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Prevalence of Burnout and its Correlation with Depression and Anxiety in Physical Therapy Students During Clinical Rotation: A Cross-Sectional Study

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ABSTRACT

Background: *Burnout syndrome, caused by chronic stress, is a major health problem on the social and occupational fronts that manifests through emotional exhaustion, depersonalization, and reduced accomplishment. Originating in the 1970s, it is still widespread among professionals and students worldwide, especially in health care and academic settings. Among the main causes are heavy workloads, academic pressure, and sleep problems, with the condition being more common in women. The WHO has classified burnout as a disease, but it still causes plenty of psychological, social, and economic issues. Cognitive behavioral therapy (CBT) and mindfulness-based therapies have proven to be the most effective in treatment and prevention. To eradicate burnout, a multidimensional plan that involves both individual and organization-wide efforts is necessary.* ***Objective:*** *The primary objective of this study is to find out the prevalence of burnout and its correlation with depression and anxiety in physical therapy students during clinical rotation.* ***Methodology:*** *The purpose of this cross-sectional study was to determine the prevalence of burnout among physical therapy students during their clinical rotations at different medical universities in Karachi, and to explore the relationships of burnout with anxiety and depression. Data was collected from 3rd to 5th year DPT students (Clinical Rotation going students). The participants were selected through a non-probability convenience sampling method, and a total of 370 subjects were enrolled. The data analysis was performed using SPSS version 29.0 with chi-square tests and descriptive statistics, considering a significance level of $p < 0.05$.* ***Result:*** *Burnout was frequent among 370 physical therapy students. with 39.2% reported high emotional exhaustion, 40% exhibiting high cynicism, and 37.3% having low academic efficacy. Psychological distress was also visible, with 23.8% suffering depression and 41.1% reporting anxiety, but stress levels remained relatively low (3.5%). Burnout aspects, notably exhaustion and cynicism, were significantly associated with depression and anxiety, although better academic efficacy proved to be protective. Demographic characteristics had little influence; however, age and gender were associated to certain burnout components. Overall, these findings show that physical therapy students face a significant burden of burnout and psychological discomfort during clinical rotations.* ***Conclusion:*** *Burnout is a significant issue among physiotherapy students, especially among females and younger students. It is characterized by emotional exhaustion, cynicism, and moderate academic efficacy, and is associated with mild psychological distress. Correlation analyses showed exhaustion was moderately linked to cynicism and weakly associated with depression, anxiety, and stress. The study's limitations include the cross-sectional design, convenience sampling, regional focus, and dependence on self-reported data. The findings highlight the significance of combining mental health assistance, stress management*

measures, and wellness programs in order to promote student well-being, academic achievement, and patient care.

Keywords: *Burnout, Depression, Anxiety, Physical Therapy*

INTRODUCTION

Burnout Syndrome is a striking social and health issue that mainly occurs in the workplace. This area of research has expanded greatly worldwide, as investigations started in other professional fields and more recently focused on undergraduate university students.[1] Burnout is usually described as a state of depersonalization (loss of empathy), emotional exhaustion (fatigue), and a feeling of decreased personal success (competence and achievement). The effects of burnout affect both the individual and the larger system. Personally, burnout is associated with depression, suicidal thoughts, and various other mental health issues. It impacts personal and work relationships, while systemically, there are concerns that burnout could lead to increased employee turnover and dropout. Additionally, research shows that burnout is linked with lower patient satisfaction and poorer outcomes. [2] For more than half a century, the term "burnout" has been widely used to describe behavioral and physical symptoms that arise as a consequence of a person's occupation. [3]

In 1974, Freudenberger published his first scientific study on BS. He defined burnout by observing that professionals who care for others experience fatigue, suffer from detachment, and become more irritable as a result of overexertion of energy and resources, which ultimately leads to reduced productivity within the organization.[4] Although the definition of burnout varies significantly depending on the group studied, Freudenberger's fundamental explanation remains constant, even as its effects on the healthcare system continually evolve.[5] It is a phenomenon that has attracted substantial research over the past 50 years. Although it first emerged in the 1970s, burnout remains a problem today, partly because of the environmental pressures and difficulties that constantly affect both individuals and organizations.[6]

According to Rodríguez Carvajal and Rivas Hermosilla, burnout syndrome progresses through four stages. The first stage, called idealism and excitement, is defined by an enormous amount of energy, great motivation, and very optimistic expectations about one's performance at work. The difference between these expectations and the real situation makes the person feels dissatisfied and disappointed, which then brings the person to the second stage, stagnation, characterized by the loss of interest, decline in productivity at work, and questioning of one's professional status. If the problem is not solved, the person will move on to the third stage, apathy, where they become totally uninterested, get emotionally detached, and might not even turn up for work, but still not be happy about it. Eventually, the fourth stage comes about, distance, which is the result of the constant exposure to stress at the workplace, and it causes the person to feel emptied, emotionally burnt out, and disengaged. At this point, the individual avoids new challenges and conflicts, keeping their position for modest pay despite a strong sense of professional worthlessness. [7] Brief episodes of anger, weariness, concern, or frustration characterize mild burnout. Moderate burnout has the same symptoms but lasts at least two weeks, and severe burnout can also cause medical problems such as ulcers, chronic back pain, and migraines. [8]

Over the last few decades, the phenomenon of burnout syndrome has been studied among medical professionals. More recently, researchers have turned their focus to the occurrence of burnout syndrome among medical students. [9] Medical education is academically and emotionally demanding, making medical students more susceptible to psychological problems than the general population. As a result, these students are often at greater risk of burnout. [10]

Burnout symptoms are visible indications of ongoing stress and mental overload that come with working in a field where interpersonal connection is the primary focus. Burnout syndrome develops in stages, characterized by a shift in attitude toward work-related activities to one of indifference or even negativity, a breakdown in interpersonal relationships, and the repression of compassionate behaviors. Without exception, all researchers point out that burnout poses a danger both to personal and professional development and to a person's mental and physical health. [11]

Many variables contribute to student burnout, and they are challenging to classify. In addition to other aspects that may be taken into consideration, some studies showed that academic stress, sleep issues, and switching from two to three semesters each academic year are important factors that raise burnout levels among PT students. Academic stress was found to be the primary cause of students' elevated levels of burnout in this investigation.[12] Environmental problems such as insufficient study spaces and insufficient rest, as well as interpersonal challenges caused by difficulties in developing relationships owing to short rotations and integration into healthcare teams, all contribute to this stress. Individual predispositions, such as anxiety, depressive symptoms, a lack of drive, low resilience, and a strong desire for perfection, all contribute considerably to the risk of burnout. [13]

Therefore, Gender is a significant risk factor for burnout that goes beyond stress tolerance. Compared to men, women are three times more likely to receive a burnout diagnosis (1.85 percent versus 0.54% annually). Even when occupation, demography, and work factors are taken into consideration, the gender discrepancy in burnout nearly always remains. [14]

Based on a study conducted in 2025, statistics on burnout among physiotherapists show that from a group of 281 people surveyed, 44. 1% experienced high levels of emotional exhaustion, 35.2% felt disconnected from their work, and 34. 5% experienced low levels of personal accomplishment. [15] According to a review of international research, revealed that the occurrence of burnout syndrome (BS) is 38. 2% for undergraduates in Saudi Arabia, 26. 7% for students in the United Kingdom, and 77% for individuals from New Zealand. Geographical location may play a role in the occurrence of BS, with regions in Oceania and parts of the Middle East showing more significant burnout compared to Central and South America and Europe. [4]

In 2019, the World Health Organization (WHO) formally recognized burnout as a syndrome induced by chronic work stress in the updated International Classification of Diseases.[14] Burnout, at its advanced stage, shares many symptoms with depression; however, it is primarily viewed as a risk factor for depression or a mediator between job stress and depression. Burnout affects every occupational sector on every continent, but it is especially common in the health care industry. In 2019, physician burnout was deemed a "public health crisis" in the United States.[16]

The validated survey to assess burnout syndrome in health care professionals is the MBI, which Schaufeli, Martínez, Pinto, and Salanova modified for students. [9] Although it is widely used for measuring burnout and has been the basis of thousands of research studies on burnout, the debates about whether it is a separate entity or closely related to depression still continue. [17] Likewise, the Depression, Anxiety, and Stress Scales (DASS), which have been validated in clinical and nonclinical samples, across more than 50 languages, and among different age groups, have demonstrated good discriminant validity. The shorter version, DASS-21, is particularly regarded for its dependability, simplicity, and efficacy in assessing stress, anxiety, and depression in adults. [18]

Burnout can lead to more medical errors, negative consequences on personal well-being, lower productivity, job discontent, and depression. In addition, it can reduce motivation to pursue studies and

engage professionally.[19] Burnout is associated with poorer physical health, including an increased risk of musculoskeletal diseases, respiratory infections, and cardiovascular disease. [20]

The main therapies for treating burnout syndrome can be classified into individual and organizational approaches. Individual therapies include cognitive-behavioral therapy (CBT), relaxation techniques, and multimodal therapy (a mix of both). Organizational interventions aim to improve working conditions, but precise standardized approaches are not usually defined. According to research, CBT is the best method to treat burnout since it aids in changing the wrong thinking and treating the negative behavior that is related to the stress of the workplace. Furthermore, mindfulness, the practice of observing the present moment without attachment, acceptance, or judgment, has been another effective and emerging approach.[7] Prior research has shown that mindfulness-based interventions reduce stress, burnout, anxiety, pain, and depression in medical students. [21] This condition has become a hallmark of modern life and is exacerbated by the increasingly dynamic and stressful environment prevalent in modern society. [22]

In conclusion, the findings of the present study, as above mentioned, are a pivotal factor in the aspect of burnout syndrome and in the literature too, because of the very reason it is no longer an individual psychological problem but a large and complicated condition, chronic stress being the major cause, that has a profound effect both personally and at the organization level. This state of affairs did not affect the quality of life only, but rather pointed to the fact that a lot of people were exhausted, especially students and medical professionals who suffered the most. It backs the notion that burnout management requires the use of evidence-based therapies like cognitive-behavioral therapy and mindfulness to the core. Finally, getting rid of burnout means employing a thorough approach that consists of personal talks as well as organizational programs aimed at securing wellness, balance, and continuous productivity.

METHODOLOGY

Study Design:

This study followed a cross-sectional design.

Sampling Technique:

A non- probability convenience sampling technique will be employed to recruit eligible participants from different Medical Universities across Karachi.

Outcome Measure:

During the course of this research, the prevalence of burnout among physical therapy students during clinical rotations was evaluated, along with its relationship to anxiety and depression. The findings indicated a considerable level of burnout within the study population. Furthermore, burnout showed a significant association with anxiety and depression, suggesting that students experiencing higher levels of exhaustion and detachment were more likely to report increased psychological distress.

Data Analysis:

Data analysis was performed using SPSS software. Graphic measurements, such as means and standard deviations, were used to account for quantitative factors. To determine any important association between subjective variables, the Chi-square test was used. (A P-value of 0.05 is considered enormous).

Ethical Considerations:

Ethical approval for this study was obtained from the institutional review board of the respective universities involved. All participants were clearly informed about the purpose, procedures, and voluntary nature of the research before data collection. Participation was completely voluntary, and students were given the option to withdraw at any point without any consequences. Written informed consent was obtained from each participant, and anonymity and confidentiality of the data were strictly maintained. The data collected was stored securely and used solely for academic research purposes. The study involved no physical or psychological risk to the participants and did not interfere with their academic or personal activities. There were no conflicts of interest declared by the researchers.

Reliability:

To ensure the reliability of the data collection tools, the internal consistency of the two standardized questionnaires, the Burnout verified Questionnaire MBI-SS, and the Depression Anxiety Stress Scales DASS-21, was evaluated using Cronbach's alpha through SPSS software. A Cronbach's alpha value between 0.70–0.79 is considered acceptable, 0.80–0.89 indicates good internal consistency, and 0.90 or above is regarded as excellent. In this study, both demonstrated satisfactory reliability coefficients, indicating acceptable to excellent internal consistency across their respective subscales. These findings confirm that the items within each instrument were internally consistent and reliable for assessing academic burnout (emotional exhaustion, cynicism, and academic efficacy) and psychological distress (depression, anxiety, and stress) among the university student population

RESULT AND FINDINGS

Introduction:

This chapter presents the results of the cross-sectional study conducted among 370 DPT students from various medical universities in Karachi. The data was analyzed using SPSS (Statistical Package for Social Sciences), with descriptive and inferential statistics applied to assess burnout and its correlation with depression and anxiety in Physical Therapy students during clinical rotation.

Descriptive Statistics:

Table 1: Descriptive Analysis of demographics Scale:

Elements	N	Min.	Max.	Mean	SD	Variance
Age	370	1	3	1.45	0.52	0.28
Gender	370	1	2	1.79	0.41	0.17
Marital Status	370	1	2	1.06	0.24	0.06

The descriptive statistics of the study participants' demographic variables are presented in Table X. A total of 370 respondents were included in the analysis. Age was coded into three categories, with values ranging from 1 to 3. The mean age score was 1.45 (SD = 0.52), indicating that the majority of participants belonged to the younger age groups, with limited variability in age distribution (variance = 0.28). Gender was coded from 1 to 2, yielding a mean value of 1.79 (SD = 0.41), suggesting a higher representation of one gender—predominantly females—in the study sample, as reflected by the relatively low variance (0.17). Marital

status was also coded from 1 to 2, with a mean score of 1.06 (SD = 0.24), indicating that most participants were single. The low standard deviation and variance (0.06) for marital status further confirm minimal dispersion and a highly homogeneous marital profile among respondents. Overall, these statistics demonstrate a relatively young, predominantly single sample with limited demographic variability.

Table 2: Descriptive Analysis of Burnout Validated Scale:

Elements	N	Min.	Max.	Mean	SD	Variance
I feel emotionally drained by my studies.	370	0	6	3.44	1.72	2.95
I feel exhausted at the end of a day at university	370	0	6	4.83	1.65	2.73
I feel tired when I get up in the morning, and I have to face another day at university.	370	0	6	4.14	1.84	3.37
Studying or attending a class is really a strain for me.	370	0	6	3.62	1.78	3.15
I feel burned out from my studies.	370	0	6	3.45	1.79	3.20
I have become less interested in my studies since my enrolment at the university.	370	0	6	2.67	1.75	3.06
I have become less enthusiastic about my studies.	370	0	6	2.54	1.65	2.72
I have become more cynical about the potential usefulness of my studies	370	0	6	2.63	1.66	2.76
I doubt the significance of my studies.	370	0	6	1.91	1.73	2.98
I can effectively solve the problems that arise in my studies.	370	0	6	2.97	1.75	3.06
I believe that I make an effective contribution to the classes that I attend.	370	0	6	2.96	1.67	2.78
In my opinion, I am a good student.	370	0	6	3.49	1.88	3.55
I feel stimulated when I achieve my study goals.	370	0	6	3.83	1.78	3.15
I have learned many interesting things during the course of my studies.	370	0	6	3.26	1.79	3.20
During class, I feel confident that I am effective in getting things done.	370	0	6	3.12	1.74	3.03

Descriptive statistics for participants' responses to study-related emotional exhaustion, cynicism, and academic efficacy items are presented in Table X. The data reveal varying levels of perceived burnout, detachment, and self-efficacy among the 370 respondents. Regarding emotional exhaustion, participants

reported moderate levels on average, with the highest mean for feeling exhausted at the end of a university day (M = 4.83, SD = 1.65) and the lowest for feeling emotionally drained by their studies (M = 3.44, SD = 1.72). Participants also indicated considerable fatigue upon waking and facing another day at university (M = 4.14, SD = 1.84) and moderate strain while attending classes (M = 3.62, SD = 1.78). For cynicism-related items, the mean scores were generally lower, suggesting mild detachment and skepticism toward studies. Participants expressed the least doubt about the significance of their studies (M = 1.91, SD = 1.73), while statements on reduced interest (M = 2.67, SD = 1.75) and enthusiasm (M = 2.54, SD = 1.65) reflected slightly higher levels of disengagement. Similarly, mean scores for cynicism about the usefulness of studies were moderate (M = 2.63, SD = 1.66). Academic efficacy items demonstrated moderate self-perceived competence. Participants reported moderate confidence in solving study-related problems (M = 2.97, SD = 1.75), contributing effectively in classes (M = 2.96, SD = 1.67), and overall self-assessment as a good student (M = 3.49, SD = 1.88). They also reported moderate stimulation when achieving study goals (M = 3.83, SD = 1.78) and satisfaction from learning interesting content (M = 3.26, SD = 1.79). Confidence in effectiveness during class activities was also moderate (M = 3.12, SD = 1.74). Variability across items was moderate, with standard deviations ranging from 1.65 to 1.88 and variances between 2.72 and 3.55, indicating diverse perceptions of exhaustion, cynicism, and academic efficacy among the participants.

Table 3: Descriptive Analysis of DASS-21 Scale:

Elements	N	Min.	Max.	Mean	SD	Variance
I found it hard to wind down.	370	0	3	1.04	0.67	0.44
I was aware of the dryness of my mouth	370	0	3	1.17	0.96	0.93
I could not seem to experience any positive feeling at all	370	0	3	1.06	0.84	0.70
I experience breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	370	0	3	0.85	0.90	0.81
I found it difficult to work up the initiative to do things	370	0	3	1.24	0.83	0.70
I tended to overreact to situations	370	0	3	1.47	0.93	0.87
I experienced trembling (e.g., in the hands)	370	0	3	0.80	0.88	0.78
I felt that I was using a lot of nervous energy	370	0	3	1.19	0.84	0.71
I was worried about situations in which I might panic and make a fool of myself	370	0	3	1.20	0.86	0.73
I felt that I had nothing to look forward to	370	0	3	0.97	0.89	0.79
I found myself getting agitated	370	0	3	1.20	0.80	0.63
I found it difficult to relax	370	0	3	1.23	0.81	0.65
I felt downhearted and blue	370	0	3	1.07	0.84	0.71

I was intolerant of anything that kept me from getting on with what I was doing	370	0	3	1.06	0.81	0.65
I felt I was close to panic	370	0	3	0.98	0.88	0.78
I was unable to become enthusiastic about anything	370	0	3	1.01	0.82	0.67
I felt I wasn't worth much as a person	370	0	3	0.87	0.92	0.84
I felt that I was rather touchy	370	0	3	0.78	0.87	0.76
I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	370	0	3	1.14	0.98	0.97
I felt scared without any good reason	370	0	3	0.91	0.85	0.73
I felt that life was meaningless	370	0	3	0.81	0.94	0.89

The descriptive analysis of depression, anxiety, and stress symptoms among the 370 respondents revealed generally low to mild symptom severity across most items. Stress-related symptoms showed relatively higher mean scores, particularly for overreacting to situations (M = 1.47, SD = 0.93), difficulty relaxing (M = 1.23, SD = 0.81), difficulty winding down (M = 1.04, SD = 0.67), and feeling agitated (M = 1.20, SD = 0.80), indicating mild but noticeable stress responses among participants. Anxiety-related symptoms were generally low to moderate, with higher mean scores reported for awareness of dry mouth (M = 1.17, SD = 0.96), nervous energy (M = 1.19, SD = 0.84), fear of panic in social situations (M = 1.20, SD = 0.86), and awareness of heart action without exertion (M = 1.14, SD = 0.98). In contrast, physical anxiety symptoms such as trembling (M = 0.80, SD = 0.88) and breathing difficulty (M = 0.85, SD = 0.90) were less frequently reported. Depression-related items reflected comparatively lower mean scores, suggesting minimal depressive symptomatology in the sample. Feelings of being downhearted and blue (M = 1.07, SD = 0.84), lack of initiative (M = 1.24, SD = 0.83), inability to experience positive feelings (M = 1.06, SD = 0.84), and reduced enthusiasm (M = 1.01, SD = 0.82) were reported at mild levels. More severe depressive cognitions, such as feelings of worthlessness (M = 0.87, SD = 0.92) and perceiving life as meaningless (M = 0.81, SD = 0.94), showed lower mean scores, indicating that these symptoms were less prevalent. Overall, the standard deviations ranged from 0.67 to 0.98, with variances between 0.44 and 0.97, reflecting moderate variability in psychological responses among participants but an overall trend toward normal to mild levels of depression, anxiety, and stress.

Correlation Matrix:

Table 4: Correlation Analysis of Burnout validated scale:

Annexed tables stated that the correlation analysis of these questionnaire items reveals the relationships among the three dimensions of student burnout: exhaustion, cynicism, and academic efficacy. The exhaustion-related items (Item-01 to Item-05) were strongly positively correlated with the overall exhaustion score, with correlations ranging from 0.6 to 0.8, indicating that participants who reported higher levels of fatigue, emotional drain, or strain during studies consistently scored higher on the exhaustion dimension. Cynicism-related items (Item-06 to Item-09), reflecting detachment and decreased interest in the usefulness of studies, showed strong positive correlations with the overall cynicism score (0.7 to 0.8), and moderate positive correlations with exhaustion (0.4 to 0.5), suggesting that emotionally exhausted

students are also more likely to develop cynical attitudes toward their studies. Academic efficacy items (Item-10 to Item-15), representing self-perceived competence and achievement in studies, were positively correlated with the academic efficacy score (0.7 to 0.8) and negatively correlated with exhaustion (−0.1 to −0.3) and cynicism (−0.2 to −0.3). This pattern indicates that students with higher feelings of competence and effectiveness tend to experience lower emotional exhaustion and cynicism. Overall, the matrix demonstrates the expected relationships within the framework: exhaustion and cynicism are positively associated, while both are negatively related to academic efficacy. The findings support the reliability and construct validity of the scale in this sample, reflecting that burnout manifests as a combination of high exhaustion, increased cynicism, and decreased academic efficacy among students.

Table 5: Correlation Analysis of DASS scale:

Annexed tables stated that the study sample consisted of 370 participants, predominantly young (Mean age = 1.45 ± 0.52), female (Mean = 1.79 ± 0.41), and single (Mean = 1.06 ± 0.24), reflecting a relatively homogeneous demographic profile. Examination of student burnout using the MBI-SS indicated moderate levels of emotional exhaustion, with items related to fatigue, strain, and end-of-day exhaustion showing strong positive correlations with the overall exhaustion score (r = 0.6–0.8). Cynicism items, reflecting detachment and reduced interest in the usefulness of studies, were also positively associated with exhaustion (r = 0.4–0.5) and strongly correlated with the overall cynicism score (r = 0.7–0.8). In contrast, academic efficacy items were negatively correlated with exhaustion and cynicism (r = −0.1 to −0.3 and −0.2 to −0.3, respectively) and positively correlated with the efficacy score (r = 0.7–0.8), indicating that students who perceived themselves as effective experienced lower burnout and detachment. The DASS-21 analysis revealed that participants generally reported low to mild levels of depression, anxiety, and stress, with depression and anxiety items moderately to strongly intercorrelated (r = 0.4–0.6), and stress items moderately correlated with both anxiety and depression (r = 0.4–0.5). Gender differences were observed, with females showing higher anxiety and stress levels than males, while single participants reported slightly higher stress compared to married ones. Overall, the results suggest that student burnout, emotional distress, and perceived academic efficacy are interrelated, with emotional exhaustion and cynicism negatively impacting academic self-perception and contributing to mild levels of psychological distress within this sample.

Table 6: Correlation Analysis of DVs:

DVs	Item-01	Item-02	Item-03	Item-04	Item-05	Item-06
Exhaustion	1.00	0.49	-0.20	0.23	0.15	0.13
Cynicism	0.49	1.00	-0.34	0.27	0.24	0.15
Academic Efficacy	-0.20	-0.34	1.00	-0.10	-0.04	0.02
Depression	0.23	0.27	-0.10	1.00	0.60	0.49
Anxiety	0.15	0.24	-0.04	0.60	1.00	0.43
Stress	0.13	0.15	0.02	0.49	0.43	1.00

Exhaustion was moderately correlated with cynicism (r = 0.49) and weakly correlated with depression (r = 0.23), anxiety (r = 0.15), and stress (r = 0.13), indicating that emotionally fatigued students tend to be more detached and slightly more distressed. Cynicism also showed weak to moderate positive correlations with

depression (r = 0.27), anxiety (r = 0.24), and stress (r = 0.15). Academic efficacy was negatively correlated with exhaustion (r = −0.20) and cynicism (r = −0.34) and had minimal associations with depression, anxiety, and stress (r = −0.10 to 0.02), suggesting a protective role against burnout. Depression, anxiety, and stress were moderately interrelated (r = 0.43–0.60), confirming their co-occurrence. Overall, higher exhaustion and cynicism are linked to greater distress, whereas stronger academic efficacy appears protective.

Table 7: Chi-Square Tests:

Test Element	Pearson Chi-Square	p-value	Result
Exhaustion * Depression	22.78	0.00	Null hypothesis rejected (Significant relationship)
Exhaustion * Anxiety	22.57	0.00	Null hypothesis rejected (Significant relationship)
Exhaustion * Stress	7.47	0.11	Null hypothesis accepted (Insignificant relationship)
Cynicism * Depression	30.78	0.00	Null hypothesis rejected (Significant relationship)
Cynicism * Anxiety	25.84	0.00	Null hypothesis rejected (Significant relationship)
Cynicism * Stress	11.14	0.03	Null hypothesis rejected (Significant relationship)
Academic Efficacy * Depression	15.88	0.01	Null hypothesis rejected (Significant relationship)
Academic Efficacy * Anxiety	15.84	0.04	Null hypothesis rejected (Significant relationship)
Academic Efficacy * Stress	5.58	0.23	Null hypothesis accepted (Insignificant relationship)
Age * Exhaustion	19.52	0.00	Null hypothesis rejected (Significant relationship)
Age * Cynicism	4.37	0.36	Null hypothesis accepted (Insignificant relationship)
Age * Academic Efficacy	12.20	0.02	Null hypothesis rejected (Significant relationship)

Age * Depression	8.49	0.20	Null hypothesis accepted (Insignificant relationship)
Age * Anxiety	9.84	0.28	Null hypothesis accepted (Insignificant relationship)
Age * Stress	1.94	0.75	Null hypothesis accepted (Insignificant relationship)
Gender * Exhaustion	5.05	0.08	Null hypothesis accepted (Insignificant relationship)
Gender * Cynicism	2.30	0.32	Null hypothesis accepted (Insignificant relationship)
Gender * Academic Efficacy	13.74	0.00	Null hypothesis rejected (Significant relationship)
Gender * Depression	2.17	0.54	Null hypothesis accepted (Insignificant relationship)
Gender * Anxiety	7.49	0.11	Null hypothesis accepted (Insignificant relationship)
Gender * Stress	1.66	0.44	Null hypothesis accepted (Insignificant relationship)
Marital Status * Exhaustion	2.31	0.32	Null hypothesis accepted (Insignificant relationship)
Marital Status * Cynicism	1.14	0.57	Null hypothesis accepted (Insignificant relationship)
Marital Status * Academic Efficacy	1.54	0.46	Null hypothesis accepted (Insignificant relationship)
Marital Status * Depression	3.40	0.33	Null hypothesis accepted (Insignificant relationship)

Chi-square analysis showed that exhaustion was significantly associated with depression ($\chi^2 = 22.78$, $p < 0.01$) and anxiety ($\chi^2 = 22.57$, $p < 0.01$), but not stress ($\chi^2 = 7.47$, $p = 0.11$). Cynicism was significantly related to depression ($\chi^2 = 30.78$, $p < 0.01$), anxiety ($\chi^2 = 25.84$, $p < 0.01$), and stress ($\chi^2 = 11.14$, $p = 0.03$). Academic efficacy was associated with depression ($\chi^2 = 15.88$, $p = 0.01$) and anxiety ($\chi^2 = 15.84$, $p = 0.04$), but not stress ($\chi^2 = 5.58$, $p = 0.23$). Regarding demographics, age was linked to exhaustion ($\chi^2 = 19.52$, $p < 0.01$) and academic efficacy ($\chi^2 = 12.20$, $p = 0.02$), while gender was associated only with academic efficacy ($\chi^2 = 13.74$, $p < 0.01$). Marital status showed no significant associations. Overall, burnout dimensions were mainly related to depression and anxiety, with cynicism also linked to stress.

Table 8: Reliability Statistics:

Cronbach's Alpha	Cronbach's Alpha	N of sub-scales
MBI-SS	0.735	15
DASS-21	0.912	21
Accumulated	0.851	36

Internal consistency was assessed using Cronbach's alpha, showing acceptable to excellent reliability. The Burnout assessment (15 items) demonstrated good reliability (α = 0.735), while the DASS-21 (21 items) showed excellent reliability (α = 0.912). When combined (36 items), the overall Cronbach's alpha was 0.851, indicating strong internal consistency. These findings support the reliability of both instruments in assessing burnout and psychological distress among students.

Table-9: Normality test for all scales:

			Shapiro-Wilk		
			Statistic	Sig.	Remarks
Age	Exhaustion	20-22 years	0.77	0.00	Normal data
		23-25 years	0.74	0.00	Normal data
		26-29 years	0.88	0.31	Normal data
	Cynicism	20-22 years	0.77	0.00	Normal data
		23-25 years	0.75	0.00	Normal data
		26-29 years	0.88	0.31	Abnormal data
	Academic Efficacy	20-22 years	0.80	0.00	Normal data
		23-25 years	0.75	0.00	Normal data
		26-29 years	0.55	0.00	Normal data
	Depression	20-22 years	0.59	0.00	Normal data
		23-25 years	0.49	0.00	Normal data
		26-29 years	0.68	0.01	Normal data
	Anxiety	20-22 years	0.76	0.00	Normal data
		23-25 years	0.69	0.00	Normal data

		26-29 years	0.55	0.00	Normal data
	Stress	20-22 years	0.15	0.00	Normal data
		23-25 years	0.20	0.00	Normal data
		26-29 years			Normal data
Gender	Exhaustion	Male	0.78	0.00	Normal data
		Female	0.76	0.00	Normal data
	Cynicism	Male	0.79	0.00	Normal data
		Female	0.76	0.00	Normal data
	Academic Efficacy	Male	0.74	0.00	Normal data
		Female	0.78	0.00	Normal data
	Depression	Male	0.55	0.00	Normal data
		Female	0.56	0.00	Normal data
	Anxiety	Male	0.64	0.00	Normal data
		Female	0.75	0.00	Normal data
	Stress	Male	0.09	0.00	Normal data
		Female	0.19	0.00	Normal data
Marital status	Exhaustion	Single	0.77	0.00	Normal data
		Married	0.73	0.00	Normal data
	Cynicism	Single	0.77	0.00	Normal data
		Married	0.73	0.00	Normal data
	Academic Efficacy	Single	0.78	0.00	Normal data
		Married	0.77	0.00	Normal data
	Depression	Single	0.56	0.00	Normal data
		Married	0.54	0.00	Normal data
	Anxiety	Single	0.72	0.00	Normal data

	Married	0.80	0.00	Normal data
Stress	Single	0.16	0.00	Normal data
	Married	0.33	0.00	Normal data

Above both table showing all data collected as normal data except a category showing in cynicism of 26-29 years.

STUDY LIMITATIONS

The methodology of this study has several limitations that should be considered. First, the cross-sectional design captures data at a single point in time, which limits the ability to establish causal relationships between burnout, depression, and anxiety among physiotherapy students. Second, the use of a non-probability convenience sampling technique may introduce selection bias, as participants who are more willing or available may not represent the entire student population, limiting the generalizability of the findings. Third, the study is geographically restricted to medical universities in Karachi, which may not reflect the experiences of students in other regions. Additionally, the reliance on self-administered questionnaires may introduce response bias, including social desirability or inaccurate self-assessment. Other potential contributors to burnout, such as sleep quality, academic workload, and social support, were not considered. Finally, the six-month duration and use of chi-square analysis limit the ability to capture long-term trends or control for confounding variables.

RECOMMENDATIONS FOR FUTURE RESEARCH

To address the limitations of the study, several remedies can be suggested. First, adopting a longitudinal study design would allow tracking changes in burnout, depression, and anxiety over time, providing stronger evidence of causal relationships. Second, employing probability-based sampling techniques such as stratified or random sampling could improve the representativeness and generalizability of the results to the wider physiotherapy student population. Expanding the study to include students from multiple regions or universities beyond Karachi would enhance the diversity and applicability of the findings. To reduce self-report bias, combining objective measures, such as academic performance records, attendance, or physiological stress markers, with questionnaires could improve data accuracy. Including additional variables such as sleep quality, workload, social support, and coping strategies would provide a more comprehensive understanding of factors influencing burnout. Finally, using multivariate statistical analyses instead of only chi-square tests would allow controlling for confounding factors, giving more robust insights into the relationships among burnout, depression, and anxiety.

CONCLUSION

Burnout syndrome (BS) is a significant social and health issue affecting both professionals and students, characterized by emotional exhaustion, depersonalization (cynicism), and reduced personal efficacy. Among university students, particularly physiotherapy students during clinical rotations, burnout manifests as concentration difficulties, memory loss, sleep disturbances, fatigue, and stress. Contributing factors include academic pressure, heavy workloads, and disrupted sleep, with female and younger students being particularly vulnerable. In the present study of 370 physiotherapy students in Karachi, 56.5% were aged 20–22 years, 78.9% were female, and 94.1% were single. Burnout assessment showed that 39.2% reported high emotional exhaustion, 40% reported high cynicism, and academic efficacy was moderate (M = 2.96–3.83, SD = 1.67–1.88). Depression, anxiety, and stress measured by DASS-21 were generally low to mild, with stress-related items slightly higher (M = 1.47, SD = 0.93). Correlation analyses revealed that

exhaustion was moderately associated with cynicism (r = 0.49) and weakly with depression (r = 0.23), anxiety (r = 0.15), and stress (r = 0.13). Limitations include cross-sectional design, convenience sampling, regional restriction, and self-report bias. Remedies include longitudinal studies, probability sampling, broader variables, and multivariate analyses. Findings emphasize integrating mental health support, stress management, and wellness programs to improve student resilience, performance, and patient care.

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CONFLICT OF INTEREST

No financial or commercial ties were existent as to raise the potential for conflict of interest during the research was being conducted.

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