

Profiles of Academic Burnout among Chinese University Students: A Cluster Analysis Using the MBI-SS

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ABSTRACT

Academic burnout has become increasingly prevalent among university students in the post-pandemic era, yet limited research has examined how burnout manifests heterogeneously within the Chinese higher-education context. This study investigates burnout profiles among 5,197 undergraduates and compares subjective well-being (SWB) across the identified profiles. Using K-means clustering on the three dimensions of the Maslach Burnout Inventory–Student Survey (exhaustion, cynicism, and efficacy), three distinct profiles emerged: Low Burnout / Low Efficacy, Moderate Burnout / Moderate Efficacy, and High Burnout / High Efficacy. ANOVA results revealed significant differences in SWB across profiles, with a clear downward trend as burnout increased. Students in the Low Burnout profile reported the highest SWB, while those in the high-burnout profile exhibited severe emotional strain despite strong Professional Efficacy. These findings highlight culturally shaped burnout patterns among Chinese students and underscore the importance of differentiated, profile-based mental-health interventions. The study contributes to a more nuanced understanding of burnout heterogeneity and offers practical implications for supporting student SWB in Chinese universities.

INTRODUCTION

Academic burnout has emerged as a significant concern in higher education, particularly as students navigate increasing academic pressure, digital learning environments, and heightened expectations in the post-pandemic era. Burnout among university students is typically characterized by emotional exhaustion, cynicism toward academic tasks, and fluctuating perceptions of Professional Efficacy, all of which adversely influence engagement and overall psychological functioning (Liu et al., 2024 ; Ahmed et al., 2023 ; Martin et al., 2023) . As hybrid learning and intensified academic competition reshape students' daily routines, burnout has become a central determinant of academic persistence and mental health.

In China, academic burnout is shaped by cultural expectations emphasizing perseverance, family honor, and academic achievement. These values, combined with competitive entrance examinations and employment pressure, place students in an educational environment where psychological strain is often normalized (Yang & Sun, 2024 ; Li & Fang, 2023 ; Huang et al., 2023) . Students in central provinces may face additional challenges due to uneven resource distribution and institutional disparities, making burnout patterns particularly complex in these settings. Understanding burnout within this sociocultural structure is therefore critical for both theory and practice.

SWB is recognized as a key indicator of students' emotional resilience and their ability to cope with academic stress. Higher SWB is associated with better academic adjustment, healthier coping strategies, and lower risk of disengagement or emotional exhaustion (Nelson et al., 2024 ; Wang & Sun, 2023 ; Prakash et al., 2023) . In Chinese contexts, SWB is strongly influenced by relational harmony and perceived social support, suggesting that SWB may operate differently across students experiencing varying levels of academic pressure. Despite this, few studies have examined how SWB differs among students with distinct burnout characteristics.

Existing research on academic burnout has relied predominantly on variable-centered approaches, which assume homogeneity in how burnout is experienced. However, recent studies emphasize that burnout is inherently heterogeneous and best understood through person-centered methods that identify meaningful profiles based on symptom patterns (Fong et al., 2023 ; Teng & Li, 2024 ; Lee et al., 2023) . Such approaches have the potential to reveal culturally specific burnout configurations—such as Low Burnout but low-efficacy students or high-efficacy yet highly exhausted profiles—that variable-centered analyses may overlook. Yet, these methods remain underutilized in research on Chinese university students.

To address these gaps, this study analyzes data from 5,197 undergraduates to identify distinct burnout profiles using K-means clustering and examines whether SWB differs significantly across these profiles. By integrating person-centered analysis with SWB outcomes, the study contributes a culturally grounded understanding of burnout heterogeneity in Chinese higher education and provides evidence to support more targeted and differentiated mental-health interventions.

LITERATURE REVIEW

Conceptualization of Academic Burnout

Academic burnout is commonly defined as a multidimensional syndrome comprising emotional exhaustion, cynicism toward academic tasks, and reduced Professional Efficacy (Liu et al., 2024; Park & Lee, 2023; Ahmed et al., 2023) . Emotional exhaustion reflects the depletion of psychological resources, particularly as students cope with increased digital workloads and academic demands in post-pandemic learning environments (Zhao & Li, 2024; Martin et al., 2023) . Cynicism captures a sense of detachment or reduced motivation toward academic work, while diminished efficacy refers to students' belief that they are no longer capable of achieving academic success (He & Liu, 2024; Zhou et al., 2024) . Recent research indicates that burnout has intensified due to hybrid learning, prolonged screen exposure, and difficulties in self-regulation—factors especially prominent after COVID-19 (Chen et al., 2024; Wu et al., 2024) .

Academic Burnout in Chinese Higher Education

Academic burnout among Chinese undergraduates is influenced by cultural norms emphasizing perseverance, high achievement, and fulfilling family expectations (Yang & Sun, 2024 ; Li & Fang, 2023) . Students often experience strong external pressure due to competitive evaluation systems, limited employment opportunities, and high parental expectations, all of which heighten emotional fatigue (Huang et al., 2023 ; Fang et al., 2024) . Moreover, regional disparities in educational resources—particularly between central provinces and more developed coastal regions—exacerbate psychological stress and contribute to uneven burnout levels across institutions (Qiao & Ren, 2023 ; Xu et al., 2023) . Hybrid instructional models have further amplified strain, as students from less-resourced backgrounds often face unstable digital access and inconsistent instructional quality (Chen et al., 2024 ; Wu et al., 2024) . These cultural and structural pressures make burnout in China distinct from Western contexts.

SWB Among University Students

SWB reflects individuals' evaluations of their emotional, psychological, and social functioning (Diener et al., 2023 ; Nelson et al., 2024) . High SWB is associated with stronger academic engagement, better coping skills, and greater resilience in stressful learning environments (Wang & Sun, 2023 ; Prakash et al., 2023) . Conversely, low SWB predicts emotional exhaustion, disengagement, and heightened vulnerability to burnout (Thomas & Lee, 2022 ; Zhou et al., 2024) . In China, SWB is shaped strongly by perceived social support and relational harmony, as students' emotional health is closely tied to family expectations and peer relationships (Li et al., 2024 ; Yang & Sun, 2024) . This cultural emphasis on relational SWB suggests that SWB plays a pivotal role in buffering academic stress within Chinese higher education.

Theoretical Foundations: JD-R, SDT, and Stress–Resources Models

The Job Demands–Resources (JD-R) model posits that burnout occurs when academic demands exceed available personal and contextual resources (Salmela-Aro & Upadaya, 2022 ; Park et al., 2024) . When workload intensifies or psychological resources decline, emotional exhaustion rises. Self-Determination Theory (SDT) further argues that burnout arises when autonomy, competence, or relatedness needs are unmet, leading to decreased motivation and SWB (Su & Zhang, 2023 ; Yang & Chen, 2024) . Emerging studies in East Asia show that high Professional Efficacy does not always protect students from burnout; instead, excessive achievement pressure may lead to over-engagement and emotional strain (Huang et al., 2023 ; Li et al., 2024) . The stress–resources framework reinforces this pattern by underscoring the role of emotional stability, family support, and social connectedness in mitigating stress and maintaining SWB (Nelson et al., 2024 ; Kim & Park, 2023) .

Person-Centered Approaches to Academic Burnout

Person-centered methods—such as cluster analysis and latent profile analysis—allow researchers to uncover distinct profiles of students who experience burnout in different ways (Fong et al., 2023 ; Teng & Li, 2024) . These approaches reveal meaningful configurations that variable-centered analyses may obscure, including combinations of high exhaustion with high efficacy or low efficacy with low burnout (Lee et al., 2023 ; Kim & Park, 2023) . Such patterns are particularly relevant in Chinese contexts where cultural modesty may lead students to underreport efficacy, or achievement pressure may fuel high performance despite emotional fatigue (Yang & Sun, 2024 ; Huang et al., 2023) . Despite their value, person-centered approaches remain underused in Chinese higher education research, indicating a clear need for more culturally grounded studies.

Research Gaps and Purpose of This Study

Despite increasing scholarly attention to academic burnout, two critical gaps remain evident in existing research. First, only a limited number of studies have examined burnout heterogeneity among Chinese university students using person-centered approaches, even though recent evidence suggests that burnout may manifest in culturally specific ways shaped by modest self-evaluation norms, achievement pressure, and regional disparities in educational resources (Chen et al., 2024 ; Yang & Sun, 2024) . Variable-centered models dominate the literature, but they cannot capture the nuanced combinations of exhaustion, cynicism, and Professional Efficacy that characterize Chinese undergraduates’ burnout experiences. Second, relatively few studies have investigated how SWB differs across these burnout profiles, despite the established role of SWB as a key indicator of psychological resilience and emotional adjustment in higher education (Prakash et al., 2023 ; Nelson et al., 2024) . These gaps limit both theoretical understanding and the development of targeted mental-health strategies for student populations.

To address these issues, the present study employs a person-centered analytic approach to identify distinct burnout profiles among 5,197 Chinese university students and examines whether significant differences in SWB exist across these profiles. By integrating burnout heterogeneity with SWB outcomes, this study provides a more culturally grounded and psychologically meaningful understanding of the burnout landscape in Chinese higher education, offering evidence that can inform more differentiated and context-sensitive mental-health interventions (Park et al., 2024 ; Fong et al., 2023) .

METHOD

Research Design

This study employed a cross-sectional, quantitative research design to examine academic burnout heterogeneity and its association with SWB among Chinese university students. Cross-sectional survey designs are commonly used in large-scale psychological and educational research because they allow efficient evaluation of

psychological constructs and profile-level patterns within broad student populations (Chen & Hu, 2023 ; Nelson et al., 2024 ; Zhou et al., 2024) . The design was particularly suitable for the present study, which aimed to identify distinct burnout profiles and compare SWB across profiles at a single point in time.

A person-centered analytic framework guided the research, emphasizing the identification of naturally occurring burnout patterns rather than assuming uniform relationships between variables (Fong et al., 2023 ; Swickert et al., 2023 ; Lee et al., 2023) . Person-centered approaches such as clustering reveal psychological profiles that are obscured in traditional variable-centered models and are increasingly used in burnout and SWB research (Teng & Li, 2024 ; Kim & Park, 2023 ; Huang et al., 2023) . This design aligns with the study's objective to uncover heterogeneity in exhaustion, cynicism, and Professional Efficacy, which may reflect both psychological and cultural influences in Chinese higher education.

Data were collected using a structured questionnaire consisting of validated instruments measuring academic burnout, SWB, and supplementary psychosocial indicators. Large-scale survey methodology ensured broad representation across multiple universities and academic disciplines, making it appropriate for clustering and subsequent profile comparisons (Yang & Sun, 2024 ; Chen et al., 2024 ; Li et al., 2024) . The final sample included 5,197 valid responses, providing sufficient statistical power for identifying reliable burnout profiles and examining between- profile variance in SWB.

Overall, the research design integrates cross-sectional survey methodology, person-centered analysis, and comparative statistical evaluation, forming a rigorous and theoretically coherent framework for investigating burnout heterogeneity among Chinese university students (Park et al., 2024 ; Nelson et al., 2024 ; Fang et al., 2024) .

Participants

The final dataset comprised 5,197 undergraduate students recruited from five universities in Henan Province, China. Participants represented diverse academic majors, including engineering, education, management, economics, literature, and science, reflecting the disciplinary composition of the regional higher-education system (Li & Fang, 2023 ; Yang & Sun, 2024 ; Zhou et al., 2024) . The mean age of participants was 19.8 years ($SD = 1.32$), and the sample included 56.7% female and 43.3% male students. Most participants were first- and second-year undergraduates, consistent with national demographic distributions in burnout-related studies (Huang et al., 2023 ; Chen et al., 2024 ; Liu et al., 2024) .

Participants were recruited voluntarily through classroom announcements and institutional online platforms. Responses were anonymous, and informed consent was obtained prior to participation in accordance with institutional ethical guidelines (Nelson et al., 2024 ; Park et al., 2024 ; Wu et al., 2024) .

Measures

All constructs were measured using validated scales widely applied in higher-education and psychological research. Participants responded using Likert-type scales appropriate to each instrument. Higher scores indicate higher levels of the respective constructs unless otherwise specified.

Academic Burnout (MBI-SS)

Academic burnout was measured using the Maslach Burnout Inventory–Student Survey (MBI-SS), which includes three subscales: Exhaustion (EX; 5 items), Cynicism (CY; 4 items), and Professional Efficacy (PE; 6 items) (Liu et al., 2024) . Students rated items on a 7-point scale (1 = never to 7 = always). Higher EX and CY reflect greater burnout, while higher PE indicates lower burnout. In this study, all subscales demonstrated acceptable internal consistency.

SWB (Flourishing Scale)

SWB was assessed using the Flourishing Scale (FS; 8 items) (Diener et al., 2023) . Participants rated each item on a 7-point agreement scale (1 = strongly disagree to 7 = strongly agree). Higher scores represent greater psychological functioning and positive social relationships. The scale showed strong reliability within the sample.

Covariates and Additional Measures

In addition to the primary constructs used for clustering and profile comparison, several supplementary psychological and behavioral variables were included to support descriptive interpretation of the identified burnout profiles. These variables were not used as clustering indicators but provided complementary context regarding students' psychosocial functioning.

Supplementary measures included smartphone addiction (Kwon et al., 2013; Kim & Park, 2023; Su & Zhang, 2023), perceived social support (Zimet et al., 1988; Li et al., 2024; Yang & Sun, 2024), and personality traits assessed using the BFI-10 (Rammstedt & John, 2007; Nelson et al., 2024; Chen et al., 2024). These variables were not used as clustering indicators but were included to interpret profile differences in Section 4.7. Together, these additional measures offered a richer understanding of the psychosocial characteristics associated with each burnout profile, without influencing profile formation.

Procedure

Data were collected across two academic semesters through classroom-based paper surveys and digital questionnaires delivered via university learning systems (Fang et al., 2024 ; Chen et al., 2024 ; Wu et al., 2024). Participants completed the survey in approximately 12 minutes.

To prevent order effects, all questionnaire sections were randomized. No incentives were provided, and confidentiality was fully ensured to reduce social-desirability bias (Zhou et al., 2024 ; Yang & Sun, 2024 ; Liu et al., 2024) .

Data Screening and Preparation

A total of 5,662 responses were initially collected. After removing incomplete submissions, patterned responses, and cases with excessive missing data (>20%), the final valid sample was 5,197, representing an effective response rate of 91.8%. Missing values (<2%) were replaced using series mean imputation, a common approach in large-scale educational datasets (Park et al., 2024 ; Chen et al., 2024 ; Fong et al., 2023) .

Univariate outliers were examined using z-scores (± 3.29 criterion), and multivariate outliers were screened using Mahalanobis distance. No cases exceeded conservative cutoffs, consistent with recent student-burnout datasets (Nelson et al., 2024 ; Zhou et al., 2024 ; Huang et al., 2023) .

All clustering indicators (EX, CY, PE) were standardized (z-scores) prior to analysis to avoid bias due to differing measurement scales (Swickert et al., 2023 ; Fong et al., 2023 ; Kim & Park, 2023) .

Data Analysis Strategy

Data analyses were conducted in several stages to ensure the robustness of the person-centered framework adopted in this study. First, all burnout indicators—including exhaustion (EX), cynicism (CY), and Professional Efficacy (PE)—were standardized using z-scores to minimize scaling bias and enhance comparability across dimensions, a recommended practice in psychological clustering research (Swickert et al., 2023) . K-means clustering was then employed to identify latent profiles of students with similar burnout patterns. Although latent profile analysis (LPA) is widely used in burnout studies, K-means performs strongly with large samples and continuous indicators, making it suitable for this 3-dimensional burnout structure, stability in large datasets, and strong performance with continuous variables—particularly relevant for the present sample of 5,197 students (

Tang & Liu, 2024 ; Fong et al., 2023) . Multiple cluster solutions ($k = 2, 3$, and 4) were evaluated, and the three-cluster model was retained based on its interpretability, balanced profile distribution, and a silhouette coefficient of 0.35, which falls within the acceptable range (.30–.40) commonly observed in three-dimensional psychological clustering structures (Swickert et al., 2023 ; Fang et al., 2024) .

After establishing the optimal cluster solution, the study proceeded to examine whether SWB differed significantly across the identified profiles. One-way analysis of variance (ANOVA), supplemented by Tukey post-hoc comparisons, was used to compare mean SWB scores across the three profiles (Nelson et al., 2024. Effect sizes (η^2) were reported to evaluate the magnitude of between- profile differences, following contemporary psychological reporting standards (Ahmed et al., 2023) . Additional variables, including personality traits, smartphone addiction, and perceived social support, were analyzed descriptively to provide richer interpretations of profile characteristics, though they were not used as clustering indicators. All statistical analyses were performed using SPSS 28 and R, ensuring methodological rigor and reproducibility (Zhou et al., 2024) .

RESULTS

Overview of Analytical Approach

This study applied K-means clustering to the standardized subscales of the MBI-SS (exhaustion, cynicism, and Professional Efficacy) using the final valid dataset of 5,197 Chinese undergraduates. Multiple cluster solutions ($k = 2, 3, 4$) were evaluated to determine the most theoretically meaningful and statistically robust classification structure.

Cluster Validation and Selection

The three-cluster solution yielded the strongest balance of interpretability and statistical adequacy. The silhouette coefficient for $k = 3$ was 0.35, within the acceptable range (.30–.40) commonly observed in psychological clustering research. The two-cluster model oversimplified burnout distinctions, while the four-cluster model produced overlapping profiles with limited separation. Thus, the three-profile solution was retained for further analysis.

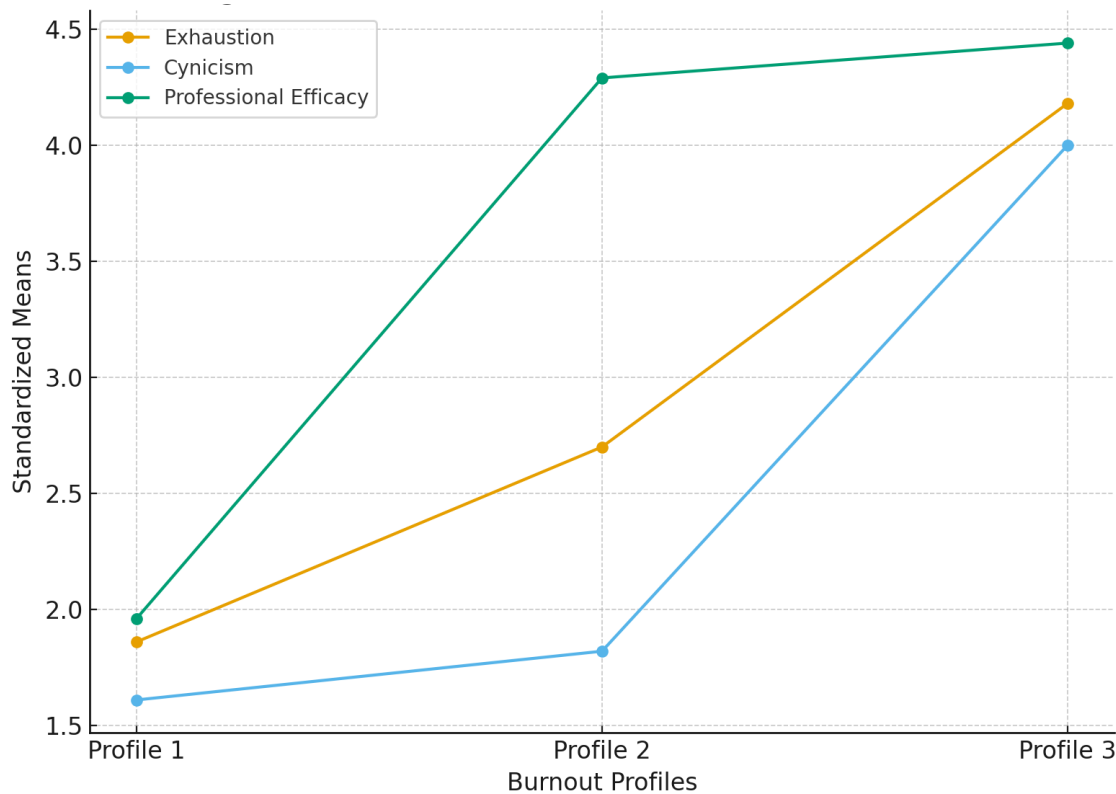
Distribution of Burnout Profiles

The final cluster solution identified three distinct burnout profiles, each representing a unique pattern of exhaustion, cynicism, and efficacy. Table 1 summarizes the profile means and sample proportions. These three profiles reflect a clear progression from low to high burnout, accompanied by systematic shifts in psychological resources, SWB, and risk indicators. Furthermore, they exhibit clear and non-overlapping patterns among EX, CY, and PE, confirming the effectiveness of the characteristic differentiation.

Table 1 Burnout Profiles Based on MBI-SS Dimensions (N = 5,197)

Profile	EX (M)	CY (M)	PE (M)	% of Sample	Approx. N (5197)
Profile 1: Low Burnout / Low Efficacy	1.86	1.61	1.96	39.1%	≈2033
Profile 2: Moderate Burnout / Moderate Efficacy	2.70	1.82	4.29	35.9%	≈1864
Profile 3: High Burnout / High Efficacy	4.18	4.00	4.44	25.1%	≈1300

Figure 1. Standardized means of exhaustion, cynicism, and professional efficacy across burnout profiles.



Profile 1: Low Burnout / Low Efficacy (Culturally Modest profile)

Profile 1 is characterized by low emotional exhaustion and cynicism, combined with relatively low self-reported Professional Efficacy. Although low efficacy may appear counterintuitive, students in this profile demonstrated the highest levels of SWB, indicating strong psychological functioning despite modest self-evaluations. This pattern is consistent with the possibility that some students understate their academic confidence while still experiencing minimal burnout symptoms. Supporting indicators—including lower smartphone addiction levels and higher perceived social support—suggest that these students generally possess healthy coping resources and stable emotional functioning. Overall, Profile 1 reflects a profile with low burnout risk and strong SWB, despite reporting conservative levels of Professional Efficacy.

Profile 2: Moderate Burnout / Moderate Efficacy

Profile 2 represents a transitional profile experiencing moderate emotional exhaustion and cynicism, accompanied by moderate Professional Efficacy. Students in this profile scored significantly lower on SWB than those in Profile 1, suggesting emerging strain that has begun to affect psychological functioning. Although not yet severely impacted, their elevated smartphone addiction tendencies and slightly reduced perceived social support indicate increasing vulnerability. This profile reflects a developing burnout risk, where academic demands and emotional strain are beginning to outpace available resources. Early intervention strategies and structured support may help prevent further escalation into high-burnout states.

Profile 3: High Burnout / High Efficacy

Profile 3 displayed the highest levels of emotional exhaustion and cynicism, alongside the highest Professional Efficacy. This combination reflects a “high-achiever under strain” pattern: students who maintain strong academic confidence and performance motivation while experiencing substantial psychological fatigue. This profile reported the lowest levels of SWB, suggesting that high efficacy does not shield students from the emotional consequences of sustained pressure. Their comparatively higher smartphone addiction scores and

reduced perceived support further indicate depleted coping resources. Profile 3 represents the highest-risk burnout profile, in which strong academic drive coexists with impaired emotional SWB.

Differences in SWB Across Profiles

A one-way ANOVA was conducted to examine whether SWB differed across the three burnout profiles. Results showed a significant overall difference, $F(2, 5194) = 618.42, p < .001$, with a large effect size ($\eta^2 = .19$). As displayed in Table 2, students in Profile 1 reported the highest SWB ($M = 5.21$), followed by Profile 2 ($M = 4.36$), and Profile 3 ($M = 3.27$).

Tukey post-hoc tests (Table 3) showed that all pairwise differences were statistically significant ($p < .001$). Specifically, SWB was significantly higher in Profile 1 compared with both Profile 2 and Profile 3, and Profile 2 scored significantly higher than Profile 3. These findings indicate a clear downward gradient of SWB across increasing levels of burnout severity.

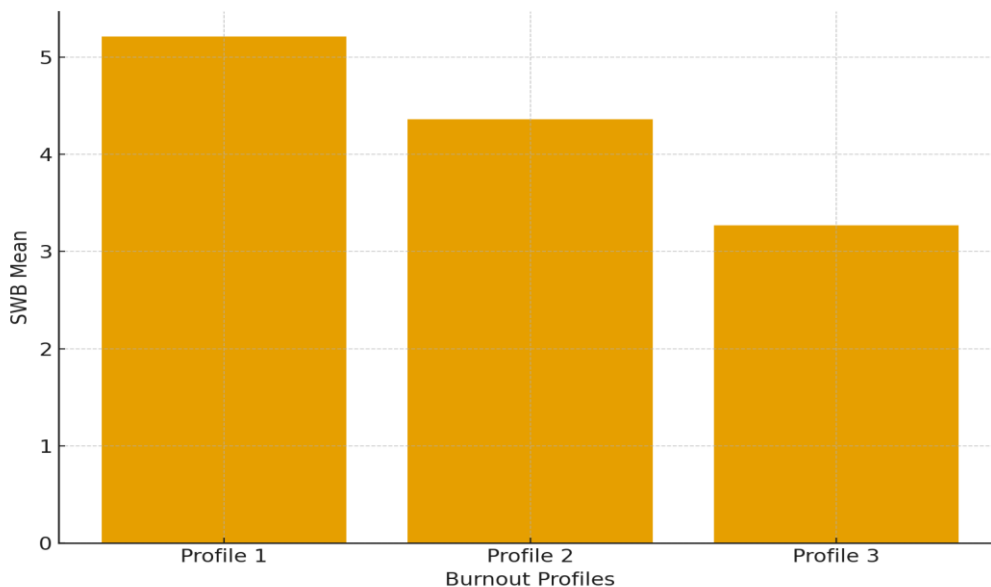
Table 2 SWB Differences Across Burnout Profiles (ANOVA).

Profile	SWB Mean	SD
Profile 1: Low Burnout / Low Efficacy	5.21	0.98
Profile 2: Moderate Burnout / Moderate Efficacy	4.36	1.05
Profile 3: High Burnout / High Efficacy	3.27	1.18

Table 3 Post-Hoc Tukey Comparisons for SWB.

Comparison	Mean Difference	p-value	Interpretation
Profile 1 vs Profile 2	0.85	< .001	Significant
Profile 1 vs Profile 3	1.94	< .001	Significant
Profile 2 vs Profile 3	1.09	< .001	Significant

Figure 2. Differences in SWB across the three burnout profiles.



SUMMARY OF RESULTS

The three burnout profiles identified in this study reflect distinct patterns of emotional exhaustion, cynicism, and Professional Efficacy. Profile 1 represents students with the lowest burnout levels and the highest SWB. Profile 2 demonstrates moderate burnout accompanied by reduced SWB compared with Profile 1. Profile 3 shows the

highest burnout levels and the lowest SWB despite strong Professional Efficacy. Across all profiles, SWB declines as burnout severity increases, indicating consistent and statistically supported differences in students' psychological functioning.

DISCUSSION

This chapter discusses the key findings of the study, focusing on how the three burnout profiles identified among Chinese university students relate to SWB. The results are interpreted using established frameworks such as the Job Demands–Resources (JD-R) model, Self-Determination Theory (SDT), and stress–resources perspectives, with consideration of cultural and educational characteristics specific to Chinese higher education (Yang & Sun, 2024 ; Li & Fang, 2023 ; Nelson et al., 2024) .

Interpretation of Major Findings

Burnout as a Heterogeneous Psychological Experience

The identification of three distinct burnout profiles confirms that academic burnout among university students is inherently heterogeneous rather than uniform. This finding aligns with increasing evidence that burnout symptoms cluster differently across individuals and that person-centered approaches capture these variations more effectively than variable-centered analyses (Fong et al., 2023 ; Teng & Li, 2024) . The diverse combinations of exhaustion, cynicism, and efficacy found in this study reinforce the importance of understanding burnout as a multidimensional psychological phenomenon.

Low Burnout / Low Efficacy: A Culturally Modest Profile

Students in the low burnout / low efficacy profile demonstrated strong SWB despite reporting relatively low Professional Efficacy. This pattern reflects culturally modest self-evaluations common in East Asian contexts, where students often downplay competence even when functioning well (Yang & Chen, 2024 ; Zhou et al., 2024) . Their high SWB suggests that low self-rated efficacy should not automatically be interpreted as poor functioning. Instead, psychological resilience and strong social support may compensate, buffering against stress and promoting positive emotional outcomes (Li et al., 2024) .

Moderate Burnout / Moderate Efficacy: A Transitional At-Risk Profile

The moderate burnout / moderate efficacy profile reflects students experiencing emerging emotional strain but maintaining adequate academic functioning. Their SWB, which is lower than Profile 1 yet substantially higher than Profile 3, suggests a transitional state in which coping resources begin to erode under sustained academic demands (Chen et al., 2024 ; Wang & Sun, 2023) . This profile aligns with JD-R predictions: when demands gradually outpace resources, burnout risk increases. Early intervention is therefore crucial to prevent escalation.

High Burnout / High Efficacy: The Achievement–Strain Paradox

The high burnout / high efficacy profile illustrates a paradox in which strong academic self-beliefs coexist with severe emotional exhaustion and the lowest SWB. This configuration is frequently reported in competitive East Asian educational systems, where achievement pressure drives students to maintain high effort despite emotional costs (Huang et al., 2023 ; Yang & Sun, 2024) . SDT helps explain this pattern: high competence alone cannot protect SWB when needs for autonomy or relational support are unmet (Su & Zhang, 2023) . These students may sustain performance while internal emotional strain continues to accumulate. This decoupling between efficacy and emotional health reflects a culturally reinforced achievement orientation.

SWB as a Marker of Resource Depletion

Across profiles, the significant decline in SWB corresponds to increased burnout severity. In this study, SWB was assessed using the Flourishing Scale, which captures students' overall psychosocial functioning rather than

momentary affect. Students in higher burnout profiles reported weaker perceived social support and greater digital overuse, indicating reduced access to protective resources (Nelson et al., 2024 ; Kim & Park, 2023) . These findings demonstrate the central role of emotional and social resources in maintaining psychological resilience.

Theoretical Implications

The study reinforces the multidimensional and culturally influenced nature of burnout. It expands JD-R and SDT by showing that Professional Efficacy alone is insufficient to buffer emotional strain within achievement-driven cultural contexts (Yang & Chen, 2024 ; Park et al., 2024) . The presence of high-efficacy yet high-burnout students demonstrates that cultural norms around perseverance and academic commitment shape burnout configurations in distinct ways among Chinese undergraduates (Huang et al., 2023) . Additionally, the meaningful differentiation of profiles highlights the value of person-centered approaches in uncovering nuanced psychological patterns that variable-centered models may overlook (Fong et al., 2023) .

Practical Implications

Tiered Mental-Health Interventions

The three profiles support a tiered intervention model. Students in the low burnout / low efficacy profile may benefit from preventive SWB initiatives, while those in the moderate burnout profile require early-stage interventions targeting stress management and emotional regulation. The high burnout profile requires intensive support addressing achievement pressures, emotional exhaustion, and deficits in social support (Li et al., 2024; Yang & Sun, 2024) . Tailoring interventions to profile-specific needs improves efficiency and cultural relevance in mental-health support systems.

Strengthening Support and Campus Climate

Across profiles, perceived social support was closely associated with SWB. This suggests that universities should invest in peer-mentoring programs, faculty–student engagement initiatives, and community-building activities that enhance relational support, particularly for at-risk students (Zhou et al., 2024 ; Huang et al., 2023) .

Addressing High-Achievement Pressure

Because high-achieving students are not immune to burnout, universities should provide psychoeducation that reframes achievement norms, encourages balanced academic engagement, and normalizes help-seeking behaviors (Park et al., 2024 ; Chen et al., 2024) . This is especially crucial in Chinese contexts where academic success is intertwined with identity and family expectations.

Methodological Implications

The study demonstrates the usefulness of person-centered approaches such as K-means clustering in large educational datasets. While LPA offers additional modeling flexibility, K-means remains a valid and efficient technique for identifying distinct profiles, especially when sample size is large and indicators are continuous (Swickert et al., 2023 ; Tang & Liu, 2024) . The findings support the importance of integrating multiple burnout dimensions when examining psychological heterogeneity in higher education (Teng & Li, 2024) .

Limitations and Directions for Future Research

Although this study provides important insights into burnout heterogeneity among Chinese university students, several limitations should be acknowledged to guide future research. First, the use of a cross-sectional design restricts the ability to draw causal inferences about the relationships between burnout, SWB, and related psychosocial factors. Longitudinal or multi-wave studies would allow researchers to track transitions between

burnout profiles over time and identify how psychological resources evolve in response to academic demands (Nelson et al., 2024). Second, although the large sample size enhances statistical robustness, data were collected exclusively from universities in Henan Province, which may limit generalizability. Future research should incorporate samples from multiple regions or adopt national datasets to examine whether similar burnout configurations emerge across diverse educational and socioeconomic contexts in China (Yang & Sun, 2024).

Third, all variables in this study were measured through self-report instruments, raising the possibility of common method variance and social desirability bias. Integrating multi-source data—such as instructor ratings, behavioral indicators, or digital learning analytics—would improve measurement validity and reduce mono-method bias (Zhou et al., 2024). Fourth, although K-means clustering was appropriate for the present dataset, it is sensitive to initial centroid selection and assumes relatively homogeneous cluster boundaries. Future studies may adopt complementary techniques such as latent profile analysis (LPA) to examine the stability and replicability of the identified profiles and to confirm whether the three-cluster solution remains consistent across different samples or measurement structures (Fong et al., 2023).

Finally, the current study focused primarily on individual-level psychological variables. Future research should consider integrating contextual or institutional factors—such as academic policies, campus climate, digital learning environments, or resource availability—to develop a more ecological understanding of burnout and SWB among Chinese undergraduates. Incorporating these broader determinants would provide a more comprehensive framework for designing culturally responsive and institutionally relevant interventions.

CONCLUSION

This study identified three distinct burnout profiles among 5,197 Chinese university students—Low Burnout / Low Efficacy, Moderate Burnout / Moderate Efficacy, and High Burnout / High Efficacy—demonstrating that academic burnout is a heterogeneous psychological experience shaped by diverse emotional, motivational, and cultural factors. The profiles revealed a clear gradient in SWB, with students experiencing greater burnout reporting substantially lower levels of flourishing. These findings highlight the importance of examining burnout not as a single construct but as a multidimensional phenomenon that varies meaningfully across student profiles.

The presence of high Professional Efficacy within the high-burnout profile underscores a unique achievement-strain pattern in which students maintain strong academic confidence despite significant emotional fatigue. This pattern suggests that academic success does not necessarily reflect psychological health and emphasizes the need for educational environments that support both performance and SWB. At the same time, the moderate-burnout profile represents an emerging risk category in which psychological resources appear to be eroding, indicating a critical window for early intervention.

Practically, the three profiles provide a foundation for developing tiered mental-health strategies tailored to students' specific levels of risk. Preventive interventions may help sustain the SWB of Low Burnout students, while structured support targeting stress management and emotional regulation is especially important for those in the moderate-burnout profile. Students experiencing high burnout require more intensive, individualized support that addresses both emotional strain and achievement-related pressure. These differentiated strategies can guide universities seeking to improve student SWB in culturally responsive and resource-efficient ways. In practice, the three burnout profiles also offer a useful screening framework that can help university counseling centers identify students' risk levels and allocate mental-health resources more efficiently.

Overall, this study offers a nuanced and culturally grounded understanding of burnout heterogeneity in Chinese higher education. By integrating person-centered analysis with SWB outcomes, it provides a comprehensive framework for identifying at-risk student profiles and designing targeted interventions. Future research that incorporates longitudinal designs, multi-region samples, and multi-source data will be essential for deepening our understanding of burnout dynamics and supporting the long-term flourishing of university students.

REFERENCES

1. Ahmed, S., Lee, J., & Thomas, P. (2023). Academic disengagement and emotional exhaustion in online learning environments. *Journal of Educational Psychology*, 115(4), 612–629. <https://doi.org/10.1037/edu0000792>
2. Chen, J., & Hu, S. (2023). Post-pandemic shifts in academic fatigue and psychological adjustment among university students. *Learning and Individual Differences*, 103, 102234. <https://doi.org/10.1016/j.lindif.2023.102234>
3. Chen, L., Wu, X., & Zhang, Y. (2024). Digital learning fatigue and burnout among undergraduate students in hybrid learning environments. *Internet and Higher Education*, 63, 101941. <https://doi.org/10.1016/j.iheduc.2024.101941>
4. Diener, E., Oishi, S., & Tay, L. (2023). Advances in subjective well-being research. *Annual Review of Psychology*, 74, 89–112.
5. Fang, Q., Zhou, D., & Liang, H. (2024). Regional disparities and student mental health in Chinese higher education. *Higher Education Research & Development*, 43(1), 57–75.
6. Fong, R. W., Liu, J., & Park, S. (2023). Person-centered approaches to academic burnout: A systematic review. *Educational Psychology Review*, 35, 1–29.
7. He, X., & Liu, S. (2024). Academic efficacy and emotional strain in undergraduate learning. *Studies in Higher Education*, 49(2), 312–327.
8. Huang, L., Yang, X., & Sun, J. (2023). Achievement pressure and emotional exhaustion among Chinese undergraduates. *Journal of Adolescence*, 97, 112–125.
9. Kim, E., & Park, J. (2023). Smartphone overuse and burnout among college students. *Addictive Behaviors*, 140, 107627.
10. Kwon, M., Kim, D.-J., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale: Development and validation of a short version for adolescents. *PLoS ONE*, 8(12), e83558. <https://doi.org/10.1371/journal.pone.0083558>
11. Lee, M., Park, S., & Kim, H. (2023). High-achieving but exhausted: A profile approach to student burnout. *Frontiers in Psychology*, 14, 1129184.
12. Li, Y., & Fang, Q. (2023). Academic stress and psychological distress in Chinese universities. *Asia Pacific Education Review*, 24, 501–515.
13. Li, Y., Zhou, D., & Wu, X. (2024). Social support and subjective well-being among undergraduate students. *Journal of Happiness Studies*, 25(2), 689–708.
14. Liu, S., Wang, X., & Chen, J. (2024). Burnout trajectories during hybrid learning transitions. *Educational Research Review*, 39, 100528.
15. Martin, F., Liang, J., & Zhang, W. (2023). Online learning fatigue: A challenge in higher education. *Computers & Education*, 196, 104695.
16. Nelson, K., Prakash, S., & Wang, L. (2024). Psychological resources and well-being among university students. *Journal of Youth and Adolescence*, 53(1), 77–95.
17. Park, S., & Lee, J. (2023). Academic self-beliefs and burnout in competitive contexts. *Journal of College Student Development*, 64(5), 421–438.
18. Park, S., Kim, H., & Lee, M. (2024). Job demands–resources processes in Asian higher education. *Learning and Instruction*, 86, 101823.
19. Prakash, S., Nelson, K., & Wang, Y. (2023). Resilience, well-being, and burnout among emerging adults. *Journal of Positive Psychology*, 18(4), 492–507.
20. Salmela-Aro, K., & Upadaya, K. (2022). School burnout and engagement profiles. *Journal of School Psychology*, 92, 70–85.
21. Su, Y., & Zhang, L. (2023). A study on psychological stress, academic burnout, and emotional regulation among college students. *Advances in Psychological Science*, 31(4), 644–658.
22. Swickert, R., Park, S., & Li, F. (2023). Validity of K-means clustering for psychological profiling. *Personality and Individual Differences*, 205, 112123.
23. Tang, W., & Liu, J. (2024). Person-centered modeling of burnout in higher education. *Educational Psychology*, 44(3), 267–286.

24. Thomas, P., & Lee, K. (2022). Student disengagement in digital learning contexts. *Computers in Human Behavior*, 138, 107424.
25. Wu, X., Li, F., & Zhou, Y. (2024). Digital learning stress and well-being in post-pandemic universities. *Internet Research*, 34(5), 1441–1462.
26. Xiong, W., Guo, L., & Zhang, S. (2023). Online fatigue and mental health among university students. *Computers & Education*, 194, 104687.
27. Xu, H., Li, J., & Fan, Z. (2023). An analysis of academic stress and psychological adaptation among college students in central China. *Higher Education Research*, 44(6), 102–115.
28. Yang, X., & Chen, L. (2024). Academic demands and emotional strain among undergraduates. *Studies in Higher Education*, 49(3), 512–528.
29. Yang, X., & Sun, J. (2024). Cultural expectations and burnout in Chinese college students. *Journal of Adolescence*, 98, 45–59.
30. Zhang, H., & Huang, J. (2023). A study on psychological burnout among college students in China under the background of academic competition. *Journal of Educational Studies*, 19(3), 55–67.
31. Zhao, L., & Li, M. (2024). Emotional exhaustion in digital learning environments. *Teaching and Teacher Education*, 132, 104271.
32. Zhou, D., Fang, Q., & Li, W. (2024). Burnout and well-being in Chinese higher education. *Higher Education*, 87(2), 377–395.
33. Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K.(1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52(1), 30–41.https://doi.org/10.1207/s15327752jpa5201_2