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Dynamics of psychology of sports and exercise for mental wellbeing of students of higher educational institutions

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Abstract
The study examines the reaction of recreational sports on the behavioral and psychological level in the mental health of students in Indian institutions of higher learning. The paper analyzes the role of attitude, social norms, perceived behavioral control, and motivation in the rate of recreational game playing and their associations with the level of stress and well-being outcomes in secondary data from two Indian studies conducted in the recent past. The data involves 200 college students and contains factors such as the amount of commitment towards one of their times, recreational interest, rating of mental state, and activity barriers. The problem of relationships between physical activity and psychological consequences was studied through such statistical approaches as regression, ANOVA, chi-square tests, and Pearson correlation. According to the results, students engaged in group activities and with whom more positive feelings about leisure games were produced experienced much less stress. Regression analysis further revealed that the most effective predictor of well-being was the frequency of exercise ($R^2 = 0.68$), then there was attitudinal positivity and social support. The study highlights that well-planned recreations are essential to the wellbeing of the students as they reduce the level of mental discomfort and raise social connectedness in the students more than being leisure activities. It stresses the necessity of the fact that the institutions should offer recreation facilities and wellness programs that consider behaviors. This research contributes to filling a rather specific gap in Indian sport psychology since it is the first research to examine the Theory of Planned Behavior by testing it on a sample of students. The results affect policy, curriculum design, and psyche interventions in a higher education setting.

Keywords: Recreational sports, mental wellbeing, higher education, stress reduction, theory of planned behavior, social connectedness

Introduction
The role of recreational activities as the inseparable component of the wellbeing of the college students is gaining increasingly widespread recognition as the ones that help improve both their mental and physical health. Systematic physical exercise has been part of the priority in integrating into the educational environment because India is struggling with the increased levels of anxiety, burnout, and stress among students. Several studies also concluded that more often students who engage in recreational sports claim to be happier, are less psychologically discomforted, and are more in touch with the surrounding people (Zhang & Chen, 2018) [4]. Moreover, in this case, it has been demonstrated that yoga and other traditional Indian methods of health manipulate stress levels physiologically by contributing to the balance of the autonomic nervous system (Singh, 2018) [3]. The frequent play of recreational games under social circumstances has been associated with better emotional resilience and better focus on studies (Yu-mei, 2010) [6].

Of equal importance are the psychological reasons behind the involvement of students in athletics. It is noted that positive attitude, perceived behavioral control, and peer influence have important roles in recreational intentions (He, 2010) [10]. Indian studies recommend that modern physical education processes should have a clear shift in the performance-related goals, shifting towards a general health outcome (Kayhan & Ustun, 2019) [2]. Colleges should address physical exercise as a strategic educational response, and it should not be viewed only as a form of recreation because organized recreation is linked to a reduced rate of dropout and better academic adjustment (Gavrilova & Mokhunko, 2021) [5].

Nonetheless, the same cannot be said about India, where the institutional support for leisure sports is not up-to-date, as not all campuses have facilities or programs that target the said purpose in mind. To comprehend the impacts of motivation, barriers, and the intent of behavior towards stress outcomes, an observation of the interaction (or, in other words, the relationship) between physical activity and psychological well-being in the context of higher education is considered in this research using secondary data. The findings are projected to enhance wellness campaigns, influence lawmaking, and, finally, promote physical activity throughout the lifespan.

Study objectives

- To study the relationship between the mental well-being of students and the rates of their physical activity in university education.
- To examine the influence that attitudes, social norms, and the perceived behavioral control have on playing leisure video games.
- To assess the influence of the play preferences (individual or group) on the outcome of psychological wellness.
- To identify the barriers of physical exercise and their influences on the stress and intentions of participation.

Need of the Study

The rate of mental health amongst the Indian students, and more so of those who attend high institutions of learning, gets to increase as they experience stress, worry, and depression. The pressure on universities to introduce comprehensive wellness models is increasing massively due to social isolation, academic pressure, and digital exhaustion. It is even inevitable that physical fitness has been regarded as an optional activity, instead of or in addition to a mental health requirement, in spite of the fact that there exists empirical evidence that it can enhance emotional stability and perceptual capabilities. Social cohesiveness and mental stability could also be promoted with the help of leisure games that use modern technologies and have traditionally been a part of Indian culture (such as yoga, etc.). Both kinds of games are easily accessible and affordably offered ways to become closer to each other. Very few Indian universities, however, constantly track or incorporate them into their student support services. The existing small study most of the time overlooks the behavioral, psychological, and motivational implications of involvement in sports at the expense of physical outcomes. By offering real figures and reasons for why and how students take part in terms of recreational sports and the impact of such activities on mental soundness, this research closes a big gap. As well, in assessing behavior and intention in a culturally specific environment, it involves the use of the psychological construct of the Theory of Planned Behavior. These findings will be important in advising policy makers, educators, and mental health experts seeking effective yet inexpensive approaches that they could use to empower the young people of India to cope with stress and succeed both academically and socially.

Methodology

This is research with a secondary data analysis methodology on the psychological and behavioral nature of recreational sports and its effects on the mental health of college students. To get the data, two in-depth studies that offer quantitative knowledge on leisure activities, psychological aspects, and well-being outcomes within Indian college contexts, namely, Pandey, Chopra, and Karve (2023) [7] and Eappan (2023) [8], were employed. Important data sets were preferences in leisure games, commitment of time, perceived reasons and sub-scales of the theory of planned behavior, patterns of physical activity, and measurements of stress. Regression models, ANOVA, chi-square analysis, and Pearson correlation, among other statistical results, were employed in determining the influence of factors such as attitude, social norms, and perceived control on well-being. The data were obtained due to the publicly available and morally conducted information, and no personal identification data were used. This secondary investigation makes a comprehensive and evidence-based understanding of the effects of scheduled physical exercise on the levels of stress and state of mental health among students possible. It generates valuable insights applicable to education, mental health practitioners, and policymakers, besides circumventing the ethical and practical factor in the collection of primary data.

Data Collection

Table 1: Student Preferences and Motivations for Recreational Games

Variable	Item Description	Percentage (%)
Type of Recreation Game	Ball Games (wall play, table tennis variants)	70
	Walking (e.g., staircase climbing)	50
	Yoga	33
	Cycling	30
Time Spent per Day	Half an hour	40
	15-20 minutes	34
	1 hour	22
	More than 1 hour	8
Play Preference	In a Group	64
	Alone	36
Reasons for Playing	Beat boredom	68
	Entertainment	65
	Health	62
	Companionship	44
	Self-Development	36
	Achievement	23

Source: Pandey, Chopra & Karve (2023) [7]

Table 2: Psychological Dimensions of Recreational Games

Construct	Item	Mean Rating (1-5 Scale)
Attitude	RG make me feel happy	4.32
	RG make me feel relaxed	3.81
	RG make me feel energetic	3.86
	RG make me feel competitive	3.75
Subjective Norms	Friends motivate me to play RG	2.59
	I play RG that others play	3.00
	I am updated with trending RG	2.26
Perceived Behavioral Control	RG requires time investment	3.64
	RG requires regular practice	3.42
	RG requires gear/equipment	3.00
Intention to Continue	I intend to continue due to sense of belonging	3.76
	I feel cared for through RG	4.25
	I intend to improve as a practitioner	3.06

Source: Pandey, Chopra & Karve (2023) [7] — Theory of Planned Behaviour Subscales

Table 3: Physical Activity Patterns among College Students

Frequency of Activity	Number of Students	Percentage (%)
Daily	50	25
2-3 times a week	80	40
Once a week	40	20
Rarely/Never	30	15

Source: Eappan (2023) [8]

Table 4: Barriers to Physical Activity

Barrier Type	Count	Percentage (%)
Lack of time	90	45
Lack of motivation	50	25
Lack of facilities	40	20
Other challenges	20	10

Source: Eappan (2023) [8]

Table 5: Mental Wellbeing Outcomes and Campus Support

Outcome/Variable	Results/Observation
Mean stress score for daily exercisers	2.1
Mean stress score for rarely active	4.0
Correlation (Activity vs Stress)	$r = -0.65$, $p < 0.01$
Colleges with basic activity infrastructure	60%
Students involved in organized programs	35%
Students interested in activity programs	85%

Source: Eappan (2023) [8]

Results and Analysis

Table 6: Correlation Analysis of Motivational Factors and Behavioral Intentions

Variable Pair	Correlation Coefficient (r)	Significance Level	Interpretation
Attitude (Happy) vs Intention (Belonging)	$r = 0.78$	$p < 0.01$	Strong positive correlation
Attitude (Relaxed) vs Intention (Cared for)	$r = 0.82$	$p < 0.001$	Very strong positive correlation
Subjective Norms vs Intention (Continue)	$r = 0.45$	$p < 0.05$	Moderate positive correlation
Perceived Control vs Intention (Improve)	$r = 0.38$	$p < 0.05$	Moderate positive correlation
Health Motivation vs Daily Activity	$r = 0.67$	$p < 0.01$	Strong positive correlation

Table 7: Chi-Square Analysis of Activity Patterns and Barriers

Variable	Chi-Square (χ^2)	df	p-value	Cramer's V	Effect Size
Activity Frequency vs Barrier Type	24.67	9	$p < 0.01$	0.36	Medium effect
Play Preference vs Time Spent	12.89	3	$p < 0.01$	0.25	Small-medium effect
Game Type vs Motivation Reason	31.45	15	$p < 0.01$	0.41	Medium effect
Activity Level vs Stress Category	18.92	6	$p < 0.01$	0.31	Medium effect

Table 8: ANOVA - Comparing Stress Levels Across Activity Groups

Activity Group	n	Mean Stress Score	SD	95% CI	F-statistic	p-value
Daily (>5 days/week)	50	2.10	0.85	[1.86, 2.34]	$F(3,196) = 47.82$	$p < 0.001$
Regular (2-3 days/week)	80	2.85	0.92	[2.65, 3.05]		
Occasional (1 day/week)	40	3.45	1.05	[3.12, 3.78]		
Rare/Never	30	4.00	1.20	[3.55, 4.45]		

Post-hoc Analysis (Tukey HSD)

- Daily vs Rare/Never: $p < 0.001$, $d = 1.89$ (large effect)
- Daily vs Regular: $p < 0.001$, $d = 0.86$ (large effect)
- Regular vs Occasional: $p < 0.01$, $d = 0.61$ (medium effect)

Table 9: Regression Analysis - Predictors of Mental Wellbeing

Predictor Variable	β (Standardized)	SE	t-value	p-value	R^2	Adjusted R^2
Model 1: Activity Frequency					0.42	0.41
Activity Frequency	-0.65	0.08	-8.12	p < 0.001		
Model 2: Comprehensive Model					0.68	0.66
Activity Frequency	-0.45	0.09	-5.67	p < 0.001		
Attitude (Happy)	-0.28	0.07	-3.85	p < 0.001		
Social Support	-0.22	0.06	-3.12	p < 0.01		
Time Barriers	0.18	0.05	2.89	p < 0.01		
Infrastructure Access	-0.15	0.06	-2.45	p < 0.05		

Hypothesis Testing

Hypothesis 1: Physical Activity and Mental Wellbeing

Null Hypothesis (H_0): The frequency of physical exercise and students' mental health (stress levels) in higher education do not significantly correlate.

Alternative Hypothesis (H_1): The frequency of physical exercise and students' mental health (stress levels) in higher education significantly correlate.

Table 10: Statistical Test Results: Hypothesis 1 Testing

Test Parameter	Value	Interpretation
Test Type	Pearson Product-Moment Correlation	
Sample Size	n = 200	
Correlation Coefficient	r = -0.65	Strong negative correlation
t-statistic	t = -11.24	
Degrees of Freedom	df = 198	
p-value	p < 0.001	Highly significant
95% Confidence Interval	[-0.73, -0.55]	
Effect Size (Cohen's d)	d = 1.68	Large effect
Power Analysis	Power = 0.99	Excellent power

Decision Matrix

Criterion	Threshold	Observed	Decision
Alpha Level	α = 0.05	p < 0.001	Reject H_0
Effect Size	Medium = 0.30	r = 0.65	Large effect
Confidence Interval	Should not include 0	[-0.73, -0.55]	Significant

The null hypothesis is rejected. According to sound statistical data, frequency of physical exercise and stress levels of college students show an inverse correlation, i.e., there is a very negative correlation between both ($r = -0.65$, $p < 0.001$).

Hypothesis 2: Recreational Game Preferences and Psychological Outcomes

Null Hypothesis (H_0): Students who prefer group-based leisure activities do not significantly vary from those who prefer solitary activities in terms of psychological wellness results.

Alternative Hypothesis (H_1): Students who prefer group-based leisure activities significantly vary from those who prefer solitary activities in terms of psychological wellness results.

Table 11: Statistical Test Results: Hypothesis 2 Testing

Test Parameter	Value	Interpretation
Test Type	Independent Samples t-test	
Group 1 (Group Preference)	$n_1 = 128$ (64%)	
Group 2 (Individual Preference)	$n_2 = 72$ (36%)	
Mean Wellbeing Score (Group)	$M_1 = 3.89$	Higher wellbeing
Mean Wellbeing Score (Individual)	$M_2 = 3.42$	Lower wellbeing
Pooled Standard Deviation	SD = 0.78	
t-statistic	t = 4.23	
Degrees of Freedom	df = 198	
p-value	p < 0.001	Highly significant
95% Confidence Interval	[0.25, 0.69]	
Effect Size (Cohen's d)	d = 0.60	Medium-large effect

Levene's Test for Equality of Variances

Test	F-statistic	p-value	Assumption
Levene's Test	F = 1.87	p = 0.173	Homogeneity assumed

Decision Matrix

Criterion	Threshold	Observed	Decision
Alpha Level	$\alpha = 0.05$	$p < 0.001$	Reject H_0
Effect Size	Medium = 0.50	d = 0.60	Medium-large effect
Practical Significance	$\Delta > 0.30$	$\Delta = 0.47$	Practically significant

The null hypothesis is rejected at the two- sided level of significance. Supporting this argument is a significant statistical result ($t = 4.23$, $p < 0.001$, $d = 0.60$) of very high quality because students with higher preferences to group-based recreational activities have a higher result in terms of their psychological wellbeing compared to those who love solitary activities.

Discussion

The present research confirms other Indian works on psychological benefits of planned physical activity by demonstrating that there is a significant association between recreational physical activity and good mental health status among college-going students. Regular play of leisure games was associated with reduced levels of stress, improved emotional hardiness, and a sense of belonging, confirming the fact that students who participated in group games mentioned having much more well-being. This is in line with results of Judge (2018), who found that collegiate players were less stressed and more psychologically well than non-athletes. On par with that, Singh (2018) [3] marked that psychological resilience and healthy well-being should become a part of the present physical education curriculum as the key objective of student development. One of the areas on which Bhattacharya (1987) [9] has expounded in his talk on the Indian cultural conception of the body-mind relationship is how long this practice has been done for recreation as a way of enhancing mental equilibrium through yoga and through traditional games. In addition, Felix (2010) [11] found out that though the intense forms of sports had a higher risk of injury and were less psychologically rewarding, the leisure forms were safer and psychologically rewarding at superior levels, particularly to the students of the South Indian physical education. All these findings are useful in supporting the hypothesis that fun, low-barrier, and socially inviting leisure activities could help young people greatly in terms of the enhancement of their mental health.

Another essential aspect of the current research is the behavioral and motivational elements of long-term participation in recreational games, which show a strong correlation with well-being outcomes. As mentioned in the behavioral predictors put forward by Snodgrass and Tinsley (1990) [16] in their early paper, which related campus recreation to personal development, stress relief, and retention, there was a significant positive correlation between higher intention to continue that activity and feelings of care and enjoyment as well as the perceived social support. An additional argument in favor of our findings about the impact of facility access and time constraints on participation and outcomes was made by Bhardwaj (2017) [10], who argued that spending in sports facilities and leisure design boosts not only the physical activity but also emotional and cognitive engagement. Kumar Phor (2012) [13] listed the following important aspects, and these should be addressed in order to develop both professions and individuals: to be proficient in physical education, the role of measurement performance should not be limited. Finally, Phashchenko and Matyunina (2022) [14] showed the significance of autonomy and intrinsic motivation, having proven that the students who autonomously engaged in the leisure activities outside the official school laboratory settings displayed a higher level of physical and psychological functioning. The studies as a bundle strengthen the present inference, as they have found out those recreational sports that are easily accessible, socially incorporative, and widely engaged in result in a high degree of psychological well-being among college students.

Research Gap

Although the benefits of leisure sports are not a secret, Indian higher learning has failed to adequately study the psychological ramifications of the same through empirical approaches. Most of the recent studies do not take into consideration the broader benefits of mental wellness that there are to ordinary students engaging in unstructured leisure, but they focus only on the physical health gains or focus on the special group of exceptional athletes. In addition, the Theory of Planned Behavior (which offers a strong model to assess the involvement intention) is rarely utilized in the Indian university settings to describe the factors of attitude, norms, and perception of controls on the involvement among the students. The lack of knowledge about group dynamics and gender is one more important failure. A good example is the groups and individuals playing in terms of stress and whether the aspects of motivation, such as friendship and personal growth, act as mediators of such effects. Moreover, very little integration of modern and traditional leisure activities into behavioral psychology is observed, but the traditional health practices such as yoga are explored independently.

Future Recommendations

Some steps are proposed to be implemented in the future to maximize the potential benefits of recreational sporting on the mental health of higher education. The first step that colleges should implement in regard to recreation-based mental health programs is the incorporation of psychological support networks and structured physical activity. To enhance consistency of engagement, mobile models (mobile applications for activities, intercollegiate recreational leagues, and yoga led by peers) are possible to be tested at a low cost and scaled. Second, more multidisciplinary research that combines behavioral sciences, school education, and sports psychology is needed.

To give an example, the mixed-method studies involving psychometric tests and interviews can bring to light the subtle differences that can affect play selection and long-term activity. Like this, interventions should measure the effectiveness with which specific behavioral strategies (e.g., gamification or social nudging) can improve the mental fortitude and adherence to practices. Third, the main priority should be when forming the infrastructure with first consideration of female students and their little time and mobility. All of these could help to eliminate such barriers as the absence of motivation and time limits, community-based events, indoor walking tracks, and flexible, unstructured play areas. Lastly, to make sure that academic achievement is observed in tandem with mental health outcomes, the government bodies such as UGC and AICTE are supposed to incorporate the recreational sport calculations in well-being and attestation. Such examples would help in imparting a culture where leisure would be considered as part of the all-round development of the students and not as an extracurricular activity.

Study Limitations

Despite the informative nature of the research on the nature of relationships between recreational sports and mental health, it is necessary to mention that the research has several limitations. One, secondary data does not allow great control over validity of measurement, sampling plans, and quality of data. Convenience samples employed in the analysis of the studies have the possible limitation that they can only be applied within the individual regions of India and the types of educational institutions. Second, only the association between variables like stress and frequency of activities is observed because the data is cross-sectional, and therefore it is not possible to demonstrate cause and effect. In order to track the changes in behavior and its impact on mental health over the course of time, longitudinal studies would suit better. Third, the predominant part of the data relies on self-reported measurements of behavioral intention, motivation, and stress, which could be affected by the social desirability effects or biased by the memory effect. Aspects of culture that can also influence recreational behavior to a large extent, like caste, gender norms, and a lack of access, amongst others, were also not discussed in detail. The theory does not capture institutional, environmental, and affective determinants, including peer conflict, sports injury, and curricular rigidity; even with the presence of the Theory of Planned Behavior, a good foundation is still presented. To understand such complicated relations between physical exercises and mental health of diverse populations of students, future studies need to consider more detailed and mixed study methodology. Moreover, the prospective nature of physical activity variables as far as the mental health outcome is concerned has been performed only in incident cases in India through statistical measurements like regression and ANOVA. The study is considered to be a significant contribution to the literature of sport psychology in India, as it overcomes the above shortcomings by analyzing the correlation between recreational participation and stress and well-being with the help of a large-sized, multi-dimensional dataset.

Conclusion

This study provided powerful evidence of the fact that regular engagement in leisure sport is closely related to the improvement of the mental well-being of higher education students. The three prominent psychological characteristics that were found to be powerful predictors in citing prolonged involvement in recreative games are attitude, social influence, and perceived behavioral control. Most importantly, those students who made up teams and exercised daily recorded a significant decrease in their stress levels, as has been acknowledged in both national and foreign studies on the psychological benefits of group exercising. Regression studies found that the most suitable predictor of lower stress level was the frequency of activities, followed by the ease of access to facilities as well as positive attitudes. Institutional matters should be improved as demonstrated by the major barrier of the well-being outcomes because of barriers like a lack of infrastructure and time. These findings confirm the impression that sports and leisure act as social stabilizers, emotional anchors, and physical outlets among the youths who are put in the situation that has to juggle between their personal and academic lives. The study offers down-to-earth solutions to the universities of learning and offers exclusive perspectives to the sport psychology research literature with the help of recently obtained data points of Indian settings. The outcomes of student mental health may greatly be embraced by the incorporation of cheap, socially inclusive, and behaviorally informed recreation activities. Finally, universities can become healing places where students are taught not only to get well but to live through instilling a culture of playing, being healthy, and being social.

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