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Impact of Physical Activity Level on Psychological Health of Postgraduate Students of Savitribai Phule Pune University

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ABSTRACT

The purpose of the study was to study the Impact of Physical Activity Level on the Psychological Health of the students of Savitribai Phule Pune University (SPPU). which 164 students from SPPU were selected using a Purposive sampling technique. The Descriptive Comparative method was administered to determine if there is a significant difference in Psychological Health among students of SPPU with respect to their Physical Activity Level. The Mean and S.D. of Psychological Health of Highly Active Male was 35.48(±13.896) and for Highly Active Female was 31.2 (±13.79), the Mean and S.D. of Psychological Health of Active Male was 39.75 (±18.714) and for Active Female was 31(±29.051) respectively, the Mean and S.D. of Psychological Health of Moderately Active Male was 43.77(±18.77) and for Moderately Active Female was 46.71 (±20.65) respectively, the Mean and S.D. of Psychological Health of Low Active Male was 37.77(±23.67) and for Low Active Female was 49(±17.62) respectively. The Mean and S.D. of Psychological Health of Sedentary Male were 35.44(±15.75) and for Sedentary Female were 50.81(±17.88), respectively. Statistical tools such as Descriptive statistics, one-way ANOVA and Post hoc test were used to analyse the data. The results of ANOVA showed that the F-value for females was 4.015 (p=0.005), indicating a significant difference in psychological health among females based on their physical activity level. Further, the F value in males was 0.529 (p=0.715), which shows that there was no significant difference in the psychological health of males based on physical activity level. Therefore, it can be concluded that there is a significant difference in psychological health among females, depending on their Physical activity level.

INTRODUCTION

The transition to university life marks a pivotal stage in an individual's personal, academic and social development. For postgraduate students, this period is often characterised by heightened academic pressures, increased responsibilities and significant personal challenges, all of which can contribute to elevated levels of psychological distress (Beiter et al., 2015). The demands of advanced education, including rigorous coursework, research commitments and career preparation, frequently lead to increased stress, anxiety and depression among students (Evans et al., 2018). These psychological health concerns are not only detrimental to students' academic performance but also influence their overall health and prospects (Levecque et al., 2017). In recent years, the psychological health of university students has become a global concern, with evidence indicating that postgraduate students are particularly vulnerable to psychological health issues compared to their undergraduate counterparts (Levecque et al., 2017). Against this backdrop, the exploration of protective factors that can buffer the negative effects of academic stress has become increasingly important.

One such protective factor that has garnered considerable attention is physical activity. Defined as any bodily movement produced by skeletal muscles that requires energy expenditure, physical activity encompasses a broad range of activities from daily routines such as walking and cycling to structured exercise and sports (World Health Organisation, 2020). The benefits of regular physical activity extend well beyond physical health, with a growing body of research demonstrating its positive effects on mental health outcomes. Engaging in physical activity has been shown to reduce symptoms of depression, anxiety and stress, while simultaneously enhancing mood, self-esteem and cognitive function (Sharma et al., 2006; Johnson & Lee, 2019). The mechanisms underlying these mental health benefits are multifaceted, involving both biochemical processes such as the release of neurotransmitters like serotonin, dopamine and endorphins and psychological factors, including increased self-efficacy, a sense of accomplishment and opportunities for social interaction (Brosse et al., 2002; Paluska & Schwenk, 2000; Smith & Jones, 2020). Furthermore, regular physical activity has been linked to improved sleep quality, better behavioural control and greater emotional regulation, all of which are essential for coping with the demands of university life (Chen & Lee, 2017).

Despite the well-established benefits of physical activity for mental health, there remains a paucity of research focusing specifically on postgraduate students in the Indian context. Indian students, particularly those at institutions like Savitribai Phule Pune University (SPPU), face unique cultural, academic and societal pressures that may influence both their mental health and engagement in physical activity (Jalmi & Pandey, 2025). These pressures, ranging from high family expectations and financial constraints to the challenge of balancing traditional values with modern academic demands, underscore the need for context-specific research. Thus, the present study aims to address this gap by examining the impact of physical activity levels on the psychological health of postgraduate students at SPPU, utilising validated instruments such as the Physical Activity Index (Fit and Well) and the Depression Anxiety Stress Scale (DASS-21). Previous studies have indicated notable gender differences in the relationship between physical activity and psychological health, suggesting that highly active female students report significantly lower levels of depression, anxiety and stress compared to their less active counterparts, while the relationship is less pronounced among male students. These findings highlight the importance of tailored interventions that account for biological, psychological and sociocultural factors influencing mental health. Given the bidirectional nature of the relationship between physical activity and psychological health and the increasing prevalence of mental health issues among university students, educational institutions must prioritise the promotion of physical activity as part of their mental health strategies. Therefore, it is hypothesised that psychological health varies significantly with physical activity level among postgraduate students at SPPU, with higher physical activity correlating with better mental health. Furthermore, this difference is anticipated to be significant among females but not among males. This study is therefore crucial in exploring the impact of physical activity levels on the psychological health of postgraduate students at SPPU, with the ultimate goal of informing effective interventions and support systems tailored to their specific needs.

METHODS

Research Design

This study employed a quantitative cross-sectional research design using survey methods to describe the relationship between Physical Activity Level and Psychological Health.

Population and Sample

A total of 164 postgraduate students (male = 78, female = 86) from Savitribai Phule Pune University (SPPU) participated in the study. Participants were selected through purposive sampling, specifically chosen because they needed to be postgraduate students at SPPU aged between 23 and 28 years, ensuring that the sample precisely reflected the target population relevant to the study's objectives. The study adhered to ethical research principles; informed consent was obtained from all participants, and participation was voluntary. Ethical consideration was ensured by seeking permission letters from the concerned department at the university before data collection, which served as formal approval to conduct the study in accordance with institutional ethical standards. Purposive sampling was adopted for this study as it allows the researcher to deliberately select participants who possess specific characteristics relevant to the research objectives. The focus of the present study is on postgraduate students of Savitribai Phule Pune University, and hence, it was essential to include individuals who are currently enrolled in postgraduate programs within the University. Also,

purposive sampling allows the researcher to ensure variability within the sample, for example, including students from diverse academic disciplines, genders, and physical activity categories (low, moderate, and high activity levels), thereby facilitating a more comprehensive understanding of the phenomenon under investigation.

Thus, purposive sampling was considered the most suitable technique for this research, as it aligns with the study's objectives, ensures relevance and adequacy of data, and allows in-depth exploration of the impact of physical activity on psychological health among postgraduate students.

Data Collection

Physical activity levels were measured using the Physical Activity Index, a standardized tool that measures frequency, duration and intensity of physical activity and the psychological health was assessed using the DASS-21, which measures levels of depression, anxiety and stress by adding all the scores as a composite score, which has showed acceptable internal consistency (Cronbach's alpha typically > 0.80) and construct validity measured through correlations with related psychological constructs. Data were analysed using SPSS, employing descriptive statistics and a one-way ANOVA along with Post hoc comparisons using Tukey's HSD test, to explore relationships between physical activity levels and psychological health.

RESULTS AND DISCUSSION

A total of 164 postgraduate students (male = 78, female = 86) from Savitribai Phule Pune University participated in the study. Participants were categorised into five physical activity levels: Highly Active, Active, Moderately Active, Low Active and Sedentary. Descriptive statistics for psychological health scores across the physical activity levels and gender are presented in Table 1.

A one-way ANOVA was conducted separately for males and females to determine whether psychological health scores varied significantly by physical activity level. Among males, there was no statistically significant difference in psychological health across physical activity levels, $F(4, 73) = 0.53$, $p = .715$, $\eta^2 = 0.03$. However, among females, there was a statistically significant difference, $F(4, 81) = 4.02$, $p = .005$, $\eta^2 = .17$, indicating that physical activity level accounted for approximately 17% of the variance in psychological health.

Post hoc comparisons using Tukey's HSD test (Table 3) revealed that the Highly Active females had higher psychological health scores than the Sedentary females (mean difference = 11.67, $p = .010$). No other pairwise differences were found to be statistically significant ($p > .05$).

These results indicate that psychological health, only among female postgraduate students, was significantly influenced by their physical activity level, with those who were more physically active reporting higher psychological health scores. Among males, physical activity level did not have a statistically significant effect.

Physical Activity Level	N	Gender	Mean	Std. Error of Mean	Std. Deviation
High Active	42	Male (27)	35.48	2.674	13.896
		Female (15)	31.20	3.561	13.790
Active	12	Male (8)	39.75	6.616	18.714
		Female (4)	31.00	14.526	29.052
Moderate Active	23	Male (9)	43.78	6.258	18.774
		Female (14)	46.71	5.522	20.660
Low Active	13	Male (9)	37.78	7.891	23.674
		Female (4)	49.00	8.813	17.626
Sedentary	74	Male (25)	35.44	3.151	15.754
		Female (49)	50.82	2.555	17.884

Table 1: Descriptive statistics of Psychological Health based on Level of Physical Activity, processed using SPSS 25 (2025) [source]

Gender	N	Groups	Sum of Squares	df	Mean Square	F	Sig.

Male	78	Between Groups	601.21	4	150.30	0.529	0.715
Female	86	Between Groups	5358.70	4	1339.68	4.015	0.005

Table 2: Results of ANOVA, processed using SPSS 25 (2025) [source]

Physical Activity Level (I)	**Physical Activity Level (J)**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
Highly Active	Active	-2.881	5.945	.989
	Moderate Active	-11.613	4.711	.104
	Low Active	-7.278	5.764	.714
	Sedentary	-11.669*	3.509	.010
Active	Highly Active	2.881	5.945	.989
	Moderate Active	-8.732	6.468	.660
	Low Active	-4.397	7.271	.974
	Sedentary	-8.788	5.652	.529
Moderate Active	Highly Active	11.613	4.711	.104
	Active	8.732	6.468	.660
	Low Active	4.334	6.302	.959
	Sedentary	-.056	4.336	1.000
Low Active	Highly Active	7.278	5.764	.714
	Active	4.397	7.271	.974
	Moderate Active	-4.334	6.302	.959
	Sedentary	-4.391	5.462	.929
Sedentary	Highly Active	11.669*	3.509	.010
	Active	8.788	5.652	.529
	Moderate Active	.056	4.336	1.000
	Low Active	4.391	5.462	.929

Table 3: Results of Post Hoc Tests, Tukey HSD processed using SPSS 25 (2025) [source]

Physical Activity Level	N	Subset for alpha = 0.05
		1
Highly Active	42	33.95
Active	12	36.83
Low Active	13	41.23
Moderate Active	23	45.57
Sedentary	74	45.62
Sig.		.239

Table 4: Results of Means for groups in homogeneous subsets, processed using SPSS 25 (2025) [source]

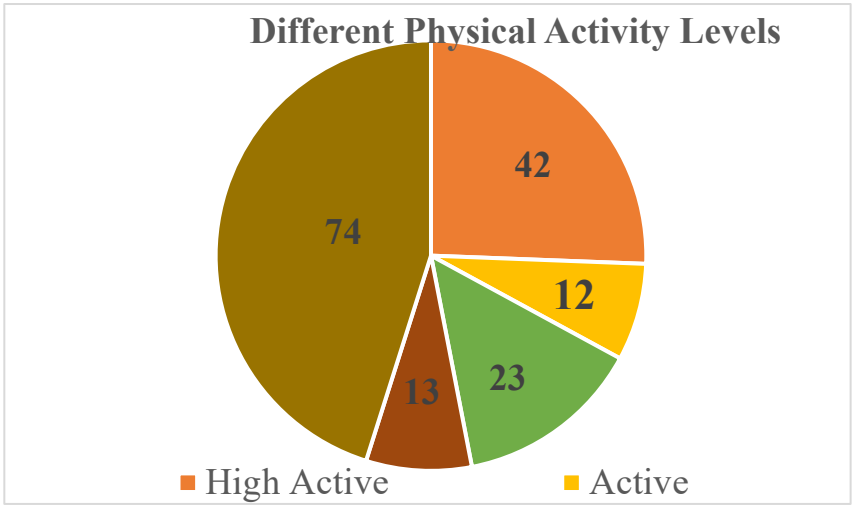

Chart 1: Physical Activity Level of Students
processed using Excel (2025) [source]

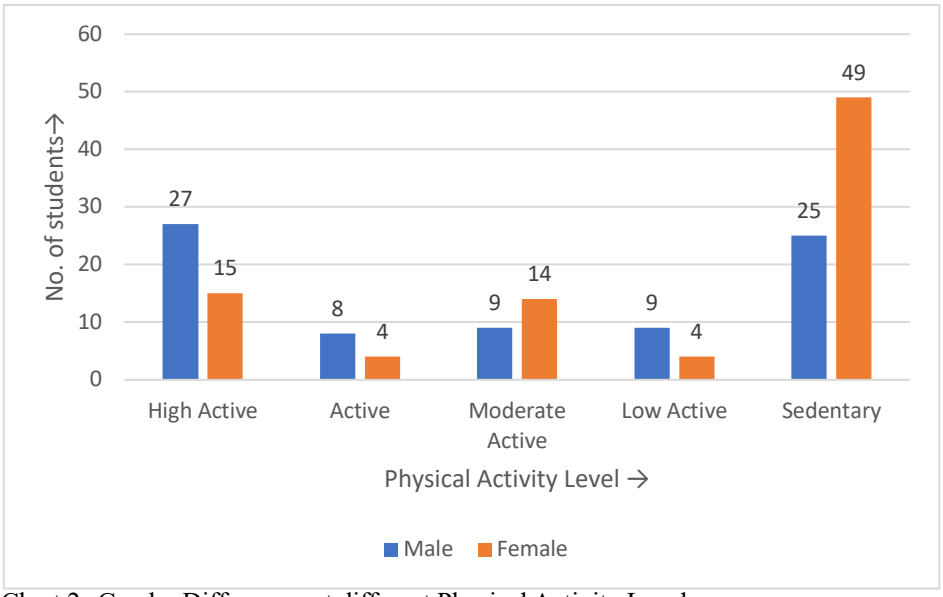

Chart 2: Gender Differences at different Physical Activity Levels,
processed using Excel (2025) [source]

Limitations

While the study provides valuable insights, it is not without limitations. The cross-sectional design limits the ability to infer causality between physical activity and psychological health. The use of self-reported measures may introduce bias, and the sample was limited to only one university, which may affect the generalizability of the findings.

Gender Differences

The notable gender differences in psychological benefits from physical activity among females can be explained by physiological, psychosocial, and cultural factors. Physiologically, women's brain chemistry and hormonal regulation, including dopamine pathways, may heighten mood and reward responses, enhancing mental health benefits from activity. Psychosocially, females often employ distinct coping strategies and have stronger social support networks, magnifying the positive effects of physical activity on psychological well-being. Culturally, societal expectations and gender roles influence the types of physical activities preferred by women and the pressures they face, which may lead to greater stress relief through exercise. Higher baseline stress and anxiety levels in females also make these benefits more pronounced compared to males. (Levecque et al., 2017; Paluska & Schwenk, 2000).

Comparison with Previous Research

These findings are consistent with international and Indian studies that highlight the mental health benefits of regular exercise (Brosse et al., 2002). However, the lack of a significant difference among male students suggests that other factors may play a more prominent role in influencing psychological health in this group, such as social engagement,

academic pressures, or lifestyle habits. This indicates the need for gender-sensitive approaches in designing mental health and wellness interventions on university campuses.

Implications for Practice

The results underscore the importance of promoting physical activity among university students, especially females, as a strategy to enhance psychological health. Universities should consider implementing targeted physical activity programs, awareness campaigns and providing accessible facilities to encourage regular participation. Additionally, integrating physical activity into student support services and academic schedules may help reduce barriers to participation.

Directions for Future Research

Future research suggestions building on the current study can be grouped by type as follows:

- **Longitudinal Research:** Employ longitudinal designs to observe changes and causal relationships between psychological health and physical activity over time.
- **Qualitative Research**: Conduct qualitative studies to explore in-depth motivations, barriers, and personal experiences related to physical activity among different student groups. Understanding these factors can help develop interventions that address psychological and social needs.
- **Lifestyle Factor Research:** Investigate the impact of additional lifestyle variables such as diet, sleep and digital media use on psychological health. Specifically, explore how high social media engagement interacts with physical activity and mental well-being, given growing concerns about online influence on stress and anxiety.

Practical Interventions Universities Could Implement

Universities can implement several practical interventions to enhance mental health through physical activity, particularly benefiting female students who show significant psychological improvements from being active. Suggested interventions include:

- Integrating structured physical activity programs into academic schedules, such as mandatory or elective physical education classes, which encourage regular moderate exercise. Incorporating short physical activity breaks during lectures to increase circulation, attention, and reduce sedentary behaviour.
- Providing accessible and diverse fitness facilities and programs that cater to various interests (e.g. yoga, dance, team sports) to appeal to different preferences and cultural backgrounds.
- Promoting group activities to improve social support and community engagement, which enhances psychological health

CONCLUSION

The present study provides significant insights into the relationship between physical activity levels and psychological health among postgraduate students at Savitribai Phule Pune University. The findings clearly demonstrate that higher levels of physical activity are associated with better psychological health, particularly among female students. The statistical analysis revealed a significant difference in the psychological health of female students based on their physical activity levels, while no such significant difference was observed among male students. This suggests that physical activity may play a more pronounced protective role against depression, anxiety and stress for female students in this context.

These results highlight the importance of encouraging regular physical activity as a strategy to promote psychological health among university students. Given the increasing prevalence of mental health issues in higher education, universities should consider integrating physical activity programs and facilities into their student support services. Creating awareness about the psychological benefits of exercise, providing accessible opportunities for participation and fostering a supportive environment can help students adopt healthier lifestyles and improve their overall psychological health.

While this study focused on the impact of physical activity on psychological health, it also opens avenues for future research to examine related factors that may influence student health. For instance, future studies could investigate the role of digital engagement and social media use, such as the experiences of students who are "celebgrams" or well-known Instagram personalities, on cognitive and psychological health. These students often face unique pressures related to constant online presence, content creation and the pursuit of social validation, which may have distinct implications for their mental health. Understanding the interplay between physical activity, digital behaviour, and psychological health could provide a more comprehensive picture of student health in the modern era.

In conclusion, this research underscores the critical role of physical activity in supporting the psychological health of postgraduate students, with particularly strong benefits observed among female students. Universities and policymakers should prioritise the promotion of physical activity as part of holistic student wellness initiatives. By continuing to explore the complex factors that influence student psychological health, including digital behaviours, social support and lifestyle choices, future research can contribute to more effective and inclusive strategies for fostering well-being in higher education settings. Lastly, it can be concluded that there is a significant difference between the psychological health of females based on their Physical activity level.

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