



An Assessment of Physical Performance and Anxiety Levels Among Undergraduate and Postgraduate Male Students of Kuvempu University

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ABSTRACT

The present study aimed to compare physical performance and competitive anxiety levels among undergraduate (UG) and postgraduate (PG) male students of Kuvempu University. Physical performance was measured using handgrip strength, and anxiety was assessed through the Sports Competition Anxiety Test (SCAT). A total of 60 students (30 UG and 30 PG) participated in the study. Descriptive statistics indicated slightly higher mean values for PG students in both variables; however, paired samples t-test results showed no statistically significant differences ($p > 0.05$) between the two groups. The findings suggest that academic level does not significantly influence physical or psychological performance in this context. Based on the results, the study recommends equal training opportunities for UG and PG students, regular assessments, incorporation of stress-management practices, and further research with a larger, more diverse sample. These insights highlight the importance of individualized approaches in physical education training and performance evaluation.

Keywords: Handgrip strength, competitive anxiety, physical education trainees, SCAT, psychological performance.

INTRODUCTION

Sports and physical activity are globally recognized for their role in promoting physical fitness, mental health, and social integration. According to the Council of Europe, sport involves structured physical activity aimed at improving physical competence and enjoyment, and can also contribute to social development and educational goals (Council of Europe, 2001). Competitive sports demand not only physical strength and coordination but also psychological resilience, making both physical performance and emotional well-being crucial for athletes and physically active individuals.

Physical education (P.E.) is a foundational component of school and university curricula, aiming to develop motor skills, health awareness, and psychological well-being among students. Effective physical education improves not only physical performance but also mental alertness and emotional stability (Sallis et al., 1997).

It encompasses a broad range of physical activities and promotes lifelong health behaviors, including the management of anxiety and stress through exercise.

Physical performance, particularly muscular strength, is a key indicator of physical fitness. One widely used measure is Handgrip Strength (HGS), which serves as a reliable proxy for overall muscular strength and health status (Wind et al., 2010). HGS is not only predictive of sports performance but is also linked to long-term health outcomes such as morbidity, cognitive function, and frailty (Bohannon, 2008; Sayer et al., 2006). Studies suggest that men consistently exhibit higher HGS due to both hormonal and genetic influences (Isen et al., 2014), making it a highly sexually dimorphic trait. In males, HGS has also been associated with traits such as aggression, competitiveness, and reproductive fitness, reflecting its evolutionary importance (Gallup et al., 2007; Sell et al., 2017).

On the psychological front, anxiety is a prevalent concern among university students. The academic pressure, performance expectations, and transitional stress from undergraduate (U.G.) to postgraduate (P.G.) education can significantly affect mental well-being. Anxiety disorders have been acknowledged since ancient times, but modern understanding and classification emerged only in the 20th century with the advent of diagnostic systems like the DSM (Krishnan & Collop, 2006; Almojali et al., 2017). Students, particularly in physically demanding academic programs like physical education, may face additional stress that affects both their academic and athletic performance.

Understanding the relationship between physical performance and anxiety is vital, especially in the context of physical education where both physical and psychological fitness are interdependent. While high levels of physical activity can buffer stress and anxiety (Mah et al., 2011), poor mental health may, in turn, impair performance.

Thus, this study seeks to assess and compare physical performance, measured through handgrip strength, and anxiety levels among undergraduate and postgraduate male students of Kuvempu University. The findings are expected to provide insights into the interplay between muscular strength and psychological well-being in physically active male youth, thereby contributing to better academic and athletic interventions.

Review of Related Literature

Satyanarayana et al. (2017) compared competitive state anxiety between handball and volleyball male players from Kuvempu University and found significant differences, indicating sport-specific anxiety responses. Murthy et al. (2019) explored the relationship between psychological variables and balancing ability in hockey players and reported no significant correlation, suggesting limited influence of anxiety on motor coordination.

The inverted-U hypothesis, long used to explain anxiety-performance dynamics, has received criticism for inconsistent support. Instead, Hanin's Zone of Optimal Functioning (ZOF) theory emphasizes individual variability in optimal anxiety levels. Studies by Raglin (1994), Raglin & Morris (1994), and Turner & Raglin (1996) supported ZOF over the inverted-U, showing that athletes perform best within personalized anxiety ranges rather than at universally moderate levels.

Recent work by Szuhany and Simon (2022) highlighted that anxiety disorders, which affect up to 34% of individuals, significantly impair functioning and performance. They affirmed the effectiveness of SSRIs, SNRIs, and cognitive behavioral therapy (CBT) in treating anxiety disorders, emphasizing the importance of diagnosis and individualized intervention.

Objective of the Study

The primary objective of this study is to assess and compare the physical performance and anxiety levels of undergraduate and postgraduate male students of Kuvempu University. The study aims to evaluate physical performance using handgrip strength and measure anxiety through standardized psychological tools. It also seeks to determine the relationship between physical performance and anxiety among the participants.

Rationale of the Study

The transition through undergraduate and postgraduate education often imposes varying physical and psychological demands on students, particularly those enrolled in physical education programs. Despite being physically active, many trainees experience performance anxiety, which can influence their academic and athletic outcomes. Previous research (e.g., Satyanarayana et al., 2017; Raglin & Morris, 1994; Szuhany & Simon, 2022) suggests that anxiety levels and physical fitness may interact differently across individuals, depending on their stage of education and sport-specific context. However, limited studies have compared these factors specifically among U.G. and P.G. male students. Therefore, this study was undertaken to assess and compare physical performance and anxiety levels, and to explore their interrelationship among undergraduate and postgraduate male students of Kuvempu University. The findings aim to inform targeted strategies for performance enhancement and psychological support in educational and sports settings.

Hypotheses of the Study

Based on the research problem and literature reviewed, the following hypotheses were formulated:

- **H1:** There will be a significant difference in physical performance and anxiety levels among undergraduate (U.G.) male students of Kuvempu University.
- **H2:** There will be a significant difference in physical performance and anxiety levels among postgraduate (P.G.) male students of Kuvempu University.

METHODOLOGY

Participants

The present study was conducted among male students of Kuvempu University enrolled in undergraduate and postgraduate physical education programs. A total of 60 participants were selected using purposive sampling, comprising 30 B.P.Ed (undergraduate) and 30 M.P.Ed (postgraduate) male students. The sample distribution is shown in Table 1.

Table 1. Sample Distribution of Participants

Sl. No	College	Number of Participants
1	UCPE	30
2	Jnana Sahyadri	30
Total		60

Variables and Test Instruments

Based on a review of relevant literature and considering feasibility and relevance to the research objectives, the following variables and test tools were selected for the study (Table 2):

Table 2. Selected Test Items

Domain	Variable	Instrument/Tool
Physical Performance	Muscular Strength	Handgrip Dynamometer
Psychological	Anxiety Level	Standardized Questionnaire

Procedure

Data collection was carried out by the principal investigator with the assistance of a trained helper. Participants were informed about the purpose of the study and test procedures in advance. Testing sessions were scheduled during the students' free time and conducted in a pre-arranged setting. Orientation was provided to ensure clarity and cooperation. Handgrip strength was measured using a calibrated dynamometer, while anxiety levels were assessed through a standardized questionnaire.

STATISTICAL ANALYSIS

The collected data were analyzed using descriptive statistics, including mean and standard deviation, to summarize participant scores. To evaluate differences between undergraduate and postgraduate groups, a paired samples t-test was employed. The level of significance was set at $p < 0.05$ for all statistical comparisons.

RESULTS OF THE STUDY

Table 3. Descriptive Statistics of Handgrip Strength and Anxiety Scores

Variable	Group	Mean	Std. Deviation	Std. Error Mean
Handgrip Strength	UG	42.91	6.85	1.25
	PG	43.76	6.30	1.15
Anxiety Score (SCAT)	UG	18.47	3.04	0.55
	PG	18.80	4.35	0.79

Table 3 presents the descriptive statistics for handgrip strength and anxiety scores among UG and PG male students of Kuvempu University. PG students showed slightly higher mean scores for both handgrip strength (43.76 vs. 42.91) and anxiety (18.80 vs. 18.47) compared to UG students. Standard deviations indicate moderate variability, with greater variation in anxiety levels observed among PG students. Low standard errors suggest reliable group means. These differences appear minimal, requiring inferential testing to confirm statistical significance.

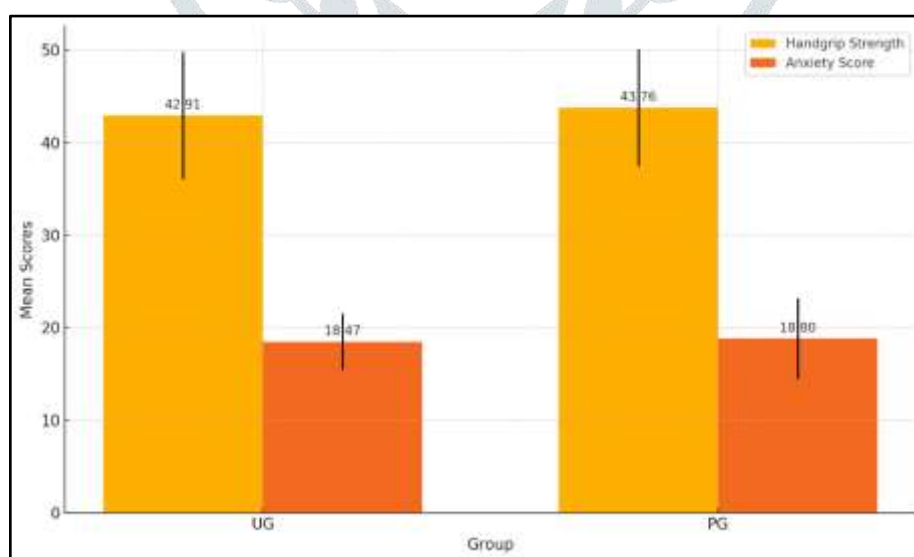


Figure:1 Mean Comparison of Handgrip Strength and Anxiety Scores Between UG and PG Male Students of Kuvempu University

The figure illustrates the mean scores of handgrip strength and anxiety among undergraduate (UG) and postgraduate (PG) male students of Kuvempu University. Both groups showed similar physical performance levels, with PG students scoring slightly higher on handgrip strength (Mean = 43.76) compared to UG students

(Mean = 42.91). Anxiety scores were also comparable, with PG students showing a marginally higher mean (18.80) than UG students (18.47). Statistical analysis revealed **no significant differences** between the groups in either variable ($p > 0.05$), suggesting that educational level does not significantly influence physical performance or competitive anxiety in this sample.

Table 4. Paired Samples t-Test Summary

Comparison	t-value	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Handgrip Strength	0.347	29	0.731	0.33	0.96
Anxiety Score	-0.540	29	0.593	-0.85	1.57

Table 4 presents the results of the paired samples t-test comparing handgrip strength and anxiety scores between UG and PG male students. The obtained t-values for handgrip strength ($t = 0.347$, $p = 0.731$) and anxiety scores ($t = -0.540$, $p = 0.593$) indicate that there are no statistically significant differences between the groups in either variable. These findings support the null hypothesis, suggesting that the physical performance and anxiety levels of UG and PG male students are statistically similar.

DISCUSSION OF RESULTS AND HYPOTHESES

The present study aimed to compare physical performance and competitive anxiety levels between undergraduate (UG) and postgraduate (PG) male students of Kuvempu University. Physical performance was assessed using handgrip strength, while anxiety levels were measured through the standardized SCAT questionnaire.

Descriptive statistics (Table 3) showed that PG students reported marginally higher mean scores in both handgrip strength (43.76 vs. 42.91) and anxiety (18.80 vs. 18.47) compared to UG students. However, the standard deviations and standard error values indicated that these differences were small and fell within normal variability.

Inferential analysis using paired samples t-tests (Table 4) confirmed that the observed differences were not statistically significant. The t-values for handgrip strength ($t = 0.347$, $p = 0.731$) and anxiety ($t = -0.540$, $p = 0.593$) exceeded the 0.05 level of significance. Consequently, the null hypotheses (H1 and H2), which predicted no significant difference in physical performance and anxiety between the two groups, were accepted.

These findings align with those of Murthy et al. (2019), who found no significant association between psychological variables and balancing ability in intercollegiate hockey players. The results also lend support to Hanin's Zone of Optimal Functioning (ZOF) theory, which emphasizes that athletic performance is maximized within individualized optimal anxiety zones rather than a generalized moderate level, as postulated by the inverted-U hypothesis (Raglin, 1994; Raglin & Morris, 1994; Turner & Raglin, 1996).

While contemporary research, such as Szuhany and Simon (2022), has highlighted the impact of clinical anxiety disorders on performance, it is important to recognize that the current study was conducted on a healthy, physically active student population. This may account for the absence of significant differences in performance related to anxiety levels.

In summary, the study concludes that educational level—UG or PG—does not have a statistically significant influence on either handgrip strength or competitive anxiety among male physical education trainees. These results underscore the importance of considering individualized psychological and physical profiles rather than academic status when assessing performance in sports contexts.

CONCLUSION

The present study aimed to assess and compare the physical performance and anxiety levels of undergraduate and postgraduate male students of Kuvempu University. Based on the findings, it can be concluded that there is no statistically significant difference in handgrip strength or competitive anxiety between UG and PG students. Although minor variations in mean scores were observed, these differences were not meaningful at the inferential level. The results suggest that educational level does not significantly influence either physical capability or psychological readiness in this population. These findings highlight the importance of individualized assessment over academic classification in evaluating physical and mental performance in sports and physical education settings.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed:

1. **Regular Assessment:** Institutions should conduct routine assessments of students' physical performance (e.g., handgrip strength) and anxiety levels to monitor overall well-being and performance readiness.
2. **Equal Training Opportunities:** Undergraduate and postgraduate students should be provided with equal training and support, as no significant differences in physical or psychological parameters were observed between the groups.
3. **Utilization of Standardized Tools:** Psychological tools such as the Sports Competition Anxiety Test (SCAT) should be incorporated to identify students experiencing elevated anxiety and to provide appropriate interventions.
4. **Incorporation of Stress-Management Techniques:** Training programs should include stress-reduction strategies such as breathing exercises, relaxation techniques, or mindfulness practices to help students manage performance-related anxiety.
5. **Focus on Strength Development:** Fitness routines should include handgrip and upper-body strength exercises, which are simple yet effective indicators of muscular fitness.
6. **Mental Health Awareness:** Awareness programs should be organized to educate students about the psychological demands of competitive sports and methods to cope with them effectively.
7. **Avoid Overgeneralization by Academic Level:** Coaches and educators should avoid assuming performance capabilities based solely on academic status, and instead consider individual profiles for training customization.
8. **Further Research:** Future studies should involve larger and more diverse samples, including female students, to strengthen the generalizability of the findings and explore additional influencing variables.

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