Original Article

A Comparative Analysis of Psychological Well-Being and Perceived Stress Among Postgraduate Athletes, Science, and Social Science Students

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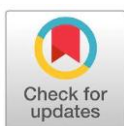[1]Research Scholar, Department of Physical Education, Central University of Punjab, Bathinda, India

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Abstract

Background: Psychological well-being and stress are vital determinants of student mental health. University students often face multiple academic and extracurricular pressures, which can affect their stress and well-being in different ways. However, the distinct psychological impacts of competitive athletic performance versus intensive academic cognitive load remain underexplored. **Material and Methods**: A cross-sectional study was conducted with 277 postgraduate students from these three groups. Psychological well-being was assessed using Ryff's 18-item Psychological Well-being Scale, which measures six core dimensions of psychological well-being. Stress levels were evaluated using the 10-item Perceived Stress Scale, a widely recognised tool for assessing subjective stress. Data were analyzed using one-way ANOVA, followed by post-hoc comparisons to explore differences among the groups. **Results**: The assumptions of normality and homogeneity were met (p > 0.05). ANOVA results indicated significant differences in perceived stress among the groups (F (2, 274) = 3.21, p = 0.042). Post hoc tests revealed that Science students reported significantly higher levels of stress compared to Social Science students (p = 0.04). However, the differences between Athletes and the other groups were not significant. In terms of psychological well-being scores, there were no significant differences among the groups (F (2, 274) = 0.27, p = 0.75), although Athletes had slightly higher mean scores. **Conclusion**: The findings indicate that Science students experience higher levels of stress compared to Social Science students. However, their overall psychological well-being is similar across both groups. These results underscore the importance of implementing targeted stress management strategies for students in demanding academic disciplines, as well as universal approaches that foster coping skills and social support for all students.

Keywords: Psychological Factor, Psychological well-being, Perceived Stress, Postgraduate Students.

Introduction

In the contemporary academic landscape, psychological well-being has emerged as a fundamental determinant of students' academic

achievement, personal growth, and future health prospects. Psychological well-being is a multidimensional construct, encompassing happiness, self-acceptance, autonomy, positive relationships, personal growth, and a sense of purpose in life (Charry et al. 2020; Ryff and Singer 1996). Within higher education, strong psychological well-being enables students to manage academic demands, adapt to changing environments, and pursue personal goals with resilience and satisfaction (Zhang & Li, 2025). Factors such as institutional support, peer relationships, and levels of academic engagement are closely linked to students' psychological well-being, which in turn reliably predicts long-term success, life satisfaction, and positive adaptation to stress (Barbayannis et al. 2022; Chaudhry et al. 2024; Harding et al. 2019; Mohammed et al. 2010; Stallman 2010).

Perceived stress is a subjective evaluation of how stressful one's life situations feel, influenced by uncertainty, instability, and belief in one's coping capacity (Cohen et al., 1983). For university and postgraduate students, perceived stress is commonly triggered by academic challenges, workload, deadlines, social pressures, and significant life transitions (Garbee et al. 1980; Huh et al. 2021; Talib and Zia-ur-Rehman 2012; Yang 2010). Persistent high levels of perceived stress can undermine mental health, learning abilities, and overall quality of life; conversely, students who can effectively manage stress are more likely to achieve academic and personal success (Abraham et al. 2019; Barbayannis et al. 2022; Garbee et al. 1980; Kumar and Bhukar 2013). The impact of perceived stress is multidimensional, often interacting with personality, coping skills, and environmental factors (Abraham et al., 2019; Huh et al., 2021).

An increasingly important aspect of student well-being is physical activity (R. Kumar et al., 2024), which exhibits a positive correlation with psychological health and resilience, defined as the ability to adapt and recover from stressors such as competitive pressures in sports (Gerber & Pühse, 2009; Xu et al., 2021). Evidence shows that university students who engage in regular physical activity generally report higher psychological well-being and fewer symptoms of psychological distress (Li & Huang, 2025), highlighting fitness as a protective factor in coping with academic and personal stressors (Abraham et al., 2019; Ansari et al., 2014; Barbayannis et al., 2022; Çakir et al., 2025; Chen et al., 2012; Han et al., 2025; Kumar & Bhukar, 2013; Thoits, 2011).

Within higher education, various student groups face distinct psychosocial and academic challenges. Athlete students face the dual challenge of managing demanding sports training and competition schedules alongside rigorous educational requirements, which can elevate stress levels despite the protective benefits of physical activity. However, this engagement simultaneously fosters enhanced resilience and psychological resources through disciplined training and teamwork (Li & Huang, 2025; Zhang & Li, 2025). Science students typically navigate performance-driven, laboratory-intensive curricula characterized by high workloads and technical precision, which contribute to elevated academic pressure and the need for sustained cognitive effort (Chaudhry et al., 2024). In contrast, social science students engage deeply with theoretical frameworks, critical analyses, and complex social phenomena, often confronting significant uncertainty regarding future career pathways. This career uncertainty has been linked to increased anxiety and diminished psychological well-being among students, emphasizing the need for effective career planning interventions to support their academic and professional development (Stallman, 2010; Talib & Zia-ur-Rehman, 2012; Thanoi et al., 2023). Understanding these distinct academic and psychosocial demands is crucial for tailoring support strategies that address the specific stressors and resilience factors within each student group.

These differences indicate that psychological well-being and perceived stress are not experienced uniformly across disciplines, but rather are shaped by each group's unique context and available resources.

In recent years, academic interruptions, digital fatigue, and heightened competitive pressures exacerbated by the COVID-19 pandemic have underscored the need to examine the distinctive patterns of well-being and stress experienced by postgraduate students within their specific disciplines (Barbayannis et al., 2022). This study thus aims to compare the mean levels of psychological well-being and perceived stress among postgraduate

athletes, science students, and social science students, accounting for the role of physical fitness and group-defining characteristics. Insights from this study will inform the development of tailored mental health supports, resilience-building initiatives, and curricular strategies that foster holistic student wellness across diverse educational contexts.

Materials and Methods

Research Design

This study employed a comparative cross-sectional research design with purposive sampling to select male students from the Athlete, Science, and Social Science groups who met the inclusion criteria; female students were deliberately excluded to focus on this specific population

Participants

The sample size was calculated a priori using G*Power 3.1 for a one-way ANOVA (α = 0.05, power = 0.80, effect size f = 0.25), which yielded a required sample size of 159 participants. We ultimately recruited 277 participants (athletes = 89; science = 94; social science = 94), exceeding the required sample size to account for potential incomplete questionnaires and to enhance statistical power and precision.

Recruitment procedure

To achieve the objectives of this study, a total of 277 male participants, aged 20 to 25 years, were purposively selected from the Central University of Punjab in Bathinda, India. The sample selection criteria comprised two categories: (i) Postgraduate athletes who had competed at the national level and were actively engaged in regular training, and (ii) postgraduate students from the disciplines of science and social sciences who were formally enrolled in their respective programs. Data regarding the selected psychological variables, stress, and psychological well-being were collected using standardized instruments: the Perceived Stress Scale (10 items) (Cohen & Williamson, 1998; adapted from Cohen et al., 1983) and Ryff's Psychological Well-being Scale (18 items) (Ryff & Keyes, 1995). Prior to data collection, the researcher met the participants in person, explained the study's objectives, and confirmed their eligibility based on the defined criteria. The questionnaires were administered via Google Forms, which were distributed through institutional email and social media platforms. Participants were encouraged to respond honestly to ensure the accuracy of the data.

Statistical Analysis

After obtaining the scores of each subject on psychological well-being and stress, the data were analyzed using **SPSS (Statistical Package for the Social Sciences)**. The Shapiro-Wilk test was used to assess the normal assumption of the data for psychological well-being and stress within the Athlete, Science, and Social Science groups. Additionally, Levene's test was used to verify the homogeneity of variance among these groups. A one-way analysis of variance (ANOVA) was conducted at a 0.05 significance level to compare the mean scores of the Athlete, Science, and Social Science groups. When a significant F-value was identified, the Scheffé post hoc test was performed for more detailed comparisons of means.

Results

The normality and homogeneity of variance assumptions were assessed using the Shapiro-Wilk and Levene's tests, respectively. All outcome variables met the required assumptions (p > 0.05). A one-way ANOVA was conducted to compare the mean scores of stresses and psychological well-being among the Athlete, Science, and Social Science student groups. Descriptive statistics are presented in Table 1.

Table 1 Descriptive Statistics of Stress and Psychological well-being among different groups

Variables	Group	N	Mean	Std. Deviation	Std. Error
Stress	Athlete	89	18.30	4.66	0.49
	Science	94	19.45	5.19	0.53
	Social Science	94	17.50	5.84	0.60
	Total	277	18.41	5.31	0.31
PWB	Athlete	89	73.32	8.62	0.91
	Science	94	72.92	9.11	0.94
	Social Science	94	72.38	8.03	0.82
	Total	277	72.87	8.57	0.51

*Level of Significance at 0.05; PWB = Psychological Well-being

Table 1 presents the descriptive statistics for stress and psychological well-being across three groups. The Social Science group reported the lowest mean stress score (M = 17.50, SD = 5.84), followed by the Athlete group (M = 18.30, SD = 4.66). In contrast, the Science group exhibited the highest mean stress score (M = 19.45, SD = 5.19). These mean scores show variations in stress levels across academic and athletic groups. At the same time, students from science disciplines experience relatively higher stress than their counterparts in the athletes and social sciences. In terms of psychological well-being, the Athlete group demonstrated the highest mean score (M = 73.32, SD = 8.62), followed closely by the Science group (M = 72.92, SD = 9.11) and the Social Science group (M = 72.38, SD = 8.03). These results demonstrate variations in psychological well-being across groups, with athlete students showing comparatively higher levels of psychological well-being overall.

Table 2 Summary of One-Way ANOVA of Stress and Psychological Well—being scores among three levels of groups

Variables	Source of Variance	df	SS	MS	F- Value	Sig.
Stress	Between Groups	2	178.29	89.14		
	Within Groups	274	7607.12	27.76	3.21	0.042*
	Total	276	7785.42			
PWB	Between Groups	2	41.07	20.54		
	Within Groups	274	20274.24	73.99	0.27	0.75
	Total	276	20315.32			

* Level of Significance at 0.05; PWB = Psychological Well-being

Table 2 presents the analysis of variance (ANOVA) outcomes for stress and psychological well-being across the three groups. For stress, the ANOVA yielded a statistically significant effect, $F_{(2, 274)} = 3.21$, $p < .05$, indicating that mean stress scores differed significantly among the Athlete, Science, and Social Science groups. In contrast, the ANOVA result for psychological well-being was non-significant, $F_{(2, 274)} = 0.27$, $p > .05$, indicating no significant differences in mean scores of psychological well-being across the three groups.

Furthermore, to determine which group has a significantly higher stress level, the data were further analyzed using the Scheffe post hoc test at a 0.05 level of significance, and the results are presented in Table 3.

Table 3 Level-wise Mean, SE, and Significance of Difference between Means Stress Scores of three groups

Athlete Group	Science Group	Social Science Group	Mean	Std. Error	Sig.
18.30	19.45		1.15	0.77	0.33
18.30		17.51	0.78	0.77	0.60
	19.45	17.51	1.93	0.76	0.04*

* Level of Significance at 0.05

As shown in Table 3, pairwise comparisons indicated that there were no statistically significant differences in stress scores between the Athlete and Science groups (p = .33) or between the Post graduate Athlete and Social Science groups (p = .60). However, a significant difference was found between the Science and Social Science groups (p = .04). Specifically, Social Science students reported lower average stress scores (M = 17.51) compared to science students (M = 19.45). These findings suggest that students in Social Science disciplines tend to experience lower stress levels than their counterparts in science disciplines. This pattern is also illustrated in Figure 1.
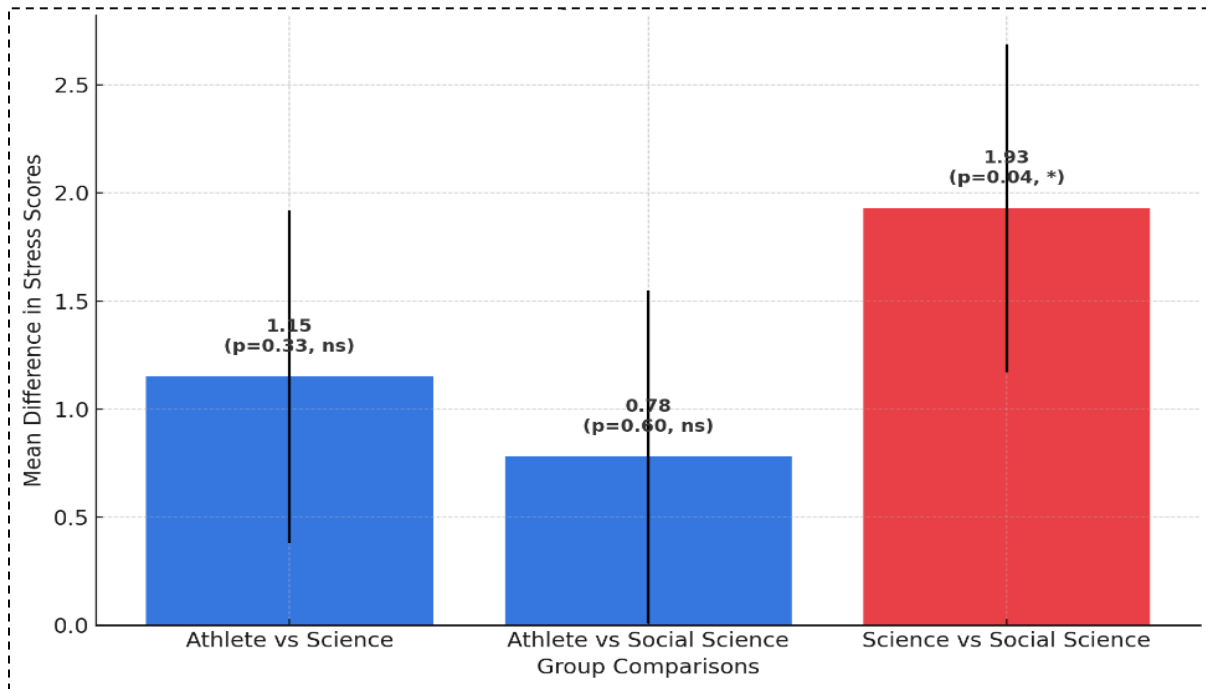

Figure 1 Pairwise comparison of Stress scores among the three levels of groups

Discussion

This study examined perceived stress and psychological well-being among Athletes, Science, and Social Science students at the Central University of Punjab. The findings indicated significant group differences in stress but not in well-being. Science students reported the highest stress scores, followed by Athletes, with Social Science students reporting the lowest. Elevated stress in Science students aligns with earlier work demonstrating that students in demanding, high-competition academic environments are especially vulnerable to academic stress (Chowdhury et al., 2017; Dahlin et al., 2005; Misra & Mckean, 2000). The structured and labour-intensive design of science programs, which include laboratory sessions and research projects, may further elevate stress compared to more flexible curricula in the social sciences (Ansari et al., 2014; Ryder et al., 1999), where academic pressures are comparatively lower. The report further highlights that students' stress-management preferences differ by discipline, reflecting the specific academic demands of each field (Alkhawaldeh et al., 2023). The role of performance competition and limited academic autonomy likely contributes to these differences (Kumar & Bhukar, 2013).

By contrast, Social Science students exhibited lower stress levels, consistent with findings that reduced technical demands and greater social support predict lower academic stress (Freire et al., 2016). Social integration and emotional resources serve as protective factors against stress, buffering its impact on functioning (Misra et al., 2003; Thoits, 2011). Furthermore, coping mechanisms such as high social support and adaptive avoidance have been shown to mitigate perceived stress and promote resilience (Alkhawaldeh et al., 2023).

Psychological well-being in this context is reinforced by internal factors, including enriched learning experiences, social development, and the formation of values. In contrast, psychological distress often arises from status disparities, competition, and unequal opportunities. Evidence further suggests a high prevalence of distress among young adults, underscoring the need for interventions that foster resilience and promote equity in academic settings (Suresh & Dar, 2025).

For Post Graduate Athletes, exhibited stress levels that did not significantly differ from other groups, aligning with empirical studies reporting comparable perceived stress in athletes versus non-athletes due to physical activity's protective effects, including endorphin release, enhanced resilience, teamwork, and social belonging (Abraham et al., 2019; Avery et al., 2022; Biddle & Asare, 2011; Fletcher & Sarkar, 2012; Gerber & Pühse, 2009; R. Li & Huang, 2025).

Regarding psychological well-being, no significant group differences were observed. Although Athletes showed marginally higher psychological well-being, this difference was not statistically significant, likely reflecting the multidimensional nature of well-being encompassing resilience, coping ability, social support, and self-efficacy, which likely explains the comparable outcomes across groups (Harding et al., 2019; Morales-Rodríguez et al., 2020; Tay et al., 2018).

Resilience and mental toughness serve as protective factors in athletic settings, mediating the relationship between pressure and anxiety. Greater self-efficacy enables athletes to face challenges confidently and minimize worry over failure (Li et al., 2025). Adaptive, task-oriented coping and psychological flexibility further enhance recovery, self-esteem, and stress regulation, while social support mitigates anxiety and depression and fosters belonging (Khatri et al., 2024; Li et al., 2025; Mao, 2025; Ronkainen et al., 2024). Athletes with higher satisfaction of autonomy, competence, and relatedness report greater happiness and well-being, perceiving stressors as opportunities for growth (Mao, 2025; Rose et al., 2023). Drawing motivation from passion and goals strengthens perseverance (Solano et al., 2025). Many athletes rely on their sports community as a support network, contributing to their higher social well-being (Rose et al., 2023).

Implications

A key implication of these findings is that stress and well-being are not linearly related. High stress levels do not necessarily result in reduced well-being, provided individuals utilize effective coping strategies and maintain strong psychosocial resources (Akhtar & Kroener-Herwig, 2019; Thanoi et al., 2023). Mindfulness, emotional regulation, and social connectedness are especially important in preserving well-being amidst academic pressures (Huang et al., 2021; Weinstein et al., 2009).

These results suggest the need for targeted stress reduction programs for students in high-pressure disciplines such as the sciences, while simultaneously promoting universal interventions that cultivate resilience, social support, and adaptive coping across all student populations (Freire et al., 2016; Harding et al., 2019; Stallman, 2010). Such programs could include mindfulness workshops, peer mentoring, resilience training, and structured physical activity modules.

Limitations and Future Directions

This study is limited by its cross-sectional design, reliance on self-reported data, focus on male students from a single university, and exclusion of female students actively engaged in physical activity due to their very low availability at the institution during recruitment. These factors limit generalizability and causal inference. Future research should employ longitudinal and mixed methods designs to capture stress trajectories, the evolution of coping mechanisms, and protective factors over time. Furthermore, the inclusion of female students and recruitment across multiple institutions would provide richer and more comprehensive insights (Eisenberg et al., 2007; Onieva-Zafra et al., 2020).

Conclusion

This study found significant differences in perceived stress levels among postgraduate students in Science (mean=19.45), Post graduate Athletes (mean=18.30), and Social

Science (mean=17.50) students, with all groups falling within the moderate range (14–26) of the scale (0–13 low, 14–26 moderate, 27–40 high), however Science students reported the highest stress. Despite these differences, psychological well-being was similar across all groups, highlighting the protective role of resilience and coping mechanisms. These findings underscore the importance of targeted stress management interventions in demanding academic fields, complemented by universal strategies to enhance coping and social support across the entire student population.

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Conflicts of interest:

The authors declare no conflicts of interest regarding this manuscript.

Declaration of Language Assistance:

I acknowledge the use of Grammarly for language and grammar enhancement to improve the clarity and readability of this manuscript.

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