

A Comparative Study on Aggression and Performance Anxiety in Physical and Non-Physical Sports in India

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Abstract

Understanding the interplay of aggression and anxiety in individuals who compete in physical sport against those who compete in non-physical sport is crucial to provide individuals with customized training programs, interventions, and coping strategies. Incorporating a comparative framework this study aims to investigate the correlation of aggression and performance anxiety in physical and non-physical sports. The study included a total 100 participants of which 51 were individuals competing in physical sports and 49 competing in non-physical sports, the distribution also included 64 males and 36 females. Both performance anxiety and aggression were measured through standardized assessment tools, Sports Anxiety Scale-2 (SAS-2) by Smith, Ronald E. et. al. (2006) and the Buss Perry Aggression Questionnaire (BPAQ) by Buss and Perry (1992). The scores of physical sport participants indicated a mean score of 78.3 (SD=16.5) in Aggressive behaviours and 29.7 (SD=9.9) in Anxious behaviours, mean scores for non-physical sport participants were 67.9 (SD=16.4) for aggression and 27.8 (SD=7.4) for sport anxiety. The findings of this study highlight that both groups physical sport and non-physical) sport had a moderate to good positive correlation of aggression and performance anxiety, and the need for further research dedicated to professional athletes in both domain.

Introduction

Optimal performance in athletes, especially professional athletes, has been primarily subjected to physical improvement and conditioning emphasizing strength, speed, and power, to sustain the quality of competition (Hoffman, 2008). Traditional sports training programs value physiological paradigms heavily, focusing on the training and progressive physiological conditioning in players to adjust and adapt key characteristics for long-term competition (Hoffman, 2008). The importance of physiological capabilities thus required systematic and adaptable programs to benefit athletes. Referred to as the periodization, tailoring strategies to improve physical conditioning in athletes based on their subjective capabilities and nature of competition (Turner, 2011). The primary objective of sports psychology during the early 1980's was to enhance athletes' performance outcomes. Attentional focus, arousal regulation, and pre-performance routines were emphasized to optimize performance in competitive environments. Marking a shift towards applied research and interventions directly benefiting athletes and coaches. Practical interventions were designed to enhance mental skills, reduce performance anxiety, and foster mental toughness. Through the application of evidence-based approaches, athletes were provided with tools to manage psychological challenges and optimize their performance outcomes.

However, with an increase in research and incorporation of sports psychology athletes, coaches, institutes, and professional trainer have slowly assimilated psychological aspects of performance in their periodization of athletes. Inscribing relevance to not only physical strength and capabilities, but also mental resilience and appraisal strategies. Defining a clear path for optimal or maximal athletic performance remains complex and subjective, requiring constant technological integration, regulating/analysing components of different sport as well as a sensitivity towards societal variations (Geoffroy Berthelot, 2015). Thus, current shift emphasis various psychological factors, with a focus on arousal regulation specifically within domains of anxiety, stress, and aggression (Bali, 2015). The narrow approach to skill development has both led to shortcomings in enhancing athletic performance yet has provided an opportunity to investigate the various psychological factors affecting athletes' performance regarding condition and exercise and/or competitive play.

The many dimensions of mental health influence individuals and team sports performance, assessing these mood states before and after competitions provide an insight to the key areas affecting individuals. Adopting this schema has brought forth multiple programs, intervention tools and coping strategies to support developing talent. (Selmi, 2023) (Filaire, 2001). Adaptive regimes to improve physiological features, with interventions to assess players psychometric properties allow for a collaboration that understands subjective needs and leads to providing athletes with tailored interventions to improve their optimal performance (Selmi, 2023). A starting point for recognizing the multifaceted effects of psychological factors on performance was understanding the multifaceted symptoms of arousal, more specifically anxiety that has been traditionally seen as a predictable situation, in which increased levels of anxiousness cause impairments in competition (Raglin, 1992). Regular psychological assessments could be crucial to understand athletes before and after competition, coping with training and arousal influencers during competition, moreover these distinctions in mental capacities offer a practical approach to measuring behavioural states and tailoring training programs (Selmi, 2023).

Anxiety has both psychological and physiological symptomatic properties, an incapacitating state felt during performing, determined as performance anxiety, is an example of such physiological responses to anxiety (Wilson, 2002). More specifically, individuals experiencing performance anxiety possess a fear of inadequacy or being unfavourably reviewed by peers, there may be a tendency to focus on mistakes and upcoming threats resulting from individuals holding high expectations for themselves and of others. It's important to note that fear of performance is generally described as a societal phobia. Governance of professional development include training of increasing younger populations, with a myriad of sporting institutions investing in younger athletes. Conditioning to their relative sport at such a young age can provide advantages through more robust programs, earlier integration of fundamentals, and deliberate learning for future success (Coutinho, 2016). Constructing programs that include interventions and skill training for both physiological aspects as well as psychological components.

A previous literature by Pierre Bourdieu, *Masculine Domination*, translated from its original French poses a central thesis around the idea of somatization, naturalization, and observation. A social commentary on mental characteristic differences in gender (Laberge, 2002). Interestingly Bourdieu's commentary distinctly highlights the cultural aspects of 'domination', a) unravelling the underlying processes of domination, b) societal conflicts in perspectives and c) the practical basis of domination in society (Laberge, 2002). Investigating cultural differences and focusing on mechanism of societal construction was the core for Bourdieu's notion, he labelled it constructivist functionalism, research has demonstrated the properties of this structure within sports by defining a 'habitus, yield and capital' (Stemoel, 2005).

Bourdieu's theory was more broadly accepted as a method, in terms of sport psychology, models based around the mechanisms of the social structure of sports, reflecting on how individuals gather area-specific knowledge, how we can inculcate various tools and strategies to adapt to incoming threats.

The general aetiology of aggression encompasses biological, psychological, and societal factors. Prominent researchers such as Konrad Lorenz proposed his theory of instinctive aggression which views this property as an inherited trait in individuals, and the biological factors at play (Dilek, 2017) (Bali, 2015). A framework given by G. Moser goes further to classify aggression theories (Felicia, 2020).

- a) Instinctual – Innate impulse is seen as a catalyst for aggressive behaviours.
- b) Reactive – Aggression is a symptom to unpleasant or frustrating emotions.
- c) Learning - Aggression is seen as a behaviour that is acquired through observation, modelling, and other forms of imitation.
- d) Cognitive – The internal cognitive process that play a role in perceiving a stimulus and the recurring response.

Albert Bandura's social learning theory introduced after the emergence of biological theories; Bandura pays close attention to the multifaceted nature of learning (Bandura, 1976). Individuals gather tools and information from their surroundings, by observing, imitating, and modelling parents and parents. Bandura accounts for attitudes, beliefs, motivational characteristics. Aggression is seen because of a physical or psychological impairment, the acquisition and the consequent aggressive behaviours are a form of attributing negative connotations to other individuals, events, or situations (Bandura, 1976).

Justification for Study

There is a current lack of emphasis on behavioural traits and how they are affecting developing athletes. With an ever-evolving sport domain, the definition is not entirely absolute. Understanding the interplay of aggression and anxiety in individuals who compete in physical sport against those who compete in non-physical sport is crucial to provide individuals with customized training programs, interventions, and coping strategies. A comprehensive analysis comparing these two groups will offer a nuanced perspective into key areas of aggression and anxiety influencing performance. Understanding differences in the type of sport further provides a basis to reduce stigma around e-sport and other non-physical sport, individuals in a competitive environment, which exhibits the dogma of a sport, should be regarded as athletes, and thus be supported to reach their optimal performance.

Review of Literature

The development of sports in India lay its roots in the early 1960's through the achievements in medicine, physical education, and the emerging psychology. This allowed for the current flourishing of sport psychology in India, with the current focus of the field being on personality and arousal. Thakkar, A. (2019) examines the status of sport psychology, and the seriousness and urgency for psychological interventions for athletes. An investigation conducted through meta-analysis outlines the development of sports psychology, such as the foundation of the Indian Association of Sport Medicine, the issues, the need, and key areas where there is a lack of focus. The results of this study emphasize psychology's critical role in enhancing an athletes physiological and mental capabilities to improve their optimal performance. Velikic D. et, al (2014) had previously stated that sports related anxiety is often deemed as a state of threat and thus were able to address a clear relationship between anxious states and levels of achievement. In addition, this investigation focuses on the connection between personality traits of various athletes and

their degree of anxiety, including disparities in age, sex, gender, type of sport and level of achievement. One of the key goals was to enhance the current understanding of personal and situational factors that were affecting individual anxiety. A total of 90 participants (56 males, 34 females), whose anxiety was measured with the use of Competitive State Anxiety Inventory (CSAI-2), and the Big Five Personality Factor (Plus Two) was used to referee personality traits. Openness, neuroticism, and aggression proved to be a significant indicator of cognitive anxiety; these findings confirmed personality traits as a predictor for somatic anxiety. By outlining key components of personality and degrees of anxiety there is a further understanding of the interplay of situational factors and that with the correct application of tool provided to coaches and managing agencies, athletes are given a more nurturing environment to grow.

Sports anxiety, and the term anxiety in general carries with a negative connotation, characterized by worries, uneasiness, and nervousness in response to a situation that is determined a threat or challenge, emphasizing the importance of cognitive abilities as a critical skill. Ramdas. R. K (2019) focuses on the analysis distinct psychological variables and cognitive processes that affect athletic performance. The study is aimed at understanding competitive anxiety and mental health, focusing on disparities in gender. A total of 80 participants (40 male, 40 female) between the ages of 20-30 years were interviewed and completed test with professional clinician, and Competitive State Anxiety Inventory (CSAI) was used to collect data. The findings proved that there is a significant difference among male and female players, specifically in areas such as cognitive anxiety, self-confidence anxiety and somatic anxiety, with males exhibiting higher levels of cognitive anxiety and lower self-confidence anxiety, whereas female responses varied with self-confidence anxiety being higher than other components measured through CSAI. Results of this study give insight into the individual and environmental aspects of sports anxiety.

It is a long-standing belief that high levels of cognitive anxiety during competitive play is ultimately harmful and worsens performance, with a likely hood of dropping out, stated by Parnabas. V et, al. (2015). Aimed at understanding the influence of cognitive anxiety on sport performance among Taekwondo athletes, Parnabas V. et al (2019) emphasizes the relationship between somatic anxiety and performance, with the use of Competitive State Anxiety Inventory-2 and the Psychological Performance Inventory. The sample included various state athletes, national athletes, district athletes and university level athletes a total of 78 Taekwondo athletes. Elite and national athletes exhibited significantly lower levels of cognitive anxiety, the results also identified that university level athletes showed higher levels of somatic anxiety along with strong associations with achievement and self-confidence. Parnabas. V et, al. state the importance of this study in developing tailored coaching and intervention strategies to allow athletes to appropriately deal with their anxiety.

An important study conducted by Chris Englert and Alex Bertrams (2012) hypothesized that self-control strength and state anxiety collaboratively are indicators of sports performance. This was investigated through 2 studies each with a unique sports task, 1) Performance in a basketball free-throw task and 2) Performance in a darts task with a total of N=64 and N=79 participants respectively. Patterns in the results stated participants with a lower or depleted self-control strength performed worse in certain task, in relation to an increase in their level of anxiety, however participants with high or fully available self-control showed no significant relation. In addition, the study further exhibits those different degrees of available self-control were not a predictor of performance in individuals with lower state anxiety, rather it was a more accurate predictor with individuals with higher state anxiety. Interventions aimed at increasing self-control strength may enable the athletes to understand and reduce negative anxiety states that affect performance.

Seth E, Jenny et, al. (2016) provides a concise historical review of electronic sports, competitive computer gaming or virtual sports, more commonly known as eSports, through paying attention to components in sports such as organization, competition, skill, institutionalization and team/individual play the study aims to incite thorough academic analysis and discussion as to the definition of eSports and whether it should be considered a sport. Analysis of existing literature on definitions of sport, both in terms of traditional philosophical and sociological definitions. Characteristics such as physically overcoming opponents emphasize the conditions of competition, and where eSports may be insufficient as individuals are sedentary during competition. However, current technological advancements in virtual reality and motion detection sensor software have given rise to computational gaming that involves stimulating physical movements to achieve a certain goal or complete a task, further integration may demonstrate credence for eSports.

Global recognition of any sports requires an institutionalized and stable definition such sports along with certain norms that may allow it to be considered in the family of competitive sports. Currently, definitions or classes of competitive sports are accepted through the credibility of Olympic standards, a rule-focused contest of human physical abilities. Parry, J. (2019) proposes this statement as the basis for concluding that eSports cannot be regulated under the same conditions of traditional sports. Parry provides two more articles indicative of his conclusion, 1) A normative approach to defining and regulating sporting communities and 2) Promoters of eSports not being able to comply with Olympic standards for integration. Expanding on these three characteristic areas, the research concludes with the lack of human physical development, whether that is a lack of direct physicality or not employing whole body movement. Resemblances in eSports and traditional sports are a significant qualifier and thus don't allow for eSports to be considered in the same bracket.

Another study conducted by Parry, J and Giesbrecht, J (2023) furthers the evidence and conclusions provided in previous studies that indicated the predominantly sedentary nature of eSports and its lack of human physical skill (Parry J. , 2019). The current research expands on the revisions made by the International Olympics Committee to pursue providers of 'virtual and stimulated' sports, and the addition of the Olympic Virtual Series. The IOC's revisions make clear distinctions of virtual sports and gaming, and key aspects such as physicality/non-physicality, competitive and casual nature, this distinction regulates whether certain events are deemed sports worthy or not. Further suggested revisions to this ruling may include more descriptive criteria for virtual and simulation gaming, as currently these lack foundational characteristics of traditional sports. By 2022 the Olympic Virtual Series has been rehabilitated and is now transferred to an inaugural event for Olympic Esports Week (in 2023), these recent developments continue to support the statement that eSports are not regarded in the same category as physically demanding sports.

A meta-analysis by Pluss, Mathew A. et, al. (2019) was proposed to provide justification as to why eSports should be considered an ideal field to contribute to the assessment and development of emerging athlete and eSport performance. Highlighting three primary benefits of implementing the expert performance approach in esports. 1) Developmental activities are accurately monitored and recorded online, enabling a comprehensive analysis of a player's progress over time. 2) The tasks used to assess performance mirror real-world challenges in esports, creating a controlled laboratory environment that closely resembles actual gameplay conditions. 3) Expertise in esports can develop organically, without the influence of structured training programs, offering researchers a unique opportunity to study expertise development in a domain free from common confounding factors. Embracing emerging fields of sports and human

performance may provide a window for academics to improve their understanding of the assessment and development of individual expertise relating to non-physical sports, may provide strategies and recommendations to conflicts.

García, J and Murillo, C (2020) set out to investigate 3 major issues associated with playing sport related video games. 1) correlation of participation and intensity, 2) Complementarity with traditional forms of sport, and lastly 3) Perceptions of sports related video games. The findings indicated that the correlation of participation and intensity in such activities varied in their patterns, moreover there was a higher correspondence in male survey responses indicating a complementarity with traditional sports in the wake of live sporting events and competitive tournaments that encourage participation from a range of skilled individuals. The perceptions of esports in recent years have garnered increasing interest, with a large population of both athletes, fans, and professional experts that provide crucial support through management and organization.

Pedraza-Ramirez, I et, al. (2019) set out with 2 goals, 1) Summarize empirical evidence emphasizing psychological characteristics of cognitive and game performance, and 2) Integrating eSports into the domain of sports psychology. Systematically reviewing current and past literature on esports and its psychological influences, through Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) reporting checklist and a Population Intervention Comparator and Outcomes (PICO) framework that allowed published items between 1994 and 2018. The review highlights how a collaboration of esports in the field of psychology may lead to a better understanding of underlying mechanisms and processes of performance. This area of research provides a promising starting point for future research to overcome theoretical and methodological constraints.

One of the more articulated topics in the field of psychology relates to the aspect of arousal, more importantly emotions that affect performance. Behnke, M et, al. (2022) predicted that effect of intense approach emotions on performance would be influenced by heightened levels of cognitive and physiological challenge, reflecting an approach-related reaction. An experimental approach included 241 male participants, each completing 5 matches a football video game (FIFA 19). Before individuals took part in their matches, they were shown visual stimulus to elicit emotions such as anger, amusement, sadness, and neutral states allowing researchers to experimentally manipulate approach tendencies. Including, collecting cardiovascular responses, game scores and challenge/threat evaluations of each participant. Conclusive data showed that participants who viewed enthusiastic or amusing videos presented stronger approach tendencies to their matches, also improving performance compared to viewing negative emotions or neutral conditions. Individuals receiving positive cognitive challenge and cardiovascular challenge showed higher scores indicating that in the context of gaming eliciting pleasant emotions may enable high-approach tendencies improving performance.

Based on literature investigating psychological aspects of performance in the domain on computer-based sports (Pedraza-Ramirez, Lisa Musculus, Raab, & Laborde) (Behnke & Kaczmarek) there are significant factors such as self-control strength (Englert & Bertams, 2012), approach-related behaviours or cognitive abilities affecting individuals. Munroe-Chandler, K et, al (2023) thus aims to bridge this gap by integrating evidence-based interventions for individuals competing in esports, providing an imagery intervention designed specially to manage anxiety in individuals who play League of Legends. There are a total of 3 phases that practitioners of this imagery intervention will follow psychological skill training, education, practice, and acquisition tasks. Three workshops of 30 minutes each, following the previously stated phases, designed to be conducted every other week over a span of six weeks, there are no constraints as to

an individual or team session. A critical aspect of the imagery intervention is the significance of self-awareness, this may involve self-monitoring and identification of negative thought patterns and association. With an ever-growing increase in popularity of esports and competitive computer-based sports, interventions aimed at providing players with the necessary tools to cope with their challenge is vital to consistent performance and the development of talent.

LeNorgant, Eric J. (2019) aimed to understand sports-related anxiety and self-talk between traditional sports and esports, a comparative approach measures the intensity and frequency of self-talk in the distinct groups as well as examining sports-related anxiety. A total of 33 esports competitors and 56 traditional sports athletes completed 2 rounds of surveys, first Sports Performance Anxiety Scale-2 (SAS-2), Self-Talk Questionnaire (STQ) and Test of Performance Strategies (TOPS) Questionnaire, and 24 hours after competitions individuals reported on the Competitive Sports Anxiety Inventory- 2R (CSAI-2R. d), S-TQ and TOPS survey. A significant amount homogeneity resulted in showcasing no support for the null hypothesis, research mention the type 1 error in the time difference when conduction the 2 rounds of survey was the main root of inconsistent findings. Future participants of competitive esports of professional practitioners should nonetheless integrate aspects of self-talk as an intervention tool.

Methodology

Research Objectives

The primary objective of this thesis was to (1) Measure the levels of performance anxiety in physical sports and non-physical sports participation, (2) Measure the levels of performance anxiety in physical and non-physical sports participation. And (3) To compare the correlation in both groups, identifying variations in types of aggression and competitive environment related anxiety.

Variables

In this study the independent variable corresponds to the type of sport, categorized as physical and non-physical. An example of these types may include basketball and football, or chess and competitive video games. The categorical differentiator provides a framework to compare psychological influences and any significant pattern variations.

Performance anxiety and aggression serve as two dependent variables of the study. Understanding the influence of these two psychological components on performance in different types of sport. Both performance anxiety and aggression were measured through standardized assessment tools, Sports Anxiety Scale-2 (SAS-2) by Smith, Ronald E. et, al. (2006) and the Buss Perry Aggression Questionnaire (BPAQ) by Buss and Perry (1992).

Aim

The aim of this study is to compare the correlation of performance anxiety and aggression, in physical sports and non-physical sports.

Hypothesis

H01 – There is no significant correlation of aggression and performance anxiety in physical sports and non-physical sports.

HA1 – Physical Aggression and Somatic Anxiety is significantly higher in participants of physical sports.

HA2– Non-physical sport participants have higher levels of Concentration Anxiety and degree of Hostility.

Research Design

The present study employs quantitative approach by applying a comparative analysis that endeavours to discern the link between aggression and performance anxiety, and whether the nature of sports, physical demands, and the intensity of sport influence the psychological states of athletes.

Demographic and Sampling

For maintaining internal validity a purposive sampling method was adopted, for individuals that participate in physical sports university level football players (N=27), university level cricket players (N=4), university level basketball players (N=10) and university level volleyball players (N=10) comprised a total of 51 physical sport participants. Participants corresponding to non-physical sport players comprised of university level chess players (N=22), university level shooting players (N=9) and university level carrom players (N=9). Non-physical respondents also included (N=9) competitive esport gamers and (N=10) checkers players, 49 Non-physical sport. The total participation tallies to 100 of which 64 are male and 36 are female, ranging from ages of 18 to 28 years.

Participation was also deemed an inclusion criterion, (i) Individuals with an experience of a minimum of 5 years in their sport, (ii) Requirement of individuals to be associated with university teams or clubs, or participation consistency in competitive events.

Description of Tools

The Buss Perry Aggression Questionnaire (Buss & Perry, 1992) was employed to assess the level of aggression in participants. The self-reported scale includes 29 items that is further divided into 4 sets of factors including Physical Aggression, Verbal Aggression, Anger, and Hostility. Participants are instructed to rate each item on a Likert-like scale of 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). The score of each factor (physical aggression, verbal aggression, hostility, and anger) are calculated separately, the total score or level aggression is a sum of scores each of the items. Total score ranges from 29 to 145.

The BPAQ is decorated for its consistent and accurate results, providing a foundational framework to measure aggression in individuals. Internal consistency coefficients generally range above 0.8, and 0.7 on test-retest reliability coefficients. Multiple research projects conducted in western and eastern demographic further support the reliability of BPAQ. Moreover, convergent validity of the BPAQ has portrayed strong correlates with other inventories that assess aggression (Gerevich, Bácskai, & Czobor, 2007).

The Sports Anxiety Scale-2 (Smith, Smoll, . Cumming, & Grossbard, 2006) measures competitive trait anxiety experienced by individuals before or during competition. The self-administered report includes 21 items that assess 3 components of Somatic Anxiety, Concentration Disruption and Worry. Individuals rate each item on a Likert-like scale ranging from 1 (not at all) to 4 (very much). Scores for Worry include 7 items, 5 items for Concentration Disruption and 9 items for Somatic Anxiety. Tally for each category provides scores for the respective factor, and the sum of all these categories give the total Trait Anxiety Score. Total score ranges from 15 to 60.

The SAS-2 was subject to the Exploratory Factor Analysis (Principal Component) with Varimax Rotation to test the factorial validity, the test supported the structure of SAS-2 with items explaining 48.04% of total variance (Karadağ & Aşçı, 2015). The internal consistency was tested using Cronbach's Alpha

coefficient, with a total of 0.65 for somatic anxiety, 0.67 for concentration disruption and 0.78 for worry. The SAS-2 has been a reliable psychometric and a gold standard in the field of sports psychology.

Procedure

Participants were selected through a purposive method, targeting specific demographic of individuals who consistently participate in physical or non-physical sports. Data collection for physical sport players was done through group sessions, after obtaining participants informed consent they were instructed as to the steps to complete both the Sport Anxiety Scale-2 and Buss Perry Aggression Questionnaire, in the order of their choosing. Surveys were conducted in a controlled laboratory setting with allocated rooms for groups of participants, responses were accurately and equally calculated for data analysis. A total of 100 participants were surveyed for the study over a period of six weeks, allocating days for certain sport professions to reduce impacts of participant bias and ensuring participant engagement.

Statistical Analysis

To compare the difference in correlation of aggression and performance anxiety in physical and non-physical sports the statistical analysis comprises several key components aimed at elucidating the relationship between sports type and psychological variables. Initially, descriptive statistics, including means and standard deviations, will be calculated for sports anxiety and aggression levels within each group. A correlation analysis was carried out to determine whether the type of sport is significantly associated with the psychological constructs. The process of calculating the Pearson correlation coefficients was to express the strength of the association between the variables. Also, an independent samples t-test will be applied to determine mean scores of sports anxiety and aggression levels among those who were involved in physical sports and those who weren't. The t-test will examine whether the difference noted among the two groups is statistically significant (e.g., $\alpha = 0.05$). This statistics approach will be utilized to investigate the gaps and relations between types of sports and psychological aspects of performance in an Indian population.

Ethical Considerations

This study maintained and accounted for all ethical guidelines. Participants were given a brief of the purpose of their participation as well as collecting informed consent from all participants. Ensuring anonymity and protection of their results, as well as conveying their voluntary participation and the right to withdraw at any given moment. During the conduction of the study any extraneous guidelines were followed to assure the protection of participants and maintaining empirical research standards.

Results

The collection of raw scores for participants were calculated for both Buss Perry Aggression Questionnaire (BPAQ) and Sports Performance Anxiety Scale-2 (SAS-2), data analysis was computed using IBM SPSS Statistics Groups were paired and interpreted by incorporating the Pearson's correlation coefficient, and the level of significance of said relationship. It was important to highlight the overall scores of both tools, studying the subcomponent scores of participants its correlation provides an insight into specific areas that affect performance. In all 100 participants the mean score for aggression were determined to be 73.2 (SD=17.2), and 28.8 (SD=8.8) the mean score for sport anxiety scores. The scores of physical sport participants indicated a mean score of 78.3 (SD=16.5) in Aggressive behaviours and 29.7 (SD=9.9) in

Anxious behaviours, moreover the estimated mean scores for non-physical sport participants were 67.9 (SD=16.4) for aggression and 27.8 (SD=7.4) for sport anxiety (Table 1). The calculated mean scores suggest that physical sport participants have a significantly higher degree of aggression than in non-physical participants (Table 1). The evidence furthermore shows the respondents differences in subcomponents of the Buss Perry Aggression Questionnaire and the Sport Performance Anxiety Scale-2, physical sport participants having higher scores in all subcomponents of aggression (physical, verbal, anger, and hostility) than non-physical participants (Table 2).

The determined correlation of aggression and performance anxiety were calculated through a 95% interval ration, with $p=0.05$ as a level of significance, with level of significance for both groups being calculated at <0.001 indicating a rejection of the null hypothesis and exhibiting the statistically significant relation. Result analysis showed a positive relationship of aggression and performance anxiety at 0.489 ($p<0.001$) in physical sports and 0.495 ($p<0.001$) in non-physical sports. Provided, the relationship of aggression and anxiety in both groups can be defined as a positively moderate to good relation. Incorporation of in paired sample test also rejects the null hypothesis showing both groups show a strong relationship ($p<0.001$) (Table 8) (Table9).

Result Tables

Type of Sport		Mean	N	Std. Deviation
Physical	Aggression Score	78.3333	51	16.48838
	Sport Anxiety Score	29.7059	51	9.87987
Non-physical	Aggression Score	67.8571	49	16.42660
	Sport Anxiety Score	27.8367	49	7.41155
Total	Aggression Score	73.2000	100	17.19995
	Sport Anxiety Score	28.7900	100	8.76436

Table 1. Descriptive Statistics for Total Scores of Buss-Perry Aggression Questionnaire and Sports Performance Anxiety Scale-2, for physical and non-physical sports.

Type of Sport		Mean	Std. Deviation
Physical	Physical Aggression	23.2549	4.91464
	Verbal Aggression	14.7059	3.57935
	Anger	19.1765	4.56818
	Hostility	21.1961	7.58161
Non-physical	Physical Aggression	20.1020	5.39770
	Verbal Aggression	13.3673	3.46827
	Anger	17.0204	5.13765
	Hostility	17.3673	6.70104

Table 2. Descriptive Statistics for Subcomponent Scores of Buss Perry Aggression Questionnaire, for physical and non-physical sport individuals.

Type of Sport		Mean	Std. Deviation
Physical	Worry	11.7059	4.27221
	Somatic	9.3529	4.02901
	Concentration	8.6471	3.07781
Non-physical	Worry	10.3061	3.24810
	Somatic	8.4694	2.73939
	Concentration	9.0612	2.59333

Table 3. Descriptive Statistics for Subcomponent Scores of Sport Performance Anxiety Scale-2, for both physical and non-physical sport individuals.

Physical Sport	Pearson Correlation	p-value	Pearson Correlation	p-value
	Aggression	1		.489**
Anxiety	.489**	<.001	1	

Table 4. Correlation coefficient for Aggression and Performance Anxiety in Physical sports individuals

Non-physical Sport	Pearson Correlation	p-value	Pearson Correlation	p-value
	Aggression	1		.495**
Anxiety	.495**	<.001	1	

Table 5. Correlation coefficient for Aggression and Performance Anxiety in Non-physical individuals.

Type of Sport	Cronbach's Alpha	N of Items
Physical	.872	29
Non-physical	.895	29

Table 6. Scale Reliability of Buss Perry Aggression Questionnaire.

Type of Sport	Cronbach's Alpha	N of Items
Physical	.919	15
Non-physical	.879	15

Table 7. Scale Reliability of Sports Anxiety Scale-2.

				p-value
Pair 1	Total BPAQ & Total SAS-2	23.948	50	<.001
a. Type of Sport = Physical				

Table 8. Paired Samples Test for BPAQ and SAS-2 scores, for Physical sport respondents

		t-value	df	p-value
Pair 1	Total BPAQ & Total SAS-2	19.607	48	<.001
a. Type of Sport = Non-physical				

Table 9. Paired Samples Test for BPAQ and SAS-2 scores, for Non-physical sport respondents

Discussion

The aim of this study was comparing the correlation of performance anxiety and aggression, in physical sports and non-physical sports. The current flourishing of sport psychology in India, with the current focus of the field being on personality and arousal outlines the development of sports psychology, such as the foundation of the Indian Association of Sport Medicine, the issues, the need, and key areas where there is a lack of focus (Thakkar, 2019). There are clear psychological factors that are affecting individual sport performance. Individuals competing in eSport competitions, chess or shooting competitions are not given the status of an athlete (Parry J. , 2019). Considering that any sport requires an institutionalized and stable definition, such sports along with certain norms that may allow it to be considered in the family of competitive sports. However, there is sound argument to consider these domains as a part of professional sports, the perceptions of esports in recent years have garnered increasing interest, with a large population of both athletes, fans, and professional experts (Seth E, Manning R, C. Keiper, & W. Olrich, 2016). Findings indicate that the correlation of participation and intensity in such activities varied in their patterns, there was also a higher correspondence in males indicating a complementarity with traditional sports in the wake of live sporting events and competitive tournaments that encourage participation from a range of skilled individuals (Englert & Bertams, 2012). It's important that domains of sport and professional performance analysis encourage and emphasize the collaboration of sport psychology in eSport and other competitive domains (Englert & Bertams, 2012). The nature of these constructs demands individuals being supported, monitored, and trained to incorporate mental resilience to obtain peak performance. The lack of research investigating the psychometric qualities of both these domains of sport (physical and non-physical) has left a gap in providing professionals with the necessary tools to cope.

H01 – There is no significant correlation of aggression and performance anxiety in physical sports and non-physical sports.

HA1– Physical Aggression and Somatic Anxiety is significantly higher in participants of physical sports.

HA2- Non-physical sport participants have higher levels of Concentration Anxiety and degree of Hostility.

The results from surveys indicated that both groups physical sport ($r=.489$) and non-physical ($r=.495$) sport had a moderate to good positive correlation of aggression and performance anxiety, within all 100

participants mean score for aggression were determined to be 73.2 (SD=17.2), and 28.8 (SD=8.8) the mean score for sport anxiety scores. Providing crucial evidence to interplay of aggression and anxiety in individuals who compete in physical sport against those who compete in non-physical sport, scores of physical sport participants indicated a mean score of 78.3 (SD=16.5) in Aggressive behaviours and 29.7 (SD=9.9) in Anxious behaviours, the calculated mean scores for non-physical sport participants were 67.9 (SD=16.4) for aggression and 27.8 (SD=7.4) for sport anxiety (Table 1). Physical sport participants generally exhibited more traits of physical aggression (M=23.2) than non-physical sport participants (M=20.2), although both groups had no significant differences in traits of verbal aggression (M=14.7, M=13.4) and anger (M=19.1, M=17.0) (Table 2). Aggression encompasses biological, psychological, and societal factors that affect individuals, similarities in subcomponent mean scores of aggressions shed light into prevalence of aggression in both domains. The mean scores of aggression in physical sport (M=78.3, SD=16.5), and non-physical sport (M=67.9, SD=16.4) indicated moderate to high levels of aggression in both groups.

Furthermore, the results of the SAS-2 calculated that in the subcomponents of anxious behaviours slight variation in the averages of mean score physical sport (M=29.6) and non-physical sport (M=27.4), physical sport participant's scores of Worry (M=11.7), Somatic (M=9.4) and, Concentration (M=8.6) indicating a moderately low level of performance anxiety. Non-physical participants score of Worry (M=10.3), Somatic (M=8.5) and, Concentration (M=9.1) overall indicated that most participants exhibited a moderate to low level of performance anxiety. The components of anxiety in the SAS-2 investigate both psychological and physiological forms of anxiety, it's important to note that an incapacitating state felt during performing, determined as performance anxiety, is an example of such physiological responses to anxiety (Wilson, 2002). And in both sets of respondents there was a moderate to low level of performance anxiety, seen in sub scores of Somatic (M=9.3, M=8.5) rather both groups presented high scores responses to items of Worry (M=11.7, M=10.3). The fear of inadequacy or being unfavourably reviewed, or a tendency to focus on mistakes and upcoming threats results from individuals holding high expectations for themselves may be an affecting factor. Assuming this data, the sample population in question considerably lacks resilience for cognitive distortions. Cognitive process of thinking, memory, beliefs, and attentional capacity are but a few areas that may resulting in negative performances. (Vincent, 2015). The correlation of aggression and performance anxiety was prominent in both physical and non-physical participants resulting in rejecting the null hypothesis, as well as the Pearson's correlation coefficient ($r=0.489$, $r=.495$) and p-value ($<.001$) conclude the positive relationship of the variables. Physical aggression scores in physical participants were significantly higher than in non-physical participants (M=23.3, M=20.1), Somatic scores in physical sport (M=9.4) were higher than in non-physical sport (M=8.5) thus accepting the alternative hypothesis (HA1). Additionally, non-physical sport participants featured higher scores in the subcomponent of concentration anxiety (M=9.1) than in physical sport (M=8.6) in the SAS-2, showing that individuals competing in non-physical, however in regards to the degree of Hostility in the BPAQ given by individuals in the non-physical categories had a mean of M=17.4 (SD=6.7) which is significantly lower than that of individuals who partake in physical sport activities. This results in the rejection of the second alternative hypothesis (HA2).

One of the primary objectives of this study was to compare the correlation of aggression and performance anxiety in physical and non-physical sports, investigating psychometric aspects of individuals who competed in different domains of sport would give us a broader perspective of the nature of said sports and the properties of each group. Data analysis concluded that both groups depict a positively good

correlation of aggression and anxiety, that both these variables are interrelated in effecting performance. The research on the relationship of aggression and anxiety is long standing, however there is a need to understand to further research this relation.

Limitations and Suggestions

The scope of this study was dedicated to analysis of the relationship of aggression and performance anxiety in physical and non-physical sports, and is imperative to recognize the research boundaries and warranted constraints, As the study devised a self-report survey in multiple communities there is a possibility of response bias affecting the accuracy of results, moreover the sample size of this study included 100 participants ranging from the ages of 18-28 consisting of individuals at various skill and competitive levels of their sport. Additionally, the nature and environmental factors of certain sports may require essentially different characteristics for optimal performance, research dedicated to professional athletes in both domain, for example in a comparative of football and Multiplayer Online Battle Arena (MOBA) eSports athletes may provide more valid foundations for the differences in the domain of sports. While the study attempted to identify the correlation of aggression and anxiety sport it didn't not include multiple psychometrics such as State Trait Anxiety Inventory (STAI) (Spielberger et al 1983) that may have provided more conclusive analysis of individual levels of anxiety, as the SAS-2 is a tool that gives insight to the anxious traits felt before and during, before and after competition relating to individual sport performance.

Conclusion

In conclusion, the correlation of aggression and performance anxiety was prominent in both physical and non-physical participants. Optimal performance in athletes, has been primarily subjected to physical improvement and conditioning emphasizing strength, speed, and power, however with the incorporation of sports psychology athletes have slowly assimilated psychological aspects of performance into their training regimes. Arousal states of aggression and anxiety are evident in the sample population and results propagate the construction of programs that include interventions and skill training for both physiological aspects as well as psychological components. The nature of sport remains complex, the demands and skill requirements for any sport varies, understanding different personality traits, cultures and beliefs can lead to equipping individuals with the necessary tools to achieve consistent optimal performance.

Bibliography

1. Thakkar, A. (2019). Sports Psychology and its need in India. *Indian Journal of Mental Health Care*, 7, 143-147.
2. Ramdas, K. R. (2019). A study of Competitive nxiety Level and Mental Health, among Male and Female Players. *Think India (Quarterly Journal)*, 13(22), 1828-1836.
3. Englert, C., & Bertams, A. (2012). Anxiety, Ego Depletion, and Sports Performance. *Journal of Sports Exercise Psychology*, 34(5), 580-599.
4. Velikić, D., Knezevic, J., & Rodić, N. (n.d.). Relations of some personality traits and characteristics of sportsmen with the level of sports anxiety. *Sportlogia*, 10, 35-43.
5. Parnabas, V., Parnabas, J., & Parnabas, A. M. (n.d.). The Influence of Cognitive Anxiety on Sport Performance among Taekwondo Athletes. *The International Journal of Indian Psychology*, 2, 56-63.

6. Seth E, J., Manning R, D., C. Keiper, M., & W. Olrich, T. (2016). Virtual(ly) Athletes: Where eSports Fit Within the Definition of “Sport”. *Quest*, 69(1), 1-18.
7. Parry, J. a. (n.d.). Esports, real sports and the Olympic Virtual Series. *Journal of Philosophy of Sport*, 50(2), 208-228.
8. Parry, J. (2019). E-sports are Not Sports. *Sport, Ethics and Philosophy*, 13(1), 3-18.
9. Pluss, M. A., Bennet, K. J., Novak, A. R., Panchuk, D., Fransen, J., & Coutts, A. J. (2019). Esports: The Chess of the 21st Century. *Frontiers in Psychology*, 10, 431830.
10. García, J., & Murillo, C. (2020). Sports video games participation: what can we learn for esports? *Sport, Business and Management: An International Journal*, 10(2), 169-185.
11. Pedraza-Ramirez, I., Lisa Musculus, L., Raab, M., & Laborde, S. (n.d.). Setting the scientific stage for esports psychology: a systematic review. *International Review of Sport and Exercise Psychology*, 13(1), 319-352.
12. Behnke, M. G., & Kaczmarek, L. D. (n.d.). The Role of Emotions in Esports Performance. *Emotion*, 22(5), 1059-1070.
13. Munroe-Chandler, K. J., Loughhead, T. M., Zuluev, E. G., & Ely, F. O. (2023). An imagery-based intervention for managing anxiety in esports. *Journal of Imagery Research in Sport and Physical Activity*, 18(s1), 20230005.
14. LeNorgant, E. J. (2019). *Sport-related Anxiety and Self-talk Between Traditional Sports and ESports*. California State University, Fresno.
15. Smith, R. E., Smoll, F. L., . Cumming, S. P., & Grossbard, J. R. (2006). Measurement of Multidimensional Sport Performance Anxiety in Children and Adults: The Sport Anxiety Scale-2. *Journal of Sport & Exercise Psychology*, 28(4), 479-501.
16. Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of personality and social psychology*, 63(3), 452.
17. Karadağ, D., & Aşçı, F. H. (2015). The Reliability and Validity of the Sport Anxiety Scale-2 for Adolescent Athletes. *International Exercise and Sport Psychology Congress*. Istanbul.
18. Gerevich, J., Bácskai, E., & Czobor, P. (2007). The generalizability of the Buss–Perry Aggression Questionnaire. *The International Journal of Methods in Psychiatric Research*, 16(3), 124-136.
19. Hoffman, J. R. (2008). The Applied Physiology of American Football. *International Journal of Sports Physiology and Performance*, 3(3), 387-392.
20. Turner, A. N. (2011). The Science and Practice of Periodization: A Brief Review. *Strength & Conditioning Journal*, 34-46.
21. Geoffroy Berthelot, A. S.-J.-D.-F. (2015). Has Athletic Performance Reached its Peak? *Sports Medicine*, 1263-1271.
22. Bali, A. (2015). Psychological Factors Affecting Sports Performance. *International Journal of Physical Education, Sports and Health*, 92-95.
23. Selmi, O. O. (2023). Monitoring mood state to improve performance in soccer players: A brief review. *Frontiers in psychology*(14), 1095238.
24. Filaire, E. B. (2001). Preliminary results on mood state, salivary testosterone: cortisol ratio and team performance in a professional soccer team. *European journal of applied physiology*, 179-184.
25. Raglin, J. (1992). Anxiety and Sport Performance. *Exercise and Sport Sciences Reviews*, 20(1), 243-274.
26. Wilson, G. D. (2002). *Performance anxiety." The science and psychology of music performance:.*

27. Coutinho, P. M. (2016). Talent development in sport: A critical review of pathways to expert performance. *International Journal of Sports Science & Coaching*, 11(2), 279-293.
28. Laberge, S. J. (2002). Pierre Bourdieu's sociocultural theory and sport practice. *heory, sport and society*, 239-266.
29. Stemoel, C. (2005). Adult Participation Sports as Cultural Capital: A Test of Bourdieu's Theory of the Field of Sports. *International Review for the Sociology of Sport*, 20(4), 411-432.
30. Dilek, A. (2017). Aggression theories revisited: Lorenz's neo- instinctivism, Wilson's socio-biology and skinner's behavioural theories. *Journal of Asian Scientific Research*, 7(2), 38-45.
31. Bandura, A. (1976). Social learning analysis of aggression.
32. Felicia, A. (2020). Psychological Theories of Aggression. Critical Perspective. *JOURNAL OF EDUCATION, SOCIETY & MULTICULTURALISM*.