



Emotional and behavioural predictors of dropout intention and the moderating role of student appraisals among international students in Australian universities

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Abstract

International student dropout presents a critical challenge for universities, with consequences for student well-being, institutional performance, and national economies. Despite their growing representation, limited research has investigated the psychological and institutional factors influencing dropout intention among international students. This study aimed to identify key psychological predictors of dropout intention and examine whether student appraisals of course content and institutional support moderate these relationships. To the authors' knowledge, this is one of the first empirical investigations to explore these dynamics within an international student population in Australia. A total of 319 international students enrolled in Australian universities completed an online survey assessing mental health, resilience, mindfulness, filial piety, acculturation, financial stress, COVID-19 stress, sleep disturbance, and institutional perceptions. Hierarchical multiple regression and moderation analyses were conducted. Anxiety, COVID-19 stress, and poor sleep emerged as significant positive predictors of dropout intention, while resilience and reciprocal filial piety were significant negative predictors. Moderation analyses revealed that students' appraisal of course content significantly strengthened the protective effects of both resilience and reciprocal filial piety. Appraisal of institutional support, however, did not moderate any of the identified relationships. These findings extend the dropout model by incorporating psychological health and cultural values into understanding persistence among international students. They highlight the importance of enhancing academic experiences and providing culturally sensitive mental health support. Institutions should consider integrating resilience-building and course quality initiatives to better support international student retention. Future research should adopt longitudinal approaches to examine how dropout intentions translate into actual behaviour over time.

Keywords International students · Dropout intention · Psychological predictors · Resilience · Filial piety

Introduction

University dropout refers to the phenomenon whereby a student enrolls in a higher education program but withdraws before completing their degree (Leow et al., 2024; Norton & Cherastidtham, 2018). Dropout rates present significant challenges for universities and have far-reaching consequences (Leow et al., 2024; McCubbin, 2003; Rotar, 2022; Tinto, 1975). A recent systematic review and meta-analysis estimated the global prevalence of university dropout at approximately 17.9% (Leow et al., 2024), while in Australia, the estimated rate is 16% (Leow et al., 2024; Norton & Cherastidtham, 2018). The effects of university dropout extend beyond the individual, impacting educational institutions and broader economic systems (Leow et al., 2024). For students, consequences may include diminished employment prospects, reduced lifetime earnings, and negative impacts on mental health and self-esteem due to the disruption of educational and career trajectories (Arria et al., 2013; Auerbach et al., 2016; Leow et al., 2024). Institutions may face reputational harm, financial losses from decreased tuition revenue, and challenges to long-term operational sustainability (Norton & Cherastidtham, 2018). At the national level, a reduced number of degree-qualified individuals entering the workforce may adversely affect economic productivity and growth (Hällsten, 2017).

Dropout intention refers to the cognitive and emotional process through which university students contemplate the possibility of leaving their institution or discontinuing their degree program prior to completion (López-Angulo et al., 2023). It is a critical antecedent and strong predictor of actual student attrition (Cortes et al., 2014; Findeisen et al., 2024). Several factors contribute to dropout intention, including academic performance, financial difficulties, and a range of mental health concerns such as depression, anxiety, stress, sleep disturbances, substance use, and gambling problems (Arria et al., 2013; Cortes et al., 2014; Leow et al., 2024). A recent meta-analysis found that depression, stress, and other mental health conditions, such as attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder, schizophrenia, and bipolar disorder, are significant predictors of dropout risk among university students (Leow et al., 2024). The COVID-19 pandemic has further exacerbated mental health challenges in this population by introducing new stressors, including health anxieties, travel restrictions, and disruptions to traditional learning environments, which may have amplified existing psychological vulnerabilities (Dingle et al., 2024). The disruptions caused by COVID-19 have been found to increase psychological distress that may persist throughout the phases of the pandemic and extend beyond (Li et al., 2025). The pandemic posed a major public health concern, contributing to prolonged uncertainty, loss of income, and isolation (Russell et al., 2023), which disproportionately affected international students who were often excluded from governmental support (Dingle et al., 2024). This heightened vulnerability contributed to poorer well-being and increased dropout risk, constituting an important educational and public health concern (Dingle et al., 2024). Notably, while the pandemic context was specific to the period of data collection, its

impact underscores the particular susceptibility of international students during large-scale crises, and offers insights for strengthening institutional preparedness and support strategies in future global disruptions (WHO, 2024).

Compared to domestic students, international students often face additional and unique stressors, including acculturative stress, language barriers, higher tuition fees, and differing educational practices and expectations (Li & Tse, 2015; Wang & Zhou, 2021). Their academic performance may be adversely affected by difficulties in adapting to unfamiliar teaching styles, instruction delivered in a second language, and the broader learning environment of the host institution (Wang & Zhou, 2021). The transition to studying in a foreign country also represents a significant life change, often accompanied by stressors associated with the acculturation process. These may include homesickness, limited social support, social isolation, a lack of connection to the host society, and experiences of discrimination (Li & Tse, 2015). Collectively, these factors can intensify mental health challenges among international students, potentially increasing their vulnerability to academic disengagement and dropout (Auerbach et al., 2016; Li & Tse, 2015; Li et al., 2014; Skromanis et al., 2018).

It is important to note that, in addition to risk factors contributing to international student dropout, several protective factors may buffer against this risk. These include psychological and cultural resources such as trait resilience, mindfulness, and filial piety. Trait resilience refers to enduring personal characteristics that enable individuals to recover from adversity and adapt with optimism (Connor & Davidson, 2003). Its psychological components (such as optimism, positive adaptation, effective coping strategies, self-regulation, and self-control) can collectively mitigate the effects of psychological distress (Li et al., 2023a). Mindfulness, defined as present-moment awareness cultivated through attitudes of non-judgment, acceptance, and non-striving (Kabat-Zinn, 2003; Li et al., 2023a) supports adaptive coping by promoting openness and acceptance of current experiences. Empirical evidence suggests that higher levels of resilience and mindfulness are significantly associated with lower levels of depression, anxiety, and stress, particularly during challenging periods such as the COVID-19 pandemic (Li et al., 2020, 2023a, 2023b). These protective factors may therefore reduce the likelihood of academic disengagement and dropout among university students.

Filial piety has been identified as a culturally rooted protective factor for both mental health and university retention among international students (Leow et al., 2024). It refers to a set of moral principles and behaviours centred on honouring, respecting, and providing for one's parents, and is grounded in the Confucian moral tradition, particularly within Chinese and other Asian cultures (Li et al., 2021a). In these contexts, academic success is often viewed as a form of filial devotion, with students perceiving their educational achievements as a means of fulfilling familial obligations (Li & Tse, 2015). Withdrawal from university may therefore be seen as a failure to meet these expectations, serving as a potential deterrent to dropout.

Filial piety is conceptualised as a two-dimensional construct comprising reciprocal filial piety (RFP) and authoritarian filial piety (AFP) (Yeh, 2003).

RFP is characterised by genuine affection and mutual support within a positive, long-term parent–child relationship. In contrast, AFP emphasises obedience to parental authority, often requiring individuals to suppress their personal desires or goals. Empirical evidence suggests that RFP is associated with lower levels of psychological distress, whereas AFP shows no such association (Li et al., 2021a). Importantly, although filial piety originates in Chinese cultural traditions, cross-cultural research indicates that RFP is valued not only among students of Chinese heritage but also among participants from predominantly Western cultural backgrounds in Australia as well as in Singapore, suggesting its broader relevance across cultural groups (Li et al., 2021b). Therefore, the protective influence of filial piety, particularly its reciprocal form, on mental health and academic persistence may extend beyond Chinese international students.

In addition to personal and cultural factors, students' appraisals of their academic programs and institutional support also influence dropout risk. Schmitt et al. (2021) identified two key dimensions of student appraisal, including course content (WWH-CC) and institutional support (WWH-SS), and developed the When, Why, How (WWH) Dropout Scale to capture these domains. The WWH-SS subscale assesses factors such as pedagogical support, infrastructure, teaching methodologies, instructor engagement, course coordination, and access to information. The WWH-CC subscale evaluates students' perceptions of workload, alignment with personal interests, clarity and comprehension of material, integration of theory and practice, professional relevance, and fairness in assessment. These components are closely tied to intrinsic motivation; that is, the internal drive to engage in learning for personal satisfaction or alignment with individual goals and values (Augustyniak et al., 2016). Research has consistently shown that intrinsic motivation fosters deeper engagement, academic success, and persistence (Augustyniak et al., 2016; Patall et al., 2008), whereas dissatisfaction with course content or institutional support has been associated with reduced motivation and an increased risk of academic disengagement and dropout (Guzmán et al., 2021).

These motivational and institutional factors are well-aligned with Tinto's (2012) theoretical model of student dropout, which conceptualises attrition as a longitudinal process influenced by students' academic and social integration. In this model, dropout intention emerges as a key intermediary stage preceding the final decision to withdraw (Guzmán et al., 2021; Schmitt et al., 2021). Both risk factors (e.g., psychological distress, financial stress) and protective factors (e.g., resilience, cultural values) interact with students' academic and institutional experiences to influence this process. For example, students with high resilience or strong cultural motivations, such as filial piety, may be more likely to persist if they are also satisfied with their academic program, whereas dissatisfaction may undermine even strong internal or cultural resources.

Therefore, students' satisfaction with course content (WWH-CC) and institutional support (WWH-SS) may moderate these relationships (Schmitt et al., 2021). Positive academic appraisals can buffer the adverse effects of risk factors on dropout intention.

Psychological vulnerabilities (e.g., anxiety, financial stress, or COVID-19-related distress) are known to increase the likelihood of academic disengagement. However, when students perceive strong pedagogical support and find their coursework engaging and meaningful, these negative influences may be mitigated. For instance, while students experiencing heightened anxiety may face symptoms such as fatigue, concentration difficulties, or sleep disturbances (Nyer et al., 2013), those with high satisfaction in course structure and support may still feel motivated to persist in their studies.

Likewise, the protective effects of personal and cultural traits may be amplified by positive academic experiences. Previous research suggests that the negative associations between resilience, mindfulness, acculturation, and reciprocal filial piety and dropout intention are stronger among students who report high satisfaction with WWH-CC and WWH-SS (Schmitt et al., 2021). Conversely, when satisfaction is low, even students with high intrinsic motivation or cultural values may feel disconnected from their academic journey. For example, students who view academic persistence as an expression of familial duty may still consider withdrawing if they perceive their course content as unengaging or irrelevant. Thus, the interplay between internal protective factors and students' academic experiences is a critical mechanism influencing dropout intention.

Given the possible moderating role that course and institutional factors play in the relationship between psychological factors and dropout intention, it is important to consider how these dynamics specifically affect international students in Australian higher education, where international students make up nearly 30% of tertiary enrolments and contribute significantly to the Australian economy and university sector (Commonwealth of Australia, 2021; Universities Australia, 2022). Despite their important contribution to Australian higher education, international students face distinct challenges that may affect their academic persistence. However, existing research on university dropout in Australia has largely focused on domestic students, with comparatively few studies addressing the unique experiences and risks encountered by international students (Leow et al., 2024; Norton & Cherastidham, 2018; Skromanis et al., 2018). This underscores the need for more targeted research examining dropout intention in this population, particularly in relation to psychological predictors and moderating institutional factors.

In light of these gaps in the literature, the present study aims to advance understanding of the psychological and institutional factors that influence dropout intentions among international students in Australia. In particular, it considers how individual vulnerabilities and strengths may interact with academic experiences to shape students' decisions to persist or withdraw. To guide this investigation, the study is structured around the following research questions:

RQ1. What are the significant psychological predictors for dropout intention among international students studying at Australian universities?

RQ2. Do international students' appraisals of course content (WWH-CC) and institutional support (WWH-SS) moderate the relationships between the significant predictors and dropout intention?

Methods

Participants

Ethical approval for the current study was granted by James Cook University University's Human Research Ethics Committee (HREC ID: H8591). Data were collected using the Qualtrics Online Access Panel, a survey distribution system comprising individuals who have consented to participate in online research (Chhabra et al., 2022; Matthijsse et al., 2015). This panel includes samples from over 20 providers, primarily drawn from traditional market research panels. Research has shown that data collected via online access panels demonstrate psychometric properties comparable to those obtained through conventional online surveys (Behrend et al., 2011; Walter et al., 2019). To ensure data quality, Qualtrics employs multiple verification tools (including TrueSample, Verity, SmartSample, IP and ID checks, LinkedIn comparisons, and digital fingerprinting) to authenticate respondent identity (Qualtrics, 2023). Duplicate entries, identified through repeated IP addresses, were excluded. Screening questions based on inclusion and exclusion criteria were presented at the beginning of the survey to confirm participant eligibility. Notably, as is typical for research conducted via online access panels, only eligible and completed responses were provided to the research team; therefore, information on attrition at the recruitment stage was not available.

The inclusion criteria for participation in the study were: (1) being an international student aged 18 years or older, (2) currently enrolled at an Australian university, and (3) residing in Australia at the time of the study. Data collection took place over a three-month period, from January to March 2022. A total of 324 participants were initially recruited. After data cleaning (removal of incomplete or invalid responses), the final sample consisted of 319 participants (59.6% female), with a mean age of 26.59 years ($SD = 6.23$; range = 18–48). The demographic characteristics of the sample are presented in Table 1.

Measures

Participants completed an online survey comprising a background questionnaire (demographic information), followed by validated self-report measures administered in a fixed (non-randomised) order: mental health outcomes, student appraisals of course content and institutional support, dropout intention, acculturation, resilience, filial piety (reciprocal and authoritarian), sleep disturbance, alcohol

Table 1 Sociodemographic characteristics of participants

Characteristics	<i>n</i>	%
Gender		
Male	129	40.4
Female	190	59.6
Employment status		
Employed	262	82.1
Unemployed	57	17.9
Highest education level		
Year 12 or below	116	36.4
Other post-secondary qualification	71	22.3
Bachelor degree or higher	132	41.4
Ethnicity background		
American	36	11.3
Chinese	38	11.9
English	66	20.7
Indian	25	7.8
African	9	2.8
Other Asian	46	14.2
Other European	19	5.9
Other / Mixed	70	21.9
Duration in Australia (in months)		
Minimum	0	–
Maximum	240	–
Mean	118	–
25th percentile	42	25%
50th percentile	96	50%
75th percentile	218	75%
English proficiency		
Native/Bilingual	141	44.2
Proficient	154	49.1
Limited proficiency	24	7.5

Participants were on average 26.59 years old ($SD=6.23$)

misuse, problem gambling, mindfulness, financial stress, and COVID-19-related stress.

Demographic variables

Participants provided demographic information to assess potential covariates, including age, gender, employment status, highest level of education, nationality, length of residence in Australia, and self-reported English language proficiency.

Dropout intention

Dropout intention was assessed using an adapted 3-item subscale from the Intentions to Persist versus Dropout Scale (Hardre & Reeve, 2003). This subscale measures students' propensity to consider leaving their educational program. Items were rated on a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The three items are: "I sometimes consider dropping out of university", "I intend to drop out of university", and "I sometimes feel unsure about continuing my studies year after year". Higher total scores (range = 3 to 15) indicate stronger dropout intention. The scale demonstrated good internal consistency in the current study (Cronbach's $\alpha = .83$).

Mental health outcome

Mental health was assessed using the 21-item Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995), which comprises three 7-item subscales measuring symptoms of depression, anxiety, and stress over the past week. Items were rated on a 4-point Likert scale from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Example items include: "I felt that I had nothing to look forward to" (depression), "I felt scared without any good reason" (anxiety), and "I found it difficult to relax" (stress). Higher scores indicate greater symptom severity. Subscale scores were summed and multiplied by two to align with the full DASS-42 scoring system (Lovibond & Lovibond, 1995), yielding a possible range of 0–42 per subscale. Internal consistency in the current study was high: Cronbach's $\alpha = .90$ (depression), $.88$ (anxiety), $.87$ (stress), and $.95$ for the total scale.

Resilience

Resilience was assessed using the 2-item Connor-Davidson Resilience Scale (CD-RISC 2; Vaishnavi et al., 2007), which evaluates the ability to cope with stress and recover from adversity. Participants rated each item on a 5-point Likert scale from 0 (Not true at all) to 4 (True nearly all the time). The items include: "I am able to adapt when changes occur" and "I tend to bounce back after illness, injury, or other hardships". Higher total scores (range = 0–8) indicate greater resilience. In the current study, the CD-RISC 2 demonstrated adequate internal consistency (Cronbach's $\alpha = .63$).

Mindfulness

Mindfulness was assessed using the 14-item Langer Mindfulness Scale (LMS; Langer, 2004), with items rated on a 7-point Likert scale from 1 (Strongly disagree) to 7 (Strongly agree). Sample items include "I like to investigate things" and "I find it easy to create new and effective ideas". Higher total scores

(range = 14–98) reflect greater mindfulness. Items 2, 4, 5, 9, 12, and 14 were reverse coded prior to scoring. The scale demonstrated good internal consistency in the current study (Cronbach's $\alpha = .81$).

Filial piety

Filial piety was measured using the 16-item Dual Filial Piety Scale (DFPS; Yeh & Bedford, 2003), which comprises two subscales: Reciprocal Filial Piety (RFP) and Authoritarian Filial Piety (AFP). Participants rated each item on a 6-point Likert scale from 1 (Extremely Unimportant) to 6 (Extremely Important). Example RFP items include “Be concerned about my parents’ health” and “Talk frequently with my parents to understand their thoughts and feelings”, while AFP items include “Take my parents’ suggestions even when I do not agree with them” and “Disregard promises to friends in order to obey my parents”. Higher subscale scores (range = 8–48) indicate stronger endorsement of each filial piety dimension. Both subscales demonstrated good internal consistency in the current study (RFP $\alpha = .87$; AFP $\alpha = .86$).

Sleep disturbance

Sleep disturbance was assessed using the 11-item Global Sleep Assessment Questionnaire (GSAQ; Roth et al., 2002), which evaluates various aspects of sleep quality and sleep-related difficulties. Items were rated on a 4-point Likert scale from 1 (Never) to 4 (All the time). Sample items include: “Did you have difficulty falling asleep, staying asleep, or feeling poorly rested in the morning?” and “Did you fall asleep unintentionally or have to fight to stay awake during the day?” Higher total scores (range = 11–44) indicate greater frequency of sleep disturbances. The scale demonstrated excellent internal consistency in the current study (Cronbach's $\alpha = .90$).

Alcohol misuse

Alcohol misuse was assessed using the 3-item AUDIT-C scale (Bush et al., 1998), which screens for alcohol abuse and dependence. Items were rated on a 5-point Likert scale, with higher scores indicating greater misuse. Example items include: “How often did you have a drink containing alcohol in the past year?” and “How often did you have six or more drinks on one occasion in the past year?” Total scores range from 0 to 12. In the current study, the scale demonstrated good internal consistency (Cronbach's $\alpha = .80$).

Problem gambling

Problem gambling was assessed using a modified version of the 5-item Brief Problem Gambling Scale (BPGS; Volberg & Williams, 2011), designed to detect pathological, problem, and at-risk gambling behaviours. For this study, the scale was adapted to include online gaming and gambling, reflecting behaviours more relevant during the COVID-19 pandemic. Participants responded to each item with “Yes” or “No”. Example items include: “Have you been preoccupied with online gaming/gambling?” and “Have you borrowed money or sold anything to get money for online gaming/gambling?” Higher scores (range=0–5) indicate greater gambling-related problems. The scale showed good internal consistency in the current study (Cronbach’s $\alpha = .82$).

Financial stress

Financial stress was assessed using a 3-item scale adapted from the Australian Bureau of Statistics (2016). Items were rated on a 5-point Likert scale, with higher scores reflecting greater perceived financial strain. Sample items include: “How do you feel about your current financial situation?” and “How often does your financial situation contribute to your stress experienced at university?” Total scores ranged from 3 to 15. The scale demonstrated acceptable internal consistency in the current study (Cronbach’s $\alpha = .73$).

COVID-19 stress

COVID-19 stress was measured using a 13-item scale adapted from prior SARS-related studies (Quah & Hin-Peng, 2004). Items 1–8 assessed participants’ current pandemic-related circumstances (e.g., “I am currently in self-quarantine”; “I am worried for my family or friends”) and were rated with Yes–No responses. Items 9–13 assessed distress related to the impact of COVID-19 (e.g., “Your progression through university”; “Your career prospects”) on a 5-point Likert scale. Higher total scores (range=5–33) indicated greater COVID-19-related stress. The scale demonstrated acceptable internal consistency in the current study (Cronbach’s $\alpha = .73$).

Acculturation

Acculturation was assessed using the 20-item Vancouver Index of Acculturation (Ryder et al., 2000), which measures two dimensions: heritage culture orientation and mainstream culture orientation. Items were rated on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Sample items include: “I often participate in my heritage cultural traditions” (heritage orientation) and “I often

participate in mainstream Australian cultural traditions” (mainstream orientation). Higher scores indicate stronger orientation toward the respective culture. Subscale scores ranged from 10 to 50. In the current study, the heritage and mainstream subscales demonstrated good internal consistency ($\alpha = .82$ and $.83$, respectively), and the total scale showed high reliability ($\alpha = .89$).

Student appraisals of course and content and the institutional support

Student appraisals were measured using the WWH-Dropout Scale (Schmitt et al., 2021). Items were rated on a 3-point Likert scale from 0 (Unsatisfied) to 2 (Totally Satisfied). The WWH-CC subscale (course and content) included 11 items (e.g., “Affinity with the chosen course”, “Relation between my course and personal interests”), while the WWH-SS subscale (structure and support) included six items (e.g., “Pedagogical support”, “General physical structure: classroom, library, laboratory”). Higher scores indicate greater satisfaction. Subscale scores ranged from 0 to 22 (WWH-CC) and 0 to 12 (WWH-SS). In the current study, internal consistency was good for both subscales (WWH-CC $\alpha = .84$; WWH-SS $\alpha = .78$).

Procedure

The questionnaire was administered online in a fixed order as outlined in the preamble to the Measures section, and completion typically required approximately 25–30 min.

Data cleaning

Univariate outliers were identified using the z -score method and visually confirmed through box plot inspection. Extreme values were adjusted by replacing them with the nearest non-outlier value. Multivariate outliers were detected using Mahalanobis distance, applying a conservative alpha level of .001 (Penny, 1996). Five multivariate outliers were excluded from the dataset, resulting in a final sample of 319 participants.

Data analysis

Data were analysed using IBM SPSS Statistics (Version 29). Preliminary analyses included: (1) identifying potential covariates through ANOVAs and independent samples t -tests on demographic variables to examine their associations with independent variables (IVs; e.g., anxiety, resilience, reciprocal filial piety), the dependent variable (DV; dropout intention), and moderators (e.g., course and content, structure and support); (2) assessing relationships among IVs, the DV, and moderators using two-tailed Pearson correlation coefficients, presented in an

intercorrelation table; and (3) examining the prevalence of depression, anxiety, stress, and alcohol misuse using descriptive statistics and cross-tabulations by gender.

To address RQ1, a hierarchical multiple linear regression was conducted across six models: Model 1 – demographic variables; Model 2 – financial factors; Model 3 – protective factors (mindfulness and resilience); Model 4 – cultural factors (acculturation and filial piety); Model 5 – COVID-19-related variables; and Model 6 – mental health variables.

To address RQ2, five moderation analyses were conducted using Model 2 of the PROCESS macro (Version 4.2; Hayes, 2017), with one model for each significant predictor identified in RQ1.

Results

Preliminary analysis

Independent samples *t*-tests, one-way ANOVAs, and linear hierarchical multiple regressions identified the following covariates: age, gender, education, nationality, and English proficiency. Employment status and duration in Australia were not identified as covariates. For detailed results, including subgroup descriptives for dropout intention, see Tables S1–S4 in the Online Only Supplementary Materials.

Intercorrelations among the variables analysed using two-tailed Pearson correlation tests are presented in Table 2.

The prevalence of depression, anxiety, and stress, as well as alcohol misuse among the participants is presented in Table 3.

Analysis of RQ1

Linear hierarchical multiple regressions were used to determine the significant predictors of dropout intention among international students studying at Australian universities. Individually, resilience ($b = -0.27$, $t = -2.49$, $p < 0.05$), reciprocal filial piety ($b = -0.07$, $t = -2.81$, $p < 0.05$), COVID-19 stress ($b = 0.11$, $t = 3.18$, $p < 0.05$), anxiety ($b = 0.06$, $t = 2.16$, $p < 0.05$), and poor sleep ($b = 0.06$, $t = 2.01$, $p < 0.05$) predicted dropout intention, after controlling for the other variables. Other variables (e.g., depression, stress, acculturation, authoritarian filial piety, alcohol misuse and gambling) were not predictive for intention to dropout. For detailed results, refer to Table 4.

Analysis of RQ2

Five moderation models were tested for the five significant psychological predictors identified in the analysis of RQ1. The moderation model explained 22.9% of the variance in dropout intention, $F(8, 310) = 11.50$, $p < 0.001$. The interaction terms were significant for resilience*WWH-CC, $\Delta R^2 = 0.01$, $F(1, 310) = 4.41$,

Table 2 Intercorrelations between continuous variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	<i>M(SD)</i>
1. Dropout intention	1	.517**	.523**	.448**	-.290**	.026	-.237**	.114*	.503**	.284**	.336**	.270**	.409**	-.061	-.058	7.46 (3.18)
2. Depression		1	.801**	.837**	-.257**	.018	-.123*	.114*	.633**	.254**	.370**	.408**	.373**	-.055	-.137*	15.80 (10.49)
3. Anxiety			1	.807**	-.190**	.066	-.060	.173**	.684**	.291**	.336**	.390**	.412**	-.039	-.047	15.66 (9.98)
4. Stress				1	-.191**	.021	-.032	.047	.634**	.234**	.257**	.377**	.337**	.037	-.033	18.10 (9.85)
5. Resilience					1	.356**	.400**	.092	-.174**	.022	-.190**	-.117*	-.155**	.417**	.404**	5.17 (1.61)
6. Mindfulness						1	.250**	.393**	.075	-.002	.004	-.030	.149**	.418**	.408**	67.46 (11.12)
7. Reciprocal filial piety							1	.268**	-.065	-.083	-.205**	-.087	-.020	.427**	.302**	38.70 (6.80)
8. Authoritarian filial piety								1	.189**	.069	.169**	-.032	.285**	.187**	.151**	30.90 (8.70)
9. Sleep problems									1	.446**	.406**	.384**	.411**	-.003	-.014	24.06 (7.47)
10. Alcohol misuse										1	.329**	.272**	.194**	.038	.169**	4.37 (2.83)
11. Gambling problems											1	.303**	.302**	-.163**	-.110*	1.20 (1.62)
12. Financial stress												1	.326**	-.111*	-.107	8.40 (2.76)
13. COVID-19 stress													1	.048	-.003	17.74 (5.21)
14. Heritage acculturation														1	.665**	38.55 (5.33)
15. Host acculturation															1	38.04 (5.70)

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed)

Table 3 Prevalence of depression, anxiety, stress, and alcohol misuse

Variable	Cut-off scores	Severity	<i>n</i>	%
Depression	0–9	Normal	93	29.2
	10–13	Mild	32	10.0
	14–20	Moderate	98	30.7
	21–27	Severe	49	15.4
	28 +	Extremely severe	47	14.7
Anxiety	0–7	Normal	78	24.4
	8–9	Mild	14	4.4
	10–14	Moderate	57	17.9
	15–19	Severe	51	16.0
	20 +	Extremely severe	119	37.3
Stress	0–14	Normal	126	39.5
	15–18	Mild	44	13.8
	19–25	Moderate	71	22.2
	26–33	Severe	52	16.3
	34 +	Extremely severe	26	8.2
Alcohol misuse (male)	0–3	Low risk	50	38.7
	4–7	Hazardous drinking	57	44.2
	8 +	High risk drinking	22	17.1
Alcohol misuse (female)	0–2	Low risk	62	32.6
	3–6	Hazardous drinking	85	44.7
	7 +	High risk drinking	43	22.6

Alcohol-misuse prevalence is reported separately for male and female participants because the AUDIT uses gender-specific cut-off scores for hazardous and high-risk drinking. Cut-offs for depression, anxiety, and stress (DASS-21) are uniform across genders

$p < 0.05$, with $b = -0.08$, $t = -2.10$, $p < 0.05$, 95% CI $[-0.15, -0.00]$, but not for resilience*WWH-SS, $\Delta R^2 = 0.00$, $F(1, 310) = 0.17$, $p = 0.68$, with $b = 0.02$, $t = 0.41$, $p = 0.68$, 95% CI $[-0.09, 0.14]$. The result indicated that the association between resilience and dropout intention was negatively moderated by WWH-CC, but not moderated by WWH-SS. The interaction results are illustrated in Fig. 1.

The reciprocal filial piety moderation model explained 21.8% of the variance in dropout intention, $F(9, 309) = 9.57$, $p < 0.001$. The reciprocal filial piety* WWH-CC interaction term was significant, $\Delta R^2 = 0.01$, $F(1, 309) = 5.30$, $p < .05$, with $b = -0.02$, $t = -2.30$, $p < 0.05$, 95% CI $[-0.03, -0.003]$, but not for the reciprocal filial piety*WWH-SS interaction term, $\Delta R^2 = 0.01$, $F(1, 309) = 3.90$, $p < 0.05$, with $b = 0.03$, $t = 1.97$, $p < 0.05$, 95% CI $[0.00, 0.05]$. The results indicated that the association between reciprocal filial piety and dropout intention is negatively moderated by students' appraisal of course and content, but not moderated by students' appraisal of structure and support. The interaction results are illustrated in Fig. 2.

The COVID-19 stress moderation model explained 29.8% of the variance in dropout intention, $F(8, 310) = 16.48$, $p < 0.001$. However, the COVID-19

Table 4 Summary of hierarchical regression analysis for variables predicting dropout intention

Variables	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	β	95%CI	<i>B</i>	<i>SE B</i>	β	95%CI	<i>B</i>	<i>SE B</i>	β	95%CI
Age	0.05	0.03	0.10	-0.01 0.11	0.06	0.03	0.12	0.004 0.12	0.05	0.03	0.10	-0.01 0.11
Gender	-0.53	0.37	-0.08	-1.26 0.21	-0.38	0.36	-0.06	-1.10 0.33	-0.31	0.35	-0.05	-1.00 0.38
Employment	0.29	0.46	0.03	-0.63 1.20	0.28	0.45	0.03	-0.59 1.16	0.47	0.43	0.06	-0.38 1.32
Education	-0.17	0.11	-0.09	-0.38 0.04	-0.16	0.10	-0.09	-0.37 0.04	-0.14	0.10	-0.08	-0.34 0.06
English proficiency	0.27	0.18	0.08	-0.09 0.63	0.22	0.18	0.07	-0.13 0.57	0.11	0.17	0.03	-0.23 0.45
Financial stress					0.32	0.06	0.27	0.19 0.44	0.28	0.06	0.24	0.16 0.40
Scholarship					0.55	0.36	0.08	-0.17 1.26	0.45	0.35	0.07	-0.24 1.14
Resilience									-0.58	0.11	-0.29	-0.80 -0.36
Mindfulness									0.03	0.02	0.11	0.00 0.06
Reciprocal filial piety												
Authoritarian filial piety												
Heritage acculturation												
Host acculturation												
COVID-19 stress												
Depression												
Anxiety												
Stress												
Sleep												
Alcohol												
Gambling												
<i>R</i> ²	0.03				0.11				0.19			
<i>F</i> for change in <i>R</i> ²	0.03				0.08				0.07			

Table 4 (continued)

Variables	Model 4				Model 5				Model 6			
	B	SE B	β	95%CI	B	SE B	β	95%CI	B	SE B	β	95%CI
Age	0.03	0.03	0.07	-0.03 0.09	0.02	0.03	0.04	-0.03 0.08	0.04	0.03	0.07	-0.02 0.09
Gender	-0.18	0.35	-0.03	-0.88 0.51	-0.30	0.34	-0.05	-0.97 0.36	-0.26	0.32	-0.04	-0.88 0.37
Employment	0.43	0.42	0.05	-0.41 1.26	0.52	0.41	0.06	-0.28 1.32	0.13	0.38	0.02	-0.62 0.88
Education	-0.11	0.10	-0.06	-0.31 0.09	-0.16	0.10	-0.09	-0.35 0.03	-0.07	0.09	-0.04	-0.25 0.10
English proficiency	0.14	0.17	0.04	-0.19 0.48	0.08	0.17	0.03	-0.24 0.41	0.10	0.15	0.03	-0.19 0.40
Financial stress	0.28	0.06	0.24	0.16 0.40	0.16	0.06	0.14	0.04 0.28	-0.02	0.06	-0.02	-0.14 0.10
Scholarship	0.25	0.35	0.04	-0.45 0.95	-0.03	0.34	0.00	-0.70 0.65	-0.26	0.32	-0.04	-0.89 0.36
Resilience	-0.51	0.12	-0.26	-0.74 -0.27	-0.41	0.12	-0.21	-0.64 -0.18	-0.27	0.11	-0.14	-0.49 -0.06
Mindfulness	0.02	0.02	0.06	-0.02 0.05	0.01	0.02	0.04	-0.02 0.05	0.01	0.02	0.02	-0.03 0.04
Reciprocal filial piety	-0.09	0.03	-0.20	-0.15 -0.04	-0.09	0.03	-0.18	-0.14 -0.03	-0.07	0.03	-0.15	-0.12 -0.02
Authoritarian filial piety	0.04	0.02	0.12	0.00 0.09	0.02	0.02	0.05	-0.03 0.06	0.00	0.02	-0.01	-0.04 0.03
Heritage acculturation	0.06	0.04	0.10	-0.03 0.14	0.04	0.04	0.07	-0.04 0.13	0.04	0.04	0.06	-0.04 0.11
Host acculturation	0.01	0.04	0.02	-0.07 0.09	0.01	0.04	0.02	-0.06 0.09	0.01	0.04	0.02	-0.06 0.08
COVID-19 stress					0.19	0.03	0.31	0.12 0.26	0.11	0.03	0.17	0.04 0.17
Depression									0.05	0.03	0.17	-0.01 0.11
Anxiety									0.06	0.03	0.19	0.01 0.12
Stress									-0.01	0.03	-0.03	-0.07 0.05
Sleep									0.06	0.03	0.14	0.001 0.12
Alcohol									0.08	0.06	0.07	-0.04 0.20
Gambling									0.06	0.11	0.03	-0.15 0.27
R ²	0.22				0.29				0.42			
F for change in R ²	0.03				0.07				0.14			

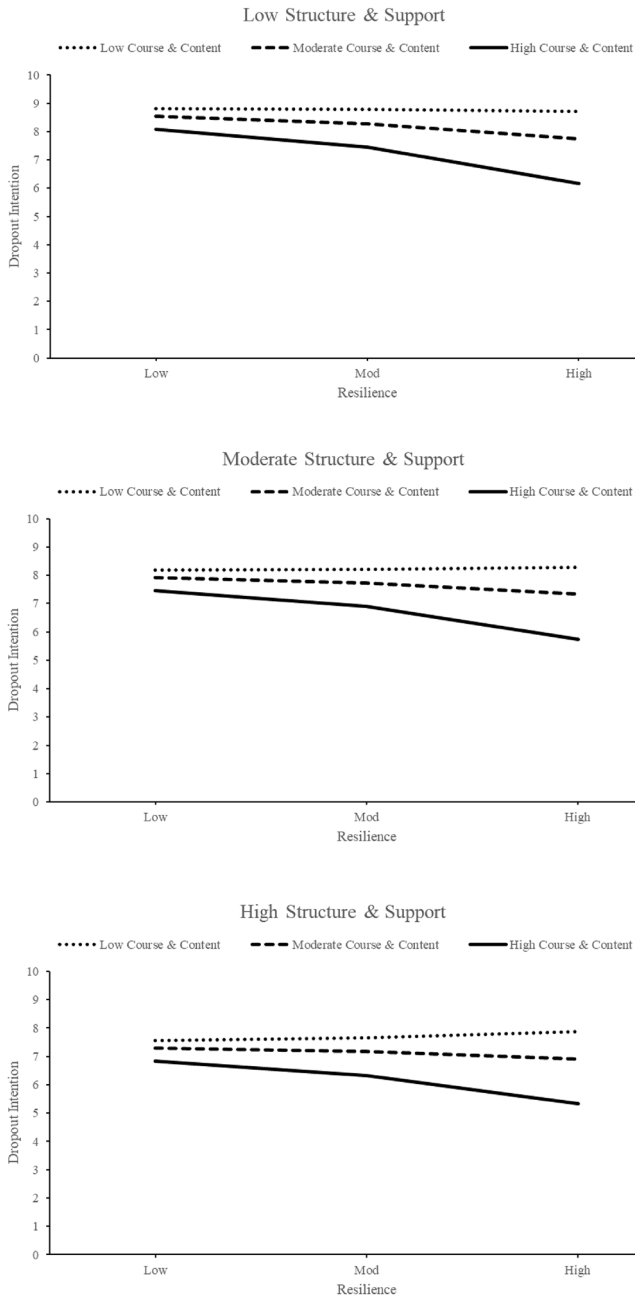


Fig. 1 Moderating effect of course and content appraisal (WWH-CC) on the relationship between resilience and dropout intention. The top panel illustrates the moderating effect of course and content appraisal (WWH-CC) on the relationship between resilience and dropout intention at low levels of institutional support (WWH-SS). The middle panel represents the same moderation effect at moderate levels of WWH-SS, while the bottom panel shows the effect at high levels of WWH-SS

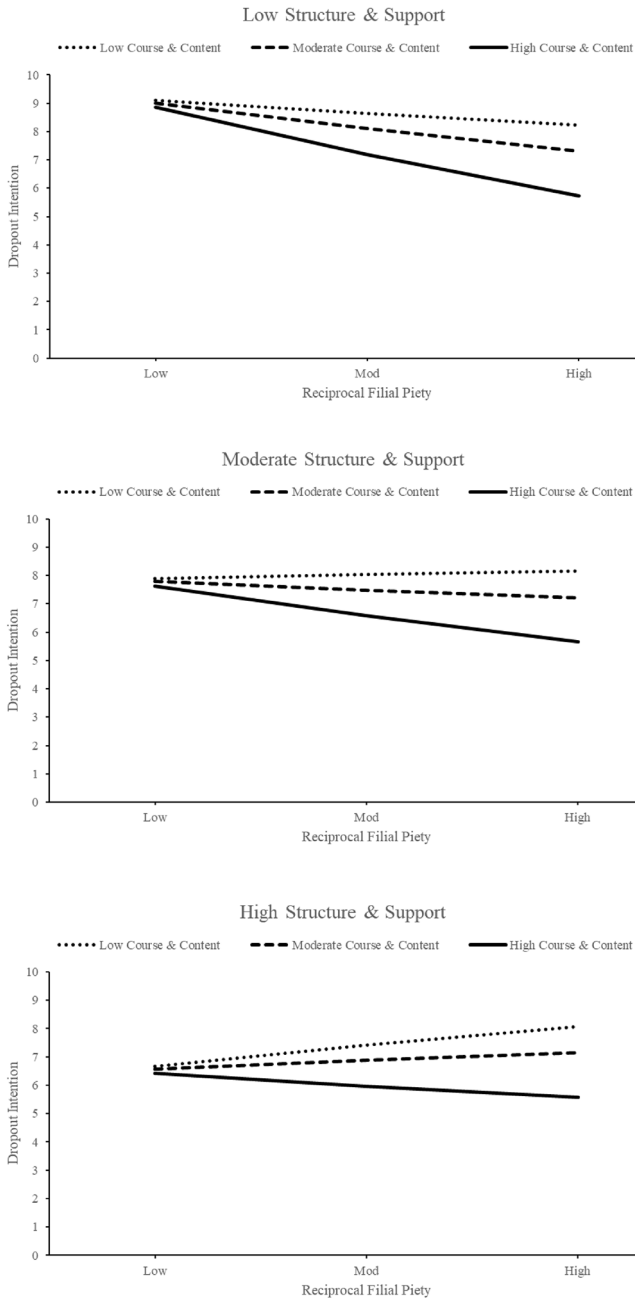


Fig. 2 Moderating effect of course and content appraisal (WWH-CC) on the relationship between reciprocal filial piety and dropout intention. The top panel illustrates the moderating effect of course and content appraisal (WWH-CC) on the relationship between reciprocal filial piety and dropout intention at low levels of institutional support (WWH-SS). The middle panel represents the same moderation effect at moderate levels of WWH-SS, while the bottom panel shows the effect at high levels of WWH-SS

stress*WWH-CC interaction term, $\Delta R^2=0.004$, $F(1, 310)=1.61$, $p=0.21$, with $b=0.01$, $t=1.27$, $p=0.21$, 95% CI $[-0.007, 0.03]$, and the COVID-19 stress*WWH-SS interaction terms, $\Delta R^2=0.001$, $F(1, 310)=0.48$, $p=0.41$, with $b=-0.01$, $t=-0.69$, $p=0.49$, 95% CI $[-0.05, 0.02]$ were nonsignificant.

The anxiety moderation model explained 40.3% of the variance in dropout intention, $F(8, 310)=26.23$, $p<0.001$. However, the interaction terms were nonsignificant for anxiety*WWH-CC, $\Delta R^2=0.0003$, $F(1, 310)=0.18$, $p=0.68$, with $b=-0.002$, $t=-0.42$, $p=0.68$, 95% CI $[-0.01, 0.01]$, and anxiety*WWH-SS, $\Delta R^2=0.004$, $F(1, 310)=2.54$, $p=0.11$, with $b=0.01$, $t=1.59$, $p=0.11$, 95% CI $[-0.003, 0.03]$.

The sleep moderation model explained 37.0% of the variance in dropout intention, $F(8, 310)=22.71$, $p<0.001$. However, the interaction terms were nonsignificant for sleep*WWH-CC, $\Delta R^2=0.001$, $F(1, 310)=0.70$, $p=0.40$, with $b=0.01$, $t=0.84$, $p=0.40$, 95% CI $[-0.01, 0.02]$, and sleep*WWH-SS, $\Delta R^2=0.001$, $F(1, 310)=0.64$, $p=0.42$, with $b=0.01$, $t=0.80$, $p=0.42$, 95% CI $[-0.01, 0.03]$.

Discussion

This study aimed to identify significant psychological predictors (including anxiety, resilience, sleep quality, and reciprocal filial piety) of university dropout intention among international students studying in Australia and to examine whether student appraisals of course content and institutional support moderate the relationships between these predictors and dropout intention. To the authors' knowledge, this is among the first empirical investigations to do so within the context of international students in Australian higher education.

Intercorrelations among variables and prevalence of mental health outcomes

Preliminary analyses revealed several significant associations between dropout intention and a range of psychological, behavioural, and socio-economic factors. Dropout intention was positively correlated with mental distress (including depression, anxiety, and stress), sleep disturbances, alcohol misuse, gambling problems, financial stress, and stress related to the COVID-19 pandemic, while being negatively correlated to resilience and reciprocal filial piety. No significant association was found between authoritarian filial piety and dropout intention.

Psychological distress and sleep disturbance were critical in academic persistence (Hjorth et al., 2016). Behavioural (e.g., alcohol misuse and gambling problems; Carney et al., 2019; Chau et al., 2016; Vázquez-Nava et al., 2019) and environmental (financial stress and stress related to the COVID-19 pandemic; Britt et al., 2017; Tsolou et al., 2021) factors were also potential risk markers for reduced academic engagement and increased dropout intention. Resilience and reciprocal filial piety served as protective factors against dropout intention, aligning with evidence that personal strength and coping capacities buffer against academic challenges (McKenzie, 2022), and students who perceive family relationships as characterised by

mutual care and responsibility were less inclined to consider leaving their studies (Song et al., 2012). However, adherence to parental expectations by suppressing personal desires (namely, authoritarian filial piety) does not appear to offer similar protective benefits. This distinction underscores the differential effects of cultural values surrounding familial expectations on academic motivation.

Additionally, 60.8% of participants reported symptoms of depression at a moderate level or higher, 71.2% reported moderate to severe anxiety symptoms, and 46.7% experienced moderate or greater levels of stress. These results match previous findings that approximately 65% of Australian university students experience psychological distress (Browne et al., 2017). Regarding alcohol consumption, 38.7% of participants were classified as low risk for alcohol misuse, while 44.2% engaged in hazardous drinking, and 17.1% exhibited high-risk drinking behaviours.

Psychological predictors for dropout intention among international students

The analysis addressing RQ1 identified three significant predictors for increased dropout intention: anxiety, COVID-19 stress, and poor sleep. COVID-19 stress was the strongest factor, aligning with Dingle et al.'s (2024) study, which linked the pandemic to increased psychological tolls and dropout intentions among international students. During the pandemic, border closures forced a quick shift to remote learning, increasing dropout rates (Colpo et al., 2024). Schanzenbach and Turner (2022) found a 3.7% lower re-enrolment rate among the first COVID-affected student cohort, especially among international students. Stricter lockdowns and border restrictions also reduced overall enrolment by 3.8%. Although the pandemic's peak is over, studying its effect on international student dropout is vital for resilient education systems and future crisis responses (Colpo et al., 2024).

Oliveira et al.'s (2025) study reported an indirect relationship between anxiety and academic engagement, mediated by grade point average (GPA). This suggests that anxiety and other mental health conditions can contribute to negative cognitive states, impairing learning and academic engagement. Auerbach et al. (2016) found high anxiety prevalence among dropouts, up to 91%, compared to 13.9% among graduates. Poor sleep also predicted dropout intention, associated with depression and reduced academic performance (Chen & Chen, 2019; Oliveira et al., 2025; Seoane et al., 2020).

In contrast, the current findings differ from Leow et al.'s (2024) systematic review, which found that anxiety was not a significant predictor of university dropout, whereas depression and stress were. Several factors may account for this discrepancy. First, the present study measured dropout intention, while the review focused on actual dropout, representing different stages of the dropout process. Second, data were collected during COVID-19, a period of heightened anxiety among international students due to border restrictions and uncertainty, likely influencing dropout intentions and patterns. Third, the review examined the general university student population, whereas this study focused on international students, who encounter unique challenges like acculturation stress, language barriers, higher

tuition, and unfamiliar pedagogical styles, differentiating their experiences and psychological responses.

Notably, several studies have demonstrated that dropout intention predicts actual dropout, and it is commonly used in university attrition models (e.g., Cortes et al., 2014; Findeisen et al., 2024; López-Angulo et al., 2023; Schmitt et al., 2021). However, intention does not necessarily cause dropout; there may be an intention-behaviour gap (Ajzen, 1991). Dropout intention reliably predicts actual dropout, though its strength varies by context (Findeisen et al., 2024). Dropout is a process that arises from the interaction of various variables, ranging from individual characteristics to the journey towards higher education and what occurs within the institution (Tinto, 1975). An important contextual factor for this study was COVID-19.

The analysis for RQ1 found resilience and reciprocal filial piety as key protective predictors of dropout intention. Resilience was the strongest protective predictor. Resilience enables individuals to adapt and confront challenges, and its relevance to academic success is well documented (Steel et al., 2024). This finding aligns with previous research; Pertegal-Felices et al. (2022) showed that students who persisted in their studies during the COVID-19 pandemic had higher resilience than dropouts, who had lower interpersonal resources, family support, sociocultural resources, and coping ability.

Reciprocal filial piety predicts lower dropout intention, aligning with its association with academic success (Guo et al., 2022). Filial piety, rooted in Confucian culture, is increasingly recognised as a universal psychological construct with two dimensions: authoritarian and reciprocal (Li et al., 2021b). The study supports this dual-factor framework, supporting reciprocal filial piety's role in reducing dropout intention.

Students' appraisals of course content and institutional support as moderators of the relationship between significant predictors and dropout intention

Analysis of RQ2 showed course and content appraisal significantly and negatively moderated the relationship between resilience and dropout intention, while structure and support did not. High ratings of course and content strengthened resilience's role in lowering dropout intent, but low appraisal kept dropout intentions high regardless of resilience. Essentially, resilient students might still consider dropping out if they perceive their course negatively. Conversely, positive perceptions enhance resilience's protective effect, further reducing dropout intent.

According to Schmitt et al. (2021), students' evaluations of course content encompass factors like weekly workload, personal affinity, relevance, expectations, clarity, comprehension, contribution to professional development, theory–practice integration, and grading system, all influencing perceived relevance, organisation, and value, which support intrinsic motivation (Patall et al., 2008). High intrinsic motivation boosts deep engagement, persistence, and academic performance, reducing dropout risk (Augustyniak et al., 2016). However, dissatisfaction and low

motivation can undermine engagement, even with resilience, increasing vulnerability to dropout ideation.

The negative moderation of reciprocal filial piety on dropout intention by course and content appraisal shows that students with positive content ratings benefit more from this value, reducing dropout intent. In contrast, negative perceptions weaken this effect, suggesting that even those valuing filial piety may consider dropping out if dissatisfied. While reciprocal filial piety can promote persistence through cultural values that emphasise diligence and educational commitment, it may not be sufficient to overcome the disengagement resulting from negative perceptions of course content.

A potential explanation for this moderation effect is that reciprocal filial piety primarily influences students' motivation through perceived family support and emotional connections, rather than a sense of obligation. When students are intrinsically motivated and see their education as matching their personal goals and family values, they are more likely to persist (Song et al., 2012). However, if courses seem irrelevant, unengaging, or overly challenging, this may weaken intrinsic motivation related to family support. In such cases, the protective influence of reciprocal filial piety might be insufficient to sustain academic engagement and prevent dropout intention.

Interestingly, our findings show student appraisal of structure and support did not significantly moderate the relationships between resilience, reciprocal filial piety, and dropout intention. Even when students viewed institutional structures and support positively, such as pedagogical assistance, physical infrastructure, teaching methodologies, instructors' dedication to student learning, course coordination, and access to course and institutional information, as described by Schmitt et al. (2021), the protective effects of resilience and reciprocal filial piety on dropout intention did not become significantly stronger compared to students with lower appraisal of these institutional elements. This suggests that while institutional support is crucial, it may not enhance the influence of personal traits, such as resilience, or cultural values such as familial reciprocity, on reducing dropout intention. Students high in resilience and reciprocal filial piety might already possess robust internal coping strategies and reliable external family support, reducing their dependence on institutional resources. In contrast, students without these supports may rely more on institutional structures and services to remain engaged.

Implications

Theoretically, our findings extend Tinto's (2012) dropout model by highlighting mental health as a key psychological factor alongside academic and social integration. While Tinto focuses on integration, this study demonstrates that mental health is crucial for student persistence. Future research should incorporate mental health variables to better explain dropout reasons. Although increasingly acknowledged as vital, its specific relationship with students' capacity to integrate academically and socially, and how this in turn affects persistence, remains underexplored. Existing literature on this interaction is limited, and our findings suggest that neglecting

mental health concerns may undermine broader institutional efforts to improve retention. As such, it is imperative that mental health be integrated into future dropout models.

Practically, our findings show anxiety, COVID-19 stress, and poor sleep increase international student dropout intent, while resilience and reciprocal filial piety decrease it, highlighting complex psychological and academic factors. Given the high prevalence of mental distress among international students, it is essential that university mental health services are not only readily accessible but also culturally sensitive and tailored to meet their distinct needs (Huang et al., 2024; Minutillo et al., 2020). Culturally sensitive support recognises diverse understandings of mental health, language, and help-seeking, ensuring relevant interventions. This may include the development of targeted programs aimed at enhancing resilience and fostering reciprocal filial piety. Additionally, universities should prioritise training for academic and support staff to identify and respond to signs of psychological distress (Gulliver et al., 2018). Addressing mental health as a key determinant of student retention helps support students' well-being and academic success (Huang et al., 2024).

Moreover, our results underscore the critical role of students' perceptions of course content in dropout among international students. While resilience remains a protective factor, its impact is contingent upon students' academic experiences. Similarly, the protective role of reciprocal filial piety on dropout intention is moderated by how students engage with their programs. These findings emphasise the importance of enhancing course quality to support student retention. Institutions should ensure that course content is engaging, relevant, professionally applicable, and well-structured to foster positive academic experiences. By addressing both individual psychological factors and institutional academic factors, universities can adopt a more holistic and effective strategy for reducing dropout rates.

In the post-pandemic world, it is essential not only to consider the roles of academic institutions and individuals in dropout risk prevention, but also consider the public health concerns and the increase in distress associated with the COVID-19 pandemic (Dingle et al., 2024). Lemyre et al. (2023) suggest a shift towards population-level interventions, which may include accessible mental health infrastructure, proactive screening for psychological distress, and policy reform to ensure equitable support for international students during crises. This would mean that universities collaborate with public health systems to enable a coordinated response towards student well-being (Brewster & Cox, 2023; Leow et al., 2024). These findings further underscore the need for universities to develop flexible mental health and retention strategies that can be rapidly deployed in response to future public-health crises or other systemic disruptions (WHO, 2024).

Limitations

Despite its valuable insights, this study has several limitations. First, the DASS-21 (Lovibond & Lovibond, 1995) was developed and normed using data from the Australian general population, and its applicability to international students from

diverse cultural backgrounds may be limited (Oei et al., 2013). Cultural differences in the expression and interpretation of mental health symptoms may result in the DASS-21 failing to capture important dimensions of psychological distress relevant to international student populations (Oei et al., 2013). These disparities may have been further exacerbated by the unique stressors associated with the COVID-19 pandemic, although this remains an area of limited understanding (Furlong & Finnie, 2020). To enhance cultural validity, future research should consider employing mental health measures that are specifically adapted or validated for use with international student populations (Minas et al., 2013).

Second, this study relied on self-reported intentions to drop out, which may not necessarily translate into actual dropout (Ajzen, 1991). The well-documented intention–behaviour gap suggests that students who express a high likelihood of dropping out may ultimately continue their studies due to external factors such as financial obligations, social support, or institutional interventions (Norton & Cherastidtham, 2018). Additionally, some students who do disengage may later re-enrol, either in a different program at the same institution or at another university. To more accurately capture the dynamics between mental health and student retention, future research should incorporate longitudinal designs that track actual dropout behaviour over time.

Third, the sample used in this study may not fully represent the broader international student population in Australia. One of the inclusion criteria in our study required participants to reside in Australia at the time of data collection; consequently, students living outside Australia during the COVID-19 pandemic were excluded. Hence, although participants were drawn from a range of countries, students from China and India, which are the two largest international student cohorts in Australia (Department of Education, 2024), were underrepresented in the current study as they were not residing in Australia during the data collection period. This limitation may affect the generalisability of the findings, particularly given that students from different cultural and national backgrounds may experience distinct challenges and support needs. Future research should aim to include more proportionally representative samples to ensure that conclusions can be more confidently extended to the wider international student population.

Finally, although most participants completed the questionnaire within approximately 25–30 min, the relatively large battery of measures may still have introduced some participant fatigue, which could have in turn affected data quality and completion rates. Such fatigue may partially explain participant attrition or missing data. Moreover, the order of questions in the survey was not randomised, which raises the potential for response biases due to order effects, such as primacy or recency influences on participants' answers.

Conclusion

This study offers valuable insights into the mental health challenges experienced by international students in Australia and their influence on dropout intentions. The findings indicate that anxiety and poor sleep are significant predictors of

students' intentions to withdraw from university, while reciprocal filial piety and resilience function as protective factors. These results underscore the importance of integrating mental health support within university retention strategies and adopting a more holistic approach to student well-being. It also highlights the relevance of the times in a post-pandemic era, where the lingering effects of psychological distress associated with the pandemic may endure. By addressing the distinct psychological needs of international students, institutions can enhance academic persistence and contribute to the long-term success of this population. Greater attention must be given to the collaborative efforts among governmental agencies, public health, and academic institutions to ensure the well-being of international students. Future research should incorporate longitudinal designs to more fully examine the relationship between mental health and actual dropout behaviour over time.

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Declarations

Competing interests The authors declare no potential conflicts of interest with respect to the research and authorship pertaining to this article.

Ethical approval Research ethics approval was obtained by the Institutional Review Board of James Cook University (HREC ID: H8591).

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