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Predicting Academic Burnout Based on Loneliness, Distress Tolerance, and Alexithymia in Students

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Abstract

Background: Academic burnout, characterized by emotional exhaustion, cynicism towards studies, and reduced academic accomplishment, undermines students' mental health and educational success, posing a critical challenge to their well-being.

Objectives: The present study aimed to determine the extent to which loneliness, distress tolerance, and alexithymia predict academic burnout among students.

Methods: This descriptive-correlational study drew its statistical population from all high school students in Shiraz during the 2023 - 2024 academic year. A sample of 259 participants was recruited via convenience sampling. Data were collected using the School Burnout Inventory (SBI), the UCLA Loneliness Scale (ULS), the Distress Tolerance Scale (DTS), and the Toronto Alexithymia Scale (TAS-20). Pearson's correlation coefficient and simultaneous regression analysis were employed to analyze the obtained data.

Results: Findings revealed significant positive correlations between loneliness ($r = 0.36$) and academic burnout, and between alexithymia ($r = 0.48$) and academic burnout. A significant negative correlation was observed between distress tolerance ($r = -0.41$) and academic burnout ($P < 0.001$). In regression analysis, loneliness, distress tolerance, and alexithymia uniquely accounted for 22%, 27%, and 28% of the variance in academic burnout, respectively, with the model explaining 28% of the total variance.

Conclusions: Loneliness and alexithymia positively predict academic burnout, while distress tolerance serves as a protective factor, collectively explaining a notable portion of burnout variance in high school students. These findings highlight the need for interventions targeting social connection, emotional regulation, and distress management to mitigate burnout. Educators and policymakers can leverage these insights to develop programs fostering emotional resilience and reducing isolation among adolescents.

Keywords: Academic Burnout, Loneliness, Distress Tolerance, Alexithymia, Students

1. Background

Academic burnout, a state of chronic stress characterized by emotional exhaustion, cynicism toward studies, and feelings of reduced academic efficacy, significantly hinders students' psychological well-being and educational outcomes (1, 2). A primary concern within this sphere, affecting both individual academic trajectories and national educational frameworks, involves the myriad obstacles learners face in achieving their educational goals. These challenges can precipitate a decrease in student motivation and academic achievement, consequently exerting a detrimental effect on their psychological well-being (3). Academic burnout is one such factor negatively influencing students' academic performance and has been the focus of recent school-based investigations (4).

Loneliness constitutes a salient factor influencing academic outcomes (5). Defined as an aversive emotional state stemming from a perceived

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incongruence between desired and actual interpersonal relationships, loneliness involves a sense of detachment or rejection and a need for reciprocal emotional connection (6, 7). This distressing experience can precipitate cognitive, emotional, and behavioral maladjustments, alongside perceived dissatisfaction and social maladjustment, particularly during adolescence (8). Gu et al. (5) have consistently indicated a significant association between loneliness and academic burnout among students. Conversely, experiences of loneliness correlate with diminished distress tolerance among students (9).

Distress tolerance is increasingly acknowledged as a pivotal construct in the developing comprehension of the etiology and persistence of psychopathology, as well as in preventative and therapeutic interventions (10). Individuals with limited distress tolerance may exhibit behavioral dysregulation as a maladaptive coping mechanism for negative emotions, sometimes engaging in destructive behaviors such as substance use or aggression to alleviate their emotional distress, potentially resulting in immediate relief from these feelings. This approach is often perceived as effective, particularly for those with low distress tolerance (11). Supporting this, Smith and Emerson (12) found a significant association between resilience and distress tolerance with academic burnout in their study of university students.

Alexithymia, defined as a difficulty in identifying, describing, and processing one's emotions, represents another notable predictor of academic burnout in students (13). Initially conceptualized by Sifneos (14) based on observations of psychosomatic patients, alexithymia literally signifies "no words for feelings". The construct reflects individual variations in the capacity to differentiate and articulate one's emotions, serving as a marker of this disparity. Defined as a deficit in the cognitive processing of emotional information and emotion regulation, alexithymia is a multidimensional construct encompassing: Difficulty identifying feelings (DIF) and distinguishing them from the physiological sensations of emotional arousal; difficulty communicating feelings to others; a restricted imaginative capacity, evidenced by a lack of fantasy; and an externally oriented cognitive style characterized by concrete, pragmatic, and reality-focused thinking (15). Supporting this, Popa-Velea et al. (16) found a significant association between alexithymia and a sense of coherence with academic burnout in students. Moreover, Zhang et al. (17) reported that higher levels of alexithymia were significantly correlated with increased academic burnout, a relationship mediated by self-compassion.

Experiencing loneliness and struggling with social connection can lead to decreased motivation and feelings of inadequacy in students, potentially culminating in academic burnout. Moreover, difficulties in tolerating distress and regulating negative emotions can compound this vulnerability, increasing susceptibility to academic burnout. Consequently, a substantial body of research has explored the diverse factors contributing to academic burnout. Female students were the focus of this study due to their reported higher sensitivity to social and emotional stressors, which may amplify their risk of academic burnout compared to male students (7). However, this group is not inherently more vulnerable but may face unique psychosocial challenges during adolescence that warrant targeted investigation. Thus, while prior research has established associations between loneliness, distress tolerance, alexithymia, and academic burnout, the combined predictive power of these factors in female high school students remains underexplored. This study addresses this gap by examining how these variables collectively contribute to academic burnout, providing insights for tailored interventions to support adolescent girls' academic and emotional well-being.

2. Objectives

Consequently, in light of the preceding discussion, the present study mainly aimed to predict academic burnout based on loneliness, distress tolerance, and alexithymia in female secondary school students.

3. Methods

This study employed a descriptive, correlational design. The population comprised all female high school students in Shiraz, Iran, during the 2023 - 2024 academic year. Using convenience sampling, five female high schools in Shiraz were selected based on their accessibility and willingness to participate, ensuring representation across different districts of the city. Five classes from each school were chosen. A total of 280 questionnaires were distributed to female students in their second cycle of high school within these classes. A

power analysis conducted prior to the study indicated that a sample size of at least 250 participants was required to detect a medium effect size ($f^2 = 0.15$) with 80% power and an alpha of 0.05 for multiple regression analysis with three predictors. After excluding incomplete or invalid questionnaires, 259 fully completed responses were analyzed.

The inclusion criteria specified that participants must be female students, aged 15 - 18 years, enrolled in the second cycle of high school, and must have provided informed consent. Exclusion criteria encompassed questionnaires with more than 10% of items left unanswered or those exhibiting signs of inattentive responding, such as identical responses across all items or patterned responses (e.g., selecting the same option repeatedly without variation). Data collection occurred between October and December 2023. Prior to data collection, ethical approval was obtained (IR.IAU.A.REC.1403.149), and informed consent was secured from both participants and their legal guardians, given that participants were minors. The consent process involved providing detailed information about the study's purpose, procedures, and confidentiality measures to students and their guardians, with written consent obtained from both parties. Adhering to ethical guidelines, participants were assured of the confidentiality and anonymity of their responses. Furthermore, to safeguard personal information and privacy, results were reported at an aggregate level only.

3.1. Measurement Tools

The School Burnout Inventory (SBI), a 15-item instrument developed by Breso et al. (18), assesses academic burnout across three dimensions: Academic exhaustion (5 items), academic cynicism (4 items), and academic inadequacy (6 items). Responses to the items are recorded on a 5-point Likert-type scale. Mohammadi et al. (19) reported a high internal consistency for the SBI, with a Cronbach's alpha coefficient of 0.87. In the current sample, the Persian version of the SBI yielded a Cronbach's alpha of 0.85.

Loneliness was assessed using the 20-item UCLA Loneliness Scale (ULS) (20), a self-report measure employing a 5-point Likert-type scale ranging from "never" to "always". Previous research has established the ULS's high internal consistency (Cronbach's alpha = 0.89) (21), a finding supported by the present sample, which yielded a Cronbach's alpha coefficient of 0.84, indicating strong internal consistency in this study. The Persian version of the ULS was used.

The Distress Tolerance Scale (DTS), a 15-item self-report instrument developed by Simons and Gaher (22), assesses an individual's capacity to withstand negative emotional states. The scale comprises four subscales: Tolerance, absorption, appraisal, and regulation. Items are rated on a 5-point Likert-type scale (1 = strongly agree to 5 = strongly disagree), with item 6 reverse-scored. Total scores range from 15 to 75, with higher scores indicating greater distress tolerance. The Persian adaptation of the DTS, validated in Iran by Azizi (23), has demonstrated acceptable internal consistency, with subscale Cronbach's alpha coefficients ranging from 0.74 to 0.85. In the current sample, the Persian DTS yielded a Cronbach's alpha of 0.80.

The Toronto Alexithymia Scale (TAS-20), developed by Bagby et al. (24) is a 20-item self-report tool used to assess alexithymia across three subscales: Difficulty identifying feelings, difficulty describing feelings (DDF), and externally oriented thinking (EOT). Items are rated on a 5-point Likert scale, with total scores ranging from 20 to 100. Scores ≤ 51 indicate low alexithymia, while scores ≥ 61 indicate high levels. Four items are reverse-scored. The Persian version, validated by Besharat, demonstrated satisfactory internal consistency, with a Cronbach's alpha of 0.75, supporting its reliability in Persian-speaking populations (25). In the current sample, the Persian TAS-20 yielded a Cronbach's alpha of 0.78.

3.2. Data Analysis

The collected data were analyzed using SPSS version 26. Descriptive statistics, including means and standard deviations, were calculated to summarize the data. For inferential analysis, Pearson's correlation coefficient and simultaneous regression analysis were employed to investigate the predictive relationship of loneliness, distress tolerance, and alexithymia on academic burnout in students.

4. Results

Analysis of demographic data revealed the following grade-level distribution: Eighty-seven tenth-grade students (33.6%), 129 eleventh-grade students (49.8%), and 43 twelfth-grade students (16.6%). In terms of academic specialization, 120 participants were enrolled

Table 1. Descriptive Statistics of the Research Variables: Means, Standard Deviations, Skewness, and Kurtosis

Variables	Means ± SD	Skewness	Kurtosis
Academic burnout	45.01 ± 7.78	0.11	1.65
Loneliness	49.98 ± 6.69	-0.12	-0.78
Distress tolerance	45.05 ± 9.70	0.07	0.06
Alexithymia	59.43 ± 10.89	-0.62	-0.22

in experimental sciences (46.3%), 71 in mathematics (27.4%), and 68 in humanities (26.3%). Table 1 presents the descriptive statistics for the key variables in this study. The mean score for academic burnout was 45.01 ± 7.78, while loneliness had a mean of 49.98 ± 6.69, distress tolerance averaged 45.05 ± 9.70, and alexithymia showed a mean of 59.43 ± 10.89. Skewness and kurtosis values for all variables fell within an acceptable range for normality (skewness < |1|, kurtosis < |2|), indicating approximately normal distributions with minimal asymmetry or peakedness.

Table 2 displays the intercorrelations among the study variables. The findings reveal significant positive correlations between loneliness (r = 0.36, P = 0.001) and academic burnout, and between alexithymia (r = 0.48, P = 0.001) and academic burnout. Conversely, a significant negative correlation was observed between distress tolerance (r = -0.41, P = 0.001) and academic burnout. Variance inflation factors (VIFs) were examined to assess multicollinearity among predictors, with all VIF values below 2.0, indicating no significant multicollinearity.

To ascertain the relative contribution of each predictor variable to academic burnout, a simultaneous regression analysis was performed, with loneliness, distress tolerance, and alexithymia entered as predictors and academic burnout as the outcome variable. Assumptions of regression analysis, including normality of residuals, independence (Durbin-Watson statistic = 1.92), and linearity, were tested and met. The outcomes of this analysis are detailed in Table 3.

As depicted in Table 3, alexithymia emerged as the strongest predictor of academic burnout in the initial model, with a correlation coefficient of 0.48 and accounting for 23% of the variance ($\Delta R^2 = 0.23$, P = 0.001). The standardized coefficient (β = 0.34) indicates a moderate effect size, suggesting a meaningful contribution to burnout. Upon the inclusion of distress tolerance in the second model, the correlation with academic burnout increased to 0.52, explaining approximately 27% of the variance ($\Delta R^2 = 0.04$, P = 0.003), with a small-to-moderate effect size (β = -0.19). The introduction of loneliness in the third model further increased the correlation to 0.53, with the model predicting 28% of the variance in academic burnout ($\Delta R^2 = 0.01$, P = 0.049). The effect size for loneliness (β = 0.13) is small, indicating a modest but significant contribution to academic burnout. Considering the sequential entry of predictors, alexithymia demonstrated the largest unique predictive power for academic burnout (standardized β = 0.34), followed by distress tolerance (standardized β = -0.19) and then loneliness (standardized β = 0.13), all of which exhibited significant predictive roles.

5. Discussion

The current investigation sought to examine the predictive capacity of loneliness, distress tolerance, and alexithymia with respect to academic burnout in a student population. The primary finding of this investigation revealed a significant positive correlation between loneliness and academic burnout among female students, aligning with prior research (5, 26). This suggests that higher levels of loneliness are associated with greater reported academic burnout in this demographic. Loneliness, a psychologically distressing experience, can exert a substantial influence across various facets of students' academic engagement. Persistent loneliness may heighten susceptibility to academic burnout by eroding motivation, impairing concentration, and diminishing the quality of academic work. The negative disposition toward the educational setting engendered by loneliness can cultivate an environment conducive to the development of burnout symptoms (26).

From a psychological standpoint, social support theory offers a framework for understanding this association. Loneliness, as an indicator of inadequate social support, depletes the psychological resources

Table 2. Pearson Correlation Coefficients Among the Research Variables

Variables	Academic Burnout	P-Value
Loneliness	0.36	0.001
Distress tolerance	-0.41	0.001
Alexithymia	0.48	0.001

necessary for individuals to manage academic stressors. Students with less robust social networks often report greater feelings of helplessness when confronted with educational challenges, progressively leading to emotional exhaustion, diminished academic self-efficacy, and ultimately, burnout. This process may be particularly acute in emotionally vulnerable female students (7). Moreover, loneliness can foster specific cognitive and behavioral patterns that directly impact academic performance. Students experiencing loneliness exhibit a greater tendency toward rumination, diverting attention and cognitive resources away from academic tasks. Avoidance of social interactions within the school environment may further deprive these students of crucial support systems, such as peer assistance or teacher guidance, thus increasing the academic burden and vulnerability to burnout.

Neuroscientific perspectives provide some context for this relationship, though evidence is limited. Chronic loneliness may influence stress response systems, potentially lowering an individual's tolerance for academic pressures (5). Elevated levels of stress hormones, such as cortisol, not only negatively affect cognitive functioning but may initiate a maladaptive cycle wherein academic burnout intensifies feelings of loneliness, and this heightened loneliness, in turn, exacerbates burnout (5). This complex interaction underscores the strong and significant relationship observed between loneliness and academic burnout in female students.

A further significant finding revealed a robust negative correlation between distress tolerance and academic burnout in female students, aligning with the results reported by Smith and Emerson (12). This implies that a greater capacity to endure and persist through aversive emotional states serves as a protective mechanism against academic burnout. Female students exhibiting higher levels of distress tolerance demonstrate an enhanced ability to withstand academic pressures and the associated negative emotions without experiencing psychological decompensation. This capacity mitigates their feelings of helplessness when confronted with educational challenges, such as demanding examinations or substantial workloads, thereby enabling them to maintain their academic engagement despite stress. Conversely, students with lower distress tolerance are more inclined to yield to academic difficulties, consequently elevating their susceptibility to burnout.

From a cognitive processing of emotional information theory, diminished emotional cognitive processing is linked to a propensity to evade stressful situations. Students who struggle to manage emotional discomfort may avoid challenging academic environments (e.g., difficult courses) or discontinue their efforts upon encountering initial setbacks (e.g., poor grades). This pattern of avoidance can lead to a cumulative effect of academic underachievement and heightened psychological strain, both recognized precursors to academic burnout. In contrast, students with greater distress tolerance tend to remain actively involved in the learning process despite experiencing discomfort, thus exhibiting a reduced risk of burnout (12).

Notably, distress tolerance impacts all facets of academic burnout. Regarding emotional exhaustion, students with higher distress tolerance can manage academic stressors without experiencing complete emotional depletion. Concerning reduced academic efficacy, these students maintain their confidence in their abilities despite facing temporary setbacks. Finally, with respect to academic cynicism, this group is less likely to develop negative attitudes toward the value of their education. This pattern holds particular significance for female students, who often navigate compounded social and academic demands.

A further salient finding of the present investigation revealed a significant positive correlation between alexithymia and academic burnout among female secondary school students, consistent with prior research (13, 17). This suggests that difficulties in identifying, processing, and expressing emotions play a

Table 3. Results of Simultaneous Regression Analysis Predicting Academic Burnout

Steps	Predictors	F	R	R^2	ΔR^2	B	SE	β	*t*	P-Value
1	Alexithymia	75.54	0.48	0.23	0.23	0.24	0.04	0.34	5.50	0.001
2	Distress tolerance	48.01	0.52	0.27	0.04	-0.15	0.05	-0.19	-2.95	0.003
3	Loneliness	33.68	0.53	0.28	0.01	0.10	0.05	0.13	1.98	0.049

critical role in exacerbating academic burnout. Female students with alexithymia often experience challenges in emotional regulation, leading to a more intense perception of academic stressors. The ineffective processing of negative emotions, such as stress, anxiety, or frustration, results in their accumulation, progressively leading to emotional exhaustion, reduced motivation, and ultimately, academic burnout. Indeed, an impaired capacity for emotional management renders individuals more vulnerable to persistent academic pressures, thus fostering a positive association between these constructs (13).

From a psychological standpoint, emotion regulation theories provide a framework for understanding this relationship. Students who struggle to recognize and articulate their feelings frequently employ maladaptive coping mechanisms, such as avoidance or emotional suppression. These coping strategies not only fail to alleviate academic stress but also augment psychological burden, thereby increasing susceptibility to burnout. Particularly in adolescent girls, who experience heightened emotional variability due to hormonal fluctuations and societal expectations, alexithymia can exert a more detrimental influence on mental well-being and academic performance. Consequently, elevated levels of alexithymia correlate with an increased likelihood of experiencing symptoms of academic burnout (17).

Moreover, alexithymia can impede the seeking of social support, a known protective factor against academic burnout. Students who lack the ability to clearly understand or express their emotions often encounter difficulties in soliciting assistance from teachers, family, or peers. This emotional isolation diminishes the resources available for coping with academic challenges, resulting in a more chronic impact of academic pressures. Additionally, an impaired capacity to process positive emotions (such as the enjoyment of learning) may diminish academic interest and intensify academic disengagement, a core dimension of burnout (16).

Cognitively, alexithymia is also associated with deficits in executive functions, including concentration and problem-solving. When a female student struggles to manage her emotions, her cognitive resources become preoccupied with attempting to understand vague and confused feelings, rather than focusing on academic tasks. This cognitive interference not only reduces academic productivity but also necessitates greater effort to achieve prior levels of performance, contributing to fatigue and burnout (13). A maladaptive cycle thus ensues wherein alexithymia contributes to decreased performance, which, in turn, amplifies anxiety and disengagement.

The present study acknowledges several limitations. Firstly, the sample was restricted to female secondary school students within the city of Shiraz, thus necessitating cautious generalization of the findings to male students and individuals in other educational stages. Secondly, the reliance on self-report questionnaires introduces the potential for response biases. Thirdly, the cross-sectional design limits the ability to infer causality among loneliness, distress tolerance, alexithymia, and academic burnout. Finally, the study did not control for potential mediating variables, such as parenting styles or socioeconomic status, which may have influenced the observed relationships.

To address these limitations, schools and counselors can implement practical interventions based on these findings. For instance, peer support programs and social skills workshops can reduce loneliness by fostering meaningful connections among students. Mindfulness-based interventions and cognitive-behavioral strategies can enhance distress tolerance, equipping students to manage academic stressors more effectively. Additionally, emotional literacy programs can help students with alexithymia improve their ability to identify and express emotions, thereby reducing

burnout risk. These targeted strategies can be integrated into school curricula or counseling services to support female students' academic and emotional well-being.

Future research should employ longitudinal designs to explore the temporal relationships among loneliness, distress tolerance, alexithymia, and academic burnout, enabling a clearer understanding of causal pathways. Studies including male students and diverse educational contexts would enhance generalizability. Additionally, investigating potential mediators, such as social support or self-esteem, could provide deeper insights into the mechanisms underlying academic burnout. Finally, evaluating the efficacy of interventions targeting loneliness, distress tolerance, and alexithymia in reducing burnout would bridge the gap between research and practice.

5.1. Conclusions

In summary, this study provides empirical evidence that loneliness and alexithymia positively predict academic burnout, while distress tolerance negatively predicts it, fulfilling the objective of examining these predictors in female high school students. The positive correlations identified between both loneliness and alexithymia with academic burnout indicate that heightened feelings of social isolation and difficulties in identifying and articulating emotions are linked to increased burnout experiences. Conversely, the negative correlation between distress tolerance and academic burnout emphasizes the protective function of one's perceived capacity to endure negative emotional states in lessening burnout symptoms. These results highlight the critical role of addressing social isolation, enhancing emotional regulation, and improving distress management to mitigate academic burnout. Targeted interventions, such as peer mentoring, emotional literacy programs, and stress resilience training, can support adolescent girls in navigating academic challenges, offering actionable strategies for educators and policymakers to foster student well-being.

Footnotes

Authors' Contribution: S. A. K.: Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis; F. H.: Administrative, technical, and material support, study supervision; F. H. and L. K.: Critical revision of the manuscript for important intellectual content.

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