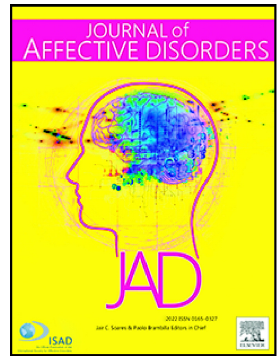
Journal Pre-proof



Correlates of burnout and dropout intentions in medical students: A cross-sectional study

Jorge Sinval, Pedro Oliveira, Filipa Novais, Carla Maria Almeida, Diogo Telles-Correia

PII: S0165-0327(24)01216-3

DOI: https://doi.org/10.1016/j.jad.2024.08.003

Reference: JAD 17964

To appear in:

Received date: 4 June 2024

Revised date: 3 August 2024

Accepted date: 8 August 2024

Please cite this article as: J. Sinval, P. Oliveira, F. Novais, et al., Correlates of burnout and dropout intentions in medical students: A cross-sectional study, (2024), https://doi.org/10.1016/j.jad.2024.08.003

Correlates of Burnout and Dropout Intentions in Medical Students: A Cross-Sectional Study

Jorge Sinval[1,2,3,4,5], Pedro Oliveira[1], Filipa Novais[6,7], Carla Maria Almeida[6,7], & Diogo Telles-Correia[6,7]

[1] Faculdade de Medicina, Universidade de Lisboa, Portugal

[2] National Institute of Education, Nanyang Technological University, Singapore

[3] Business Research Unit (BRU-IUL), Instituto Universitário de Lisboa (Iscte-IUL), Portugal

[4] Faculty of Philosophy, Sciences and Languages of Ribeirão Preto, University of São Paulo, Brazil

[5] Department of Evidence-Based Health, Escola Paulista de Medicina, Universidade Federal de São Paulo, Brazil

[6] Clínica Universitária de Psiquiatria e Psicologia Médica, Faculdade de Medicina, Universidade de Lisboa, Portugal

[7] PSYLAB — Instituto de Saúde Ambiental, Faculdade de Medicina, Universidade de Lisboa, Portugal

Corresponding author: Jorge Sinval (email: jorgesinval@gmail.com); address: National Institute of Education, Nanyang Technological University, 1 Nanyang Walk, Block 2-11, Singapore 637616.

Declarations of interest: none.

Funding: This work was produced with the support of INCD, and it was funded by FCT I.P. under the project Advanced Computing Project CPCA/A1/435377/2021, platform Cirrus.

Jorge Sinval ORCiD: https://orcid.org/0000-0002-2855-1360

Pedro Oliveira ORCiD: https://orcid.org/0000-0002-4989-2113

Filipa Novais ORCiD: https://orcid.org/0000-0001-9379-1734

Carla Maria Almeida ORCiD: http://orcid.org/0000-0002-5463-5955

Diogo Telles-Correia ORCiD: https://orcid.org/0000-0003-4217-2823

Introduction

Conceptually burnout is considered as a syndrome belonging to affective spectrum and/or very close to affective disorders, either because it has symptoms that often overlap with those of depression and anxiety (Stoyanov et al., 2013; Tavella et al., 2023), or because it can predispose to depression disorders (Hakanen and Schaufeli, 2012). In aligning with a modern conceptualization of burnout, Schaufeli and De Witte (2023) delineate four core dimensions: (1) exhaustion, where significant energy depletion manifests as both physical and mental fatigue; (2) mental distance, characterized by a profound resistance or aversion towards academic tasks, leading to apathy and skepticism; (3) cognitive impairment, which includes difficulties in memory, attention, and concentration, resulting in suboptimal cognitive performance; and (4) emotional impairment, marked by intense emotional reactions such as anger or sadness, overwhelming the individual's emotional capacity.

These dimensions contribute to apathy and a diminished sense of purpose but are also indicative of potential underlying affective disturbances. The intensive demands of medical education and the emotional burden of patient care may predispose students to high levels of burnout, which recent studies suggest may be a significant precursor to dropout intentions (Dyrbye et al., 2014). Furthermore, within the network of burnout, depression, and anxiety, mental distance symptoms appear to be particularly prevalent among medical students (Peng et al., 2023). The combination of high workload, rigorous examinations, the stress of mastering novel clinical procedures, insufficient social support, sleep deprivation, and feelings of guilt forms a toxic milieu that fosters burnout but also potentially triggers or exacerbates psychiatric disorders (Greenmyer et al., 2022; Thun-Hohenstein et al., 2021).

This intersection underscores the importance of considering burnout in medical students not merely as a stress-related educational issue but as an integral component of the broader spectrum of affective disorders, necessitating a multifaceted approach to diagnosis, prevention, and treatment.

Beyond burnout, satisfaction with educational experiences plays a pivotal role in influencing medical students' intentions to dropout. It is a well-supported notion that students who find fulfillment in their educational journeys are less likely to disengage from their programs. This relationship between educational satisfaction and dropout intention has been substantiated across various academic disciplines (Duque, 2014; Li and Carroll, 2017; Tinto, 1975), however, the unique pressures and challenges inherent to medical education demand a more tailored exploration of this relationship.

Discontentment with the educational environment can exacerbate feelings of exhaustion, mental distance, and emotional impairment, potentially escalating into more severe affective disturbances. Thus, the relationships between educational satisfaction and affective outcomes warrants specific attention in research, with an aim to develop targeted interventions that enhance both educational experiences and psychological well-being among medical students.

Psychological capital (PsyCap), encompassing hope, resilience, optimism, and self-efficacy, is a positive psychological construct that has demonstrated significant potential in aiding individuals to thrive in challenging environments (Luthans et al., 2007b). The relevance of PsyCap extends beyond general workplace settings, where it has been linked to enhanced performance, job satisfaction, and overall well-being (Avey et al., 2011), to the highly demanding context of medical education. Casanova et al. (2024) emphasized the role of self-efficacy — a component of PsyCap — in predicting academic success among heterogeneous student populations in higher education, emphasizing its influence on students' academic engagement and subsequent achievements. This aligns with findings that PsyCap could serve as a protective factor not only in mitigating burnout but also in enhancing satisfaction with education and reducing dropout intentions among medical students (Sánchez-Cardona et al., 2021; Sweet and Swayze, 2023). The capacities to maintain hope, resilience, optimism, and self-efficacy may buffer the cognitive and emotional impairments that are symptomatic of burnout, potentially disrupting the onset or progression of affective disorders (Barratt and Duran, 2021). Investigating PsyCap within the framework of medical education could therefore yield pertinent insights into how these positive psychological resources can be cultivated to support students' mental health and academic persistence, aligning with a preventive approach to mental health disorders in this high-risk population.

Social support is another factor that stands as a pillar in promoting academic success and well-being, particularly within the high-pressure environment of medical education. Recognized for its stress-buffering effects, social support manifests in various forms such as emotional, instrumental, informational, and appraisal support (Wills et al., 2016). Extensive research underscores its role in mitigating stress impacts, enhancing psychological well-being, and fostering academic achievement (Abreu Alves et al., 2022; Barratt and Duran, 2021; Li et al., 2018). In the context of medical students, where the prevalence of burnout and affective disturbances is notably high (Frajerman et al., 2019; Slavin and Chibnall, 2016), social support could be instrumental not only in reducing burnout and enhancing educational satisfaction but also in reducing dropout intentions (Abreu Alves et al., 2022). The protective effects of social support might extend to mitigating the prodromal symptoms of affective disorders, thereby playing a relevant role in the continuum from stress to potential psychiatric conditions. Exploring the specific mechanisms through which social support influences these outcomes can provide valuable insights for developing targeted interventions aimed at bolstering resilience against affective disturbances among medical students.

These elements — PsyCap, social support, burnout, and satisfaction with education — represent not merely isolated factors, but interconnected dimensions that can reflect and affect the broader spectrum of affective disorders present within the medical student population (Ernst et al., 2021). Understanding how these factors interact is important for developing targeted strategies aimed at reducing dropout rates and promoting mental health resilience, ultimately benefiting the broader fields of healthcare and education by ensuring the continuity and stability of medical training.

Purpose of the Present Study

Considering the complex relationships between affective disorders and educational outcomes in medical education, this study aims to investigate the role of social support and PsyCap as underlying correlates of burnout, satisfaction with education, and dropout intentions among medical students. By employing a structural model, this research that allows to explore the direction and respective magnitude of association among these variables (Figure 1). This model will particularly emphasize the roles of PsyCap and social support as mitigating factors in the context of burnout and its repercussions on educational satisfaction and dropout intentions.

While previous studies have explored the incidence of burnout and its correlates (Abreu Alves et al., 2022; Almutairi et al., 2022; Cabaços et al., 2023), this study introduces novelty by measuring burnout from a fresh, thorough, and comprehensive perspective (Schaufeli and De Witte, 2023), conceptualizing it with two new core dimensions — cognitive impairment and emotional impairment — in addition to the established dimensions of exhaustion and mental distance. This study positions PsyCap — which includes hope, resilience, optimism, and self-efficacy — as a potential protective factor against burnout and dropout intentions in medical education. Additionally, by integrating other established factors in medical education literature — namely satisfaction with education and social support — this study explores how these variables interact within the educational setting and seeks to clarify potential pathways for reducing burnout and the risk of attrition. Moreover, these insights are expected to inform the development of interventions that not only prevent dropout but also enhance a supportive educational environment conducive to managing and mitigating the onset and impact of affective disorders among medical students.

The first hypothesis (H_1) of this study proposes that PsyCap — encompassing hope, efficacy, resilience, and optimism — significantly associates with burnout, satisfaction with education, and dropout intentions among medical students. Given PsyCap's established role in enhancing academic performance and wellbeing (Barratt and Duran, 2021; Sánchez-Cardona et al., 2021), it is anticipated that medical students with higher levels of PsyCap will exhibit resilience against the cognitive and emotional challenges of their rigorous training. This resilience may not only mitigate symptoms associated with burnout but also potentially buffer against the development and escalation of affective disorders, thus fostering greater educational satisfaction and persistence in their programs.

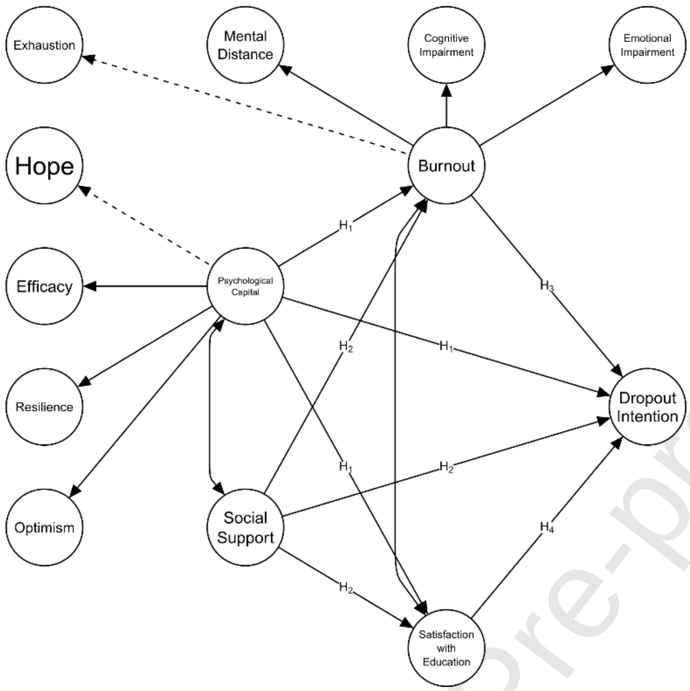
The second hypothesis (H_2) suggests that social support serves as a correlate for burnout, satisfaction with education, and dropout intentions among medical students. Recognized for its potent stress-buffering effects and its role in enhancing academic success (Abreu Alves et al., 2022; Li et al., 2018), social support is expected to be a key factor in mitigating the challenges faced by medical students. It is hypothesized that students who perceive higher levels of social support are less likely to exhibit symptoms of burnout. Additionally, robust social support networks are anticipated to contribute positively to students' satisfaction with their educational experience and reduce their intentions to drop out, thereby promoting a healthier, more supportive learning environment conducive to both academic and emotional well-being.

The third hypothesis (H_3) posits that burnout significantly associates with dropout intentions among medical students. Supported by research indicating that burnout presents a relevant association with students' intentions to leave their programs (Dyrbye et al., 2010; Peng et al., 2023).

The fourth hypothesis (H_4) proposes that satisfaction with education is a significantly associated with dropout intentions among medical students. Consistent with findings that students who are more content with their educational experiences are generally less likely to consider leaving their programs (Duque, 2014; Li and Carroll, 2017), this hypothesis emphasizes the role of educational satisfaction in the broader context of student well-being and persistence.

Figure 1

Hypothesized Model



Method

Sampling

A non-probability sampling — convenience sample — was implemented by inviting first- and second-year undergraduate medical students from a public university in Portugal to participate in the study. There were no exclusion criteria. The minimum sample size for the proposed structural model (df = 647) was determined based on the assumption that the population *RMSEA* should not exceed $\varepsilon_0 = .06$ (H_0: $\varepsilon \geq .06$). This assumption relies on the premise that rejecting this hypothesis indicates a model fit better than .06, a threshold representing a fair fit (Browne and Cudeck, 1993). The true population *RMSEA* was set at $\varepsilon = .050$. With $\alpha = .05$ and $\beta = .20$ (i.e., $\pi = .80$), the needed minimum sample size for the structural model was determined to be $n = 185$ (Kelley and Lai, 2018).

Sample Characterization

Table 1represents a demographic and academic snapshot of 351 medical students, comprised of 263 females and 88 males. With an average age of 20.2 years (*SD* = 3.99) spanning 17-49 years, the majority (59.5%) of students are native to their city of study. Lisbon is the predominant administrative region of origin (49.9%), followed by Setúbal (11.4%). The average number of higher education enrollments is 1.86 (*SD* = 1.69), with a minor proportion (12.0%) having undertaken undergraduate study in other disciplines. Financial aid is received by 14.2% of the students, while the majority (85.8%) are self-financed.

Table 1

Demographic and Academic Characteristics of the Participants

	Female (*n* = 263)	Male (*n* = 88)	Overall (*N* = 351)
Age (years)			
M (*SD*)	20.2 (4.17)	20.3 (3.41)	20.2 (3.99)
Mdn [*Min*, *Max*]	19.0 [17.0, 49.0]	19.0 [17.0, 34.0]	19.0 [17.0, 49.0]
Moved from the city of origin			
Yes	108 (41.1%)	34 (38.6%)	142 (40.5%)
No	155 (58.9%)	54 (61.4%)	209 (59.5%)
Administrative Region of Origin			
Lisbon	128 (48.7%)	47 (53.4%)	175 (49.9%)
Santarém	10 (3.8%)	8 (9.1%)	18 (5.1%)
Setúbal	35 (13.3%)	5 (5.7%)	40 (11.4%)
Others*	77 (29.3%)	22 (25.0%)	99 (28.2%)
Outside Portugal	13 (4.9%)	6 (6.8%)	19 (5.4%)
Number of enrollments in Higher Education			
M (*SD*)	1.80 (1.54)	2.02 (2.07)	1.86 (1.69)
Mdn [*Min*, *Max*]	1.00 [1.00, 13.0]	1.00 [1.00, 14.0]	1.00 [1.00, 14.0]
Undergraduate Course in Other Disciplines			
Yes	30 (11.4%)	12 (13.6%)	42 (12.0%)
No	233 (88.6%)	76 (86.4%)	309 (88.0%)
Grant Holder			
Yes	38 (14.4%)	12 (13.6%)	50 (14.2%)
No	225 (85.6%)	76 (86.4%)	301 (85.8%)

Note. * — All other administrative regions with a relative frequency of ≤ 5% in the overall sample have been merged into the category "Others."

Procedure

All first- and second-year medical students enrolled in the integrated master's program at the faculty of medicine of a major public university in Lisbon were invited via email to participate in the study. Data collection commenced six weeks after the start of the 2023-2024 academic year and lasted for two weeks. An online survey comprising psychometric instruments, sociodemographic and academic questions was applied through the *LimeSurvey* software (LimeSurvey GmbH, 2024). Students were initially presented with an electronic informed consent form, which they had to accept to proceed to the questionnaire and were informed they had the option to withdraw from the study at any stage. To enhance adherence, participants were informed that they would receive an automatically generated report summarizing their responses with terms of means and percentiles regarding the global sample. The study received approval from the Ethics Committee of CHLN-HSM and the Faculty of Medicine at the University of Lisbon (FMUL) (Ref. N. 210/20).

Measures

Burnout Assessment Tool (BAT-12)

The Burnout Assessment Tool 12-item version (BAT-12) comprises four first-order dimensions — exhaustion, mental distance, emotional impairment, and cognitive impairment — with three items each. It assumes hierarchical structure, with the second-order latent factor burnout. It has an ordinal answering scale ranging from 1 — "Never" to 5 — "Always." The BAT was originally developed by Schaufeli et al. (2020) and has been adapted in several countries to measure job burnout (de Beer et al., 2020). More recently, it was also adapted to measure academic burnout (Popescu et al., 2023). The items used in the current study were adapted from the Portuguese workers' version, which demonstrated good validity evidence, confirmed its original dimensionality, and provided good estimates of internal consistency and measurement invariance across male and female participants (Sinval et al., 2022). Examples of items are: "At school, I feel mentally exhausted" (exhaustion), "I struggle to find any enthusiasm for school" (mental distance), "At school, I have trouble staying focused" (cognitive impairment), and "At school, I feel unable to control my emotions" (emotional impairment).

Revised Compound PsyCap Scale (CPC-12R)

PsyCap was measured using the Revised Compound PsyCap Scale (Dudasova et al., 2021) which is composed of 12 items. There are three items for each of the first-order dimensions (hope, efficacy, resilience, and optimism), which are nested under a second-order latent factor, PsyCap. Items are using a six-point ordinal scale ranging from 1 — "Strongly disagree" to 6 — "Strongly agree." The CPC-12R presented good validity evidence based on its internal structure, supporting the originally proposed dimensionality, internal consistency, and measurement invariance across genders and countries (Ikeda et al., 2023; Lorenz et al., 2022). Examples of items are: "If I should find myself in a jam, I could think of many ways to get out of it" (hope), "I am confident that I could deal efficiently with unexpected events" (efficacy), "I consider myself to be able to stand a lot, I am not easily discouraged by failure" (resilience), and "I am looking forward to the life ahead of me" (optimism).

Brief Form of the Perceived Social Support Questionnaire (F-SozU K-6)

Perceived Social Support was assessed using the F-SozU K- 6 (Kliem et al., 2015), a concise 6-item version of the F-SozU K-14. This shortened version maintains good psychometric properties when compared to its longer versions. It measures general social support and has a five-point ordinal scale ranging from 1 — "Does not apply" to 5 — "Exactly applicable." In previous research, the F-SozU K-6 presented good validity evidence based on the internal structure — dimensionality, reliability, and measurement invariance across countries — and based on the relations to other variables — convergent and test-criterion evidence (Lin et al., 2019). One example of item is "I receive a lot of understanding and security from others." (social support).

Screening Instrument for Students At-Risk of Dropping Out

Satisfaction with Education. Satisfaction with education was measured using a four-item measure from the Screening Instrument for Students At-Risk of Dropping Out (Casanova et al., 2021a). Responses were recorded on an ordinal scale, ranging from 1 — "Strongly disagree" to 5 — "Strongly agree." In the original study, this measure displayed satisfactory internal consistency (ω = .80). One example of item is "I am satisfied attending this university" (satisfaction with education).

Dropout Intention. Dropout intentions were assessed via a four-item measure from Casanova et al.'s (2021) Screening Instrument for Students At-Risk of Dropping Out, with responses on an ordinal scale ranging from 1 — "Strongly disagree" to 5 — "Strongly agree." The measure demonstrated acceptable internal consistency (ω = .75) in the original study. One example of item is "I am thinking in the possibility of dropping out of higher education" (dropout intention).

Academic and Demographic Variables

Data was also collected on students' sex, age, whether they relocated from their hometown for education, and their original administrative region of origin. The original administrative region refers to the specific first-level administrative division, district, or autonomous region from which individual respondents originate. Additionally, information on the number of enrollments in higher education, prior undergraduate studies in other disciplines, and their grant holder status.

Data Analysis

Statistical analyses were conducted using the *R* program (R Core Team, 2024), via the integrated development environment, *RStudio* (Posit Team, 2024). Confirmatory factor analysis (CFA) was conducted to investigate the proposed dimensionality of the measurement model. The goodness-of-fit indices were the scaled versions of *NFI*, *TLI*, *CFI*, *RMSEA*, *SRMR*, and χ^2. Good values are *NFI*, *TLI*, *CFI* above .95 (Hu and Bentler, 1999) and *RMSEA* and *SRMR* below .08 (Browne and Cudeck, 1993; Hu and Bentler, 1999). The analysis was performed using the *lavaan* package (Rosseel, 2012) with the weighted

Least Squares Mean and Variance adjusted (WLSMV) estimator (Muthén, 1983). The sample size for the tested models was determined using the *MBESS* package (Kelley, 2023) following guidelines by Kelley and Lai (2018).

The reliability of the first-order factors was assessed via the ordinal version of ω (McDonald, 1999). For second-order factors the internal consistency estimators were ω_{L2} (proportion of the variance in the first-order factors that the second-order factor explains), $\omega_{partial\ L1}$ (proportion of variance explained by the second-order factor after removing the uniqueness of the first-order factor), and ω_{L1} (proportion of the total score that the second-order factor accounts for). All the internal consistency estimates were calculated using the *semTools* package (Jorgensen et al., 2023).

The *lavaan* package was also used to test the structural model (Rosseel, 2012). Listwise deletion was implemented. All statistical analyses were carried out with an $\alpha = .05$. The diagrams were generated utilizing the *semPlot* package (Epskamp, 2015) in conjunction with the *semptools* package (Cheung and Lai, 2023).

Results

Measurement Model

The original dimensionality of the measurement model revealed a satisfactory fit to the data ($n = 323$; $\chi^2_{(647)} = 1141.42$; $p < .001$; $CFI = .96$; $NFI = .92$; $TLI = .96$; $SRMR = .06$; $RMSEA = .05$; CI 90% (.04; .05); $p_{[RMSEA \leq .05]} = .670$). No modifications were introduced regarding the original dimensionality of each individual psychometric instrument. Only the complete cases were used (listwise deletion).

The reliability of the scores was analyzed in terms of internal consistency demonstrating satisfactory evidence: exhaustion (ω = .78); mental distance (ω = .79); cognitive impairment (ω = .81); emotional impairment (ω = .89); satisfaction with education (ω = .79); hope (ω = .76); optimism (ω = .83); resilience (ω = .77); efficacy (ω = .83); social support (ω = .85), and dropout intention (ω = .90).

Similarly, the burnout (ω_{L2} = .87; $\omega_{partial\ L1}$ = .94; ω_{L1} = .82) and PsyCap (ω_{L2} = .92; $\omega_{partial\ L1}$ = .94; ω_{L1} = .87) second-order factors presented satisfactory evidence in terms of internal consistency.

Table 2 presents the latent correlations between the variables included in the measurement model. All latent correlations in the model presented the expected direction (p < .001).

Table 2

Latent Correlations within the Measurement Model, Mean and Standard Deviation of the Raw Scores

Variable	*M*	*SD*	1	2	3	4
Burnout (1)	2.49	0.66				
Satisfaction with Education (2)	4.06	0.68	-.70***			
Psychological Capital (3)	4.27	0.80	-.73***	.56***		
Social Support (4)	3.99	0.81	-.57***	.44***	.50***	
Dropout Intention (5)	1.48	0.71	.68***	-.61***	-.61***	-.38***

Note. *** — p < .001.

Structural Model

The original dimensionality of the structural model — Figure 2 — revealed a satisfactory fit to the data (n = 323; $\chi^2_{(647)}$ = 1141.42; p < .001; *CFI* = .96; *NFI* = .92; *TLI* = .96; *SRMR* = .06; *RMSEA* = .05; CI 90% (.04; .05); $p_{[RMSEA \leq .05]}$ = .670). Table 3 presents the latent regression coefficients for the tested direct, indirect, and total effects. PsyCap and social support showed statistically significant associations with burnout and with satisfaction with education (p < .001). More specifically, higher levels of PsyCap and general social support are directly associated with reduced burnout and increased educational satisfaction, both factors that in turn present statistically significant relationships with dropout intentions.

Burnout displayed a positive direct relationship with dropout intentions ($\hat{\beta} = .373; p = .002$), while satisfaction with education had an inverse relationship ($\hat{\beta} = -.249; p = .003$). Interestingly, PsyCap also had a negative relationship with dropout intentions ($\hat{\beta} = -.224; p = .005$), while social support does not show a direct significant association ($\hat{\beta} = .052; p = .442$).

The indirect effects also present meaningful findings, with both PsyCap and social support showing a statistically significant indirect effect on dropout intentions through a negative relationship with burnout and a positive one with satisfaction with education. This suggests that these variables are not only directly associated with dropout intentions, but also indirectly through their relationship with burnout and satisfaction with education.

In terms of total effects, PsyCap has a significant total negative effect on dropout intentions, both directly and indirectly. However, the total effect of social support on dropout intentions is not significant, indicating that its impact on dropout intentions is primarily through indirect means. The variance of the endogenous variables of interest explained by the model was large for burnout (r^2 = .59), satisfaction with education (r^2 = .35), and dropout intention (r^2 = .52) (Cohen, 1988).

Table 3

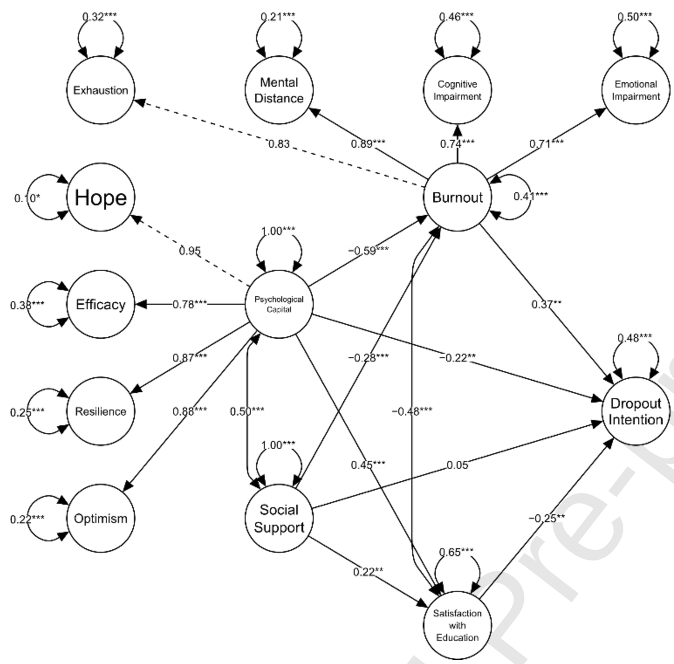
Latent Regression Coefficients

Path	$\hat{b}$	se	z	$\hat{\beta}$	p	95%CI
Direct Effect						
Bur ← PsyCap	-0.637	0.076	-8.334	-0.592	< .001	(-0.787; -0.487)
Bur ← SSp	-0.239	0.052	-4.624	-0.280	< .001	(-0.340; -0.138)
StE ← PsyCap	0.606	0.092	6.572	0.449	< .001	(0.425; 0.787)
StE ← SSp	0.235	0.077	3.060	0.220	.002	(0.084; 0.385)
DrI ← Bur	0.473	0.149	3.167	0.373	.002	(0.180; 0.766)
DrI ← StE	-0.251	0.086	-2.939	-0.249	.003	(-0.419; -0.084)
DrI ← PsyCap	-0.306	0.109	-2.817	-0.224	.005	(-0.519; -0.093)
DrI ← SSp	0.056	0.070	0.800	0.052	.424	(-0.081; 0.193)
Indirect Effect						
Indirect Effect (DrI ← Bur ← PsC)	-0.301	0.097	-3.109	-0.221	.002	(-0.491; -0.111)
Indirect Effect (DrI ← Bur ← SSp)	-0.113	0.045	-2.534	-0.105	.011	(-0.200; -0.026)
Indirect Effect (DrI ← StE ← PsC)	-0.152	0.056	-2.737	-0.112	.006	(-0.262; -0.043)
Indirect Effect (DrI ← StE ← SSp)	-0.059	0.028	-2.079	-0.055	.038	(-0.115; -0.003)
Total Effect						
Total effect [DrI ← PsC + (DrI < -Bur ← PsC)]	-0.607	0.100	-6.075	-0.445	< .001	(-0.803; -0.411)
Total effect [DrI ← SSp + (DrI ← Bur ← SSp)]	-0.057	0.073	-0.776	-0.053	.438	(-0.201; 0.087)
Total effect [DrI ← PsC + (DrI ← StE ← PsC)]	-0.458	0.125	-3.667	-0.336	< .001	(-0.703; -0.213)
Total effect [DrI ← SSp + (DrI ← StE ← SSp)]	-0.003	0.074	-0.040	-0.003	.968	(-0.149; 0.143)

Note. Bur — Burnout; PsyCap — Psychological Capital; SSp — Social Support; StE — Satisfaction with Education; DrI — Dropout Intention.

Figure 2

Structural Model Diagram



Note. *** — *p* ≤ .05; *** — *p* ≤ .01; *** — *p* ≤ .001. Dotted lines indicate fixed parameters.Discussion**

The findings from the current study offer insights into the associations between PsyCap, social support, burnout, educational satisfaction, and dropout intentions within the medical student population. This comprehensive understanding supports the notion that factors such as PsyCap and social support are instrumental in mitigating burnout and its associated risks, thereby influencing educational satisfaction and reducing the likelihood of dropout. Assuming the relation between burnout and more severe affective disorders, this also suggests that such conditions could be better managed or even preempted through targeted interventions that address these key areas.

Consistent with the first hypothesis (H_1), the findings demonstrate that PsyCap serves as a significant correlate of burnout, satisfaction with education, and dropout intentions among medical students. Higher levels of PsyCap correlated with reduced burnout and increased educational satisfaction, which in turn were associated with decreased dropout intentions. These results support previous studies that highlight PsyCap as a relevant psychological asset fostering well-being and academic success (Avey et al., 2009; Barratt and Duran, 2021; Luthans et al., 2007a; Sweet and Swayze, 2023). Moreover, this relationship emphasizes the potential of PsyCap to enhance academic and emotional outcomes and to act as a buffer against the development of affective disorders within the stressful environment of medical education. The findings align with research by Sánchez-Cardona et al. (2021), which noted the positive impact of PsyCap on performance and satisfaction, further suggesting that enhancing PsyCap could be a strategic focus in preventative mental health interventions in medical schools.

The results partially supported the second hypothesis (H_2), positing that social support significantly influences burnout and satisfaction with education, though its direct impact on dropout intentions was not significant. However, the indirect effects of social support on dropout intentions via burnout and satisfaction with education were meaningful, indicating that in the current data the effect of social support on reducing dropout intentions is primarily mediated through these factors. This finding aligns with existing literature which highlights the association of higher social support with reduced burnout and higher academic achievement (Abreu Alves et al., 2022; DeBerard et al., 2004). These indirect effects suggest that fostering a supportive network can help mitigate dropout intentions by reducing burnout and enhancing educational satisfaction. Social support emerges as an important element in comprehensive approaches to maintain student well-being and persistence in their educational trajectories' persistence (Robbins et al., 2004; Ye et al., 2021).

The findings supported the third hypothesis (H_3) that burnout significantly associates with dropout intentions among medical students. Higher levels of burnout correlated with increased intentions to dropout, consistent with prior research underscoring the negative impact of burnout on student retention (Abreu Alves et al., 2022; Dyrbye et al., 2014). The results underline the need for effective strategies within medical education to alleviate burnout. Addressing burnout proactively could not only reduce dropout rates but also mitigate the progression towards more complex mental health challenges, thus enhancing both student well-being and their capacity to continue successfully in their medical training (Miyazaki et al., 2024).

The findings corroborate the fourth hypothesis (H_4), demonstrating that higher satisfaction with education is associated with reduced dropout intentions among medical students. This relationship highlights the role of educational satisfaction in influencing students' decisions to continue their studies. Consistent with past research, educational satisfaction emerges as an important factor of student retention (Casanova et al., 2021a; Duque, 2014; Tinto, 1975). Importantly, the impact of educational satisfaction extends beyond retention, potentially influencing the broader psychological well-being of students (Franzen et al., 2021; Zalazar-Jaime et al., 2022).

Implications for Practice

This study highlights the role of PsyCap as a relevant correlate of burnout, satisfaction with education, and dropout intention. Educational institutions are thus encouraged to integrate targeted interventions aimed at enhancing PsyCap, which may include resilience training, activities to boost self-efficacy, and programs designed to cultivate hope and optimism (Liang et al., 2018; Luthans et al., 2014). Such interventions can serve dual purposes: directly enhancing academic and emotional outcomes and indirectly preventing the onset or exacerbation of affective disorders among medical students.

Furthermore, the importance of social support in reducing burnout and enhancing educational satisfaction was evident, underscoring the necessity for medical schools to cultivate supportive learning environments. Possible strategies could involve the establishment of mentorship programs, peer support groups, and regular interactions with academic advisors, all aimed at fostering a network of support that addresses both academic and mental health needs (Silva and Miyasaki, 2022).

Additionally, the significant role of burnout in relating to dropout intentions calls for proactive strategies to manage and prevent burnout among medical students (Madigan et al., 2023). Educational institutions should consider implementing stress management workshops, offering counseling services, and promoting a healthy balance between academic responsibilities and personal life. These measures can help mitigate burnout and its related affective disturbances, thus supporting student retention and well-being. By addressing these factors, educational institutions can play a central role in shaping a more supportive and effective educational landscape for future healthcare professionals.

Lastly, the findings of this study emphasize the relevant role of enhancing educational satisfaction in reducing dropout intentions among medical students. To achieve this, educational institutions might consider implementing regular feedback sessions that actively address student concerns, revising curricula to increase engagement, and maintaining high standards of teaching quality (Hénard, 2010; Patfield et al., 2022). Enhancing satisfaction may indirectly support mental health by creating a more positive and engaging learning experience, thereby reducing feelings of burnout and dissatisfaction that could lead to severe affective disturbances. Such proactive steps are relevant for fostering an educational atmosphere that not only retains students but also supports their mental and emotional well-being, ultimately preparing them for successful careers in healthcare.

Limitations and Strengths

One of the limitations of the current study is the reliance on self-report measures, which may introduce response biases such as social desirability, potentially affecting the results' accuracy. The self-reported nature of burnout assessments might not fully capture the underlying biological and psychological predispositions that contribute to affective disturbances observed in medical students. Future research could benefit from incorporating multimodal methods, including peer or teacher evaluations, objective biological markers (e.g., cortisol levels or neuroimaging data), or factual course dropout rates. These additions would help in understanding the complex associations of factors influencing burnout and dropout intentions, aligning with the continuum concept of affective disorders (Juster et al., 2010).

The cross-sectional design of this study limits our ability to draw inferences about the predictive relationships tested, particularly in understanding the progression and temporal dynamics of symptoms that can precede burnout and dropout intentions among medical students. Longitudinal studies are central for tracking the evolution of these symptoms over time and for establishing causal links between early affective disturbances and later educational outcomes. Such studies would also contribute to the broader understanding of the continuum of affective disorders, from sub-threshold affective symptoms to more pronounced mood disturbances, as they manifest in high-stress environment (Maslach and Leiter, 2016).

The non-probability convenience sampling method employed in this study may limit the generalizability of the findings to the broader population of medical students in Portugal. Moreover, the exclusive collection of data from a single faculty of medicine further restricts the applicability of the results. This limitation is particularly significant given the potential for varying biological, cultural, and educational backgrounds to influence the manifestation and progression of prodromal symptoms that can lead to burnout and dropout intentions. Future research should aim to utilize probabilistic sampling methods, include a more heterogeneous sample, and establish comparisons between students from different medical schools to explore the heterogeneity in etiological factors of mood disorders across different populations (Merikangas and Kalaydjian, 2007). This approach would enhance our understanding of the causal dimension in the continuum of affective disorders among medical students.

This study introduces a novel approach by examining burnout through an innovative conceptualization within the context of medical education (Schaufeli and De Witte, 2023). This provides a fresh perspective on a well-studied issue and contributes to a deeper understanding of the factors influencing medical student dropout. Importantly, our findings also shed light on the potential affective spectrum syndromes, such as burnout. The ability of the study to explain a significant amount of variance in dropout intentions underscores the importance of PsyCap, social support, burnout, and satisfaction with education as associated variables. These factors highlight potential targets for interventions designed not only to reduce dropout rates but also to address the broader spectrum of affective symptoms within the continuum of mood disorders among medical students (Almutairi et al., 2022; Dyrbye et al., 2006; Frajerman et al., 2019). This aligns with the growing recognition of the need for early identification and intervention in mood disorders, which could be critical in settings such as medical schools where the pressure is high, and the stakes are substantial.

Conclusion

This study explored the interrelations among PsyCap, social support, burnout, and satisfaction with education in medical students, confirming the complexity of these relationships and their effects on dropout intentions. Notably, our findings emphasize the potential of burnout as an indicator of underlying disturbances that could be precursors or components of more severe affective disorders within this high-pressure group. Enhancing PsyCap and social support, alongside reducing burnout and improving educational satisfaction, might be important not only for preventing dropout but also for addressing the broader spectrum of affective symptoms observed in medical students.

From a psychoeducational perspective, these findings underscore the importance of integrating mental health and resilience training into medical education curricula (Slavin et al., 2014; Wasson et al., 2016). Interventions such as stress management workshops, resilience-building programs, peer support networks (Walsh et al., 2019; Yusoff, 2014), and strategies to improve recovery from work could be particularly useful for their future work experiences (Sinval et al., 2021). Additionally, fostering an educational environment that promotes PsyCap — through activities that enhance hope, efficacy, resilience, and optimism — can potentially help mitigating burnout and improve satisfaction with education (Finch et al., 2023; Solms et al., 2024). Given that dropout in higher education is a significant concern for students, families, educational institutions, and society, addressing these factors is crucial for empowering students and supporting their academic and professional success (Casanova et al., 2021b, 2018).

Further research is essential to validate these findings in different cultural and educational contexts and with more diverse, representative and larger samples. Future studies should also explore additional variables that may influence dropout intentions and the effectiveness of targeted interventions in mitigating both dropout rates and the progression of affective symptoms. Despite its limitations, this study significantly contributes to our understanding of the factors influencing medical student dropout intentions and opens new avenues for research and interventions designed to support mental health and resilience in medical educational settings.

By implementing psychoeducational strategies and promoting a supportive learning environment, educational institutions can play a relevant role in enhancing student well-being and potentially reducing dropout rates (Casanova et al., 2018). Ultimately, this approach not only benefits individual students but also contributes to the development of a more resilient and effective future healthcare workforce (Prince et al., 2007).

Funding

This work was produced with the support of INCD, and it was funded by FCT I.P. under the project Advanced Computing Project CPCA/A1/435377/2021, platform Cirrus.

References

Abreu Alves, S., Sinval, J., Lucas Neto, L., Marôco, J., Gonçalves Ferreira, A., Oliveira, P., 2022. Burnout and dropout intention in medical students: the protective role of academic engagement. BMC Med Educ 22, 83. https://doi.org/10.1186/s12909-021-03094-9

Almutairi, H., Alsubaiei, A., Abduljawad, S., Alshatti, A., Fekih-Romdhane, F., Husni, M., Jahrami, H., 2022. Prevalence of burnout in medical students: A systematic review and meta-analysis.

International Journal of Social Psychiatry 68, 1157–1170. https://doi.org/10.1177/00207640221106691

Avey, J.B., Luthans, F., Jensen, S.M., 2009. Psychological capital: A positive resource for combating employee stress and turnover. Hum Resour Manage 48, 677–693. https://doi.org/10.1002/hrm.20294

Avey, J.B., Reichard, R.J., Luthans, F., Mhatre, K.H., 2011. Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. Hum Resour Dev Q 22, 127–152. https://doi.org/10.1002/hrdq.20070

Barratt, J.M., Duran, F., 2021. Does psychological capital and social support impact engagement and burnout in online distance learning students? Internet High Educ 51, 100821. https://doi.org/10.1016/j.iheduc.2021.100821

Browne, M.W., Cudeck, R., 1993. Alternative ways of assessing model fit, in: Bollen, K.A., Long, J.S. (Eds.), Testing Structural Equation Models. Sage, Newbury Park, CA, USA, pp. 136–162.

Cabaços, C., Macedo, A., Carneiro, M., Brito, M.J., Amaral, A.P., Araújo, A., Correia, D.T., Novais, F., Vitória, P., Pereira, A.T., 2023. The mediating role of self-compassion and repetitive negative thinking in the relationship between perfectionism and burnout in health-field students: A prospective study. Pers Individ Dif 213, 112314. https://doi.org/10.1016/j.paid.2023.112314

Casanova, J.R., Cervero, A., Núñez, J.C., Almeida, L.S., Bernardo, A., 2018. Factors that determine the persistence and dropout of university students. Psicothema 30, 408–414. https://doi.org/10.7334/psicothema2018.155

Casanova, J.R., Gomes, C.M.A., Bernardo, A.B., Núñez, J.C., Almeida, L.S., 2021a. Dimensionality and reliability of a screening instrument for students at-risk of dropping out from higher education. Studies in Educational Evaluation 68, 100957. https://doi.org/10.1016/j.stueduc.2020.100957

Casanova, J.R., Sinval, J., Almeida, L.S., 2024. Academic success, engagement and self-efficacy of first-year university students: Personal variables and first-semester performance. Annals of Psychology 40, 44–53. https://doi.org/10.6018/analesps.479151

Casanova, J.R., Vasconcelos, R., Bernardo, A.B., Almeida, L.S., 2021b. University dropout in engineering: Motives and student trajectories. Psicothema 33, 595–601. https://doi.org/10.7334/psicothema2020.363

Cheung, S.F., Lai, M.H.C., 2023. semptools: Customizing structural equation modelling plots (R package version 0.2.10.1) [Computer software].

Cohen, J., 1988. Statistical power analysis for the behavioral sciences, 2nd ed. Lawrence Erlbaum Associates, Hillsdale, NJ, USA.

de Beer, L.T., Schaufeli, W.B., De Witte, H., Hakanen, J.J., Shimazu, A., Glaser, J., Seubert, C., Bosak, J., Sinval, J., Rudnev, M., 2020. Measurement invariance of the Burnout Assessment Tool (BAT) across seven cross-national representative samples. Int J Environ Res Public Health 17, 1–14. https://doi.org/10.3390/ijerph17155604

DeBerard, M.S., Spielmans, G.I., Julka, D.L., 2004. Predictors of academic achievement and retention among college freshmen: A longitudinal study. Coll Stud J 38, 66–80.

Dudasova, L., Prochazka, J., Vaculik, M., Lorenz, T., 2021. Measuring psychological capital: Revision of the Compound Psychological Capital Scale (CPC-12). PLoS One 16, e0247114. https://doi.org/10.1371/journal.pone.0247114

Duque, L.C., 2014. A framework for analysing higher education performance: Students' satisfaction, perceived learning outcomes, and dropout intentions. Total Quality Management & Business Excellence 25, 1–21. https://doi.org/10.1080/14783363.2013.807677

Dyrbye, L.N., Thomas, M.R., Power, D. V., Durning, S., Moutier, C., Massie, F.S., Harper, W., Eacker, A., Szydlo, D.W., Sloan, J.A., Shanafelt, T.D., 2010. Burnout and serious thoughts of dropping out of medical school: A multi-institutional study. Academic Medicine 85, 94–102. https://doi.org/10.1097/ACM.0b013e3181c46aad

Dyrbye, L.N., Thomas, M.R., Shanafelt, T.D., 2006. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Academic Medicine 81, 354–373. https://doi.org/10.1097/00001888-200604000-00009

Dyrbye, L.N., West, C.P., Satele, D., Boone, S., Tan, L., Sloan, J.A., Shanafelt, T.D., 2014. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. Academic Medicine 89, 443–451. https://doi.org/10.1097/ACM.0000000000000134

Epskamp, S., 2015. semPlot: Unified visualizations of structural equation models. Structural Equation Modeling 22, 474–483. https://doi.org/10.1080/10705511.2014.937847

Ernst, J., Jordan, K.-D., Weilenmann, S., Sazpinar, O., Gehrke, S., Paolercio, F., Petry, H., Pfaltz, M.C., Méan, M., Aebischer, O., Gachoud, D., Morina, N., von Känel, R., Spiller, T.R., 2021. Burnout, depression and anxiety among Swiss medical students – A network analysis. J Psychiatr Res 143, 196–201. https://doi.org/10.1016/j.jpsychires.2021.09.017

Finch, J., Waters, A.M., Farrell, L.J., 2023. Developing the HERO within: Evaluation of a brief intervention for increasing Psychological Capital (PsyCap) in Australian female students during the final year of school in the first year of COVID-19. J Affect Disord 324, 616–623. https://doi.org/10.1016/j.jad.2022.12.169

Frajerman, A., Morvan, Y., Krebs, M.-O., Gorwood, P., Chaumette, B., 2019. Burnout in medical students before residency: A systematic review and meta-analysis. European Psychiatry 55, 36–42. https://doi.org/10.1016/j.eurpsy.2018.08.006

Franzen, J., Jermann, F., Ghisletta, P., Rudaz, S., Bondolfi, G., Tran, N.T., 2021. Psychological distress and well-being among students of health disciplines: The importance of academic satisfaction. Int J Environ Res Public Health 18, 2151. https://doi.org/10.3390/ijerph18042151

Greenmyer, J.R., Montgomery, M., Hosford, C., Burd, M., Miller, V., Storandt, M.H., Lakpa, K.L., Tiongson, C., 2022. Guilt and burnout in medical students. Teach Learn Med 34, 69–77. https://doi.org/10.1080/10401334.2021.1891544

Hakanen, J.J., Schaufeli, W.B., 2012. Do burnout and work engagement predict depressive symptoms and life satisfaction? A three-wave seven-year prospective study. J Affect Disord 141, 415–424. https://doi.org/10.1016/j.jad.2012.02.043

Hénard, F., 2010. Learning our lesson: Review of quality teaching in higher education. OECD, Paris. https://doi.org/10.1787/9789264079281-en

Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Struct Equ Modeling 6, 1–55. https://doi.org/10.1080/10705519909540118

Ikeda, M., Hatano, K., Tanaka, S., Nakahara, J., 2023. Validation of the Japanese version of the revised version of the compound psychological capital scale (CPC-12R). Front Psychol 13, 1–9. https://doi.org/10.3389/fpsyg.2022.1053601

Jorgensen, T.D., Pornprasertmanit, S., Schoemann, A.M., Rosseel, Y., 2023. semTools: Useful tools for structural equation modeling (R package version 0.5-6.925) [Computer software].

Juster, R.-P., McEwen, B.S., Lupien, S.J., 2010. Allostatic load biomarkers of chronic stress and impact on health and cognition. Neurosci Biobehav Rev 35, 2–16. https://doi.org/10.1016/j.neubiorev.2009.10.002

Kelley, K., 2023. MBESS: The MBESS R package (R package version 4.9.3) [Computer software].

Kelley, K., Lai, K., 2018. Sample size planning for confirmatory factor models: Power and accuracy for effects of interest, in: Irwing, P., Booth, T., Hughes, D. (Eds.), The Wiley Handbook of Psychometric Testing: A Multidisciplinary Reference on Survey, Scale and Test Development. John Wiley & Sons, Hoboken, NJ, USA, pp. 113–138. https://doi.org/10.1002/9781118489772.ch5

Kliem, S., Mößle, T., Rehbein, F., Hellmann, D.F., Zenger, M., Brähler, E., 2015. A brief form of the Perceived Social Support Questionnaire (F-SozU) was developed, validated, and standardized. J Clin Epidemiol 68, 551–562. https://doi.org/10.1016/j.jclinepi.2014.11.003

Li, I.W., Carroll, D.R., 2017. Factors influencing university student satisfaction, dropout and academic performance: An Australian higher education equity perspective. Curtin University, Perth.

Li, J., Han, X., Wang, W., Sun, G., Cheng, Z., 2018. How social support influences university students' academic achievement and emotional exhaustion: The mediating role of self-esteem. Learn Individ Differ 61, 120–126. https://doi.org/10.1016/j.lindif.2017.11.016

Liang, L., Xiao, Q., Yang, Y., 2018. The psychological capital of left-behind university students: A description and intervention study from China. Front Psychol 9. https://doi.org/10.3389/fpsyg.2018.02438

LimeSurvey GmbH, 2024. LimeSurvey: An open source survey tool (version 6.2.5) [Computer software].

Lin, M., Hirschfeld, G., Margraf, J., 2019. Brief form of the perceived social support questionnaire (F-SozU K-6): Validation, norms, and cross-cultural measurement invariance in the USA, Germany, Russia, and China. Psychol Assess 31, 609–621. https://doi.org/10.1037/pas0000686

Lorenz, T., Hagitte, L., Prasath, P.R., 2022. Validation of the revised Compound PsyCap Scale (CPC-12R) and its measurement invariance across the US and Germany. Front Psychol 13. https://doi.org/10.3389/fpsyg.2022.1075031

Luthans, B.C., Luthans, K.W., Avey, J.B., 2014. Building the leaders of tomorrow: The development of academic psychological capital. J Leadersh Organ Stud 21, 191–199. https://doi.org/10.1177/1548051813517003

Luthans, F., Avolio, B.J., Avey, J.B., Norman, S.M., 2007a. Positive psychological capital: Measurement and relationship with performance and satisfaction. Pers Psychol 60, 541–572. https://doi.org/10.1111/j.1744-6570.2007.00083.x

Luthans, F., Youssef, C.M., Avolio, B.J., 2007b. Psychological capital: Developing the human competitive edge. Oxford University Press.

Madigan, D.J., Kim, L.E., Glandorf, H.L., 2023. Interventions to reduce burnout in students: A systematic review and meta-analysis. European Journal of Psychology of Education. https://doi.org/10.1007/s10212-023-00731-3

Maslach, C., Leiter, M.P., 2016. Understanding the burnout experience: Recent research and its implications for psychiatry. World Psychiatry 15, 103–111. https://doi.org/10.1002/wps.20311

McDonald, R.P., 1999. Test theory: A unified treatment. Routledge, Mahwah, NJ, USA. https://doi.org/10.4324/9781410601087

Merikangas, K.R., Kalaydjian, A., 2007. Magnitude and impact of comorbidity of mental disorders from epidemiologic surveys. Curr Opin Psychiatry 20, 353–358. https://doi.org/10.1097/YCO.0b013e3281c61dc5

Miyazaki, E., Miyazaki, G., Miyazaki, M.C., 2024. Physicians' mental health: Is it possible to tackle the problem throughout academic education?, in: Amarin, Z.O. (Ed.), Advances in Medical Education and Training. IntechOpen, Rijeka, Croatia. https://doi.org/10.5772/intechopen.115050

Muthén, B.O., 1983. Latent variable structural equation modeling with categorical data. J Econom 22, 43–65. https://doi.org/10.1016/0304-4076(83)90093-3

Patfield, S., Gore, J., Prieto, E., Fray, L., Sincock, K., 2022. Towards quality teaching in higher education: Pedagogy-focused academic development for enhancing practice. International Journal for Academic Development 1–16. https://doi.org/10.1080/1360144X.2022.2103561

Peng, P., Chen, S., Hao, Y., He, L., Wang, Q., Zhou, Y., Tang, Y.-Y., Yang, W.F., Wu, Q., Liu, T., 2023. Network of burnout, depression, anxiety, and dropout intention in medical undergraduates. International Journal of Social Psychiatry 69, 1520–1531. https://doi.org/10.1177/00207640231166629

Popescu, B., Maricuțoiu, L.P., De Witte, H., 2023. The student version of the Burnout Assessment Tool (BAT): Psychometric properties and evidence regarding measurement validity on a Romanian sample. Current Psychology `, 1–15. https://doi.org/10.1007/s12144-023-04232-w

Posit Team, 2024. RStudio: Integrated development for R (version 2024.04.2+764) [Computer software].

Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M.R., Rahman, A., 2007. No health without mental health. The Lancet 370, 859–877. https://doi.org/10.1016/S0140-6736(07)61238-0

R Core Team, 2024. R: A language and environment for statistical computing (version 4.4.0) [Computer software].

Robbins, S.B., Lauver, K., Le, H., Davis, D., Langley, R., Carlstrom, A., 2004. Do psychosocial and study skill factors predict college outcomes? A meta-analysis. Psychol Bull 130, 261–288. https://doi.org/10.1037/0033-2909.130.2.261

Rosseel, Y., 2012. lavaan: An R package for structural equation modeling. J Stat Softw 48, 1–21. https://doi.org/10.18637/jss.v048.i02

Sánchez-Cardona, I., Ortega-Maldonado, A., Salanova, M., Martínez, I.M., 2021. Learning goal orientation and psychological capital among students: A pathway to academic satisfaction and performance. Psychol Sch 58, 1432–1445. https://doi.org/10.1002/pits.22505

Schaufeli, W.B., De Witte, H., 2023. Burnout Assessment Tool (BAT): A fresh look at burnout, in: Krägeloh, C.U., Alyami, M., Medvedev, O.N. (Eds.), International Handbook of Behavioral Health Assessment. Springer, Cham, Switzerland, pp. 1–24. https://doi.org/10.1007/978-3-030-89738-3_54-1

Schaufeli, W.B., Desart, S., De Witte, H., 2020. Burnout Assessment Tool (BAT)—Development, validity, and reliability. Int J Environ Res Public Health 17, 1–21. https://doi.org/10.3390/ijerph17249495

Silva, E.F. de S.F., Miyasaki, M.C. de O.S., 2022. Implementation of mentoring in a medical school - mentors and students' perceptions. Rev Bras Educ Med 46. https://doi.org/10.1590/1981-5271v46.1-20200501.ing

Sinval, J., van Veldhoven, M., Oksanen, T., Azevedo, L.F., Atallah, Á.N., Melnik, T., Marôco, J., 2021. Interventions for improving recovery from work. Cochrane Database of Systematic Reviews. https://doi.org/10.1002/14651858.CD014518

Slavin, S.J., Chibnall, J.T., 2016. Finding the why, changing the how: Improving the mental health of medical students, residents, and physicians. Academic Medicine 91, 1194–1196. https://doi.org/10.1097/ACM.0000000000001226

Slavin, S.J., Schindler, D.L., Chibnall, J.T., 2014. Medical student mental health 3.0: Improving student wellness through curricular changes. Academic Medicine 89, 573–577. https://doi.org/10.1097/ACM.0000000000000166

Solms, L., van den Heuvel, M., Nevicka, B., Homan, A.C., 2024. Be a hero, be your own best friend: a self-compassion-based PsyCap intervention improves PhD students' well-being. High Educ (Dordr). https://doi.org/10.1007/s10734-024-01257-3

Stoyanov, D.S., Hristozova, S., Arabadziev, Z., Tilov, B.G., 2013. Psychopathological dimensions of burn out syndrome: Depression and anxiety correlates. European Psychiatry 28, 1. https://doi.org/10.1016/S0924-9338(13)76220-5

Sweet, J., Swayze, S., 2023. Academic psychological capital: A novel approach to freshmen retention. J Coll Stud Ret 25, 235–253. https://doi.org/10.1177/1521025120980372

Tavella, G., Hadzi-Pavlovic, D., Bayes, A., Jebejian, A., Manicavasagar, V., Walker, P., Parker, G., 2023. Burnout and depression: Points of convergence and divergence. J Affect Disord 339, 561–570. https://doi.org/10.1016/j.jad.2023.07.095

Thun-Hohenstein, L., Höbinger-Ablasser, C., Geyerhofer, S., Lampert, K., Schreuer, M., Fritz, C., 2021. Burnout in medical students. Neuropsychiatrie 35, 17–27. https://doi.org/10.1007/s40211-020-00359-5

Tinto, V., 1975. Dropout from higher education: A theoretical synthesis of recent research. Rev Educ Res 45, 89–125. https://doi.org/10.3102/00346543045001089

Walsh, A.L., Lehmann, S., Zabinski, J., Truskey, M., Purvis, T., Gould, N.F., Stagno, S., Chisolm, M.S., 2019. Interventions to prevent and reduce burnout among undergraduate and graduate medical education trainees: A systematic review. Academic Psychiatry 43, 386–395. https://doi.org/10.1007/s40596-019-01023-z

Wasson, L.T., Cusmano, A., Meli, L., Louh, I., Falzon, L., Hampsey, M., Young, G., Shaffer, J., Davidson, K.W., 2016. Association between learning environment interventions and medical student well-being: A systematic review. JAMA 316, 2237. https://doi.org/10.1001/jama.2016.17573

Wills, T.A., Bantam, E.O., Ainette, M.G., 2016. Social support, in: Benyamini, Y., Johnston, M., Karademas, E.C. (Eds.), Assessment in Health Psychology., Psychological Assessment — Science and Practice. Hogrefe Publishing, Boston, MA, pp. 131–146.

Ye, Y., Huang, X., Liu, Y., 2021. Social support and academic burnout among university students: A moderated mediation model. Psychol Res Behav Manag Volume 14, 335–344. https://doi.org/10.2147/PRBM.S300797

Yusoff, M.S.B., 2014. Interventions on medical students' psychological health: A meta-analysis. J Taibah Univ Med Sci 9, 1–13. https://doi.org/10.1016/j.jtumed.2013.09.010

Zalazar-Jaime, M.F., Moretti, L.S., Medrano, L.A., 2022. Contribution of academic satisfaction judgments to subjective well-being. Front Psychol 13. https://doi.org/10.3389/fpsyg.2022.772346

Contributors

Jorge Sinval: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

Pedro Oliveira: Conceptualization, Methodology, Project administration, Resources, Supervision, Validation, Writing – review & editing

Filipa Novais: Conceptualization.

Carla Maria Almeida: Conceptualization.

Diogo Telles-Correia: Conceptualization, Writing – review & editing, Supervision, Project administration.

Acknowledgement

The authors would like to extend their sincerest gratitude to all the students who participated in the study. Additionally, the authors wish to express their appreciation to the Portuguese National Distributed Computing Infrastructure and acknowledge the significant support provided by Mário David, João Pina, Jorge Gomes, and others in setting up the survey platform and the cloud computing infrastructure.

Role of Funding

The funding source was not involved in the study design, data collection, analysis, interpretation of data, writing of the report, or in the decision to submit the article for publication.

Correlates of Burnout and Dropout Intentions in Medical Students: A Cross-Sectional Study

Jorge Sinval[1,2,3,4,5], Pedro Oliveira[1], Filipa Novais[1], Carla Maria Almeida[1], & Diogo Telles-Correia[1]

[1] Faculdade de Medicina, Universidade de Lisboa, Portugal

[2] National Institute of Education, Nanyang Technological University, Singapore

[3] Business Research Unit (BRU-IUL), Instituto Universitário de Lisboa (Iscte-IUL), Portugal

[4] Faculty of Philosophy, Sciences and Languages of Ribeirão Preto, University of São Paulo, Brazil

[5] Department of Evidence-Based Health, Escola Paulista de Medicina, Universidade Federal de São Paulo, Brazil

Declarations of interest: none.

Abstract

Background

Burnout is a pervasive issue among medical students, exhibiting a high prevalence that jeopardizes their academic success and may also predispose them to more severe affective disorders such as depression. This study aims to explore the complex relationships between psychological capital, general social support, educational satisfaction, and burnout, and how these factors collectively influence dropout intentions.

Methods

Utilizing an online survey, data was gathered from first and second-year medical students at a Medical Faculty in Portugal, employing psychometric instruments to measure burnout (BAT-12), social support (F-SozU K-6), psychological capital (CPC-12R), satisfaction with education, and dropout intentions (Screening Instrument for Students At-Risk of Dropping Out). Structural equation modeling was applied to analyze the data from 352 participants.

Results

The model demonstrated a significant positive association between burnout and dropout intentions ($\beta_{DI<-SB}$ = .38; p < .001), underscoring burnout as a direct correlate of dropout intentions alongside educational satisfaction and psychological capital.

Limitations

Conclusions

These findings emphasis the importance that burnout may have in the dropout intentions, and they also contribute to the understanding of affective syndromes such as burnout in educational settings.

Keywords: Burnout, Affective Disorders, Depression, Anxiety, Satisfaction with Education, Psychological Capital, Social Support, Medical Students, Dropout Intention.

Highlights

- PsyCap is inversely related to burnout and dropout intentions.
- Social support is associated with reduced burnout and increased educational satisfaction.
- High levels of burnout are related to stronger dropout intentions.
- Satisfaction with education is negatively associated with dropout intentions.