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Burnout and its Association with Academic Performance among Students of Allied Health Sciences, Peshawar

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Abstract

Background: Burnout is a multidimensional psychological syndrome arising from chronic, unmanaged stress, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. Although burnout is well-documented among healthcare professionals, its burden among allied health sciences students in Pakistan, particularly in Khyber Pakhtunkhwa, remains poorly understood. These students face a dual burden of demanding theoretical coursework and emotionally intensive clinical training, placing them at heightened risk. Understanding the prevalence of burnout and its relationship with academic performance in this population is essential for developing targeted institutional interventions.

Objective: To assess the prevalence of burnout and its association with academic performance (GPA) and psychosocial factors among undergraduate allied health sciences students at Khyber Medical University affiliated institutes in Peshawar, Pakistan.

Methods: A cross-sectional analytical study was conducted from October 2025 to February 2026, enrolling 424 undergraduate students from public and private allied health sciences institutes affiliated with Khyber Medical University via proportional stratified random sampling. Data were collected using a structured self-administered questionnaire comprising a sociodemographic section, the Perceived Stress Scale (PSS-10), and the Copenhagen Burnout

Inventory (CBI). Burnout was defined as a CBI total score ≥50. Descriptive statistics, chi-square tests, independent-samples t-tests, Pearson correlation, one-way ANOVA, and multiple linear regression were performed using IBM SPSS Statistics. Ethical approval was obtained from the Ethical Review Committee of Khyber Medical University (No. KMU/IPHSS/Ethics/CO/2026/434).

Results: Of 424 participants (60.4% male; mean age 22.97±1.94 years), 32.8% met the criteria for burnout. Personal burnout was the most prevalent domain (43.9%), followed by work-related (32.8%) and client-related burnout (20.5%). Burnout was significantly associated with female gender (χ^2=5.98, p=.014), severe perceived stress (χ^2=57.04, p<.001), presence of chronic disease (χ^2=15.41, p<.001), physical inactivity (χ^2=7.82, p=.005), fewer study hours per week (χ^2=9.99, p=.019), and single marital status (χ^2=4.06, p=.044). A significant negative correlation was observed between total burnout score and GPA (r=−.153, p=.002). Multiple linear regression confirmed burnout (β=−.175, p<.001) as an independent predictor of lower academic performance, with the model explaining 7.3% of variance in GPA (R^2=.073).

Conclusion: Approximately one-third of allied health sciences students in Peshawar experience burnout, with personal burnout being the dominant domain. Burnout is significantly associated with female gender, high perceived stress, physical inactivity, chronic illness, lower study engagement, and single marital status. Burnout independently predicts reduced academic performance. Proactive institutional measures, including structured stress management programs, mental health counselling services, and physical wellness initiatives, are urgently needed to mitigate burnout and protect both student wellbeing and academic outcomes.

Keywords: Burnout; Allied health sciences; Academic performance; Copenhagen Burnout Inventory; Perceived stress

Introduction

Burnout is a multidimensional psychological syndrome that develops as a prolonged response to chronic stress. Maslach and Jackson described burnout through three major dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment.(1) Burnout has

become a major public health concern because of its negative impact on mental health, academic performance, and professional functioning.

Although initially associated with healthcare professionals and human service workers, burnout has increasingly been recognized among students, particularly those enrolled in healthcare related disciplines.(2) Healthcare students experience continuous academic pressure, demanding clinical responsibilities, and emotional exposure to patient suffering, making them highly vulnerable to burnout. In 2019, the World Health Organization officially recognized burnout in the International Classification of Diseases (ICD-11) as a syndrome resulting from chronic workplace stress that has not been successfully managed.(3)

Burnout differs from stress and depression, although these conditions may overlap. Stress is generally a temporary response to excessive demands, while burnout reflects chronic emotional and psychological exhaustion.(4) Depression affects all aspects of life, whereas burnout is usually limited to academic or occupational settings.(5) Several theoretical models explain burnout development, including Maslach's Three-Dimensional Model, the Job Demands–Resources (JD-R) Model, and the Conservation of Resources Theory, which emphasize the imbalance between demands and available coping resources.(1, 6-10)

Allied health sciences students are particularly vulnerable to burnout because of the dual burden of theoretical education and clinical training. In Pakistan, allied health sciences programs include disciplines such as radiology technology, anesthesia technology, respiratory therapy, surgical technology, and emergency care technology.(11) Students in these programs often face heavy workloads, examination stress, sleep disturbances, financial difficulties, and emotionally demanding clinical environments, all of which contribute to burnout.(12-14) Furthermore, the COVID-19 pandemic significantly increased psychological distress among healthcare students by disrupting academic schedules, reducing clinical exposure, and increasing social isolation.(15)

Despite the growing international literature, limited research has focused on burnout among

allied health sciences students in Pakistan, particularly in Khyber Pakhtunkhwa. Therefore, the present study aimed to assess the prevalence of burnout and its association with academic and psychosocial factors among allied health sciences students in Peshawar, Pakistan. This study aimed to assess the burden of burnout and its associated factors in the undergraduate allied health sciences students of Peshawar, Khyber Pakhtunkhwa.

Materials and Methods

Study design and setting

This cross-sectional analytical study was carried out from October 2025 to February 2026 five conveniently selected affiliated institutes of Khyber Medical University in Peshawar, Khyber Pakhtunkhwa, Pakistan.

Study population

The study population consisted of undergraduate students attending a Bachelor's level Allied Health Sciences program during the study period. The participants were selected from public and private institutes under the Khyber Medical University. The selected institutes were KMU Institute of Paramedical Sciences which is a public sector institute and the private sector institutes Rehman College of Allied Health Sciences, Northwest Institute of Health Sciences, Khyber Pakhtunkhwa Institute of Medical Sciences and Institute of Health Sciences.

Sample Size and Sampling Technique

The sample size was determined through the use of the OpenEpi software at 95% confidence level, 5% margin of error, and 50% assumed prevalence to give a minimum sample size of 384. A total of 10% of the responses were incomplete, giving a final sample size of 424 participants. Proportional stratified random sampling technique was used to select students, randomly from each institute based on proportional allocation.

Eligibility Criteria

Students enrolled in the 5th semester and onwards (3rd and 4th year) of Allied Health Sciences programs were included in the study, as these students were actively involved in hospital clinical rotations. Stratified random sampling was used in proportionate to ensure the balance of the participants across university and institute strata.

Data Collection Tools

Structured self-administered questionnaire was used to collect data. A socio-demographic section, the Perceived Stress Scale (PSS-10) measuring stress and the Copenhagen Burnout Inventory (CBI) measuring burnout were included in the questionnaire. Burnout assessment was performed on the three domains of personal burnout, work-related burnout, and client-related burnout, with the computation of the total score. Burnout was defined as a score ≥50. Burnout scores were also compared to levels of stress and sociodemographic factors.

Data Collection Procedure

Eligible students were approached and informed of the purpose of the study, confidentiality of data, voluntary participation and the right to withdraw at any stage of the study after securing ethical approval. All data was collected with informed consent forms. A standardized questionnaire, with the same instrument for each participant, was used to collect data, both in physical form and via an online link on Google Forms.

Data Analysis

Data was entered, cleaned and analyzed using IBM SPSS Statistics. Data were summarized using descriptive statistics, the number and percentage of all categorical variables and mean and standard deviations of all continuous variables. Chi-square tests were used to assess the relationships among categorical data. Independent-samples t-tests were performed for comparing the mean scores of the two groups for each of the burnout and GPA measures. Pearson's

correlation was used to evaluate the correlation between burnout and GPA (academic performance). A p-value < 0.05 was statistically significant

Ethical Considerations

The study was approved by the relevant graduate and research authorities and, ethical clearance was obtained from the Ethical Review Committee of Khyber Medical University (Ethical Approval No: KMU/IPHSS/Ethics/CO/2026/434). The participants were anonymous and their data was kept confidential during the study. All participants gave written informed consent before data collection.

Results

Socio-demographic characteristics

Of the 424 participants, 249 (60.4%) were male and 163 (39.6%) were female. Most participants studied less than 10 hours per week (n = 246, 58.0%), followed by 11–20 hours (n = 124, 29.2%), 21–30 hours (n = 39, 9.2%), and more than 30 hours (n = 15, 3.5%).

The majority were single (n = 382, 90.1%), with 42 (9.9%) married. Slightly more than half lived in urban areas (n = 223, 52.6%), while 201 (47.4%) were from rural areas. Most fathers had primary to middle education (n = 257, 60.6%), whereas most mothers had primary to middle education (n = 368, 86.8%).

Regarding financial support, most participants were funded by family (n = 391, 92.2%), while 33 (7.8%) had scholarships. Slightly more than half (n = 228, 53.8%) reported regular physical exercise.

Descriptive statistics of Mean Burnout score

The mean total burnout score was 41.73 ± 17.28, with scores ranging from 2.78 to 92.26. Based on the predefined cutoff value, participants scoring 50 or above were classified as having burnout. Overall, $32.8\%\left(n \approx 139\right)$ of participants met the criteria for burnout, while 67.2% had scores below the cutoff level.

Descriptive statistics of Burnout Domains

The mean personal burnout score was 49.61 ± 22.63, with scores ranging from 4.17 to 100.00. Based on the cutoff value of 50 or above, approximately 43.9% of participants demonstrated personal burnout.

The mean work-related burnout score was 42.42 ± 19.88, with scores ranging from 0 to 100. Approximately $32.8\%$of participants had work-related burnout scores of 50 or greater.

The mean client-related burnout score was 33.16 ± 21.55, with scores ranging from 0 to 100. Around $20.5\%$of participants met the criteria for client-related burnout.

Among the three burnout domains, personal burnout was the most prevalent and had the highest mean score, whereas client-related burnout was the least prevalent and demonstrated the lowest mean score.

Descriptive statistics of GPA (Academic Performance)

The GPA scores ranged from 1.90 to 4.00, indicating variability in academic performance among the students. The majority of participants had relatively high academic performance, with most students falling within the GPA range of 3.00–4.00.

The most frequently reported GPA category was 3.50 $(n = 25, 5.9\%)$, followed by a perfect GPA of 4.00 $(n = 23, 5.4\%)$. Overall, the findings suggest that most students demonstrated satisfactory to high academic achievement.

Association between Chronic Medical condition and Burnout Status

A highly significant association was found between the presence of chronic disease and burnout status, $\chi^2(1, N = 414) = 15.41, p < .001$. Participants with chronic diseases demonstrated a higher prevalence of burnout compared to those without chronic diseases.

Association between Study hour per week and Burnout Status

A statistically significant association was observed between average weekly study hours and burnout status, $\chi^2(3, N = 414) = 9.99, p = .019$. Participants studying fewer than 10 hours per week demonstrated a higher prevalence of burnout compared to those studying longer hours.

Association between Gender and Burnout Status

A statistically significant association was found between gender and burnout status, $\chi^2(1, N = 414) = 5.98, p = .014$. Female participants demonstrated a relatively higher prevalence of burnout compared to male participants.

Association between Regular Physical Exercise and Burnout Status

A statistically significant association was observed between regular physical exercise and burnout status, $\chi^2(1, N = 414) = 7.82, p = .005$. Participants who did not perform regular physical exercise showed a higher prevalence of burnout compared to those who exercised regularly.

Association between Perceived Stress Level and Burnout Status

A highly significant association was observed between perceived stress levels and burnout status, $\chi^2(2, N = 413) = 57.04, p < .001$. Participants with severe perceived stress had a substantially higher prevalence of burnout compared to those with mild or moderate stress levels.

Association between Marital status Level and Burnout Status

A chi-square test showed a significant association between burnout status and marital status, $\chi^2(1, N = 414) = 4.06$, $p = .044$, with burnout being more common in single participants (31.7%) than married participants (16.7%). The relationship was weak ($r = -.099$).

Comparison of PSS and Burnout status

An independent-samples t-test showed that perceived stress (PSS) scores were significantly higher in students with burnout ($M = 22.74$, $SD = 5.94$) than those without burnout ($M = 16.90$, $SD = 6.36$), $t(248.14) = 8.97$, $p < .001$, indicating greater stress among students with burnout.

Correlation between Burnout and GPA (Academic Performance)

A Pearson correlation showed a small but statistically significant negative relationship between GPA and total burnout, $r(422) = -.153$, $p = .002$. This indicates that higher burnout is associated with slightly lower GPA among participants.

Comparison between Academic Performance and Burnout Level

A one-way ANOVA showed a statistically significant difference in GPA across burnout severity levels, $F(2, 409) = 3.46$, $p = .032$. Descriptively, GPA was highest in the mild group ($M = 3.39$, $SD = 0.44$), followed by moderate ($M = 3.28$, $SD = 0.52$) and severe ($M = 3.14$, $SD = 0.68$).

However, Levene's test indicated unequal variances ($p < .001$), so results should be interpreted with caution.

Prediction of GPA and its Predictors

A multiple linear regression was conducted to predict GPA from age, total burnout, gender, and marital status. Results indicated that total burnout ($\beta = -.175$, $p < .001$), age ($\beta = -.137$, $p = .005$), gender ($\beta = .154$, $p = .002$), and marital status ($\beta = .111$, $p = .023$) were all significant predictors of GPA.

Discussion

The present study aimed at identifying the prevalence of burnout among allied health sciences students of Peshawar, KPK province and its association with academic performance. The overall prevalence of burnout reported in this study was comparable to previous reports.(16) Another study that included medical students in Pakistan found the same rates of burnout as Erschens et al. did in their review, which confirms that medical students in Pakistan are also at risk of burnout.(11)

Personal burnout (43.9 %) was the most common of the three CBI domains, followed by work-related burnout (32.8 %) and client-related burnout (20.5 %).[9] Our allied health students had comparatively low scores on the client-related burnout subscale; this could be attributed to the limited patient contact that these students have in early clinical practice.(17)

Gender was an important factor, as female students had a higher prevalence of burnout when compared to their male peers ($chi2=5.98$, $p=.014$). Dyrbye et al. also reported that women in the health sciences consistently have higher rates of emotional exhaustion and overall burnout, which they attributed to differential coping strategies and other societal role expectations, further supporting the importance of considering gender in institutional support strategies to address burnout(12).Rodrigues et al. also found that females were an independent risk factor for overall burnout and emotional exhaustion in both medical and allied health students, and that gender should be taken into account in institutional support efforts to reduce burnout.(18)

The factor most strongly associated was perceived stress ($chi2=57.04$, $p<.001$), and it was found that the burned-out students had significantly higher scores for the PSS ($M=22.74$) than the non-

burned-out students (M=16.90). This mirrors the basic concept of Maslach and Jackson, who proposed that burnout is a result of unresolved stress for an extended period that gradually diminishes psychological coping skills, and is the most consistent across all medical student populations around the world in a large systematic review conducted by Rotenstein et al. Reported prevalence of burnout was significantly higher among students who were not physically active regularly (chi2=7.82, p=.005).(19)

The benefits of regular exercise as a protective factor against burnout were illustrated by Toker and Biron who found that exercise reduced physiological responses to stress and increased psychological resilience (20), especially important for health sciences students who often study in a sedentary fashion due to heavy academic and clinical training loads.(13)

It was found that the counterintuitive association was that higher prevalence of burnout was found in students who studied less than 10 hours per week (chi2=9.99, p=.019). This pattern may be associated with disengagement from school and avoidance tendencies typical of the burnout syndrome(21). Burned-out students also had significantly lower study hours (chi2=15.41, p<.001), and there was evidence that physical comorbidities are harmful to adaptive capacity and increase susceptibility to exhaustion, as a behavioral effect of burnout.(14)

The marital status was significantly related to burnout; the single students had a higher prevalence (31.7%) than the married students (16.7%). Being married can buffer academic stress whether for emotional or instrumental reasons. They found that strong social support systems, including those within the home and family environment, were important moderate factors for health profession students' risk for burnout, reported by Voltmer et al.(22)

One of the important aims of this study was to determine the correlation between burnout and the student's academic performance. Total burnout score was negatively correlated with GPA (r=-.153, p=.002) which suggests that a higher burnout score is related to lower academic performance. The results of one-way ANOVA showed that GPA significantly decreased as a function of level of burnout: mild (M=3.39), moderate (M=3.28), and severe (M=3.14) (F=3.46, p=.032). These findings are consistent with Frajerman et al., whose meta-analysis demonstrated a

consistent inverse relationship between burnout and academic performance in medical students.(23)

Mcdermott et al. reported analogous findings in nursing and allied health cohorts, noting that burnout-related cognitive impairment, reduced motivation, and emotional disengagement collectively undermine academic productivity.(24) Further studies using multiple linear regression found that total burnout (beta=-.175, p<.001) was an independent predictor of GPA, accounting for 7.3% of the variance in GPA (R2=.073) when age, gender, and marital status were adjusted for the analyses.

Conclusion

The present study has shown that allied health sciences students of Peshawar suffer from a high prevalence of burnout in the present study, around one-third of the sampled students were suffering from burnout with personal burnout being the most predominant domain. Being female, perceived stress, lack of regular physical activity, chronic medical conditions, less student engagement and marital status of singlehood were significantly related to burnout. Of importance, academic performance was negatively and independently correlated with burnout, and total burnout was confirmed as an independent predictor of decreased GPA, after controlling for pertinent covariates. Overall, these results showed the need now to adopt proactive and evidence-based approaches in educational institutions, such as structured stress management programs, mental health counselling services, and physical wellness programs, to prevent burn-out and protect the academic performance and welfare of students in allied health sciences.

AI Use Disclosure

Manuscript drafting and editing were carried out with the assistance of Artificial Intelligence in language. The authors have reviewed, verified and fully assume responsibility for the correctness, originality and integrity of the content of the manuscript. AI tools have not been identified as authors.

Data Availability

All the datasets used and analyzed during the current study are available from the corresponding author on reasonable request. The authors can also make the dataset available in a public repository, as per the PJHSL data sharing policy.

Conflict of Interest

The authors have no conflict of interest.

Informed Consent

All participants gave informed consent prior to participation. The participation was voluntary, the confidentiality was respected and no personally identifiable information was reported.

Ethical Approval

This study has been approved by the Ethical Review Committee of Khyber Medical University, Peshawar. The study was carried out following the principles of the Declaration of Helsinki.

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Table 1. Socio-demographic characteristics of the participants

Variable	Category	Frequency	Percent (%)
Gender	Male	249	60.4
	Female	163	39.6
Study hours per week	<10	246	58.0
	11 to 20	124	29.2
	21 to 30	39	9.2
	>30	15	3.5
Marital Status	Single	382	90.1
	Married	42	9.9
Family Residence	Urban	223	52.6
	Rural	201	47.4

Father's Education	No education	167	39.4
	Primary to middle	257	60.6
Mother's Education	No education	56	13.2
	Primary to middle	368	86.8
Tuition Fee Funding	Family	391	92.2
	Scholarship	33	7.8
Regular Physical Exercise	Yes	228	53.8
	No	196	46.2
Total		424	100.0

Table 2. Descriptive statistics of age, GPA, PSS and total burnout scores

Statistic	Age (years)	GPA	PSS Score	Total Burnout Score
Mean	22.97	3.34	18.68	41.73
Median	23.00	3.42	18.00	43.45
Std. Deviation	1.94	0.48	6.83	17.28
Range	25.00	2.10	36.00	89.48

Table 3. Association between sociodemographic with burnout status

Variable	Category	Total (n)	Burnout Absent n (%)	Burnout Present n (%)	χ^2	p
Gender	Male	249	185 (74.3)	64 (25.7)	5.98	.014
	Female	165	104 (63.0)	61 (37.0)		
Marital Status	Single	372	254 (68.3)	118 (31.7)	4.06	.044
	Married	42	35 (83.3)	7 (16.7)		
Chronic Disease	No	369	269 (72.9)	100 (27.1)	15.41	<.001
	Yes	45	20 (44.4)	25 (55.6)		
Study Hours per Week	<10	237	151 (63.7)	86 (36.3)	9.99	.019

	11–20	123	97 (78.9)	26 (21.1)		
	21–30	39	30 (76.9)	9 (23.1)		
	>30	15	11 (73.3)	4 (26.7)		
Regular Physical Exercise	Yes	222	168 (75.7)	54 (24.3)	7.82	.005
	No	192	121 (63.0)	71 (37.0)		

Graph 1. Showing Association between sociodemographic with burnout status

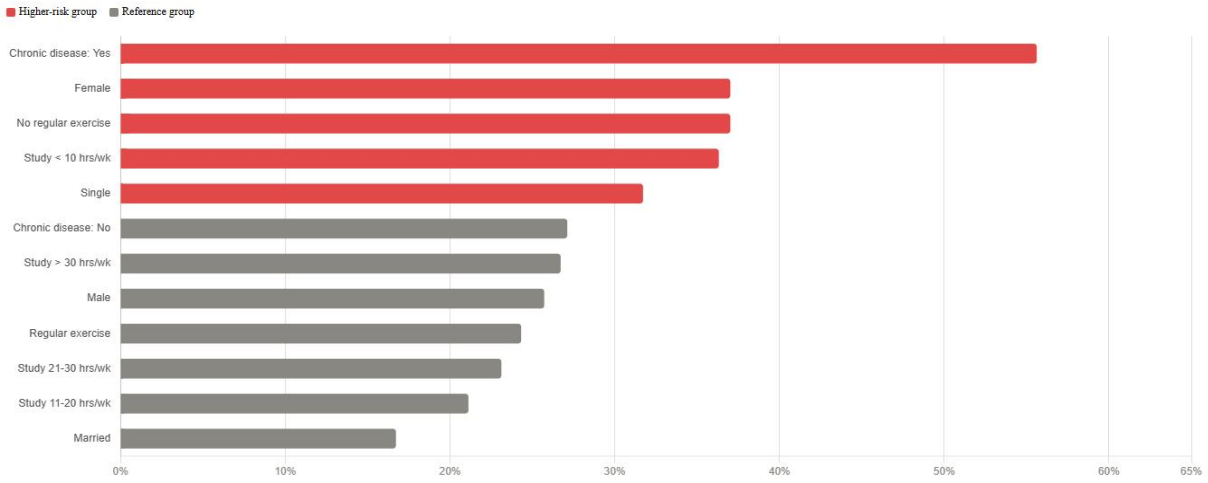

Table 4. Association Between Burnout and Academic Performance

Variable	Statistical Test	Result	p-value
Burnout level vs GPA	One-way ANOVA	$F(2, 409) = 3.46$	.032
Total burnout vs GPA	Pearson correlation	$r = -.153$	.002

Table 5. Multiple Linear Regression Predicting Academic Performance (GPA)

Predictor	β	t	p-value	Model Statistics	Value
Age	−.137	−2.81	.005	R	.270
Total Burnout	−.175	−3.65	<.001	R^2	.073
Gender	.154	3.16	.002	Adjusted R^2	.064
Marital Status	.111	2.28	.023	F (4,419)	8.21*

References

1. Maslach C, Jackson SEJJoob. The measurement of experienced burnout. 1981;2(2):99-113.
2. Schaufeli WB, Martinez IM, Pinto AM, Salanova M, Bakker ABJJoc-cp. Burnout and engagement in university students: A cross-national study. 2002;33(5):464-81.
3. Bianchi R, Schonfeld ISJBotWHO. Examining the evidence base for burnout. 2023;101(11):743.
4. Selye H, Selye H, Selye H, Physician H, Selye H, Médecin H. The stress of life: McGraw-hill New York; 1956.
5. Bianchi R, Schonfeld IS, Laurent EJCpr. Burnout–depression overlap: A review. 2015;36:28-41.
6. Bakker AB, Demerouti EJJomp. The job demands-resources model: State of the art. 2007;22(3):309-28.
7. Hobfoll SEJAp. Conservation of resources: a new attempt at conceptualizing stress. 1989;44(3):513.
8. Schaufeli WB, Salanova M, González-Romá V, Bakker ABJJoHs. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. 2002;3(1):71-92.
9. Kristensen TS, Borritz M, Villadsen E, Christensen KBJW, stress. Copenhagen burnout inventory. 1999.
10. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WBJJoAp. The job demands-resources model of burnout. 2001;86(3):499.

11. Khan MM. Suicidal behaviours in Pakistan. Suicidal behavior in Muslim majority countries: Epidemiology, risk factors, and prevention: Springer; 2024. p. 223-43.
12. Dyrbye LN, Thomas MR, Shanafelt TD, editors. Medical student distress: causes, consequences, and proposed solutions. Mayo Clinic Proceedings; 2005: Elsevier.
13. Almojali AI, Almalki SA, Alothman AS, Masuadi EM, Alaqeel MKJJoe, health g. The prevalence and association of stress with sleep quality among medical students. 2017;7(3):169-74.
14. Gunasinghe C, Gazard B, Aschan L, MacCrimmon S, Hotopf M, Hatch SLJJoMH. Debt, common mental disorders and mental health service use. 2018;27(6):520-8.
15. Marvaldi M, Mallet J, Dubertret C, Moro MR, Guessoum SBJN, Reviews B. Anxiety, depression, trauma-related, and sleep disorders among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. 2021;126:252-64.
16. Erschens R, Keifenheim KE, Herrmann-Werner A, Loda T, Schwille-Kiuntke J, Bugaj TJ, et al. Professional burnout among medical students: systematic literature review and meta-analysis. 2019;41(2):172-83.
17. Higuchi Y, Inagaki M, Koyama T, Kitamura Y, Sendo T, Fujimori M, et al. A cross-sectional study of psychological distress, burnout, and the associated risk factors in hospital pharmacists in Japan. 2016;16(1):534.
18. Rodrigues H, Cobucci R, Oliveira A, Cabral JV, Medeiros L, Gurgel K, et al. Burnout syndrome among medical residents: A systematic review and meta-analysis. 2018;13(11):e0206840.
19. Rotenstein LS, Torre M, Ramos MA, Rosales RC, Guille C, Sen S, et al. Prevalence of burnout among physicians: a systematic review. 2018;320(11):1131-50.
20. Toker S, Biron MJJoap. Job burnout and depression: unraveling their temporal relationship and considering the role of physical activity. 2012;97(3):699.
21. Manzano-García G, Ayala J-CJPo. Insufficiently studied factors related to burnout in nursing: Results from an e-Delphi study. 2017;12(4):e0175352.

22. Voltmer E, Kieschke U, Schwappach DL, Wirsching M, Spahn CJBme. Psychosocial health risk factors and resources of medical students and physicians: a cross-sectional study. 2008;8(1):46.

23. Frajerman A, Morvan Y, Krebs M-O, Gorwood P, Chaumette BJEP. Burnout in medical students before residency: a systematic review and meta-analysis. 2019;55:36-42.

24. Ruthven I. Dealing with change through information sculpting: Emerald Publishing Limited; 2022.