau and mainland China: Prevalence, demographics and quality of life. *Scientific Reports*, 10, 16222. <https://doi.org/10.1038/s41598-020-73329-1>
- Zhao, Y., Wei, S., & Zhang, S. (2021). Health behaviors and their association with academic burnout in students: A cross-sectional study. *Journal of Health Education Research & Development*, 38(2), 87–96. <https://doi.org/10.1177/0972145420933597>
- Zhao, X., & Li, J. (2023). Health behaviors and academic burnout in adolescents: A longitudinal study. *Journal of School Health*, 93(2), 100–107. <https://doi.org/10.1111/josh.13230>
- Zhang, Y., & Li, H. (2023). Internet addiction and emotional intelligence in university nursing students: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 20(15), 3962. <https://doi.org/10.3390/ijerph20153962>
- Zhang, Y., & Wang, L. (2023). The impact of internet addiction on academic performance among adolescents. *Journal of Adolescent Health*, 72(4), 456–463. <https://doi.org/10.1016/j.jadohealth.2022.12.003>

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