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Tensile Minds: Relationship between Stress and Psychological Flexibility in Health Science Undergraduates: A Descriptive Study

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ABSTRACT

Undergraduate health science students face considerable academic and psychosocial stressors, placing them at elevated risk for mental health challenges. Psychological flexibility the capacity to remain open, adaptable, and goal-oriented amid internal stress has emerged as a key factor in promoting resilience. This study investigates the relationship between perceived stress and psychological flexibility among undergraduate health science students in Maharashtra, India. Using a descriptive cross-sectional correlational design, 150 participants aged 18–25 from various health disciplines were assessed using the Perceived Stress Scale (PSS-10) and the Personalized Psychological Flexibility Index (PPFI). Data collection was conducted via structured questionnaires, and statistical analysis employed Spearman's rank correlation. Results revealed a significant negative correlation ($r = -0.2422$, $p = 0.0003$), indicating that students with higher psychological flexibility reported lower stress levels. These findings underscore the importance of psychological adaptability in managing academic pressures and suggest that fostering flexibility may serve as a protective factor against stress. The study highlights the need for targeted mental health interventions and curriculum reforms tailored to health science students, who face unique challenges due to clinical exposure and performance demands. Future research should explore broader variables such as coping styles and social support to deepen understanding and enhance student well-being.

Keywords: Psychological Flexibility, Perceived Stress, Health Science Students, Undergraduate Mental Health, Academic Pressure, Stress

1. Introduction

Undergraduate health science students face intense academic demands and psychosocial pressures [(1)]. These factors put them at a higher risk for stress-related issues. Stress can impair emotional control, learning ability, and mental health, making it a significant concern in higher education [(2)].

In this context, psychological flexibility the ability to stay open, adaptable, and focused on goals in response to changing internal experiences has become an important concept for improving resilience and mental health [(3)]. Recent studies affirm that students exhibiting greater psychological flexibility report lower levels of depression, anxiety, and academic burnout [(4)]. Conversely, elevated stress levels have been shown to correlate with psychological inflexibility, suggesting a deteriorating ability to cope effectively under pressure [(5)].

During the COVID-19 pandemic, these trends became more pronounced, as flexible coping styles were strongly linked to improved mental health outcomes across student populations [(6)]. Despite growing interest in this area, limited research has focused specifically on health science undergraduate students who must navigate both academic rigor and emotionally demanding clinical environments.

This study seeks to examine the relationship between perceived stress and psychological flexibility among undergraduate health science students. By investigating how increasing stress levels impact adaptive psychological functioning, the research aims to enrich the understanding of student mental health and support the development of targeted interventions to foster resilience in future healthcare professionals.

While existing literature has established an inverse relationship between stress and psychological flexibility in general student populations, there remains a notable gap in understanding how this dynamic unfolds among undergraduate health science students—a group uniquely exposed to both academic rigor and emotionally demanding clinical environments. These students not only face performance pressure but are also being shaped as future healthcare providers, making their psychological resilience especially critical.

Previous studies have predominantly focused on broad university cohorts or post-pandemic mental health trends [(4)]. However, the intersection of stress and adaptability in health science learners calls for focused exploration. Cultural, curricular, and institutional factors may influence how students in this domain experience and respond to stress, which underscores the importance of localized and discipline-specific research.

Furthermore, understanding the nature and extent of this correlation in health science undergraduates can aid in designing targeted psychological support programs, curricular reforms, and resilience-building strategies within educational institutions. By addressing this gap, the present study aims to not only validate existing findings but to contribute actionable insights tailored to the needs of health science students in India.

2. Materials and Methods:

This study used a descriptive cross-sectional correlational design to explore the relationship between perceived stress and psychological flexibility among undergraduate health science students. Participants were undergraduate students enrolled in health science disciplines (e.g., nursing, physiotherapy, medical, dental, biotechnology, etc.) at different universities in Maharashtra, India. Convenience sampling was used. Participants included were having age group from 18–25 years, enrolled in a health science undergraduate program, voluntarily agreed to participate.

A sample size of 150 was calculated using G*Power 3.1 software, assuming a medium effect size (r = 0.3), alpha level of 0.05, and power of 0.80 for Pearson correlation. This ensured adequate statistical power to detect meaningful relationships.

Instruments used for the study were Perceived Stress Scale (PSS-10) (Cronbach's $\alpha = 0.84$ in Student samples), Personalized Psychological Flexibility Index (PPFI) (Cronbach's $\alpha = 0.81–0.87$ across subscales). Both tools are validated and widely used in research involving student populations.

3, Procedure:

Ethical clearance was obtained from the Institutional Ethics Committee prior to data collection (Ref. No. PIMS/DR/PhD/COPT/2022/160). Afterwards participants were informed about the purpose, confidentiality, and voluntary nature of the study. Informed consent was collected digitally or on paper.

Data collection using the Perceived Stress Scale (PSS-10) involved administering a structured questionnaire consisting of 10 items that measure individuals' perceived stress over the past month. Participants responded to each item using a 5-point Likert scale ranging from "never" to "very often." Similarly, for PPFI a 19 item questionnaire was provided to the

participants and scoring was done on 7-point likert scale ranging from “strongly disagree” to “strongly agree.” After gathering the responses, scoring was done.

The survey was administered using Google Forms and hard copies of both the scales during lecture breaks or at leisure time of the students. Responses were kept anonymous and securely stored. Data were collected over a 4-week period**.**

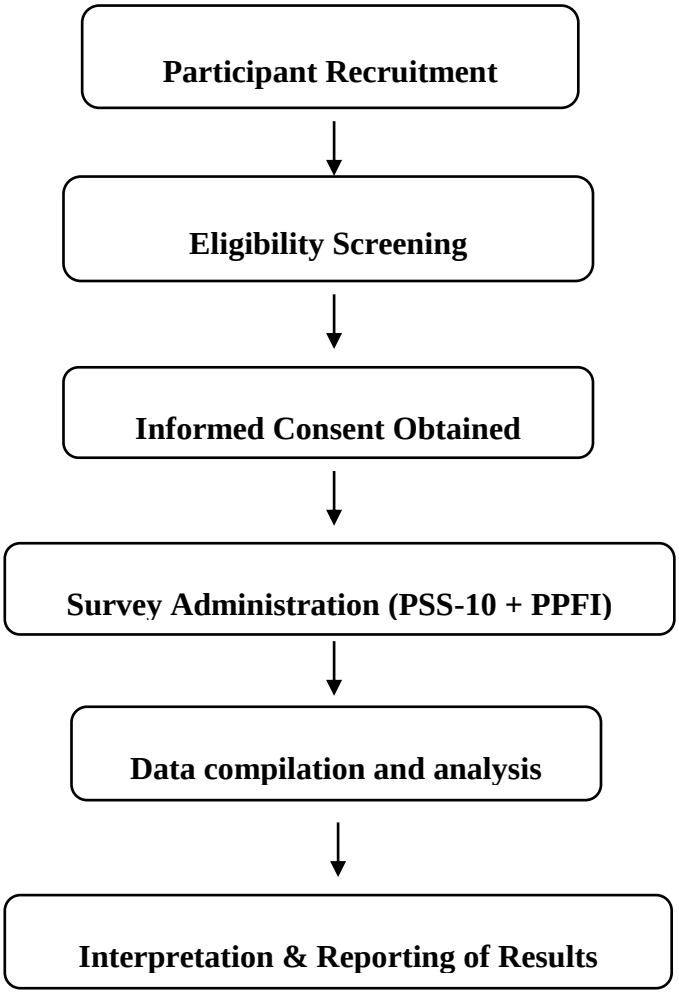

Fig 1: Flowchart of the Study Process

Statistical Analysis:

For data analysis, Graphpad instat version 3 was utilized. Descriptive statistics including mean, standard deviation were calculated to summarize the demographic and core variables of the study. To evaluate the relationship between perceived stress and psychological flexibility, the Pearson correlation coefficient was employed as the primary inferential statistical method. Statistical significance was determined using a threshold of $p < 0.05$, ensuring that findings considered meaningful met an accepted standard of reliability.

4. Results:

The demographic characteristics are presented in table no. 1

Parameter	Mean	± SD
Age	20.21	1.44
Height (cm)	157	29.86
Weight (kg)	58.07	12.02
Psychological Flexibility	69.75	11.50
Stress	20.7	5.02
Gender	Male: n = 108	
	Female: n = 112	

Table 1: Demographic data of the participants

In terms of gender distribution, the study comprised 108 male participants and 112 female participants, ensuring a reasonable balance across genders.

Correlation Analysis

The relationship between psychological flexibility (as measured by the PPFI) and Stress level (as quantified by the perceived stress cale) was examined using Spearman's rank correlation coefficient (r). Graph 1 visually represents this correlation.

figure 1. demonstrates Spearman's rank correlation analysis revealed a significant relationship between psychological flexibility (PPFI) and perceived stress (PSS), with a correlation coefficient of r = – 0.2422 (two-tailed p = 0.0003). This suggests that individuals with greater psychological flexibility tend to report lower stress levels.

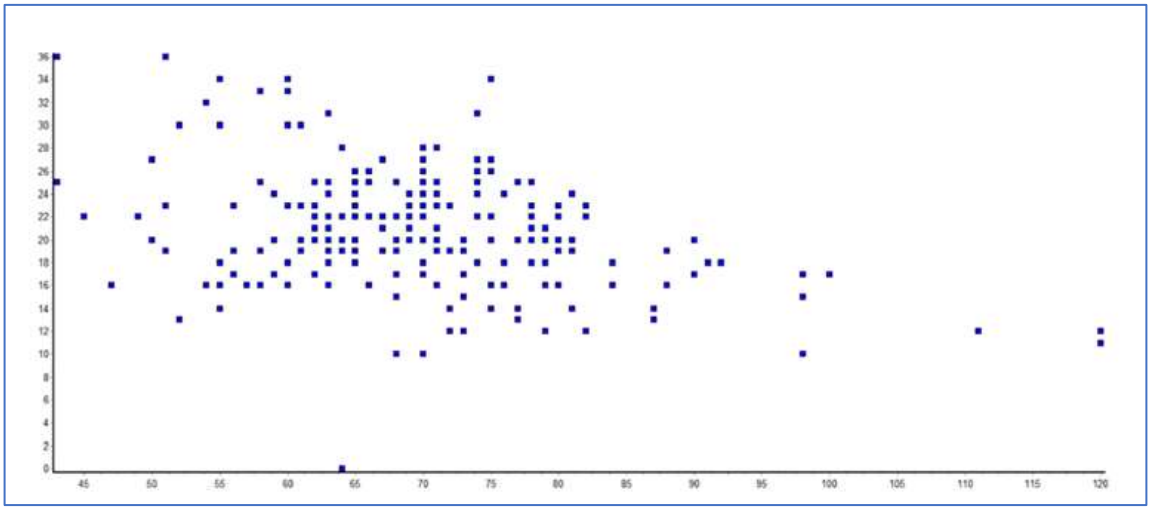

Figure 1: Graphical representation relationship between PPFI and PSS

5. Discussion:

The present study examined the association between psychological flexibility and perceived stress, utilizing Spearman's rank correlation analysis. The results indicated a statistically significant negative correlation ($r = -0.2422$, $p = 0.0003$), suggesting that higher psychological flexibility, as measured by the Personalized Psychological Flexibility Index (PPFI), is modestly linked to lower stress levels, assessed using the Perceived Stress Scale (PSS). This result underlines the relevance of psychological flexibility as a factor in stress modulation.

This finding aligns with the theoretical underpinnings of Acceptance and Commitment Therapy (ACT), which defines psychological flexibility as the capacity to adapt to situational demands, shift mental states, and maintain persistence in value-driven behaviour despite psychological discomfort [(7)]. Individuals demonstrating this trait are thought to experience stress differently, relying less on avoidance-based coping strategies and more on acceptance-based responses. Supporting this view, Kashdan and Rottenberg (2010) emphasized that psychological flexibility contributes to emotional well-being and adaptive functioning across diverse contexts [(3)].

Previous studies reinforce these observations. Wersebe et al. (2018) reported that improvements in psychological flexibility through ACT interventions were associated with decreased stress and enhanced emotional resilience [(8)]. Likewise, Zarvijani et al. (2021) found that ACT training significantly lowered perceived stress among psychiatric nurses, a population frequently exposed to high-pressure environments. Such evidence supports the notion that psychological flexibility serves not only as a coping resource but as a foundational mechanism for psychological health [(9)].

However, the relatively low correlation coefficient obtained in the current study suggests that psychological flexibility, while significant, may not be a dominant predictor of stress. Stress is a multifactorial construct influenced by various individual and contextual variables including personality traits, social support, life events, and environmental stressors. Tindle et al. (2022) demonstrated that psychological flexibility interacts with social support to buffer psychological distress, indicating a more complex interplay of factors [(10)]. In line with this, Barwal and Cherian (2024) highlighted the combined role of resilience and coping strategies in stress management among student populations [(11)].

Furthermore, using Spearman's rank correlation shows the monotonic, not just linear, relationship between psychological flexibility and stress. This analysis is especially important in psychology since variables often stray from linear patterns and show complex distributions. Future research should use multivariate statistical methods, like multiple regression to break down the contributions of psychological flexibility along with other psychosocial variables.

In conclusion, while psychological flexibility emerges as a meaningful factor associated with reduced stress, its modest correlation invites a broader exploration of additional buffers and mediators. Intervention programs designed to enhance psychological flexibility may benefit from integrating components aimed at strengthening social networks, fostering resilience, and promoting adaptive coping mechanisms. Such a holistic approach could enhance the efficacy of stress-reduction strategies across various demographic and clinical groups, paving the way for more nuanced and effective mental health interventions.

6. Conclusion:

This study found inverse correlation between psychological flexibility and perceived stress among health science students. Students who were more psychologically flexible tended to report lower stress levels. These findings suggest that helping students build psychological flexibility through different methods can be a useful way to reduce stress in academic environments**.**

Future research could explore this relationship further by including larger and more diverse samples, and by looking at other factors that may influence stress, such as coping styles or social support.

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