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GENDER-BASED DIFFERENCES IN TRAIT SELF-CONTROL, EMOTIONAL EATING AND PERSONALITY FACTORS AND THE MEDIATING IMPACT OF EMOTIONAL EATING ON THE ASSOCIATION BETWEEN NEUROTICISM PERSONALITY TRAIT AND TRAIT SELF-CONTROL: INSIGHTS FROM VARSITY STUDENT-ATHLETES

Original Research

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ABSTRACT

Background: Psychological factors such as neuroticism, emotional eating, and trait self-control play an important role in shaping the well-being and performance of varsity athletes. Student-athletes frequently experience heightened emotional and physical stress due to the dual demands of academics and competitive sport, making them vulnerable to emotion-driven behaviors. However, limited evidence exists on how emotional eating may function as a mediating mechanism linking neuroticism with self-control, particularly within this unique population.

Objective: This study aimed to examine whether emotional eating mediates the relationship between neuroticism and trait self-control among varsity student-athletes and to identify gender-based differences across these psychological constructs.

Methods: A cross-sectional survey was conducted among 701 varsity athletes (351 males; 350 females) from seven universities in Lahore, Pakistan. All participants were active competitors at intervarsity, national, or international levels. Data were collected using a structured questionnaire consisting of demographic information, the Big Five Inventory-10, the Emotional Eater Questionnaire, and a 10-item self-control scale. Mediation analysis estimated pathways between neuroticism, emotional eating, and trait self-control, while independent samples t-tests compared gender differences. Statistical significance was set at $p < .05$.

Results: Higher neuroticism significantly predicted greater emotional eating ($\beta = 0.329$, $p = 0.0004$). Emotional eating was positively associated with self-control ($\beta = 0.184$, $p = 0.0001$). Neuroticism showed a significant direct negative effect on self-control ($\beta = -0.242$, $p = 0.0235$), while the indirect effect through emotional eating remained significant ($\beta = 0.061$, 95% CI [0.020–0.116]). Gender analyses showed males had higher self-control (M = 3.14) and conscientiousness (M = 6.66), whereas females scored higher in neuroticism (M = 6.15) and emotional eating (M = 13.56).

Conclusion: Emotional eating partially mediated the association between neuroticism and trait self-control, offering new insight into how emotional mechanisms shape regulatory behaviors in varsity athletes. Gender-specific differences further highlighted the need for tailored psychological and nutritional support to enhance athletes' emotional well-being and performance.

Keywords: Athletes, Eating Behavior, Gender Differences, Neuroticism, Psychological Mediation, Self-Control, Students.

INTRODUCTION

Psychological constructs such as trait self-control, emotional eating, and personality traits are increasingly recognized as influential determinants of both academic achievement and athletic performance among varsity student-athletes (1). These individuals operate within demanding environments where academic responsibilities intersect with rigorous training schedules, exposing them to unique psychological stressors that extend beyond physical competencies. Within this context, trait self-control—defined as the capacity to regulate impulses, emotions, and behaviors in pursuit of long-term goals—emerges as a critical stabilizing factor that supports healthier lifestyle choices, adaptive coping, and enhanced performance outcomes (2,3). Conversely, emotional eating represents a maladaptive response pattern characterized by consuming food in reaction to negative emotions rather than physiological hunger cues, a behavior that may further compromise emotional regulation and overall health (4). Emotional eating frequently functions as a coping mechanism in individuals facing stress, anxiety, or emotional burden, circumstances commonly reported among student-athletes striving to balance academic expectations with competitive sports demands (5). These maladaptive responses can amplify psychological distress and may interact significantly with personality traits, particularly neuroticism. Neuroticism, widely associated with emotional instability, anxiety, and vulnerability to negative affect, has been repeatedly linked to impaired self-regulation and unhealthy coping patterns such as emotional eating, potentially diminishing one's capacity for sustained self-control (6,7). Such connections highlight the need to understand how emotional eating may mediate the relationship between neuroticism and self-control, especially within populations exposed to heightened performance-related pressures.

Gender further complicates this psychological landscape, as evidence consistently demonstrates gender-based differences in personality profiles, emotional regulation strategies, and self-control abilities. Studies indicate that females often report higher levels of neuroticism and greater susceptibility to emotional eating, whereas males tend to exhibit higher levels of trait self-control (8–10). These disparities may result from biological influences, sociocultural expectations, or gender-specific emotional expression patterns that shape coping behaviors within high-pressure environments, including competitive sports (11). Among varsity athletes, such gender distinctions may play a meaningful role in determining psychological resilience, performance consistency, and overall well-being (12). Despite growing attention to mental health in athletic populations, existing literature offers limited insight into the interplay between neuroticism, self-control, and emotional eating, as well as the potential mediating function of emotional eating, particularly within the context of gender differences. Varsity student-athletes constitute a distinct and understudied group, as their simultaneous engagement in academic and athletic commitments imposes unique cognitive, emotional, and behavioral challenges that warrant tailored investigation (13). Therefore, the present study seeks to address this gap by examining gender differences in trait self-control, emotional eating, and neuroticism among varsity athletes, while specifically evaluating whether emotional eating mediates the association between neuroticism and self-control. Through this inquiry, the study aims to contribute evidence that may support development of targeted psychological interventions to enhance mental well-being, optimize performance, and promote healthier coping strategies in this high-risk population.

METHODS

This study employed a cross-sectional survey design to collect data from varsity student-athletes at a single point in time. The primary objective was to examine whether emotional eating functioned as a mediator in the relationship between neuroticism and trait self-control among university athletes, and to evaluate gender-based mean differences in trait self-control, emotional eating, and personality traits. The target population comprised undergraduate athletes enrolled across seven major universities in Lahore, Pakistan, all of which had active participation in inter-university, national, and international tournaments. All registered student-athletes representing their university teams were invited to participate. A total of 701 athletes consented and completed the study, including 351 males and 350 females, with a mean age of 20.76 years (SD = 1.893). Participants represented diverse sports and competitive backgrounds, with an average of 6.26 years of playing experience (SD = 1.477). Inclusion criteria required participants to be currently enrolled undergraduate students, active members of a university sports team, and willing to provide informed consent. Individuals who were not competing at the university level, were enrolled in postgraduate programs, or failed to provide complete responses were excluded. Data were collected through a structured, self-administered questionnaire divided into four sections. The first section captured demographic and sport-related information, including age, gender, university and department name, academic year, years of sports experience, and highest level of

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athletic participation. Personality traits were assessed using the BFI-10, a brief and validated measure developed by Rammstedt and Kemper (14) and adapted from the BFI-44 by John, Donahue (15). This tool assessed five major personality dimensions—Neuroticism, Openness, Conscientiousness, Agreeableness, and Extraversion—and demonstrated acceptable psychometric properties in previous research (16,17). Emotional eating was evaluated using the Emotional Eater Questionnaire (EEQ), a 10-item scale designed by Arnow, Kenardy (18), which has consistently shown strong reliability across diverse populations (19–21). Trait self-control was measured using the 10-item Self-Control Scale developed by Velasquez, Crouch (22), previously supported by robust reliability evidence (23,24). All tools were used with formal permission obtained from the respective authors. The researchers conducted data collection through face-to-face administration, ensuring standardized instructions and an average completion time of 20–25 minutes per participant. Prior to analysis, the dataset was examined for completeness, normality, and the assumptions required for inferential testing. Statistical analyses were performed using SPSS version 27. Descriptive statistics summarized participant characteristics and variable distribution, while independent samples t-tests evaluated gender differences. Mediation analysis was performed to assess whether emotional eating mediated the relationship between neuroticism and self-control. Statistical significance was set at $p < .05$. Ethical approval was obtained from the respective varsity authority board prior to data collection. All participants were informed about the voluntary nature of the study, the confidentiality of their responses, and their right to withdraw at any stage without consequences. Informed consent was obtained prior to participation, and no identifying information was collected to ensure privacy.

RESULTS

The study included 701 varsity student-athletes, comprising 351 males (50.1%) and 350 females (49.9%). Participants represented varied competitive levels, with most competing at the intervarsity level (67.5%, n = 473), followed by national-level athletes (29.4%, n = 206) and international-level athletes (3.1%, n = 22). Academic standing was distributed across first year (24.1%, n = 169), second year (31.2%, n = 219), third year (26.2%, n = 184), and fourth year (18.4%, n = 129). The mean age of the sample was 20.76 years (SD = 1.893), and athletes reported an average of 6.26 years (SD = 1.477) of sports experience. Mediation analysis assessing the relationship between neuroticism, emotional eating, and trait self-control showed a statistically significant positive association between neuroticism and emotional eating ($\beta = 0.3290$, SE = 0.0927, $t = 3.5507$, $p = 0.0004$, 95% CI [0.1471, 0.5110]). Emotional eating demonstrated a significant positive association with self-control ($\beta = 0.1839$, SE = 0.0432, $t = 4.2591$, $p = 0.0001$, 95% CI [0.0991, 0.2687]). Neuroticism showed a significant direct negative effect on trait self-control ($\beta = -0.2423$, SE = 0.1068, $t = -2.2699$, $p = 0.0235$, 95% CI [-0.4519, -0.0327]). The total effect of neuroticism on trait self-control was negative but not statistically significant ($\beta = -0.1818$, $p = 0.0900$). The indirect effect through emotional eating was statistically significant ($\beta = 0.061$, Boot SE = 0.025, 95% CI [0.020, 0.116]), indicating partial mediation. Independent t-test results revealed significant gender-based differences across several psychological variables. Males reported higher self-control scores (M = 3.14, SD = 0.563) than females (M = 2.81, SD = 0.470), $t = 8.384$, $p = .001$, with a moderate effect size. Females scored slightly higher in emotional eating (M = 13.56, SD = 4.514) compared with males (M = 12.84, SD = 4.932), $t = -2.015$, $p = .044$, although the reported effect size appears implausibly large. For personality traits, males demonstrated higher conscientiousness (M = 6.66, SD = 1.767) than females (M = 6.03, SD = 1.810), $t = 4.637$, $p = .001$, while females scored higher in neuroticism (M = 6.15, SD = 1.884) than males (M = 5.76, SD = 1.932), $t = -2.711$, $p = .007$. No significant gender differences were observed in extraversion, agreeableness, or openness ($p > .05$).

Table 1: Demographic features of varsity student athletes

Variables	Categories	N	%
Gender	Male	351	50.1
	Female	350	49.9
Playing Level	Intervarsity	473	67.5
	National	206	29.4
	International	22	3.1

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Variables	Categories	N	%
Academic year	1 year	169	24.1
	2 years	219	31.2
	3 years	184	26.2
	4 years	129	18.4
		M	SD
Age		20.76	1.893
Sports Experiences		6.26	1.477

Table 2: Summary of mediation analysis of the relationship between neuroticism and trait self-control via emotional eating among varsity student athletes

Effect type	Predictor	Outcome	Coefficient (Effect)	SE	t	p	95% CI
Path a	neuroticism	Emotional eating	0.3290	0.0927	3.5507	0.0004	[0.1471, 0.5110]
Path b	Emotional eating	Self-control	0.1839	0.0432	4.2591	0.0001	[0.0991, 0.2687]
Direct effect (c')	neuroticism	Self-control	-0.2423	0.1068	-2.2699	0.0235	[-0.4519, -0.0327]
Total effect (c)	neuroticism	Self-control	-0.1818	0.1071	-1.6976	0.0900	[-0.3921, 0.0285]

Table 3: Summary of t-test for gender-based differences in self-control, emotional eating and BFI-10 among varsity student athletes

	Male		Female				
Variables	M	SD	M	SD	t	P	Cohens d
Self-control	3.14	.563	2.81	.470	8.384	.001	.519
Emotional eating	12.84	4.932	13.56	4.514	-2.015	.044	4.728
Extraversion	6.32	1.803	6.19	2.077	.869	.385	1.945
Agreeableness	6.79	1.834	6.96	1.713	-1.317	.188	1.775
Conscientiousness	6.66	1.767	6.03	1.810	4.637	.001	1.789
Neuroticism	5.76	1.932	6.15	1.884	-2.711	.007	1.908
Openness	6.56	1.680	6.62	1.755	-.409	.683	1.718

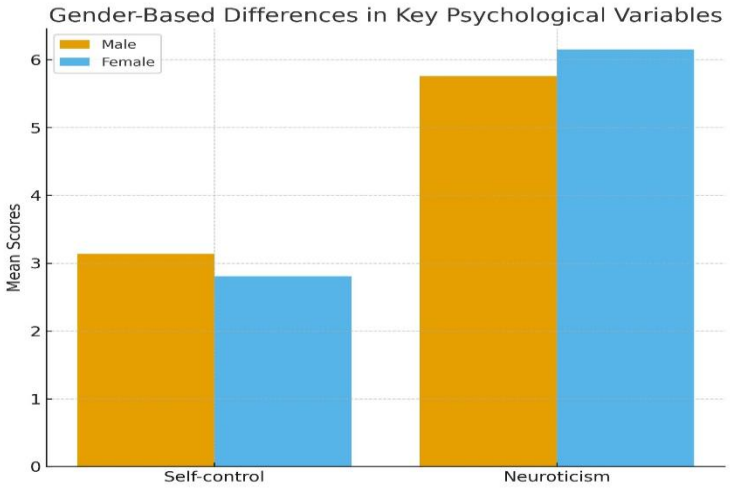

Figure 2 Gender-Based Difference in Key Psychological Variables

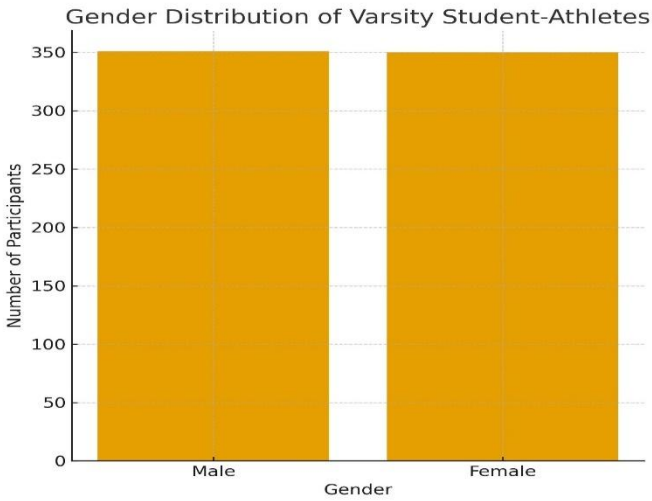

Figure 2 Gender Distribution of Varsity Student-Athletes

DISCUSSION

The study examined whether emotional eating mediated the association between neuroticism and trait self-control among varsity student-athletes, while also exploring gender-based differences in psychological characteristics. By addressing a previously uninvestigated relationship, the study contributed novel insights to the literature on personality, eating behavior, and self-regulation in athletic populations. The findings demonstrated that higher neuroticism was associated with increased emotional eating, aligning with earlier research in which individuals with elevated neurotic tendencies exhibited heightened vulnerability to emotion-driven eating (9). This association reflects established theories of emotion regulation, suggesting that individuals prone to negative affect may rely on maladaptive coping strategies such as emotional eating when faced with psychological stress. A notable finding was the positive association between emotional eating and trait self-control, diverging from several earlier reports in which emotional eating was linked with poorer self-control and reliance on food to manage distress (19). This difference may reflect the uniqueness of the athletic sample. Varsity athletes, despite exhibiting emotional eating tendencies, may possess structured routines, discipline derived from training, or enhanced compensatory behaviors that support overall self-control. The high-performance demands placed on such athletes may cultivate self-regulatory strategies that buffer the detrimental effects typically observed in non-athlete populations. The significant negative direct effect of neuroticism on trait self-control was consistent with existing reports that individuals with high neuroticism struggle to regulate impulses and maintain emotional stability (20,21). The mediation pathway, in which emotional eating partially explained the relationship between neuroticism and reduced self-control, contributed an important psychological mechanism to the literature. Such pathways are supported by earlier work indicating that maladaptive emotional responses may link negative emotionality with diminished regulatory capacity (22).

The total effect of neuroticism on trait self-control was not statistically significant, a finding that may reflect compensatory self-regulatory strategies common in athletes, measurement variability, or suppression effects within the mediation model. The competitive environment in Lahore, characterized by intense physical training, academic pressure, and sociocultural expectations, may further shape psychological coping strategies and influence the expression of neuroticism and self-control. Athletes functioning in such high-pressure environments may develop self-regulatory strengths that offset the expected negative influence of neuroticism. Gender-based analyses showed distinct psychological differences between male and female athletes. Males scored higher in trait self-control and conscientiousness, consistent with reports in which male athletes demonstrated greater discipline and goal-oriented behavior (23). Other studies showed contrasting patterns, suggesting that gender differences in self-control may be influenced by context, type of sport, or sociocultural expectations (8). Females scored higher in emotional eating and neuroticism, patterns that have been linked to heightened emotional sensitivity, internalization tendencies, and hormonal influences (24,25). These gender differences may also be reinforced by social norms guiding emotional expression and coping behaviors in competitive settings. The findings of this study carry practical implications for athletic programs and universities. Enhancing psychological support systems, including stress management training,

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emotional regulation strategies, and nutritional counseling, could mitigate the risks associated with emotional eating and impaired self-control. Screening for emotional vulnerabilities during athletic training may help identify athletes who would benefit from early intervention. Given the gender-based differences reported, psychological programs may be more effective when tailored to the specific needs and emotional profiles of male and female athletes.

This study had several notable strengths. It addressed an unexplored mediation process within a unique population of varsity athletes and utilized validated tools to assess personality, self-control, and emotional eating. The large sample size and inclusion of athletes across competitive levels enhanced the robustness of the findings. However, several limitations should be acknowledged. The cross-sectional design restricted causal inference, and reliance on self-report measures introduced the risk of social desirability or reporting biases. The sample was limited to universities in a single city, potentially reducing generalizability to athletes from other regions or performance contexts. The unusually large effect size reported for emotional eating in gender analysis suggested potential measurement or calculation inconsistencies warranting further examination. Additional factors such as emotional intelligence, external stressors, and coaching style were not assessed but may play meaningful roles in shaping self-control and eating behaviors. Future research would benefit from longitudinal or experimental designs to better establish causal relationships and observe psychological changes over time. Inclusion of qualitative approaches may also help explain why emotional eating showed a positive association with self-control in this athletic population. Broader sampling across diverse regions, sports disciplines, and cultural backgrounds would improve external validity. Further studies examining additional mediators or moderators—including emotion regulation skills, motivation, or environmental stressors—could deepen understanding of how personality interacts with behavioral outcomes in student-athletes.Overall, the study extended existing knowledge by identifying emotional eating as a partial mediator between neuroticism and self-control in varsity athletes and by documenting meaningful gender-based psychological differences. These insights underscore the importance of integrating psychological support and targeted interventions within athletic environments to promote healthier coping, stronger self-regulation, and improved performance outcomes.

CONCLUSION

This study demonstrated that emotional eating played a meaningful mediating role in the association between neuroticism and trait self-control among university student-athletes, highlighting an important psychological mechanism that has not been previously explored in this population. The findings underscored that individuals with higher neuroticism were more inclined toward emotional eating, and although the direction of emotional eating's association with self-control differed from earlier reports, it reflected the unique regulatory patterns seen in competitive athletes. Gender differences further revealed distinct psychological tendencies, with male athletes showing stronger self-regulatory traits and female athletes displaying greater emotional sensitivity. Together, these insights emphasized the complex interaction between personality, emotion-driven behaviors, and self-control in athletic environments. The study contributes valuable evidence to guide targeted psychological support, gender-responsive interventions, and athlete-centered mental health strategies aimed at strengthening emotional regulation, promoting healthier coping, and enhancing overall performance and well-being.

AUTHOR CONTRIBUTION

Author	Contribution
Zuneera Mushtaq	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Dawood Suleman	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Qaisar Ali	Substantial Contribution to acquisition and interpretation of Data

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Author	Contribution
	Has given Final Approval of the version to be published
Asif Ali*	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Azam	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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