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The Mediating Role of Loneliness in the Relationship between Academic Burnout and Psychological Well-Being

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Abstract

This study investigates the mediating role of loneliness in the relationship between academic burnout and psychological well-being among university students. Academic burnout, characterized by emotional exhaustion, cynicism, and reduced academic efficacy, has become increasingly prevalent and is known to negatively affect students' psychological well-being. Drawing on Ryff's Psychological Well-being Theory and the Evolutionary Theory of Loneliness, this research explores how loneliness may serve as a key mechanism linking burnout to diminished mental health. A total of 389 undergraduate students participated in the study, completing validated scales measuring academic burnout, loneliness, and psychological well-being. Structural Equation Modeling (SEM) was employed to analyze the data. Results revealed that academic burnout was positively associated with loneliness and negatively associated with psychological well-being. Furthermore, loneliness significantly mediated the relationship between burnout and well-being, suggesting that students experiencing higher burnout also suffer increased loneliness, which in turn lowers their psychological well-being. These findings highlight the importance of addressing loneliness in interventions aimed at reducing the negative psychological effects of academic burnout. Universities are encouraged to implement support systems that foster social connection and emotional resilience to protect student mental health and academic success.

Keywords: Academic Burnout, Loneliness, Psychological Well-Being, University Students, Mediation Model

Introduction

Academic burnout is a prevalent concern in higher education, characterized by emotional exhaustion, cynicism, and a reduced sense of accomplishment (Maslach, Schaufeli & Leiter, 2001). The increasing academic demands, competition, and pressure to succeed have made burnout a common phenomenon among university students (Salmela-Aro & Upadyaya, 2014). Academic burnout not only affects students' motivation and academic performance but also influences their psychological well-being and overall life satisfaction (Rehman, Bhutah & You, 2020).

Academic burnout is associated with the multidimensional theory of burnout proposed by Christina Maslach (1998). According to this theory, burnout is a form of personal stress experience and is not a single psychological state but a composite state composed of three dimensions. Burnout is conceptualized from the perspectives of three core dimensions: emotional exhaustion, cynicism and reduced personal accomplishment (Maslach, 1998; Maslach & Jackson, 1981a, 1986). Emotional exhaustion refers to the feeling of emotional overextension and depletion of emotional resources, primarily resulting from work overload and interpersonal conflicts in the workplace, leading to a sense of fatigue and exhaustion. The emotional exhaustion component represents the fundamental personal stress dimension of burnout. Cynicism refers to a negative, cynical or excessively detached response, typically involving a loss of idealism and a reaction to emotional exhaustion from overload. The cynicism component represents the interpersonal dimension of burnout. Reduced personal accomplishment refers to a decline in work ability and productivity. This reduced sense of self-efficacy is associated with depression and an inability to cope with work demands. Additionally, a lack of social support and opportunities for professional development may exacerbate this situation. Feeling inadequate in one's abilities, personal accomplishment is the self-evaluative dimension of occupational burnout (Maslach, 1998).

Ryff's Psychological Well-being Theory (Ryff, 1989) is used to conceptualize psychological well-being in this study. This framework defines well-being as a multidimensional construct encompassing six key dimensions: autonomy, personal growth, self-acceptance, environmental mastery, purpose in life, and positive relationships (Ryff & Keyes, 1995). Psychological well-being is not merely the absence of distress but the presence of a fulfilling and meaningful life (Ryff, 2013). In the context of higher education, students who experience psychological well-being demonstrate resilience, strong social relationships, and a positive self-concept, which may counterbalance the effects of burnout and loneliness (Keyes, Shmotkin, & Ryff, 2002).

Loneliness, defined as the subjective perception of social isolation (Hawkley & Cacioppo, 2010), is an essential factor influencing students' psychological health. Social relationships and connectedness play a crucial role in shaping students' academic experiences and emotional stability (Cacioppo & Patrick, 2008). When students experience academic burnout, they may withdraw from social interactions, further exacerbating their loneliness (Zhao & Wu, 2022). Studies have shown that loneliness can significantly impact mental health, increasing vulnerability to depression, anxiety, and emotional distress (Bhagchandani, 2017; Heinrich & Gullone, 2006).

The Evolutionary Theory of Loneliness (ETL) was proposed by John T. Cacioppo and Stephanie Cacioppo (2018). According to this theory, loneliness is considered a product of human evolution. It suggests that, due to the fundamental need for social connections, individuals have an innate tendency to maintain relationships with other members of society. Loneliness is viewed as a psychological warning signal that alerts individuals when they are lacking current social connections or are deficient in meaningful social relationships, signaling a departure from the social group. As individuals inherently possess basic needs for social affiliation, they are instinctively inclined to maintain relationships with other members of society. The theory suggests that loneliness serves as an adaptive mechanism, signaling that an individual's current social connections are inadequate, thereby prompting proactive efforts to establish, repair, maintain or update social connections to meet social needs (Spithoven, Bijttebier & Goossens, 2017). In the same way that hunger drives individuals to seek food and physical pain motivates actions to minimize physical harm, loneliness is to some extent adaptive, as it signals damage to social relationships and forces individuals to rebuild connections, thereby increasing their chances of survival and those of their offspring.

However, loneliness also activates individuals' self-protective motives and implicit vigilance against social threats, increasing avoidance motivations. Particularly, when interpersonal distance decreases and the potential costs of evolution rise, vigilance and avoidance levels are higher. Individuals may use avoidance as a strategy to reduce potential conflicts and achieve self-protection. The Evolutionary Theory of Loneliness suggests that implicit vigilance aims to promote short-term survival, while the repair hypothesis aims to promote long-term survival (Cacioppo & Cacioppo, 2018).

The evolutionary theory of loneliness emphasizes the critical role of social connections in human evolution and survival, considering loneliness as an adaptive outcome. The evolution of loneliness is believed to facilitate and protect beneficial social connections (Baumeister & Leary, 2017). Social exclusion or isolation may be perceived as a threat, and the experience of loneliness may serve as a psychological mechanism that makes individuals more alert and motivated to maintain social connections (Cacioppo & Hawkley, 2009). While the Evolutionary Theory of Loneliness focuses on the biological and adaptive roles of social connectedness, it also interacts with modern constructs such as digital loneliness. Despite being constantly "connected" through social media, many university students report feelings of superficial relationships and lack of deep emotional bonds. This phenomenon, termed "crowded loneliness," reflects a mismatch between digital interaction and emotional intimacy. For Malaysian students, particularly international or rural-origin students studying in urban universities, this dissonance may be profound.

Existing research has explored the individual relationships between academic burnout, loneliness, and psychological well-being, but there is limited understanding of how these variables interact (Yang, Sun & Jiang, 2022). A critical gap remains in identifying the mediating role of loneliness in the relationship between academic burnout and psychological well-being (Arslan, 2021). Given the increasing mental health challenges faced by university students, it is essential to explore how loneliness mediates this relationship to provide effective interventions (Zhao & Wu, 2022).

Understanding the relationship between academic burnout, loneliness, and psychological well-being has practical implications for universities and mental health professionals (Stoliker & Lafreniere, 2015). If loneliness is found to mediate this relationship, interventions that promote social engagement and emotional support could help students navigate the challenges of burnout more effectively (Russell et al., 2012). University administrators can develop peer mentorship programs, student wellness initiatives, and academic counseling services to reduce feelings of isolation and enhance students' overall well-being (Baik, Larcombe, & Brooker, 2019). Moreover, strategies such as resilience training, time management workshops, and stress-reduction activities may further help students cope with academic burnout and maintain high levels of psychological well-being (Shankland & Rosset, 2017).

Additionally, the COVID-19 pandemic has heightened students' experiences of loneliness and academic burnout due to remote learning, reduced social interactions, and increased academic stress (Marmarosh, Forsyth, Strauss & Burlingame, 2020; Wang et al., 2021). The shift to online education has created new challenges in maintaining student motivation and social connections (Cao et al., 2020), further underscoring the need for institutions to implement proactive strategies that support students' mental health (Son, Hegde, Smith, Wang, & Sasangohar, 2020; Peloso, Bedin, de Almeida, Freitas & Valarelli, 2021).

To address this research gap, this study aims to:
Examine the direct relationship between academic burnout and psychological well-being.
Investigate whether loneliness mediates the relationship between academic burnout and psychological well-being.

By addressing these objectives, the study provides valuable insights into how academic burnout and loneliness interact to influence students' well-being. Findings from this research can inform policies and interventions that foster a supportive academic environment, ultimately enhancing students' academic and psychological outcomes. Furthermore, universities can leverage these insights to create policies that prioritize mental health and social well-being alongside academic achievement, ensuring that students thrive holistically.

Research Objectives

1. To examine the relationship between academic burnout and psychological well-being.
2. To investigate the relationship between academic burnout and loneliness.
3. To examine the relationship between loneliness and psychological well-being.
4. To investigate the mediating role of loneliness in the relationship between academic burnout and psychological well-being.

Research Hypothesis

Ho1: There will be no significant relationship between academic burnout and psychological well-being.
Ho2: There will be no significant relationship between academic burnout and loneliness.
Ho3: There will be no significant relationship between loneliness and psychological well-being.
Ho4: Loneliness will be no significantly mediate the relationship between academic burnout and psychological well-being.

Method

Participants

The study recruited 389 undergraduate students from University in Malaysia. Participants were selected using a convenience sampling method, targeting students across various faculties to ensure diversity in academic disciplines and experiences. Inclusion criteria required participants to be physically and mentally healthy, proficient in the research language (English), and capable of providing informed consent. Students with severe medical or psychiatric histories were excluded.

In the survey of this study, participants were asked to indicate their gender as either male or female. The total number of respondents is 389, with 104 males, accounting for 26.7% of the total, and 285 females, making up 73.3%. Table 1 presents the demographic information for all participants.

Table1

Demographic Information

		F	%
Age	19	12	3.1
	20	77	19.8
	21	135	34.7
	22	93	23.9
	23	48	12.3
	24	16	4.1
	25	6	1.5
	26	1	0.3
	27	1	0.3
Semester	1	10	2.6
	2	211	54.2
	3	18	4.6
	4	91	23.4
	5	21	5.4
	6	33	8.5
	7	3	0.8
	8	1	0.3
	9	1	0.3

Measurements

Three validated scales were used to assess the study variables:

Academic Burnout Scale The assessment of academic burnout was conducted using a modified version of the MBI–General Survey (MBI-GS), tailored for students and referred to as the MBI–Student Survey (MBI-SS) (Schaufeli, 1996). This version is specifically designed for student samples, with items adapted to reflect academic contexts. For instance, the statement "I feel emotionally drained by my studies" was rephrased as "My studies make me feel emotionally drained." The MBI-SS consists of three dimensions that they are Exhaustion, Cynicism and Professional Efficacy comprising 15 items.

All items are rated on a 7-point frequency scale, ranging from 0 (Never) to 6 (Always). Reverse scoring is applied to all EF items and high scores on EX and CY, as well as low scores on EF, indicate academic burnout (Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002). In the

course of this study, the scale demonstrated excellent reliability, with reliability coefficients exceeding 0.80 for each item within each subscale. The overall Cronbach's α coefficient for the questionnaire was determined to be 0.757. Specifically, the Cronbach's α coefficients for the dimensions of burnout, cynicism, and efficacy were 0.869, 0.856 and 0.852, respectively (Ilic, Todorovic, Jovanovic, & Ilic, I., 2017).

The University of California at Los Angeles Loneliness Scale (ULS-8) In this study, researcher selected the University of California at Los Angeles Loneliness Scale (ULS-8) developed by Hays and DiMatteo (1987) to measure participants' feelings of loneliness. This scale is a validated instrument specifically designed to assess individuals' experiences of loneliness and has been widely used in research in the fields of psychology and sociology.

The ULS-8 consists of 8 items and is a unidimensional scale designed to comprehensively and accurately measure individuals' feelings of loneliness. These items cover various situations and experiences that may contribute to feelings of loneliness, including the need for social interaction, satisfaction with interpersonal relationships, and cognitive and emotional responses to loneliness. Among them, 2 items are designed as reverse-scored items to explore different aspects of individuals' experiences of loneliness. See Table 3.4 for details.

When filling out the instrument, participants need to choose the appropriate answer based on their feelings and experiences in the past month. The Likert scale scoring ranges from 1 to 4, with 2 reverse-scored items. Each item has a 4-level frequency score with answer choices of 1 (never), 2 (rarely), 3 (sometimes), and 4 (always). The total score ranges from 8 to 32, with higher scores indicating higher levels of loneliness.

The internal consistency indicator Cronbach's α value of 0.84 suggests a high degree of correlation among the items of the scale, indicating that it is a measurement tool with good internal consistency. The scale's internal validity coefficient of 0.94 further indicates strong reliability, reliably reflecting participants' levels of loneliness (Hays & DiMatteo, 1987).

Ryff's Psychological Well-being Scale Psychological well-being is assessed using the 18-item Psychological Well-Being (PWS) scale developed by Ryff and Keyes (1995). The PWB scale comprises six subscales, they are autonomy, environmental mastery, personal growth, positive relations with others each consisting of three items.

The scale employs a 7-point Likert scale scoring method to assess participants' feelings, reactions and level of agreement. The scoring criteria are as follows: "1" strongly agree; "2" somewhat agree; "3" a little agree; "4" neither agree or disagree; "5" a little disagree; and "6" somewhat disagree; and "7"strongly disagree. Each dimension consists of both positive and negative items, with eight items reverse scoring. Scores are then aggregated across all items, resulting in a score range of 18 to 126 points. Lower scores suggest a lower level of well-being, while higher scores indicate a higher level of psychological well-being.

The 18 items met the criteria of psychological measurement standards, with an internal consistency Cronbach's alpha of 0.87 and a test-retest reliability of 0.91, indicating good to excellent reliability (Tay, 2023).

Procedure

Data collection was conducted online using a university-approved survey platform. Participants were recruited via university mailing lists, course announcements, and student organizations. The survey link was shared through official university channels to ensure a broad reach among students.

Before beginning the survey, participants were presented with an informed consent form detailing the study's objectives, confidentiality agreements, and voluntary participation. Those who consented proceeded to complete the online questionnaire, which took approximately 15-20 minutes. Inclusion criteria required participants to be currently enrolled full-time in an academic program, while exclusion criteria included incomplete responses and duplicate submissions. Measures were taken to reduce response bias, such as ensuring anonymity and randomizing question order.

Data Analysis

Researchers entered the results of each questionnaire received into Statistical Package for the Social Sciences (SPSS) version 29 for Windows (SPSS 29) and conducted data analysis according to the objectives of the study. The analysis followed a structured approach to ensure the reliability and validity of the findings.

Descriptive Statistics

Means, standard deviations, and frequency distributions were computed to summarize participant characteristics and variable distributions (Livingston, 2004). Descriptive statistics provided an overview of the central tendencies and dispersion of key variables, offering insights into the general patterns of academic burnout, loneliness, and psychological well-being among participants.

Correlation Analysis

Pearson correlation coefficients were used to examine the relationships among academic burnout, loneliness, and psychological well-being (Cohen, Cohen, West, & Aiken, 2013). This analysis helped determine the strength and direction of associations between variables, providing preliminary evidence for potential mediation effects. A significant negative correlation between academic burnout and psychological well-being, alongside a positive correlation between burnout and loneliness, would support further investigation into the mediating role of loneliness (Hayes, 2018).

Mediation Analysis

Structural Equation Modeling (SEM) was conducted to test the hypothesized mediation effect of loneliness on the relationship between academic burnout and psychological well-being (Kline, 2012). SEM allowed for simultaneous estimation of multiple relationships, providing a more comprehensive analysis of the mediation process compared to traditional regression-based mediation tests (Baron & Kenny, 1986; Preacher & Hayes, 2008). The indirect effect of academic burnout on psychological well-being through loneliness was tested using bootstrapping techniques, ensuring robust statistical inference (MacKinnon, Fairchild, & Fritz, 2007).

Model Fit Indices

To assess the adequacy of the proposed mediation model, several model fit indices were evaluated, including Chi-square (χ^2), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI) (Hu & Bentler, 1995). Acceptable model fit was determined based on established guidelines (i.e., RMSEA < 0.08, GFI > 0.90, AGFI > 0.85) to ensure the validity of the mediation model (Byrne, 2016). If necessary, model modifications were made based on modification indices to improve overall fit while maintaining theoretical justification.

Results

Descriptive Statistics

Table 2 summarizes the descriptive statistics for academic burnout, loneliness, and psychological well-being. The analysis includes the mean (M), standard deviation (SD), minimum (Min), and maximum (Max) for each variable.

Table2

Descriptive Statistic of Study Variable

Variable	High level	Min	Max	M	SD
Academic burnout	50.7%	1	84	34.25	13.26
Loneliness	52.2%	8	30	17.62	4.73
Psychology well-being	57.2%	23	97	60.98	11.61

The results indicate an average academic burnout score of 34.25, suggesting a mediate level of burnout among the participants overall. A standard deviation of 13.26 highlights significant individual differences in burnout levels within the sample. The scores range from 1 to 84, reflecting a spectrum where some individuals experience minimal burnout, while others face extremely high levels. The similar numbers of individuals with high and low burnout levels suggest a relatively even distribution across the sample, though with a slight tendency toward higher burnout levels.

The average loneliness score is 17.62, indicating a slightly below-mediate level of loneliness among the participants. A standard deviation of 4.73 suggests a mediate degree of individual variation within the sample. Scores range from 8 to 30, reflecting significant differences, with some individuals experiencing minimal loneliness while others report very strong feelings of isolation. The proportion of high loneliness levels slightly exceeds that of low levels, potentially linked to academic pressure or a lack of social support.

The average psychological well-being score is 60.98, indicating a slightly above-mediate level of well-being among the participants. A standard deviation of 11.61 suggests a mediate degree of variation in well-being levels within the sample. Scores range from 23 to 97, highlighting significant individual differences. The proportion of high psychological well-being levels is notably greater than low levels, suggesting an overall positive state of mental health.

Correlations

Pearson correlation analysis was conducted to examine the relationships among the study variables. The results are presented in Table 3.

Table 3
Correlation Analysis Among Study Variables

Variable	Academic Burnout	Loneliness
Loneliness	0.597**	
Psychology Well-being	-0.564**	-0.520**

Note: **. Relationship is significant at the 0.01 level (2-tailed).

The analysis shows that the correlation coefficient between academic burnout and loneliness is r = 0.597, indicating a significant mediate-to-strong positive correlation. The correlation analysis reveals several key findings. According to Evans' (1996) classification of correlation strength, academic burnout shows a significant positive correlation with loneliness (r = 0.597, p = 0.000), indicating a strong association (Evans, 1996), This suggests that higher levels of academic burnout are associated with higher levels of loneliness. Academic burnout exhibits a significant negative correlation with psychological well-being (r = -0.564, p = 0.000), demonstrating a medium relationship, which implies that greater academic burnout is associated with lower psychological well-being scores. Loneliness and psychological well-being show a significant negative correlation (r = -0.520, p = 0.000), indicating a medium association. This suggests that individuals with higher levels of loneliness also tends to be linked to lower psychological well-being.

Structural Model for The Relationship Between Academic Burnout, Loneliness and Psychology Well-Being

This study involves four constructs to test the proposed model and hypotheses, with loneliness acting as mediating constructs, psychological well-being as the endogenous construct, and academic burnout as the exogenous construct. The structural model of this study is shown in Figure 1. The fit indices are provided in Table 4.

Fig.1 The Hypothetical Model for The Relationship Between Academic Burnout, Loneliness and Psychology Well-Being

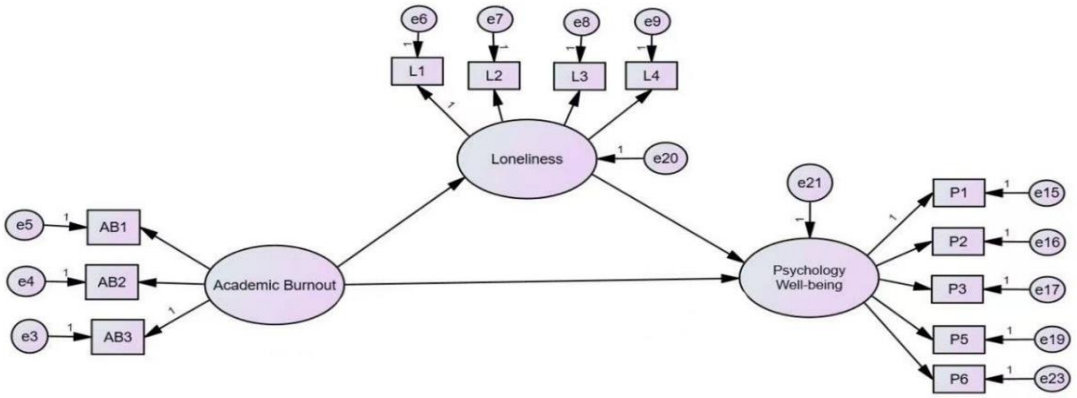


Table 4
Interpretation of Goodness of Fit Index for Structural Relationship Model

Fit index	Value	Criteria	Result Description
Chi/DF	2.578	< 5	The model has a good fit and meets the acceptance criteria.
GFI	0.945	> 0.9	The model has a high fit and meets the acceptance criteria.
AGFI	0.816	> 0.85	After considering model complexity, the fit remains good and meets the acceptance criteria.
RMSEA	0.064	< 0.08	The model has a good fit after simplification and meets the acceptance criteria.

Note: Data adapted from Alavi et al. (2020) and Gebremedhin, Gebrewahd & Stafford (2022) and Miljko (2020) and Ng, Wah, Fitriana & Arumugam (2023).

Chi/DF is the ratio of Chi-square to the model's degrees of freedom (DF), indicating the quality of the model's fit to the data. A lower Chi/DF value suggests a better fit of the model. Typically, a Chi/DF value below 5 is considered an acceptable model fit (Alavi et al., 2020). In this study, the Chi/DF value is 2.578 (<5), indicating that the model's fit is adequate and acceptable.

GFI, or Goodness of Fit Index, is an absolute fit index that measures how well the model fits the data, with values ranging from 0 to 1. It represents the percentage of variance in the observed data explained by the model. Generally, a GFI greater than 0.9 is considered a good fit (Ng, Wah, Fitriana & Arumugam, 2023). In this study, the GFI value is 0.945 (>0.9), indicating a high fit of the model to the data.

AGFI, or Adjusted Goodness of Fit Index, is an adjustment to the GFI that takes into account the complexity of the model and the sample size. It also ranges from 0 to 1, with values greater than 0.85 generally indicating a good fit (Miljko, 2020). In this study, the AGFI value is 0.916 (>0.85), suggesting that, even considering the model's complexity, the fit remains high.

RMSEA, or Root Mean Square Error of Approximation, is a fit index that measures the error of the model, reflecting the size of the error after model simplification. The smaller the RMSEA, the better the model fit. Generally, an RMSEA value less than 0.08 is considered an acceptable fit. In this study, the RMSEA value is 0.064 (<0.8), indicating that the model still has a good fit after simplification (Gebremedhin, Gebrewahd & Stafford, 2022). All indices meet the evaluation criteria, suggesting that the model performs well overall, and the model fit is acceptable.

Mediation Analysis

In this study, the total effect of academic burnout on psychological well-being is decomposed into direct and indirect effects. The direct effect refers to the impact of academic burnout on psychological well-being without considering mediating variables. The indirect effect occurs when academic burnout influences psychological well-being through loneliness and

resilience. Table 5 presents the mediation results, and Figure 2 illustrates the standardized mediation model.

Table 5
Testing the Mediating Effect of Loneliness

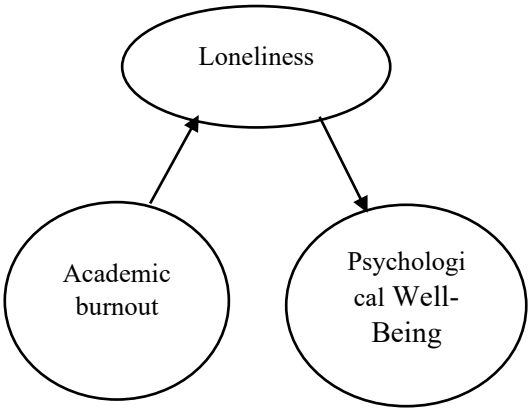
Path	Path coefficient	Significance	Mediation result
	-0.354	0.000	Partial mediation

Fig.2 Mediation Model of Loneliness

The findings confirm that loneliness act as partial mediators in the relationship between academic burnout and psychological well-being.

The impact of academic burnout on psychological well-being is partially mediated by loneliness. The study finds that academic burnout has a significant positive effect on loneliness, with a path coefficient of 0.68, indicating that higher levels of academic burnout are associated with stronger feelings of loneliness. Meanwhile, loneliness has a significant negative impact on psychological well-being, with a path coefficient of -0.52, suggesting that increased loneliness leads to lower psychological well-being. Further calculations show that the indirect effect of academic burnout on psychological well-being through loneliness is -0.354, while the direct effect of academic burnout on psychological well-being is -0.17. These findings indicate that loneliness plays a partial mediating role in the relationship between

academic burnout and psychological well-being, meaning that academic burnout affects psychological well-being both directly and indirectly through loneliness.

Discussion

The Relationship between Academic Burnout and Psychological Well-being

The findings of this study provide significant insights into the complex relationships among academic burnout, loneliness, and psychological well-being. The results indicate that loneliness partially mediates the relationship between academic burnout and psychological well-being, highlighting its crucial role in shaping students' mental health outcomes. This section discusses the implications of these findings in relation to existing literature, potential explanations for observed patterns, and practical applications for educational institutions and policymakers.

Research findings indicate a significant negative correlation between academic burnout and psychological well-being. This suggests that higher levels of academic burnout are associated with poorer psychological well-being. Therefore, the null hypothesis (Ho1), which states that there will be no significant relationship between academic burnout and psychological well-being, is rejected. Regression analysis further shows that academic burnout serves as a negative predictor of mental health, meaning it can effectively forecast a decline in psychological well-being. As students experience increased academic burnout, they are more likely to face mental health challenges such as anxiety, depression, and lowered self-evaluation. This finding highlights that academic burnout not only affects academic performance but may also have detrimental effects on students' overall psychological adjustment.

These results align with Ryff's (1989) theory of psychological well-being, which conceptualizes mental health as a multidimensional construct encompassing personal growth, self-acceptance, life purpose, autonomy, environmental mastery, and positive relationships. When students experience academic burnout, they may perceive a decline in their abilities, struggle to achieve personal and academic goals, and encounter difficulties in decision-making and controlling their environment, ultimately leading to reduced psychological well-being (Ryff & Keyes, 1995). Additionally, from the perspective of psychological resources, academic burnout depletes individuals'mental energy, making it harder to maintain a positive emotional state, which in turn negatively impacts mental health.

The findings of this study are consistent with numerous previous studies. For instance, a study by Yu and Chae (2020), conducted in South Korea, found a negative correlation between academic burnout and psychological well-being among medical students. The study also revealed that first- and second-year preclinical students experienced higher levels of academic burnout compared to third- and fourth-year clinical students. This suggests that lower-year students have lower psychological well-being. The study also highlighted that academic burnout is a significant factor influencing psychological well-being, emphasizing the importance of interventions aimed at improving psychological well-being. Similarly, Wei et al. (2021) found that academic burnout is not only negatively correlated with psychological well-being but also with students' academic engagement. This indicates that students experiencing academic burnout tend to lack investment and enthusiasm for their studies, which in turn affects their overall mental health.

Research by Rehman, Bhuttah, and You (2020), conducted in China, also supports these findings. Their study explored the link between academic burnout and psychological well-being across different educational systems and revealed a negative correlation between the two. Overall, these studies consistently show that academic burnout is a critical factor affecting students' psychological well-being, with its mechanisms likely involving emotional exhaustion, depersonalization, and a sense of low achievement.

However, the results of this study also contrast with certain research findings. In some cultural contexts, academic burnout may not have a significant negative impact on psychological well-being, and may even have positive effects in certain situations. For example, Li & Hasson (2020) noted that in some cultures, academic burnout is seen as a necessary path to success, and students may internalize it as part of the process of achieving their goals. In these cultural contexts, students may view their fatigue and stress as part of their efforts, which may not significantly diminish their psychological well-being.

Particularly in countries with a collectivist culture, such as Malaysia, academic achievement is often highly valued socially, and students' psychological well-being is often influenced by their sense of academic accomplishment (Kotera & Ting, 2021).

The Relationship between Academic Burnout and Loneliness

The research results indicate a positive correlation between academic burnout and loneliness ($p < 0.05$). When students experience high levels of academic pressure and exhaustion, they may feel overwhelmed by their academic burdens, leading to energy depletion and a lack of motivation to continue learning. This results in a negative attitude toward both their studies and social relationships, reducing interactions with classmates and friends (Misirlis, Zwaan & Weber, 2020; Viner et al., 2022). Prolonged high-intensity studying leads to mental and physical fatigue, leaving students with little energy for socializing, which in turn reduces social connections and intensifies feelings of loneliness (Hawkley & Cacioppo, 2010). Therefore, the null hypothesis (Ho6), which states that there will be no significant relationship between academic burnout and loneliness, is rejected.

These findings support the evolutionary theory of loneliness (Cacioppo & Cacioppo, 2018), which suggests that loneliness triggers stress responses and, if sustained, may lead to issues with psychological well-being. In an academic context, students facing burnout may isolate themselves, further exacerbating their loneliness and negatively impacting their psychological well-being.

When students experience academic burnout, they may develop a negative attitude toward both learning and socializing, reducing their proactive communication, which ultimately intensifies feelings of loneliness (Hysing et al., 2020). Due to prolonged academic pressure, students may begin to doubt their abilities, believing they are unable to meet academic demands, which in turn leads to a loss of social confidence and an increase in loneliness. Self-doubting students are more likely to avoid social interactions because they fear exposing their inadequacies in social settings (Lin & Huang, 2012; Yuan et al., 2023).

The results of this study align with previous research. Bhagchandani (2017) found that students in high-stress academic environments are more likely to report high levels of

loneliness, a phenomenon closely related to emotional exhaustion. Students experiencing academic burnout are more likely to feel lonely than those with lower burnout levels, especially in the absence of social support. Burned-out students often lack the motivation to interact with others, leading to a shrinking social circle and deepening loneliness (Vasileiou et al., 2019). Dopmeijer et al. (2022) found that depersonalization is one of the main predictors of social isolation among students. Eriş and Barut (2020) also found that burned-out students tend to have higher social avoidance tendencies, which contributes to an increase in loneliness.

The Relationship between Loneliness and Psychological Well-Being

The correlational analysis in this study revealed a statistically significant negative relationship between students' loneliness and their psychological well-being ($p < 0.001$), indicating that higher loneliness scores were associated with lower well-being scores. In other words, as students' feelings of loneliness increase, their psychological well-being tends to decline. This finding is consistent with prior research; for example, Bhaghchandani (2017) similarly reported a significant inverse correlation between loneliness and psychological well-being.

Importantly, the link between loneliness and reduced well-being has been tied to elevated stress and negative affect. Richardson, Elliott, and Roberts (2017) found that college students with stronger feelings of loneliness showed significantly poorer mental health, including higher levels of anxiety, depression, and stress. These results suggest that social isolation can directly harm students' psychological health by exacerbating stress and depressive symptoms. In the context of hypothesis testing, the null hypothesis H03 (which posits no significant relationship between loneliness and psychological well-being) is not supported by the data. Because the observed correlation is statistically significant ($p < 0.001$), we reject H03 and conclude that there is a significant negative relationship between loneliness and psychological well-being in this sample. We reject H03 (no relationship) because the correlation between loneliness and psychological well-being is statistically significant ($r = -0.520$, $p < 0.001$).

This finding aligns with a large body of research indicating that loneliness is a key predictor of poor psychological well-being. Loneliness has been linked to various negative psychological effects, including lower self-esteem, increased rumination, and heightened sensitivity to social threats-all of which contribute to a decline in psychological well-being (Lazuras, Ypsilanti & Mullings, 2024; Piejka, Wiśniewska & Okruszek, 2024).

The evolutionary theory of loneliness (Cacioppo & Cacioppo, 2018) suggests that loneliness serves as an adaptive mechanism, signaling individuals to reconnect with their social groups. However, when loneliness persists for an extended period, it can lead to heightened vigilance toward social threats, increased stress, and ultimately lower psychological well-being.

The negative correlation between loneliness and psychological well-being is consistent with previous research, though some studies offer more nuanced perspectives. Hickin et al. (2021) found that loneliness is distressing and associated with various psychological well-being issues, reinforcing the idea that prolonged isolation leads to poorer well-being. Similarly, Hancock, Liu, Luo, and Mieczkowski (2022) reported that loneliness is linked to higher levels

of psychological distress, including anxiety and depressive symptoms, further intensifying its negative impact on psychological well-being.

Çiçek (2021) studied 340 university students at Batman University in Turkey and found a significant negative correlation between loneliness and each of self-esteem, psychological well-being, and subjective well-being. The study also noted that female students tended to experience slightly lower levels of loneliness than male students. Moreover, self-esteem played a partial mediating role in the relationship between loneliness and well-being, significantly and positively predicting both psychological well-being and subjective well-being.

The Mediating Role of Loneliness on The Relationship between Academic Burnout and Psychological Well-Being

This study found that loneliness plays a statistically significant mediating role in the relationship between academic burnout and psychological well-being. Structural equation modeling results revealed that the indirect effect of academic burnout on psychological well-being through loneliness was significant, with a path coefficient of –0.354 and a p-value of 0.000. This indicates that individuals experiencing higher levels of academic burnout are more likely to feel lonely, which in turn further undermines their psychological well-being. These findings suggest that academic burnout not only has a direct negative impact on psychological well-being but also exerts an indirect effect by increasing feelings of loneliness (Zhou & Yu, 2021). Therefore, the null hypothesis (Ho4), which states that loneliness will not significantly mediate the relationship between academic burnout and psychological well-being, is rejected.

This aligns with the psychological well-being theory proposed by Ryff (1989), which highlights positive interpersonal relationships and a sense of environmental mastery as core components of well-being. Loneliness, by its very nature, disrupts these domains. When individuals experience chronic loneliness, they often report feeling disconnected and powerless in their environments, which directly undermines both relational satisfaction and a sense of agency-two pillars of Ryff's well-being framework. Empirical research has shown that persistent loneliness correlates with lower scores in Ryff' s dimensions of positive relations with others, self-acceptance, and purpose in life (Cahyadi, 2019).

Moreover, the evolutionary theory of loneliness by Cacioppo & Cacioppo (2018) provides a biological and psychological lens for interpreting these outcomes. From this perspective, loneliness is not merely a passive emotional state but an adaptive signal, akin to hunger or pain, that alerts the individual to potential threats to their social survival. However, prolonged exposure to loneliness can lead to heightened social vigilance, mistrust, and withdrawal, which ironically makes it more difficult for the individual to reconnect with others. This self-reinforcing cycle-where loneliness impairs social functioning, and impaired social functioning increases loneliness-can lead to further psychological deterioration, including increased risk for depression, anxiety, and poor emotional regulation.

The findings of this study align with some of the existing literature. For example, Juntunen et al. (2022) conducted their study in Finland and found that academic burnout significantly predicts loneliness, which in turn further lowers psychological well-being. This study emphasized the importance of managing academic stress to prevent loneliness. Arslan (2021)

showed that loneliness acts as a partial mediator between academic stress and psychological distress, suggesting that reducing loneliness could be a key pathway to mitigate the negative effects of academic burnout. Similarly, Kim et al. (2021) found in their study of South Korean university students that academic burnout not only directly impacts psychological well-being but also indirectly influences well-being by increasing loneliness.

While most studies support the mediating role of loneliness between academic burnout and psychological well-being, some research presents different viewpoints.
This study supports the mediating role of loneliness between academic burnout and psychological well-being, suggesting that reducing loneliness may be an effective strategy for alleviating the psychological negative impacts caused by academic burnout.

Limitations

Despite its contributions, this study has several limitations that should be acknowledged.
First, the use of a cross-sectional design limits the ability to infer causality between academic burnout, loneliness, and psychological well-being. While the study identifies significant associations, it cannot determine whether burnout directly causes changes in loneliness and well-being or whether other unmeasured factors contribute to these relationships (Maxwell & Cole, 2007). Longitudinal studies are needed to track how these relationships evolve over time and whether interventions can modify these effects. Future research should employ repeated-measure designs to observe the temporal progression of burnout and its impact on psychological outcomes (Taris & Kompier, 2014). Such studies could also help determine whether students naturally recover from burnout or whether prolonged exposure leads to long-term psychological consequences.

Second, the sample consisted only of students from a single university in Malaysia, which may restrict the generalizability of the findings to other cultural or educational contexts. Cultural values and academic expectations differ across regions, and the pressures associated with academic achievement may have varying effects on burnout and well-being (Chirkov, 2009). Future studies should include diverse student populations from different countries and academic institutions to better understand the universality or cultural specificity of these relationships (Smith & Khawaja, 2011). Comparative studies between Western and Asian educational systems, for example, could provide insights into how cultural factors shape students' experiences of burnout and loneliness.

Third, self-reported measures were used to assess burnout, loneliness, and psychological well-being, which may introduce social desirability bias or inaccuracies in participants' responses (Podsakoff et al., 2012). Self-reports are vulnerable to subjective interpretation and may not fully capture the complexities of students' emotional states. Future studies could incorporate objective behavioral measures, such as physiological indicators of stress (e.g., cortisol levels, heart rate variability) or real-time mood-tracking applications, to validate self-reported data (Sandvik, Diener & Seidlitz, 1993). Additionally, the use of experience sampling methods (ESM) could provide moment-to-moment assessments of students' psychological states, offering a more dynamic understanding of how burnout and loneliness fluctuate over time (Myin-Germeys et al., 2018).

Another limitation is that the study did not explore potential moderating variables, such as personality traits or coping strategies, that might influence the relationship between burnout, loneliness, and well-being. Research has shown that factors such as resilience (Tugade & Fredrickson, 2004), emotional intelligence (Zeidner et al., 2012), and social support (Hefner & Eisenberg, 2009) can buffer the negative effects of burnout. Future research could examine these variables to identify which students are most vulnerable or most resilient to burnout's effects. Understanding these moderators could help develop more targeted interventions to support students at risk of experiencing severe burnout and loneliness.

Additionally, intervention-based studies are necessary to test strategies aimed at reducing burnout and loneliness. Experimental research on the effectiveness of structured social engagement programs (Walton, Logel, Peach, Spencer & Zanna, 2015), cognitive reframing techniques (Gross, 2015), or resilience-building workshops (Southwick & Charney, 2012) could provide valuable insights for educational institutions seeking to improve student mental health. By implementing and evaluating evidence-based interventions, universities can develop tailored strategies to help students navigate academic stress while maintaining their psychological well-being. Further qualitative studies could explore students' living experiences of burnout and loneliness, providing richer, more nuanced data on how these factors interact (Braun & Clarke, 2013).

Overall, while this study sheds light on the relationships between academic burnout, loneliness, and psychological well-being, future research must address these limitations to deepen our understanding and develop effective interventions that promote student well-being in diverse academic settings.

Theoretical and Contextual Contribution

This study makes a significant theoretical contribution by integrating Ryff's Psychological Well-being Theory (Ryff, 1989; Ryff & Keyes, 1995) and the Evolutionary Theory of Loneliness (Cacioppo & Cacioppo, 2018) to construct a comprehensive framework explaining how academic burnout impacts psychological well-being through the mediating role of loneliness. While prior research has often examined these constructs in isolation, this study bridges the conceptual gap by demonstrating how loneliness functions not merely as an outcome but as a psychological mechanism that intensifies the impact of burnout on mental health (Cacioppo & Hawkley, 2009; Bhagchandani, 2017). The findings contribute to existing knowledge by highlighting the multidimensional interplay between emotional exhaustion, social disconnection, and diminished psychological functioning, offering a validated mediation model supported by structural equation modeling (Kline, 2012; Preacher & Hayes, 2008). This reinforces the theoretical argument that mental health research in academic contexts should adopt integrative models that account for both intrapersonal and interpersonal processes (Keyes, Shmotkin & Ryff, 2002).

Contextually, this research provides valuable insights into the psychological experiences of university students in Malaysia, a population that has been underrepresented in academic burnout research (Baik, Larcombe, & Brooker, 2019). In collectivist cultures such as Malaysia, academic achievement is often intertwined with social expectations and familial pressure, which may intensify both burnout and loneliness (Kotera & Ting, 2021; Chirkov, 2009). The study sheds light on the paradox of digital hyper-connectivity and emotional isolation-a

phenomenon described as 'crowded loneliness'-that is particularly relevant in post-pandemic educational environments (Peloso et al., 2021; Hancock et al., 2022). These contextual dynamics make it imperative for universities to address not only the academic demands placed on students but also the quality of their social and emotional lives. Therefore, this study not only expands theoretical understanding but also provides culturally relevant evidence to inform targeted mental health interventions and university policy development.

Future Research Directions

Future research should employ longitudinal designs to better understand the causal pathways and temporal relationships among academic burnout, loneliness, and psychological well-being. While cross-sectional studies provide valuable insights into associations between these variables, longitudinal research would allow for a more precise examination of how burnout develops over time, whether loneliness fluctuates as a consequence, and how these experiences impact long-term psychological well-being. Longitudinal studies can also help determine whether interventions effectively reduce burnout and loneliness or if these conditions persist despite institutional support.

Comparative studies across different cultural or educational contexts could shed light on the generalizability of these findings and explore potential cultural mediators. Academic stressors, societal expectations, and coping mechanisms vary across cultures, and understanding these differences can provide a more nuanced perspective on how burnout and loneliness manifest in diverse student populations. For example, research has shown that collectivist cultures emphasize social harmony and familial expectations, which may alter the ways students experience and cope with burnout (Chirkov, 2009). Comparative studies between students in Western and Asian education systems could reveal distinct patterns in how academic pressure influences psychological well-being.

Experimental studies could assess the efficacy of targeted interventions, such as resilience training, cognitive-behavioral strategies, or social support programs, in mitigating the effects of academic burnout on mental health. Randomized controlled trials (RCTs) could be used to evaluate intervention effectiveness by comparing student groups receiving different types of support. For instance, some interventions may focus on promoting emotional regulation and stress management, while others emphasize peer mentorship and community engagement. Evaluating these strategies would help educational institutions develop evidence-based programs tailored to students' needs.

Incorporating qualitative methods, such as interviews or focus groups, could provide a deeper understanding of students' living experiences and the mechanisms underlying these relationships. While quantitative research identifies statistical trends, qualitative approaches offer rich, detailed narratives that capture personal insights into how students perceive and navigate academic burnout and loneliness. Through thematic analysis, researchers can explore coping mechanisms, social support systems, and personal growth emerging from these challenges (Braun & Clarke, 2013). Qualitative research can also help refine intervention strategies by incorporating students' perspectives on what support mechanisms they find most effective.

By integrating longitudinal, comparative, experimental, and qualitative approaches, future research can build a more comprehensive understanding of the complex interactions between academic burnout, loneliness, and psychological well-being. Such studies will not only advance theoretical knowledge but also inform practical interventions aimed at improving student mental health and academic resilience.

Conclusion

This study provides valuable insights into the complex interplay between academic burnout, loneliness, and psychological well-being. Contrary to conventional views, the findings suggest that academic burnout and loneliness can, in some cases, contribute positively to students' psychological well-being by fostering resilience, self-reflection, and personal growth. These results align with Ryff's theory of psychological well-being, which emphasizes the role of autonomy, purpose, and self-acceptance in overall mental health.

The implications of these findings highlight the importance of understanding the nuanced effects of burnout and loneliness. Rather than being solely detrimental, these experiences can serve as catalysts for self-improvement and increased emotional resilience when properly managed. Universities and policymakers should recognize the dual nature of burnout and loneliness, integrating intervention programs that harness their potential benefits while mitigating their harmful effects.

Future research should continue to explore these relationships in diverse cultural and academic settings. Longitudinal studies are particularly needed to determine the long-term impact of academic burnout and loneliness on psychological well-being. Additionally, further investigation into personality traits and coping mechanisms that influence these dynamics could provide a more comprehensive understanding of how students navigate academic stress and isolation.

Overall, this study contributes to the growing body of literature on student mental health, emphasizing the importance of a balanced approach to managing burnout and loneliness. By fostering environments that encourage self-reflection, resilience, and social engagement, educational institutions can better support students in their pursuit of both academic success and psychological well-being.

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