CONSTRUCTION AND STANDARDIZATION OF RECREATIONAL PHYSICAL FITNESS TEST FOR SCHOOL GOING CHILDREN

Thesis Submitted for the Award of the Degree of

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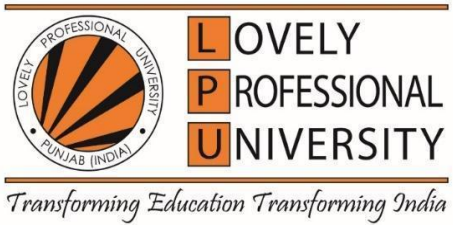

LOVELY PROFESSIONAL UNIVERSITY, PUNJAB

2025

DECLARATION

I, hereby declared that the presented work in the thesis entitled "Construction and Standardization of Recreational Physical Fitness Test for School Going Children" in fulfillment of degree of **Doctor of Philosophy (Ph. D.)** is the outcome of research work carried out by me under the supervision of Dr. Neelam K Sharma, working as Professor and Deputy Dean, in the Lovely Institute of Physical Education , Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigators. This work has not been submitted in part or full to any other University or Institute for the award of any degree.

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CERTIFICATE

This is to certify that the work reported in the Ph.D. thesis entitled "Construction and Standardization of Recreational Physical Fitness Test for School Going Children" submitted in fulfillment of the requirement for the award of degree of **Doctor of Philosophy (Ph.D.)** in the Lovely Institute of Physical Education, is a research work carried out by Sunil Singh, Registration No. 42000127, is bonafide record of his/her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

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ABSTRACT

The current study is focused on the construction and standardization of recreational physical fitness tests for school-going children. Physical fitness is a crucial component of a child's overall health and development, and it is essential to assess and monitor this aspect to promote a healthy lifestyle from a young age. Traditional fitness tests often emphasize competitive sports, potentially overlooking the recreational and fun aspects that could engage children more effectively. Therefore, this study aimed to develop a series of recreational physical fitness tests that not only assess fitness levels but also encourage participation by making the activities enjoyable and accessible.

Objectives

The primary objectives of this research were to construct, validate, and establish norms for a set of recreational physical fitness tests specifically designed for school-going children. These tests were intended to measure various components of physical fitness, including agility, hand-eye coordination, upper body strength, abdominal strength, and speed. In addition, the study sought to establish percentile norms and grading scales to provide a comprehensive assessment framework that could be applied across different age groups in school settings.

Methodology

To achieve these objectives, the study was conducted in several phases. Initially, a thorough review of existing literature was undertaken, and consultations were held with experts in the field of physical education to identify the most relevant and effective fitness components for inclusion in the test battery. Based on these inputs, five recreational physical fitness tests were proposed: the Recreational Agility Test, the Recreational Hand-Eye Coordination Test, the Recreational Upper Body Strength Test, the Recreational Abdominal Strength Test, and the Recreational Speed Test.

Data was collected from a sample of 1,122 school-going children, and the tests were administered under standardized conditions. Descriptive statistics, including mean, median, and standard deviation, were calculated for each test item. Skewness and kurtosis analyses were performed to assess the normality of the data distribution. The reliability, objectivity, and

criterion validity of the tests were established through rigorous statistical methods, including the test-retest method and Pearson product-moment correlation coefficient.

Results

The results of the study indicated that the newly constructed tests exhibited high levels of reliability, objectivity, and validity. The correlation coefficients for test-retest reliability ranged from 0.853 to 0.963, indicating excellent consistency in the measurements. Similarly, the objectivity coefficients, which ranged from 0.902 to 0.949, demonstrated that the tests could be administered consistently by different testers. The criterion validity was also well established, with correlation coefficients between the newly constructed tests and standardized tests ranging from 0.828 to 0.943.

The study also developed percentile norms for each test, providing a benchmark for assessing individual performance. For instance, in the Recreational Agility Test, children who completed the test in 11.418 seconds or less were in the top 10th percentile, while those taking more than 14.99 seconds fell below the 10th percentile. Similarly, grading scales based on the Six Sigma model were formulated to classify performance levels into categories such as Excellent, Good, Satisfactory, Average, Poor, and Very Poor. These grading scales offer a more nuanced assessment of physical fitness, allowing for a more comprehensive understanding of a child's capabilities.

Conclusion

The study successfully constructed and standardized a set of recreational physical fitness tests tailored to school-going children. These tests are reliable, objective, and valid, making them suitable for widespread use in educational settings. The development of percentile norms and grading scales further enhances the utility of these tests, providing educators and coaches with a robust framework for assessing and promoting physical fitness among children. The recreational nature of these tests ensures that they are engaging and enjoyable, potentially increasing participation and fostering a lifelong interest in physical activity.

The findings of this study contribute significantly to the field of physical education by offering a novel approach to fitness assessment that balances rigor with enjoyment. Future research could

explore the long-term impact of using these tests on children's overall health and fitness levels, as well as their potential to be adapted for use in different cultural and environmental contexts.

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Dated:- Signature of the Researcher

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CHAPTER I

INTRODUCTION

1.1 Introduction of the Problem

Recreation is a fundamental aspect of human life, encompassing a wide range of activities that people engage in during their leisure time. “Recreation refers to activities pursued for enjoyment, relaxation, and leisure. However, the world is far richer and more complex than in these blissful activities. Recreation is an essential component of human well-being and goes beyond temporary enjoyment” (Driver et al., 2010). “It is a powerful remedy that satisfies our desires, strengthens our bodies, and generates the fire in our souls” (Kelly et al., 2018). “Humans have understood the inherent benefits of leisure throughout history. The ancient Greeks, who placed a strong emphasis on intellectual and physical activities, as well as the modern emphasis on work-life balance, showed that leisure is not a useless enjoyment but rather an essential human need, which is acknowledged by societies nowadays” (Henderson & Rosenberg, 2007). “It enables us to set ourselves free from the fatigue of everyday life, build meaningful relationships with people, and connect with our inner selves” (Driver et al., 2010). The health benefits of leisure activities exceed just your own satisfaction. “Research has shown that recreational activities improve physical health by lowering blood pressure, enhancing general fitness, and reducing stress” (Pretty et al., 2005). “Additionally, it increases memory, stimulates creativity, and improves cognitive function. Also, it is essential for building communities, creating social links, and advancing cross-cultural understanding” (Fredman et al., 2014). The value of recreation is more important than ever in a society where jobs and advances in technology are taking over. It serves as a reminder that humans are beings with a deep desire for connection, joy, and discovery rather than merely parts of a machine. Engaging in recreational activities such as hiking, drawing, or just hanging out with loved ones gives an opportunity to rediscover our humanity and appreciate life to the fullest.

Recreational physical activities refer to exercises and movements undertaken primarily for enjoyment, relaxation and leisure, rather than for competitive or professional purposes. “Recreational physical activities provide a diverse perspective of movement that attracts every person's mind and body, outside the boundaries of scheduled workouts and competitive events”

(Kerr et al., 2015). Recreational activities help to discover the hidden abilities inside our bodies, encouraging a symphony of physical, mental, and social well-being. These activities range from the calm activity of an early morning walk to the pounding excitement of a Zumba class. According to Warburton et al. (2016), recreational activities serve as a barrier against long-term illnesses, reducing the incidence of diabetes, heart disease, and even some types of cancer. “Physical activity releases endorphins, which act as our body's natural anesthesia, lowering stress and anxiety and improving memory and cognitive performance” (Dishman & Biddle, 2010). “Also, it was found that recreational activities improve bone density, build and maintain muscle mass, and enhance the cardiovascular system” (Tudor-Locke et al., 2011). “Recreational activities serve as a strong mediator for mental wellness, delivering a break from the everyday routine and a place for self-discovery and personal growth” (Pretty et al., 2005). “Movement helps to establish a relationship with ourselves, promoting a sense of happiness and confidence, whether it's through the peaceful mindfulness of yoga or the thrilling rush of achieving a difficult climb” (Söderström et al., 2013). It fuels the creative spark, presenting fresh perspectives and remedies to life's problems. But occasionally, the whole work of leisure activities might fall apart, just like any rhythm. “The pressure to win, the aim of unachievable fitness objectives, and the commercialization of exercise may transform the joy of physical activity into a burden” (Pedlar & Ruddock, 2019). It's critical to keep in mind that the real joy of leisure physical activities is found in movement itself, in celebrating the potential of our bodies, and in developing a strong bond with both the environment and ourselves. Rather than in external confirmation or endless competition. Therefore, let's inhale deeply, go outside, and sense the life-giving energy under our soles. Grab some equipment, like a dancing groove, a frisbee, or a pair of trekking boots, and join the joyful music of relaxation physical activities. Allow the leisure of physical activity to lead a less stressful, happier, and healthier life where every action serves as a lever towards personal achievement.

Recreational games are activities that people engage in for enjoyment, relaxation, and social connection. “Playing recreational games causes endorphins to flow, muscles to pound, and hearts to race” (Tudor-Locke et al., 2011). “These games turn into smart fitness partners, combining endurance, coordination, and agility into lighthearted competition” (Dishman et al., 2006). The body becomes a playground while playing tag with friends or planning shots in a badminton match, realizing the endless possibilities for joy and movement. Recreational games offer people

a means of amusement, social contact, and relaxation and have long been an essential component of human society. From ancient civilizations to modern society, individuals have engaged in a wide range of leisure activities that have promoted a sense of satisfaction and togetherness among participants. These games take many different forms, from card games and board games to outdoor activities and conventional sports. Playing leisure games, whether competitively or recreationally, is a great way to relieve stress, get exercise, and stimulate the mind. There are many alternatives to accommodate a variety of interests and ability levels. Recreational games are more than just hobbies; these games play a big role in the physical and mental growth of players. These games improve general mental agility by encouraging collaboration, strategic thinking, and problem-solving abilities. Furthermore, social connection may occur through leisure games, which unite individuals of different ages, ethnicities, and backgrounds. This common experience improves interpersonal ties and creates a feeling of community, which benefits both the general wellbeing of people and society at large. The researchers shall examine the diverse range of pastimes that have captivated people's interest across time as the researchers examine leisure games. The researchers will explore the various ways that recreational games have developed and endured as a beloved part of human enjoyment, from the organized rivalry of sports to the more relaxed environment of board games. Come along on an adventure into the realm of leisure games, where enjoyment, challenge, and friendship combine to develop enduring relationships and a feeling of delight that unites people.

India's history of recreational sports is rich and varied, a reflection of the nation's complex inheritance and customs. India has been the home of joyful laughter for generations, from the sun-drenched beaches of ancient Indus Valley towns to the busy playgrounds of contemporary metropolises. The ancient world of recreational activities, which have long been more than just amusement, is filled with this symphony of happiness. Games are symbols of tradition, windows into a rich cultural fabric, and the limitless creativity and belonging of the human spirit. “Archaeological traces hint at past board games, such as the four-player dice game chaupar, which dates back to 3000 BC. These games provide insights into past social structures and forms of enjoyment” (Gupta, 2015). Numerous games and sports have been played for thousands of years all throughout the Indian subcontinent, each with its own special combination of talent, strategy, and cultural importance. These games have been very important in maintaining cultural identities, strengthening links within communities, and encouraging physical health, in addition

to being a source of pleasure. One of the first references to leisure games in India may be found in ancient texts such as the Arthashastra, which is attributed to Chanakya and dates back to the fourth century. It provides insights into various games and their cultural impacts. Numerous age-old Indian games continue to exist, coexisting with the rise of today's sports and recreational activities. Indian recreational games are more than just enjoyment; these games are hidden fitness allies that include endurance, coordination, and agility in a lighthearted competitive environment. The tactical sprints of kho-kho, the rhythmic stomping of tapsee, and the thrilling pursuit of the gilli-danda all transform into hidden exercises that serve as a reminder of the underappreciated capacity for movement and excitement that exists within each of our bodies. Played on the dusty grounds of rural India, games like Kabaddi reflect the spirit of traditional sports. Kabaddi, a sport with strong origins in Indian tradition, is a symbol of physical strength and team spirit. Similar to this, classic Indian card games like Teen Patti and board games like Pachisi (also called Ludo) have been passed down through the years, providing entertainment for family and friends when people get together. Additionally, the differences in location in games represent the diversity of India. “The popular stick-and-ball game Gilli Danda is played in southern India, whereas the tag game Kho Kho, which is played in the northern areas, is noted for requiring quickness and cooperation” (Dhanaraj et al., 2019).

Physical Fitness

Physical fitness is not solely about the absence of disease, it also involves the capacity to meet the demands of everyday life efficiently and effectively. “One's ability to carry out routine tasks with energy and without experiencing undue tiredness is a standard definition of physical fitness” (Caspersen et al., 1985). Numerous physiological systems, such as the respiratory, musculoskeletal, neuromuscular, and circulatory systems, must be integrated to maintain and enhance these systems. To achieve the highest level of physical fitness, regular exercise and physical activity are crucial. A person's ability to be physically active is essential to their general health and wellbeing. It consists of several components, such as cardiovascular endurance, muscular strength, flexibility, and body composition. “Regular physical exercise has been linked to several advantages, such as longer lifespans, better mental and physical health, a lower risk of chronic illnesses, and higher cognitive performance” (Lee et al., 2012). One of the most important components of physical fitness is cardiovascular endurance, which is the heart, blood

vessels, and lung's ability to provide oxygen and nutrients to the muscles throughout extended physical activity. “Studies on cardiovascular endurance have demonstrated that those with greater endurance levels are less likely to suffer from heart attacks and coronary artery disease” (Myers et al., 2002; Lee et al., 2008). Aerobic activities like riding, dancing, swimming, or jogging significantly improve cardiovascular endurance. Muscular strength is another crucial component of physical fitness, in addition to cardiovascular endurance. The term "muscular strength" describes the power that muscles may produce when faced with opposition. In order to carry out regular tasks and maintain proper posture, muscular strength is essential. “Frequent strength training activities, such as weightlifting or resistance training, have been demonstrated to improve joint stability, build muscle mass, improve bone density, and raise overall functional capacity” (Westcott, 2012). Another element of physical fitness is flexibility, which is the range of motion surrounding a joint. “Sustaining optimal flexibility is essential for carrying out everyday tasks and avoiding injuries. It has been demonstrated that regular stretching, yoga, and Pilates increase joint range of motion and flexibility” (De Oliveira et al., 2012). Another crucial measure of physical fitness is body composition, or the ratio of fat to lean tissue. “A higher risk of chronic illnesses, including diabetes, cardiovascular disease, and several forms of cancer, has been linked to having excess body fat” (Harrington et al., 2009). According to Ross et al. (2000), maintaining a healthy body weight and lowering body fat percentage may be achieved with regular exercise and a balanced diet. There is no way to overestimate the significance of physical fitness. “Regular physical activity has several health advantages. Studies have repeatedly demonstrated that regular exercisers have lower death rates than inactive people” (Paffenbarger et al., 1993). “Frequent exercise has also been demonstrated to lower the risk of chronic illnesses such as type 2 diabetes, obesity, hypertension, and several kinds of cancer” (Warburton et al., 2006). “Studies show that exercise reduces the symptoms of stress, anxiety, and depression, demonstrating the beneficial effects of physical activity on mental health as well” (Craft et al., 2004). Moreover, improved cognitive performance has been connected to physical fitness. “Several studies have shown that regular exercise enhances cognitive functions in both adults and children, including executive functioning, memory, and attention” (Hillman et al., 2008; Colcombe et al., 2004). “Exercise-induced physiological changes, such as elevated cerebral blood flow and the release of certain neurotransmitters, may account for some of these cognitive benefits” (Cotman et al., 2007). There are several well-established advantages of physical fitness.

For people of all ages, doing regular exercise should be a top goal. The WHO advises people to do muscle-strengthening exercises two or more days a week along with 2.5 hours of moderate-intensity aerobic exercise or 1 hour and 15 minutes of intense aerobic activity each week. The World Health Organization (2018) states that kids and teenagers should aim for at least 60 minutes a day of moderate-to-intense physical activity.

Physical fitness is usually divided into two categories: health-related fitness and skill-related fitness. Both components improve general well-being and performance in various physical pursuits. These components are critical in lowering the risk of chronic illnesses, increasing physiological performance, and promoting overall well being. Cardiorespiratory endurance is a key component of health-related physical fitness. This component emphasizes the circulatory and respiratory systems' effectiveness in providing oxygen to working muscles during prolonged activity. It is the foundation for exercises requiring persistent effort, such as jogging, swimming, and cycling. Muscular strength is another important health factor, focusing on the maximum force that a muscle or muscle group generates during a single contraction. Weightlifting and resistance exercises improve overall strength, which leads to greater everyday functionality and a lower chance of injury. Muscular endurance, in addition to muscular strength, is concerned with muscles' capacity to conduct repeating contractions over a lengthy period of time without becoming fatigued. This component is essential for tasks that require persistent effort, such as lengthy walks or carrying groceries. Flexibility, an often ignored component, refers to the range of motion around joints. Stretching activities, yoga and pilates help improve flexibility, reduce the risk of musculoskeletal injuries, and increase general mobility. Finally, body composition refers to the percentage of body fat to lean body mass. “Maintaining a healthy body composition through a balanced diet and regular exercise is connected with a reduced risk of obesity-related disorders and an increase in general health” (Kluwer, 2018).

Skill-related physical fitness components are the key components of a person's ability to succeed in a variety of physical activities, sports, and recreational activities. Unlike health-related components, which are primarily concerned with physiological well-being, skill-related components focus on characteristics that lead to greater athletic performance and mastery in a certain range of motion. These components are critical for athletes and those who perform tasks that require accuracy, coordination, and agility. Agility is an essential skill-related component

that determines a person's ability to shift directions quickly and effectively. It is vital in sports like soccer, basketball, and tennis, where quick changes in movement direction helps to achieve a competitive advantage. Another crucial component is balance, which refers to the capacity to maintain stability, whether static or dynamic. This skill is important in sports like gymnastics, martial arts, and even everyday tasks that need postural control and stability. The skillful integration of several actions to generate effective and under control movement is called coordination. This is an important factor in activities like ball sports, dancing, and gymnastics, where timing and accuracy of motions are vital for performance. Speed is defined as the capacity to complete a movement or to perform an action in a short period of time. It is an essential element in sprinting, track and field events, and sports like football or basketball, where fast bursts of speed will be game changers. Finally, power is the rapid generation of force through a combination of strength and speed. Athletes in weightlifting, sprinting, and other high-intensity exercises benefit from increased power, which improves performance. These skill-related physical fitness components are not just important for athletes but also for everyone looking to improve their physical ability, coordination, and total movement competence.

Physical Fitness Tests

Physical fitness testing is a systematic and objective way to evaluate a person's general health, performance ability, and adherence to fitness objectives. These exams give useful insights into certain aspects of physical fitness, influencing the development of tailored training regimens and allowing individuals to track their improvement over time. Physical fitness testing is essential in many sectors, including sports medicine, physical therapy, and corporate wellness initiatives. It enables people to create realistic fitness objectives, measure their progress, and make accurate assessments about their workout approaches. Furthermore, these tests help fitness instructors, trainers, and healthcare practitioners adjust interventions to individual requirements and improve overall health. Physical fitness tests are used in a variety of situations, including sports training and healthcare, and these tests play an important role in fostering optimal well-being and accomplishing fitness goals. “Physical fitness testing is a series of assessments meant to analyze various aspects of the body's capacity to do physical activities with efficiency and effectiveness” (Kluwer, 2018). “It offers an idea of the present physical health and well-being, making it a useful tool for establishing baseline fitness testing, which provides a starting point for tracking

the development over time and allowing one to assess the effectiveness of various exercise programs and make adjustments as needed" (Thompson et al., 2018). "Setting realistic goals by understanding strengths and limitations allows for the development of realistic exercise objectives that are targeted at specific talents and interests" (Loehr and Schwartz, 2003). "Motivating oneself by seeing real improvements in fitness levels will be a great incentive to stick with your workout regimen" (Warburton et al., 2016). "To identify possible health concerns, as certain fitness test results may suggest potential health hazards or underlying issues that require additional evaluation by a healthcare expert" (Thompson et al., 2018).

One of the most fundamental parts of physical fitness testing is assessing cardiorespiratory endurance, which measures the efficiency of the circulatory and respiratory systems during prolonged physical exercise. Assessments such as the VO2 max test or the 1.5-mile run are routinely used to determine an individual's aerobic capacity. Muscular strength and endurance tests examine a muscle or set of muscle's maximal force and capacity to conduct repetitive contractions over time. Bench press, squat, and push-up examinations are all standard evaluations for muscular strength. Flexibility testing assesses the range of motion around certain joints, providing information on an individual's ability to move freely and without limits. A common assessment is the sit-and-reach test, which assesses hamstring and lower back flexibility. In addition to these health-related components, skill-related components are frequently evaluated in sports-specific settings. "Agility, balance, coordination, speed, and power tests measure an individual's ability in tasks that require accuracy, coordination, and quick movements" (Kluwer, 2018).

Skill-related physical fitness assessments are critical in determining an individual's ability and competency in a variety of sporting and leisure activities. These tests focus on factors that are critical for success in sports, dancing, and other physical activities, offering significant information about an individual's coordination, agility, balance, speed, and power. Agility is an essential skill in sports that involve quick changes of direction. The Illinois Agility Test is a commonly used agility test. This test consists of navigating through a sequence of cones or markers in the quickest amount of time possible, imitating the rapid changes in movement direction necessary in sports such as soccer or basketball. Balance tests analyze a person's ability to maintain equilibrium, which is essential for sports like gymnastics and martial arts. The Single

Leg Balance Test involves participants standing on one leg for a certain amount of time to test their ability to maintain balance and control. Coordination assessments assess the integration of different motions to provide efficient and regulated execution. The Alternate Hand Wall Toss Test, for example, requires participants to throw a ball against a wall with one hand and catch it with the other, thus measuring hand-eye coordination and motor abilities. Speed tests assess a person's ability to move or accomplish a distance in the shortest possible duration of time. The 10-Meter Sprint Test is a simple example that measures how rapidly a person accelerates and covers a small distance, indicating their overall speed. Power evaluations emphasize the combination of strength and speed to create power explosively. The Vertical Jump Test is widely used to assess power. Participants leap vertically, and the height attained indicates their ability to create power quickly, which is vital in sports such as basketball and volleyball. “The skill-related physical fitness tests provide a more specialized assessment of an individual's athletic ability than common fitness examinations. By combining these tests into training plans, athletes may discover particular areas for growth and personalize their routines to improve their performance in their preferred sport or activity” (Baechle and Earle, 2008). To summarize, skill-related physical fitness assessments give an insightful overview of a person's skills in important athletic characteristics. These evaluations are useful tools for improving training regimens and reaching peak performance in sports and physical activities.

Physical fitness tests are carefully constructed assessments that examine several aspects of one's physical fitness. These assessments are useful for assessing health-related and skill-related factors, forming the foundation for designed exercise prescriptions, tracking progress, and making educated fitness intervention decisions. To ensure accuracy and efficacy in measuring an individual's physical capabilities, these tests must be carefully developed with scientific principles, reliability, and validity in mind. The first step in creating physical fitness tests is to have an adequate understanding of the particular components of fitness that are being evaluated. Flexibility, agility, balance, coordination, speed, power, muscular strength, and cardiorespiratory endurance are a few examples of these components. Every element requires an individual testing procedure that is consistent with the scientific ideas supporting the construct under investigation. “As part of the building process, the validity and reliability of the fitness tests are established. Validity guarantees that the test measures the things it says it will measure, while reliability assures consistency and reproducibility of findings. The validity and efficacy of the tests depend

on these psychometric characteristics. To determine the validity and reliability of the fitness evaluations, rigorous scientific procedures, statistical analysis, and pilot testing are used during the building process" (Kluwer, 2018). These recognized guidelines for exercise testing and prescription offer valid procedures for developing health-related fitness assessments. Various fitness experts consider this publication as a fundamental resource that directs the development of tests for numerous elements, including muscular strength, flexibility, and cardiorespiratory endurance. The evidence-based methods place a strong emphasis to guarantee the validity and reliability of fitness evaluations. The national strength and conditioning association provides guidance on how to create evaluations for skill-related fitness tests that emphasize agility, balance, coordination, speed, and power. A manual from the national strength and conditioning association, offers helpful guidance on creating tests that concentrate on these skill-related elements. This source acts as a manual for researchers and fitness experts who are creating tests for athletes and others who want to get better at a certain sport. To sum up, creating physical fitness assessments is a methodical, scientific procedure. It requires a thorough comprehension of the elements of fitness, adherence to scientific standards, and the validation and reliability of results. Fitness professionals may create efficient tests that contribute to reliable evaluations of an individual's health and skill-related fitness by using guidelines from authoritative resources like the national strength and conditioning association and the American college of sports medicine.

1.2 Significance of the Study

It has been reviewed from the literature that recreational physical activities help improve physical fitness and well-being. Recreational activity participants are more likely to have better cardiovascular health, more restful sleep, higher self-esteem, more stamina, and lower stress levels—all of which enhance quality of life (Bouchard, 2007). Walking, dancing, hiking, rock climbing, bicycling, and ball games are some recreational physical activities. Recreation, according to research, is an important factor in everyone's quality of life, including differently abled people. Research into the development and standardization of a recreational physical fitness test for school-age children is critical for fostering a holistic approach to their well-being. This research helps to establish evidence-based approaches that will improve children's physical, emotional, and academic well-being. A standardized fitness test developed for school children

will be an effective means for encouraging physical exercise in educational settings. By adding recreational features, the test will make physical fitness more appealing, encouraging children to participate in activities that benefit their overall well-being. Using a standardized fitness test, coaches will develop specific physical education programs that will be customized to each student's specific requirements and capabilities. This specific approach improves the efficacy of physical education courses by creating a positive and inclusive atmosphere for all students. Fitness assessments for school-aged children will help with the early diagnosis of health problems or developmental disorders. Identifying areas of weakness or possible dangers allows educators and healthcare professionals to take action early, providing assistance and advice to enhance children's overall health outcomes. A recreational fitness test will help school children improve their physical literacy as the test provides a snapshot of each child's physical abilities, helping teachers and students understand their strengths and areas needing improvement. It not only assesses essential fitness components but also promotes the development of fundamental movement skills, establishing the fundamentals for a lifetime interest in physical exercise. The research findings from the construction and standardization of a fitness test for school children will inform the development of policies and curricula related to physical education in schools. Policymakers may utilize this knowledge to adopt evidence-based initiatives to improve the health and fitness of the younger generation. After reviewing various studies, it was found that no standardized recreational physical fitness test has been developed at this time, so this study may add knowledge in the field of developing recreational physical fitness tests for various populations. The newly developed norms may also assist teachers, physical education teachers and coaches in identifying talent for various games and sports. The findings of this study may also assist coaches and physical education teachers in developing recreational training programmes to improve school children's physical fitness. Further, this study will inspire other researchers to conduct more research studies on recreational physical fitness tests for a variety of other populations of varying ages.

1.3 Statement of the Problem

In India, 265 crore population is school going and various previous studies showed that school going children go through considerable physical and cognitive growth; therefore, it's important to conduct fitness evaluations that take into account their particular requirements. “Conventional

fitness assessments lack the engagement necessary to capture the attention and participation of children" (Robinson et al., 2009). The objective was to make the fitness test more engaging, entertaining, and supportive of long-term interest in physical exercise by adding recreational components. The purpose of this study was to construct a tool that will precisely assess different physical fitness components along with recreational components in order to promote a positive attitude toward physical exercise. Thus, the present study was stated as "Construction and Standardization of Recreational Physical Fitness Test for School-Going Children."

1.4 Operational Definitions of the Terms Used

Construction: It is a systematic procedure to develop test items of recreational physical fitness test by grouping items, administering them to a representative sample of people, and analyzing the results using known statistical methodologies.

Standardization: Standardization refers to the process of developing and implementing uniform procedures, criteria, or protocols to ensure consistency, reliability, and comparability in the assessment of various physical fitness components.

Recreational Physical Fitness Test: A recreational physical fitness test is a set of assessments designed to evaluate an individual's overall physical fitness levels, specifically in relation to activities performed for leisure and enjoyment rather than competitive or professional purposes.

School going children: In this study, the school going children are referred to as those school students who have an age between 13 to 15 years.

1.5 Objectives of the Study

1. To construct and standardize recreational physical fitness tests for school children aged 13-15 years.
2. To develop the norms of physical fitness for school children aged 13-15 years.

1.6 Delimitations

The present study was delimited to the following conditions:-

1. The subjects of the study were selected from various government high schools (list attached) in Jammu district.
2. The subjects of this study were male students between the ages of 13 and 15 years.
3. The present study was delimited to the sample size of 1100 government high school boys.
4. The present study was delimited to the following physical fitness components which were defined below:

   Strength: Strength is the maximal force that a muscle or muscle group may generate at a specific velocity through recreational activity.

   Upper body strength: Upper body strength refers to the maximum force a muscle or muscle group generates in the upper body, including the chest, back, shoulders, arms, and core.

   Abdominal Strength: Abdominal strength refers to the capacity of the muscles in the abdominal region, including the rectus abdominis, obliques, and transverse abdominis, to generate force and provide stability to the spine and pelvis.

   Agility: Agility is the ability to rapidly and precisely change the direction of the entire body in space, integrating the actions of the neuromuscular system to maintain postural control.

   Speed: Speed is the rate at which an individual is able to perform a specific movement or cover a distance in the shortest amount of time possible.

   Coordination: Coordination is the harmonious integration of multiple movements and muscle groups to produce efficient and controlled actions.

5. To establish the criterion validity, the following standardized tests were delimited:
   - Shuttle Run Test
   - Alternate Hand Wall Toss Test
   - Push Ups Test
   - Bent Knee Sit up
   - 50 Meter Dash

6. The researcher selects the recreational game keeping in mind the component of physical fitness.
7. Keeping in mind the requirements of the test, new recreational games were modified to develop the norms.
8. The experts to establish content validity of the various recreational games were those who have rich experience in recreation.
9. Grading norms have been prepared using standardized statistical procedures i.e percentile and sigma scores and the scores which will not fall in any alphabetical grading will be considered as an outlier of the study.

1.7 Limitations

The study was carried out under the following constraints:

1. The students chosen as subjects came from a variety of families with varying socioeconomic backgrounds.
2. The subjects of different schools were not similar in terms of their lifestyles, eating habits, and regular physical activities.
3. The subject's motivation, interest, and attitude were limiting factors.
4. The psychological states of the subjects during test administration will not be controlled, which may influence their performance to some extent.

Chapter II

REVIEW OF RELATED LITERATURE

This chapter presents the related literature that was studied in order to gain a better knowledge of the topic and to systematically analyse the findings. The reviews were gathered from the Lovely Professional University, Department of Physical Education's library in Phagwara, as well as the Internet. Literature in any discipline serves as the foundation for future effort. Building on the review of literature will help researchers avoid overlooking previous work on the same issue. The Reviews of the literature have been classed under the following headings:

1. Studies pertaining to agility test
2. Studies pertaining to coordinative ability test
3. Studies pertaining to upper body strength test
4. Studies pertaining to abdominal strength test
5. Studies pertaining to speed test
6. Summary of the literature

2.1 Studies Pertaining to Agility Tests

Alim *et al.,* (2024) aimed to develop an agility test for wheelchair tennis. This research consists of four steps. To develop a wheelchair tennis agility test, the process began with a review of research publications and documents, identifying six key aspects: dependability, safety, ease of use, specification of agility test motion, and relevance to match conditions. Experts first evaluated the test results, followed by applying the Delphi technique. The Aiken formula was used to verify content accuracy based on expert judgment, involving seven experts (two with doctorates in tennis science and five national coaches). Using the Coefficient of correlation and Cronbach's Alpha reliability, sixteen seasoned wheelchair athletes (aged 18–40, with an average of 11.20±1.7 years of training) were evaluated. Validity test results showed V values ranging from 0.78 to 0.96 across the six aspects, with a reliability value of 0.804. The wheelchair tennis agility test is thus confirmed as highly reliable and valid, with strong content validity and reliability, making the instrument credible to both readers and researchers.

Abe *et al.,* (2022) developed a reactive agility test utilizing movements unique to soccer goalies and to look at the validity and dependability of goalkeepers in college. A star-shaped course with five branches that included diving and ball-catching exercises was created for reactive situations. A start-goal line was placed 3.5 meters from the center of the course. Six experts evaluated content validity, resulting in a content validity of 0.82, above the acceptable 0.78 level. Thirty-three male goalkeepers (GKs) participated in two test sessions. Three shuttles were used in each G-RAT test session, moving from the starting goal line to the diving and ball-catching zones. Upon reaching a distance of 1.5 meters from the start-goal line, goalkeepers were notified of the ball direction. GKs were divided into two groups: regular and non-regular. Assessments of convergent validity, predictive power, and reliability were made applying the correlation among classes coefficient and receiver operating characteristic curve. The confidence limit at 95% for the ICC was 0.88-0.97, and the value was 0.94 ($p < 0.01$). It took the R group 14.3 ± 0.7 seconds to finish the test, but it took the NR group 15.3 ± 1.0 seconds. For G-RAT, the area under the curve was 0.80. According to these findings, a reactive agility test tailored for GKs has good validity, reliability, and convergent validity among GKs in college.

Morral-Yepes *et al.,* (2022) reviewed the discriminating validity of agility tests and the reliability of reactive agility tests. Using databases like sportdiscus, cochrane plus, and pubmed, the required reporting components for systematic assessments and meta-analyses guidelines were followed in order to perform searching for literature on agility in sports with teams. Of the studies retrieved, 42 satisfied the inclusion requirements; 37 of them looked at agility's dependability, while the remaining ones evaluated their validity. Most studies reported greater than average intraclass correlation for reliability (0.79-0.99), except for two. Additional research confirmed satisfactory decision correctness (ICC = 0.74-0.93), movement time with 0.92, and decision time reliability with 0.95. Higher performance level players showed superior speed (mean = 6.4%), decision accuracy (mean = 9.3%), and decision time (mean = 23.2%), demonstrating strong discriminatory validity. Reactive agility tests have high validity and reliability, but most assess simple scenarios with limited answers.

Lima *et al.,* (2021) evaluated the validity of a novel reactive agility test which was designed to improve hand-eye coordination and response time in young volleyball players.

Twenty-four juvenile volleyball players (15 females, 9 males) with an average age of 11.58 ± 2.20 years participated in the study. Responsive duration and eye-hand coordination were assessed using a FitLight Trainer, a cordless gadget with light-powered sensing. Two sessions, separated by one week, were used to deliver the eye-hand coordination testing. Each session had three trials lasting thirty seconds. Reaction time in session 1 was much longer than in session 2, according to repeated measures ANOVA. Trial 3 in session 1 showed the highest average (ICC = 0.784) and single (ICC = 0.645) ICC measures, while session 2 recorded the highest average (ICC = 0.863) and single (ICC = 0.951) ICC measures. The FitLight Trainer proved to be a reliable tool for improving reaction speeds in young volleyball players.

Dewangga (2020) developed the karate agility test for the kumite division. This research endeavor has three stages of development. The initial step was to construct a karate agility test for the kumite category by examining research articles and publications. The karate agility assessment for the kumite division was developed using the Delphi method in the initial phase, and in the following phase, experts were requested to assess its quality. In this third phase, content validity was assessed by analysing expert evaluation findings using the Aiken formula. This study involved seven professionals and documents. When the Kumite category karate agility test was being constructed, it was discovered that: item one received a V 0.85; item two received 0.95; item three received 0.90; item four received 0.90; item five received 0.90; and item six received 0.90. The substance or content was given a score of 0.85. The V value for the separation between the cones was 0.95. Kumite category's karate agility test demonstrated a good content validity.

Di Domenico and D'isanto (2019) conducted a study to determine the role of speed and agility in the effectiveness of motor performance. This method is an experimental study that collects data via surveys and questionnaires created with the Google Forms platform, and it uses technological instruments to measure motor motions. Next Optojump. Twenty-seven to twenty-seven-year-old Sport Science bachelor's degree candidates from the University of Salerno make up the sample. The first data returns show that understanding the movement requires studying it as a whole, and that it is impossible to break the movement down into smaller, more manageable parts. The merging of qualitative educational evaluation and quantitative

biomechanics is made possible by self-evaluation and self-esteem. In conclusion, the study can help pinpoint the performance areas that should be analyzed to develop motor-sport educational skills with a strong focus on evaluation.

Pojskic *et al.,* (2019) determined four freshly created RT testing procedures for AG and NAG athletes, as well as their effectiveness, reliability, and usefulness.One complicated time response protocol involving multi-joint motions and a whole body shift over a short distance was performed by 37 AG and ten NAG athletes. The three randomly allocated simple response time protocols involving a single limb motion were performed as well. Three trials with five randomized tries each made up each RT test. Two sensors are installed on the left and right sides of SRT1 and SRT2. SRT3 and CRT each had three sensors installed: left, middle, and right. To evaluate reliability, ICC was calculated. The independent sample t-test, area under curve and effect size were employed to evaluate the discriminating correctness of the tests. The findings demonstrated that AG athletes outperformed NAG athletes in terms of accuracy and usefulness on the recently developed tests. In the CRT test, AG athletes outperformed NAG athletes in terms of RT from the left sensor and right sensor. In contrast, the SRT tests revealed no changes between the groups. Response time for single and multijoint limb motions should not be regarded as a single motor capability, according to the limited correlation between the SRT and CRT tests. This study concluded that during difficult motor tasks, AG athletes responded more quickly than their NAG counterparts. This improved ability to quickly and precisely rewire intricate motor tasks may be considered one of the key components for greater performance in agility-related sports.

Sobolewski *et al.,* (2018) investigated the construct validity and reliability of the new functional reactive agility test's (FRAT). In a fast lateral movement test (FRAT), forty-three young men, 32 middle-aged men, and 19 elderly men responded to a randomly delayed visual stimulus. To assess minimal difference scores and test-retest reliability, a subgroup of people was examined. The correlation between class coefficients, standard error of measurement, and minimum score values for judgment length, activity duration, and total time varied from 0.87 to 0.95, and 0.13-0.14 seconds, respectively. There was not a single systematic mistake in between testing days. In comparison to middle-aged and older males, young men showed faster decision

times and total times.The FRAT showed respectable construct validity and reliability across age groups. Future clinical population studies may find the FRAT to be a helpful tool due to its small space needs.

Fessi *et al.,* (2016) assessed an innovative repeated sprint T-test (RSTT) for criterion-related validity and reliability that required strong multifaceted inconsistent attempts. The agility T-test was administered seven times at maximum repetition during the RSTT, with a 25-second passive recovery break in between. To ascertain the reliability of the RSTT's best time and total time, 45 team sports participants completed two RSTTs spaced three days apart. For both BT and TT, Strong relative dependability between test and retest was indicated by the intra-class correlation coefficient assessment. Strong absolute dependability is demonstrated by the RSTT's average error of measurement. The least noticeable decrease for both BT and TT from the RSTT was 0.08 and 0.59 seconds, respectively. The RLS, RSCD, and RSTT all had a substantial correlation between their BT and TT. The RSTT is a credible and trustworthy measure of intermittent repeated sprint agility as a result. It is advised that team sports coaches, fitness instructors, and sports scientists include this evaluation in their training follow-up as this talent is fundamental to all team sports.

Inglis and Bird (2016) carried out a fresh agility test using a stimulus unique to a particular sport. This review's objectives were to assess the body of research on reactive agility assessments and offer suggestions to coaches on the most effective ways to measure and improve athlete’s agility. A literature search turned up several agility tests that evaluated athletes at various skill levels using a stimulus particular to that sport. Ten papers that met the inclusion requirements were found; half of the studies used a tester, and the other half used a video-based stimulus. It was discovered that reactive agility tests were a reliable and valid way to evaluate agility when compared to conventional pre-planned agility testing. Even if scheduled agility workouts might not be able to provide a sport-specific stimulus, reactive agility tests are employed as a training tool to improve an athlete's perception and response time.

Sekulic *et al.,* (2014) assessed the validity as well as reliability of a newly developed reactive-agility assessment that might be used to assess an individual's competence in sports

where they frequently have to "stop-and-go". The ATMEL microprocessor serves as the foundation for the measuring hardware. Anthropometric assessments, countermovement jump, and stop-n-go change of direction velocity were taken for a total of 36 college-aged male athletes and 21 college-aged female athletes. The results of the assessments of reliability showed that the tests that were given had a good degree of consistency for men and women, respectively. The shared variance between the SNG RAT and SNG CODS was less than 40%. The expanded SNG RAT was shown to be appropriate for usage with men and contained five unexpected direction shifts. Furthermore, female athletes are suggested to use a reduced version of the SNG RAT, since it better distinguishes between athletes who are more and less agile. Since both tests were given on the same course, we think that administering the SNG RAT and SNG-CODS concurrently can be useful in defining "stop'n'go" agility. This suggests that strength and conditioning coaches will be able to evaluate their athletes' perception and reaction skills indirectly by using the computed SNG CODS to SNG RAT ratio.

Serpell *et al.,* (2010) developed a trustworthy agility test that focused on various aspects for rugby league players. Two tests were administered to the players of a sub elite rugby league team: the CODS exam and the sport-specific reactive agility test (RAT). We looked at the trustworthiness of the data. The first test's validity results from sub elite groups were contrasted with information from an elite class. Participants had to race in the direction of an unanticipated full-length footage of their enemy targeting them, then quickly reverse course to avoid it. The identical movement patterns were needed for the CODS exam, but the direction changes were prearranged. Research findings indicated a good association (coefficient of intraclass correlation = 0.87 and 0.82, respectively) and no significant difference in means ($p < 0.05$). The tests were finished by the top group in 1.65 ± 0.09 and 1.79 ± 0.12 seconds on average. The elite and subelite groups had significantly different mean RAT times, according to statistical analysis ($p < 0.05$). Validity and dependability were shown by the RAT. Variations in perceptual abilities and/or reaction times were linked to discrepancies in performance on the RAT. Therefore, rather than focusing just on CODS, testing and teaching agility should also include those aspects of agility.

Sporis *et al.,* (2010) assessed factorial validity and reliability of soccer-related agility test. One hundred fifty male junior soccer players who are excellent players from the First Junior League Team (n = 150) offered their time to participate in the research. With within-subject variance ranging from 2.9 to 5.6%, the reliability coefficients for The sprint and slalom test (ST) had higher α values (0.992, 0.979, and 0.976). The six agility tests listed above led to the identification of two main components. The S4 X 5 test exhibited the lowest correlation coefficient (>0.63) of the five agility tests with the first component, whereas the other five had better correlations. The T-test revealed a substantial difference between attackers, midfielders, and defenders (TT). There were statistically significant disparities between attackers and defenders in the sprint with backward and forward running (SBF). The SBF, TT, and S180 degree agility tests were shown to be the most valid and reliable among the six agility tests employed in this study for evaluating the agility of soccer players. The study discovered that the above two given tests are the best for assessing midfield agility, the TT test is best for measuring defensive agility, and the S4 X 5 test is best for predicting offensive agility.

Veale *et al.,* (2010) constructed the validity and consistency of a reactive agility test (RAT) created particularly for Australian football. In the first study, twenty exceptional junior AF players answered the RAT twice, one week apart, in order to gauge its reliability. 60 participants were split into three age-matched groups for Study II: 20 sub elite athletes from the same league, twenty fit boys who did not play AF and twenty elite athletes from a State Under-18 AF league who had participated at the national level (controls). In test-retest reliability, there was no significant difference and a strong correlation between the mean findings. Every metric showed that the two AF groups performed better than the control group, and there were significant differences among the two AF groups . according to nonparametric testing (Kruskal-Wallis and Mann-Whitney). 75% of individuals were correctly identified using the stepwise discriminant analysis, which showed that total time discriminated across groups. In terms of construct validity and reliability, the RAT used in this study are demonstrated. It also suggests that a reactive element in agility test designs could be used to distinguish between athletes at varying competitive levels, highlighting its practical application in training exercises.

Oliver and Meyers (2009) established the reliability of a novel process that uses commercially available timing gates to evaluate many agility dimensions. A novel protocol consisting of a series of 10-meter sprints was tested four times on seventeen physically fit male subjects. Sprints were either done in a straight line or by changing directions every five meters. People either intentionally or inadvertently changed course in response to a visual light stimulus. None of the measures showed systematic bias; however, when just the last two trials were taken into account, In planned agility and straight acceleration, random variation was reduced, with mean coefficients of variance (CV) . With mean CVs of around 3%, reactive agility consistency remained constant throughout. The studies' findings revealed a considerable amount of shared variance across the two agility protocols, as well as between acceleration times and reactive and planned agility. Accurate measurements of both deliberate and responsive agility were possible. Physical skills that are similar to other exam measures are highlighted by the rules and layout of the reactive test and its use of a light stimulus. Thus, it does not seem that the addition of a reactive light stimulus necessitates the development of any new perceptual abilities.

2.2. Studies Pertaining to Coordination Tests

Iorga *et al.,* (2023) determined the ability and speed with which one may pick up coordinated movements while working in an online situation. Simultaneously, Using the Teaching Games, we aimed to assess the level of motor coordination learned during training. for understanding the approach and the eLearning platform Hudl. Consequently, three sets of children with different motor histories were examined. In the first and third years of study, the three tested groups were analyzed. The COVID-19 epidemic prompted changes to the training courses, which also affected how they were used within the web-based platform. The results of this study imply that these exercises can be beneficial if they support learning through the use of computer programs in an online system. Simultaneously, In addition to the typical growth of young children and adolescents, the study demonstrates that learning creates and implants an advanced type of motor control.

Herrmann *et al.,* (2019) developed the validity of basic motor skills, also known as motorische Basiskompetenzen, or MOBAK, in order to actively participate in sports culture. This paper evaluates the construct validity of the MOBAK-1 test, which is designed for children between the ages of six and eight. Furthermore, the relationship between MOBAK and age, gender, body mass index (BMI), and motor ability (i.e., strength) is investigated. Data from 923 first and second students (422 girls, 501 males) were analyzed. The MOBAK-1 exam was utilized to assess the children's basic motor abilities. Three confirmatory factor analyses including variables, frequency, correlation, and variance were carried out. There were two MOBAK factors, each containing four components. Both object control and locomotion were significantly impacted by motor ability strength. Older pupils performed better than younger ones in object control. Boys outperformed girls in object handling, whereas females outperformed boys in mobility. Students with larger body mass indices performed worse on the locomotion element. The test instrument developed for this study, the MOBAK-1, meets the criteria for psychometric authenticity and may be used to evaluate the benefits of sports and physical education.

Rovniy *et al.,* (2018) developed coordination skills for the rugby players as the cornerstone of technical preparedness. In the study were thirty junior championship rugby players from Ukraine, ages sixteen to seventeen. In order to enable the rugby squad to display technical competence in challenging competitive conditions, a specific coordination training program was developed. The degree to which coordination skills influenced technical preparedness was ascertained by calculating the correlation coefficient between these measurements. A unique program was created to help rugby players between the ages of 16 and 17 improve their coordination skills. It consisted of a number of exercises designed to improve vestibular stability, the precision with which traffic parameters were reproduced following different abrupt stops, rotations, and conflicts with athletes from the opposing team. Results from coordination ability tests and athlete technical preparation markers are consistently correlated. Through research, we were able to demonstrate the need for these program parameters, which are based on regularities in the athlete's bodily systems' adaptation to physical demands and which consistently match signs of technical preparedness.

Antunes (2015) developed a gross motor coordination (MC) test and looked into differences in gross MC between children who are normal weight, overweight, and obese. The "Healthy Growth of Madeira Study," a cross-sectional survey of kids between the ages of 6 and 14, provided the statistics. In this gross motor coordination (KorperkoordinationsTest fur Kinder, KTK), all 1,276 individuals had their anthropometry (height and body mass), physical activity (measured using the Becke questionnaire), and socioeconomic level (SES) evaluated. The sample consisted of 619 guys and 657 girls out of them. Generously adjusted additive estimates of shape, size, and position were used to generate centile curves for average MC for each gender. Moving sideways and backwards demonstrated that age had a significant effect. Boys were significantly more adept at driving laterally than girls. For girls and boys leaping and moving horizontally as well as for females hopping on one leg, inter-individual variance was larger near the top end of the distributions that occur. When age, physical activity, and socioeconomic status were taken into account, a one-way ANCOVA showed that children of normal weight performed better on all gross motor skills measures than their obese counterparts. Overweight boys and girls performed superior than their obese classmates on several MC exams. Portuguese children and teens between the ages of 6 and 14 can use these centile curves as reference data. Obesity and overweight were major barriers to the children's performance in MC tests, which in turn affected their health and physical fitness.

Liu (2015) reviewed the technique used in the coordination training of young boxers. Eighteen boxers, ages eleven to thirteen, took part in the study. In a span of four months, forty-two training sessions were held. The amount of time allotted to completing the coordination load varied from 15 to 45 minutes per session. The results of the control test demonstrated statistical confidence in the evaluated movement characteristics. It shows how beneficial it is to use complex coordination-oriented exercises, with an emphasis on how junior boxer training affects the sensor-informational and motor systems of movement. When starting boxing coordination training, there are a number of different methods and techniques that need to be employed in order to assist the development of motor condition and skill foundation. Junior athletes can enhance their coordination abilities by utilizing their motor skills and condition as a reserve.

Faber *et al.,* (2014) established the validity and dependability of an eye-hand coordination assessment that may be used to determine a table tennis player's skill. Nineteen table tennis players, ages seven to twelve, from national, regional, and local training institutions took part in all. Children were required to properly catch a ball with their other hand and toss it around an erect table tennis table as frequently as they could in just over thirty seconds as a component of an eye-hand coordination test. Four distinct test versions were evaluated, each using a game of tennis or game of table tennis ball and varying the distance from the tables. The two first test attempts were used to quantify the "within session" reproducibility. Four weeks later, 10 children were retested in order to estimate the "between sessions" repeatability. In all test versions, players from national and regional centers outperformed those from local centers significantly ($p<0.05$), according to validity studies that included age as a covariate. Comparing the tests at one and two meters, the one-meter tests demonstrated better discriminative ability. Once age was taken into consideration, the test with an indoor table tennis ball at one meter showed the strongest correlation. The ICC values for all test types ranged from 0.71 to 0.85, and the discrepancies between the initial and subsequent attempts were comparable. The test with the one-meter table tennis ball revealed the least amount of variation. Psychometrically speaking, the one with the table tennis ball at one meter seems to be the most suitable version of the test for identifying talent. In order to evaluate this test's predictive potential, longitudinal research is necessary.

Paul *et al.,* (2011) evaluated the impact of training in sports vision and hand-eye coordination on table tennis player’s sensory and motor abilities. Three equal groups of fifteen players each were randomly selected from 45 university-level table tennis players. Eight weeks of sports vision and eye-hand coordination instruction were given to the experimental group. For eight weeks, the control group did nothing but standard practice sessions; the placebo group viewed televised table tennis matches and read stories regarding athlete's performances. The eight weeks of instruction included assessments of each person's motor function and visual function both before and after. Statistically significant pre-to-post training improvements were seen in the experimental group, who showed greater enhancement in visual parameters and motor abilities as compared to the placebo and control groups. Thus, the current study came to

the conclusion that visual training programs enhance fundamental visual skills, which can then be applied to performance in sports.

Zuvela *et al.,* (2011) developed and certified a new FMS coordination test for kids eight years old. Ninety-five children aged eight were examined. Only the top candidates from the movement areas were included in the final test product, FMS-POLYGON, out of a total of 24 new FMS jobs. The multivariate evaluation identified the top performers in each of the following movement domains that were included in the FMS-POLYGON: carrying medicine balls, tossing and collecting volleyballs along walls, running over barriers, and straight-line sprinting. For each of the 24 tasks, the ICC was high. The assessment's intra rater consistency was proven by the extraordinarily high fms polygton score. The "Test of Gross Motor Development" was used to confirm concurrent validity. The freshly created fms polygton and the TGMD2 shown a strong connection in a correlation analysis. Finally, the novel FMS assessment test for 8-year-old children was found to have authenticity as well as dependability. It makes sense for schools to adopt this exam, which may have a big impact on students' participation in sports and physical education.

2.3 Studies Pertaining to Upper Body Strength Tests

Sigvaldsen *et al.,* (2023) established the reliability and validity of three distinct strength testing techniques for figuring out One-repetition maximums (1RM) for the seated bench pressing and supine bench pulls. Twenty-eight for leisure purposes active people underwent three sessions of load-velocity (L-V), maximum isometric force (MIF), and maximal repetitions to failure (MRF) tests in a Smith Machine. 1RM was predicted using linear regression based on the L-V connection, MIF, and MRF. A fixed criterion of significance of $\rho < 0.05$ was established. The intraclass correlation value was larger than 0.96, the mean differences between test days 1 and 2 ranged mainly insignificant effects and the coefficient of variation (CV) varied from 2.3 to 8.3% for all tests, according to reliability assessments of the different 1RM estimations. Regarding validity, the mean difference between all 1RM estimates in comparison to the real bench press 1RM was less than 1.3 kg (trivial). The only exception was the L-V relationship technique, which under estimated the projected 1RM by 5 kg (small). The L-V connection

approach, however, yielded the lowest mean absolute errors. The CV ranged from 4.5% to 13.2%. The estimate's standard error ranged from 3.2 to 9.7 kg. With the exception of there was a high association seen between the test change scores and the real 1RM change scores in the prone bench pull. The 1RM forecasts with the least deviations were generated via the L-V relationship technique. All of the 1RM estimation techniques were comparatively close to the conventional 1RM test. However, they cannot be used interchangeably because of the significant variation in the individual projections for each approach.

Ashall *et al.,* (2021) compared the ability of a mounted hand-held dynamometer (MHHD) and a hand-held dynamometer (HHD) to measure isometric neck strength simultaneously. A design of observation was employed. Nineteen rugby players, who are semi-professionals (weight = 98.7 ± 12.8 kg, height = 186.5 ± 6.5 cm, age = 26 ± 5 years). Positional comparisons, intrarater reliability (ICC), and concurrent validity of HHD and MHHD. Compared to the MHHD, the HHD produced lower absolute peak and mean peak forces, with a mean bias of -1.8 to -3.8 kgf ($P < 0.05$). For extension, the adjustment equations revealed substantial differences, but not for flexion (-0.5 to 2.1 kgf, $P > 0.05$). Big-to-very large correlations were found between the approaches; both showed excellent intraclass correlations (ICC = 0.72-0.89) and no location difference ($P < 0.05$). When compared to the MHHD and the corrective equation employed, the concurrent validity of HHD was found to be good. Rugby players can test their neck strength using one of the two viable and helpful methods; however, care should be taken while assessing strength during neck extension.

Romero-Franco *et al.,* (2019) examined the accuracy and consistency of a cheap digital dynamometer for determining maximum upper limb isometric strength. The major motions of the upper limb, which include the shoulder's abduction and adduction, internal-external rotation, flexion and extension of the wrist and elbow, were performed by fourteen physically active volunteers with maximum isometric strength. The low-cost digital dynamometer's validity was examined by contrasting its strength readings with those from the gold standard, an isokinetic dynamometer. The Bland-Altman plots showed perfect agreement, and the two devices had perfect correlation ($r > 0.913$). In wrist extension, the bias value range that was highest was -0.99-1.00 N. High intra- and inter-tester reliability was shown by all movements (ICC > 0.855).

The low-cost electronic dynamometer demonstrated high validity and consistency in measuring maximum strength in isometric positions throughout upper-limb major movements. It is an inexpensive way for professionals to assess strength of isometric muscles in the athletic setting.

Wang *et al.,* (2017) established a prediction model for upper-body power and the bench press exercise's maximum strength and the ballistic push up exercise's consistency. Sixty male recreational athletes completed two BPU tests and a one-rep maximum bench press in three separate testing periods. Peak and mean power, net impulse, peak velocity, flight time, peak and average force, as well as peak and average development of force pace, were calculated.. The intraclass correlation coefficients were used to assess the reliability of the BPU. Power prediction equations for the 1RM bench press were produced using stepwise linear regression. The intraclass correlation values for the BPU measures ranged from 0.849 to 0.971. The 1RM bench press prediction equation that follows is the outcome of multiple regression analysis: An accurate indicator of upper-body strength and power is the BPU. The findings indicate that upper-body power can be predicted using the peak velocity and flight length measured during the BPU, whereas 1RM bench press can be predicted using the mean force produced by the BPU. These results provide credence to the BPU's prospective application as a reliable gauge of upper-body power and strength.

Fernandez-Santos *et al.,* (2016) assessed the validity and reliability of the pushup, basketball throw, and handgrip tests in kids between the ages of six and twelve. One hundred eighty healthy children, 82 of whom were girls, participated in this study. Every upper body physical fitness test was conducted twice, separated by seven days, with the bench press test being conducted two days following the initial testing session. With the exception of the push ups test, all tests exhibited excellent repeatability. The bench press test and the handgrip test correlated the best ($r = .79$, $p < .01$; $R2 = .621$). In summary, basketball throw and handgrip tests have been shown to be accurate and dependable ways to assess kids' upper body strength. Further research is required to determine the validity and reliability of tests measuring upper body muscular endurance in youngsters.

Fawcett and DeBeliso (2014) evaluated the efficacy and consistency of a modified push-up test in identifying ASGSE in females aged 11 to 12. Twenty girls, aged eleven to twelve, participated in this study (height: 149.9 ± 8.9 cm, body mass: 44.0 ± 10.7 kg). The individuals performed a sitting bench press test with a repetition maximum of 40 percent in addition to two push up sessions using a modified push up methodology. The two push-up testing sessions were evaluated for stability and reliability using an intra-class correlation coefficient (ICC). The average push-up test and seated bench press results were evaluated for criteria validity using the Pearson correlation coefficient (PCC). The adjusted push-up results from Trials 1 and 2 were 24.2±9.3 and 25.4±9.0, respectively. Repetitions for the sitting bench press at 40% body weight were 15.6±7.8. The stability reliability coefficient (ICC) of the modified push-up test was 0.89. The average of the two push-up test sessions and the sitting bench press had a criterion validity of r = 0.52. The modified push-up procedure showed sufficient reliability within the parameters of this study and ought to be considered a reliable test for ASGSE in females aged 11–12.

Perez *et al.,* (2014) developed a modified test to assess the strength of preschool children. In order to accomplish this, 120 children underwent the evaluations three times with a week's break between each assessment. Construct validity was assessed by comparing the outcomes of each test with "handheld dynamometry" (the criterion measure). By comparing the outcomes from the second and third administrations of each test, or retest, the reliability of the tests was evaluated. Pearson's correlations were used to evaluate validity, while intraclass correlations were used to evaluate reliability. For children aged 3 to 5 (ICC, 0.702; 95% CI, 0.441-0.841) and 4 (ICC, 0.848; 95% CI, 0.715-0.919), the bent knee push-up demonstrated moderate reliability (ICC, 0.690; 95% CI], 0.379-0.845). Children ages 3 showed comparable results from timed dipping with the exception, the tests exhibited good construct validity. The timed dipping and bent knee push-up have psychometric qualities that make them suitable for use in preschool research, according to the study's findings.

Castro-Pinero *et al.,* (2010) thoroughly reviewed the current field-based fitness tests for kids and teenager’s criterion-related validity. The number of participants, the population under study's description, and the statistical analysis were used to rank the studies. Every study had a quality rating of excellent, poor, or very low. Three distinct levels of evidence were identified:

strong evidence, which is defined as consistent findings across three or more high-caliber studies; moderate evidence, which is defined as consistent findings across two high-caliber studies; and limited evidence, which is defined as consistent findings but not meeting the requirements for a moderate number of studies. The following findings examined the criterion-related validity of field-based fitness tests in children and adolescents: there is moderate evidence that the 1-mile run/walk test is a valid method for estimating cardiorespiratory fitness; strong evidence that the 20-meter shuttle run test is a valid test to estimate musculoskeletal fitness; and strong evidence that the hand-grip strength test is a valid measure of musculoskeletal fitness. A modest number of studies (one for each test) yielded inadequate evidence for a significant number of additional field-based fitness tests. The results of this current systematic review should be interpreted cautiously because there is a notable lack of consistency in the reporting and design of previous validity studies.

Castro-Pinero *et al.,* (2010) investigated the correlation between multiple child measurements of lower body muscular strength and the correlation between physical strength in the lower and upper bodies. The study population consisted of 94 healthy Caucasian children aged 6 to 17 years, 45 of whom were girls. Both upper body physical strength tests (e.g., basketball throw, push-ups, and isometric strength exercises) and lower body explosive muscular strength tests (e.g., standing long jump [SLJ], vertical leap, squat jump, and countermovement jump) were administered to the children. To investigate the relationship between the study tests, multiple regression analysis was employed. The SLJ had a strong connection with other tests of muscular strength in the upper and lower bodies (R2 = 0.694-0.851) and lower body (R2 = 0.829-0.864). Thus, the SLJ test could be seen as a general measure of young people's muscle fitness. The SLJ test is easy to use, quick, affordable, and needs minimal equipment.

Clemons *et al.,* (2010) assessed the concurrent validity of a recently developed medicine ball put (MBP) criteria measure in conjunction with the bench press power (BPP) test. 43 college-age participants were enrolled in the study. The subjects performed one maximal speed repetition with a grip of biacromial breadth, utilizing 61.4 kg for the men and 25 kg for the females. The timing automatically halted and the timing started manually at the point of upward bar movement. In less than two weeks, all testing was finished. Two separate testing sessions

were held: one for the MBP and one for the BPP. There was also one practice session for the BPP test. There were at least two minutes of passive recovery in between each of the three BPP trials. The findings for each individual were the Watts-per-unit average of the second and third testing. Bar mass kg multiplied by 9.81 and 0.3 m/s is the formula for power. The average distance thrown from a sitting posture during the second and third trials was used to calculate medicine ball put scores. Concurrent validity was determined by using a Pearson Correlation on BPP and MBP scores at an alpha level of 0.05. An intraclass R for MBP and BPP showed high test-retest reliability in both sexes. The BPP test was found to be a theoretically and practically sound way for coaches and trainers to evaluate upper body strength in college students, both male and female.

España-Romero *et al.,* (2010) investigated whether a teenager's elbow posture affects their handgrip strength. We also looked into the validity and dependability of the TKK, DynEx, and Jamar dynamometers in relation to the criteria. The handgrip strength test was completed by 66 teenagers, ages 12 to 16, with their elbows extended and flexed to a 90° angle. Using known weights, the validity and reliability of the TKK, DynEx, and Jamar dynamometers were evaluated. When the test was finished using the TKK dynamometer with the elbow fully extended, the highest score was achieved. A systematic bias of -1.92, -1.43, and 0.49 kg for the Jamar, DynEx, and TKK dynamometers, respectively, was found in the criterion-related validity evaluations ($p < 0.05$). The results of the reliability studies indicated that the TKK, DynEx, and Jamar dynamometers had systematic biases of 0.02 kg, 0.26 kg, and 0.23 kg, respectively (all $p > 0.05$). It seems that the most effective method for determining an adolescent's maximal handgrip strength when using the TKK is to do the handgrip strength test with the elbow extended. Additionally, it seems that the TKK dynamometer offers the best validity and reliability in relation to criteria. The current study provides pertinent and useful information regarding the sort of dynamometer and elbow posture that maximize teenagers' handgrip strength.

2.4 Studies Pertaining to Abdominal Strength Tests

Rifki *et al.,* (2022) develop in order to provide more precise and efficient results for Sit Up tests, an Arduino-based Sit Up test measuring device and an Ultrasonic sensor with an

Android application are being used. Research and development research is this kind of study. Research and development techniques are techniques used in research to create specific goods and evaluate their efficacy. Electrical and measurement test professionals were the first to validate the invention of the Sit Up test measuring instrument. A small group test with ten participants and a large group test with twenty participants followed. According to the study's findings, test and measurement experts with an evaluation percentage of 94% or in the "Good/Decent" category and electrical experts with an assessment percentage of 88.8% or in the "Decent" category both contributed to validity. Additionally, a big group of 0.996, also falling into the "Very Strong" category, and a small group value of 0.995, both falling into the same category, were obtained from the reliability test findings. It follows that in order to provide more precise calculations for the Sit Up test, the Ultrasonic sensor with the Android application and the Arduino-based measurement device are deemed appropriate for usage.

Ojeda *et al.,* (2020) determined the reliability and validity of the Muscular Fitness Test (MFT) in evaluating young, healthy individuals' body strength-resistance during self-loading. Second, create qualitative grading systems to evaluate this physical capacity at different levels. 489 people completed the MFT (test), with 77 doing it twice. The MFT was 60 seconds (s) of burpees, deep squats, push-ups, and sit-ups done in that order, interspersed with a 10-second micropause. The final heart rate (FHR), percentage of reserve heart rate (%), and Rating of Perceived Exertion (RPE) were used to evaluate the validity of the MFT.. The percentiles of ≤25 (poor), ≤50 (fair), ≤75 (good), ≤90 (very good), and >90 (excellent) were used to build the qualitative scales. MFT has been demonstrated to be a viable and accurate method for evaluating young, healthy individuals' self-loaded body strength-resistance. The evaluation of body strength-resistance in this population is made possible by the establishment of MFT qualitative scales.

Zemková (2018) addressed a gap in the measurement of core stability and strength between science and practice, and it provides our answer to this issue. By having the individual maintain a neutral spinal posture under load in a quadriplegic or supine orientation, typical abdominal stability tests evaluate the whole core muscles' endurance. All of these non-dynamometric tests, however, were created with clinical and research settings in mind.

Appropriate substitutes include torsional testing conducted in both stable and unstable environments, along with instrumented tests such load release exercises and trunk repositioning. When doing lifting jobs, isometric strength evaluations are frequently employed as a benchmark. Nevertheless, the pressures on the spine during dynamic movement are underestimated in these measurements. Workouts that incorporate both upper and lower body major muscle groups, such as deadlifts and high pulls. Moreover, isokinetic loading is not exclusive to the demands of sports and does not arise in daily human activities. It is possible that the test could give sports-specific conditions, since rotational power is a stronger predictor of athlete performance. There is also a gadget that allows for the assessment of muscle power when performing trunk rotations while seated or standing and using a barbell resting on the shoulders. These tests can be used in conjunction with current testing methods to provide competent assessment for athletes, sedentary or manual workers, and people. The tests make use of portable diagnostic instruments.

Majewski-Schrage *et al.,* (2014) developed a thorough explanation of the core-stability model, including its elements and techniques for evaluation. The Delphi method was applied. 15 subject matter experts representing a variety of specialties from the US and Canada. An open-ended questionnaire about the definition, elements, and evaluation processes of core stability was sent by the authors to each expert. They conducted two rounds of phone interviews to gather data. When a consensus was reached—that is, when 51% of respondents agreed—they ended the data collection process. The ability to regain and sustain control over the trunk region both at rest and during precise movement is the authors' working definition of core stability. The definition was deemed adequate by 83% of the experts. Consequently, the definition was accepted. In addition, the experts thought that neuromuscular control (8/12 = 66.7%) and muscles (14/15 = 93.3%) were crucial elements of core stability. Inconsistencies in assessment procedures were noted and brought to light, but no agreement was established. Two elements were specified along with a common definition of core-stability. The fact that none of the experts' initial definitions were the same, however, emphasizes the diversity of the experts and the importance of this study. Still, the objective of arriving at a common definition was accomplished. While no agreement was reached over the methods for evaluating core stability, it was a helpful starting point to find discrepancies among content specialists.

Park *et al.,* (2014) assessed the applicability of the muscle endurance test at three different isometric contraction posture angles and also developed reliable and valid testing methods that may be used in place of sit-ups. The following outcomes were obtained from the recruitment of 92 young, healthy participants (68 men and 24 women). Females demonstrated a good correlation while males exhibited a low correlation when comparing muscular and aerobic endurance capability. There was a significant correlation found between the number of sit-up repetitions and the tolerance time measured using an isometric contraction. At forty inclined degrees, the highest correlation was found and at fifty inclined, the lowest correlation was found. It concluded that an alternative to sit-ups, which may result in numerous back-related injuries, maintaining an isometric contraction at forty degree inclined was much better. This method has been shown to be a valid and useful technique for assessing abdominal muscle endurance. To determine the ideal angles that may be applied safely to individuals of different ages and physical conditions, more research is required.

Mijnarends *et al.,* (2013) reviewed the muscle mass, strength, and physical performance measuring techniques used to gauge older persons living in the communities. This can assist in identifying a valid and reliable set of techniques for screening and detecting sarcopenia in the future. On January 11, 2012, a thorough search of the databases was conducted. Studies that assessed the measuring capabilities or applicability of techniques to measure physical performance in older people living in communities who are 60 years of age or older were included. Sixty-two publications—including tools for physical performance (31) and muscle mass (16) and strength (15)—were deemed appropriate. As gold standards for estimating muscle mass, computed tomography was used. Bioelectrical impedance (BIA) and dual-energy x-rays are two more frequently used metrics for muscle mass; nevertheless, there aren't many reliable BIA measurements. Muscle strength and physical performance can be measured with validity and accuracy. It can be concluded that a variety of methods are available for reliable and valid measurements of muscle mass, strength, and function in clinical settings. The most practical, valid, and trustworthy techniques for BIA in the home include handheld dynamometry, gait speed, and a brief physical performance battery. More research is required on the combination of the chosen tools and their application in detecting and classifying sarcopenia in older people who live in the community.

Noguchi *et al.,* (2013) correlated the links between abdominal muscle thickness and tests of abdominal flexion strength, as well as between sit-up tests. Thirteen healthy young boys (weight 64.9 ± 8.80 kg, height 170.2 ± 0.70 cm, age 18.9 ± 0.64 years) involved in the research. Tests of abdominal flexing strength and sit-ups were performed, along with measurements of the thickness of the rectus abdominis, external oblique, internal oblique, and transversus abdominis muscles. The Pearson correlation coefficient was used to analyze the correlations between the measured data. The evaluations of abdominal flexing capacity and sit ups were found to be significantly correlated ($r = 0.75$). Furthermore, the thicknesses of the rectus abdominis and internal obliques showed strong correlations ($r > 0.65$) in both examinations. According to the current research, there is a substantial association among abdominal flexing strength tests and sit-ups, and the thickness of the rectus abdominis and internal oblique muscles is correlated with the results of both tests. Both abdominal muscle endurance and static strength can be evaluated using sit up.

2.5 Studies Pertaining to Speed Tests

Pyanzin and Pyanzina (2020)developed readiness of each athlete's unique speed-strength profile. The analysis of data was conducted with four topic groups in mind: powerlifting, kettlebell lifting, basketball, and sports. The researcher used scientific manuscript analysis and summarization, quantitative statistical techniques, instructional examination, and modeling mathematics. Both unassisted and weighted vertical jumps were used to assess the subjects' shoulder heights, using weights ranging from Twelve to 110 kg. Six hundred and eighteen observations were made. Based on the elevation of unaided vertical jumps, the equations used to determine the height of weighted vertical jumps were found to be adequate when analyzing the degree of consistency with which the jumping height varies with the masses of the weights driven by the competitors. As the amount of weight matter increases, the formula can be used to find the precise model parameters for jump height and to examine the integrity of the appearance of the components of an athlete's speed-strength ability. It can be evaluated under proportional use of speed-strength ability establishing indicators within the framework of the physical training process in various sports, namely, inadequate focus on primarily high-speed and largely strength

element advancement, thanks to the dynamics of jump height communication to the individual standard level revealed.

Imbach *et al.,* (2020) established the submaximal speed range for which the stride sprinting strength metre is usable. An indoor sprinting assessment with steps was finished by six casual joggers. Standard measures from a handheld metabolic tester, force platforms, and a motion recording system have been assessed to power output, ground contact time, and leg spring stiffness. For systems authenticity and comparability, a Bayesian model was employed. Both Stryd PO and oxygen consumption and Stryd PO and external mechanical power were shown to have strong, positive linear relationships. The GCT and LSS results did not significantly deviate from the reference measurements, while the PO was overestimated by the Stryd power meter. The Stryd power meter understates absolute PO while measuring GCT and LSS properly, we find.

Wawer *et al.,* (2020) verified the authenticity as well as consistency of an assessment for sprinting run aerobic capability. There were three parts to the investigation. Twelve female and sixty-one male athletes were included in the study. On separate days, twenty-five subjects,12 females performed straight sprints and progressive step assessments on a treadmill course at varying time intervals. A 10- or 12-second sprint was performed by 25 male volunteers on a non-powered treadmill. In the third section, 23 male participants had a 10-second LSRT and NMT on separate days. The capillaries blood samples were taken at intervals of one minute before to (Lacr) and following ten minutes of sprint sprinting in order to calculate the maximal lactic rate of manufacture and maximal level of lactate following training. All portions showed LPRmax consistency. The third section was verified in order to assess the validity of LPRmax). We demonstrate that LSRT and NMT are valuable diagnostic tools for physiological performance, and they can reliably measure anaerobic capacity.

Altmann *et al.,* (2019) examined the consistency and authenticity of many speed assessments relevant to football. The purpose of this methodical investigation was to look at the reliability and validity of speed tests given to senior players who play soccer. The requirements of PRISMA were followed in conducting a methodical investigation. Research on senior football

players' speed assessments that provided information on reliability or validity were taken into attention. The assessments were separated into five distinct groups: agility, change-of-direction sprint, straight sprint, repeated sprint, and tests that integrated these abilities. A total of 167 tests from 90 studies were considered in all. The most often studied sprinting were change-of-direction and linear, followed by combinations of both and repeated-sprint tests. The least amount of tests was done on agility. All classes' assessments, with the possible exception of the agility assessments, which lacked a validity analysis, reported satisfactory validity. The majority of tests across all categories showed reliability. These results held true for average and total times. On the other hand, tiredness metrics such percent degradation scores yielded inconsistent validity outcomes. ICCs varied from 0.11-0.49 and CVs from 16.8 to 51.0 with respect to dependability. In addition to agility assessments, there are additional exams available for every category with sufficient levels of validity and reliability for soccer players who are adults. Exercise caution when using fatigue measurements, such as percent degradation scores. In light of the absence of recognized gold standard assessments for every group, professionals and academics can select their assessments by consulting the comprehensive database provided by this comprehensive assessment. Future research should concentrate on developing and evaluating agility tests tailored to football, as well as criterion validity, which investigates the connection between test outcomes and match variables.

Nimmerichter *et al.,* (2017) confirmed the accuracy of the crucial speed calculated from the treadmill in forecasting 5000m track race results. An escalating treadmill test measuring maximum oxygen-dependent speed was performed on a total of sixteen trained athletes. They also completed three independently arranged sprints to fatigue at seventy percent, one hundred percent, and over ninety percent of MAS. The uniform speed inverse-time, linear distance-time, and hyperbolic speed-time models were used to calculate the critical speed and distance achieved over CS. Performance of more than 5,000 was evaluated on a 400-meter sprinting course. Multiple regression analyses and individual estimates of the 5,000m jogging time and speed were obtained for each of the three categories. The value of the coefficient of variability, the mean variance expressed in units of measurement, and standard error of estimation (SEE) from linear regression analysis were used to evaluate the precision of predictions. The sprinting efficiency over 5,000 meters was superior to the estimations obtained from all three models. The duration

variation was roughly 65-105 seconds, while the average velocity variation was -0.22 to -0.34 m·s−1. There was no discernible difference between the expected and observed running efficiency, according to several regression tests that used CS and D′ as predictor variables. The modest SEE of all models and forecasts was around 65 seconds. The research outcomes illustrated the importance of both lactic and oxidative energy system responses in forecasting sprinting performance over 5,000 meters. Performance across 5,000m race distances may be predicted with the use of estimates of CS and D′.

Di Mascio *et al.,* (2015) determined the reactive repeated-sprint test's authenticity, reactivity, and consistency. Female footballers classified as top (72), sub-elite (87), and elite (12) executed the RRST at prearranged intervals over the course of the campaign. The RRST performance indicator was the overall time over eight repetitions, and the overall area traversed was 30 meters. GPS was utilized to measure sprinting effectiveness during competitive matches, particularly sprinting at high levels of exertion. Top U16 players and sub-elite U19 players had test-retest coefficients of variance of 0.71 and 0.84%, respectively. Top U18 players scored better in RRST (58.25 ± 1.34 versus 59.97 ± 1.64, 61.42 ± 2.25, 61.66 ± 1.70, 61.02 ± 2.31, and 63.88 ± 1.46 s; ES 0.6-1.9) than top U16, sub-elite U16, U18, U19, and top senior female players. The RRST times of central defensive players for top U18 professionals were slower than those of full support but not of forwards or middle and outside midfielders.When comparing the preparatory time to the begin, the center, and conclusion of the time of year, top U16 athletes performed worse on the RRST. For both top and sub-elite U18 competitors, there was a significant connection between RRST efficiency and intense sprinting throughout the most strenuous 5-minute portion of a match. Furthermore, for elite U16 and U18 players, the most effective time on the RRST coincided with the results of the arrowhead agility test. The results demonstrate the validity and reliability of the RRST test in differentiating effectiveness over their position, norm, and seasonally timeframes.

Ramírez-Vélez *et al.,* (2015) developed the physical fitness related to health measures' consistency that were used in the "Fuprecol investigation" for promoting wellness in Colombia. two hundred and thirty Colombian children, ages 9 to 17.9 in which 124 males and 105 girls were involved in the research. The following five morphological components of physical fitness related to health were measured: height, weight, waist circumference, triceps skin folds,

subscapular skin folds, and fat percentage (%) using impedance. Tests for standing long jump and handgrip are muscular and skeletal components. Flexibility component: sit & reach test, hamstrings and spinal extensibility, speed/agility test (4x10m shuttle run). A shuttle run test lasting 20 meters is used to measure the maximum amount of oxygen consumed in the cardiopulmonary element. With the exception of the SRT, which was only administered once, all of the tests were performed twice, on the same day, one week apart. The anatomical element assessed both reliability between observers and intra-observer technical errors in measurement. The dependability of the motor, cardiovascular, and muscular and skeletal aspects of fitness was assessed using the BlandAltman tests. The anatomical element is small and has a greater than 95% reliability rate. Regarding systematic and random errors, we found sufficient patterns of reliability for the musculoskeletal, motor, flexibility, and cardiorespiratory components. With the exception of the sit and reach test, all tests showed nearly 0% systematic error when the fitness ratings were performed twice. According to the research's findings, health aspects of physical fitness in children and adolescents in a Colombian school setting could be reliably measured using the "Fuprecol study" health-related physical fitness battery, which was administered by physical education teachers.

Barbero-Álvarez *et al.,* (2013) demonstrated that adolescents playing soccer aged 14 years could be accurately predicted for sprinting at a high intensity throughout games using the results of a repeated-sprint capability assessment(RSAT). One day prior to a sporting event, the players efficiency was assessed and contrasted to intense activity throughout the competition. GPS tracking was used to track game effectiveness, while short-range instrumentation was used to assess heart rate. Players traveled at above 13 km/h (HIA) throughout their initial half. The results of the RSA parameters showed a strong correlation with maximum speed, matched HR, and HIA. The athletic and physiological requirements for youth soccer are significantly correlated, according to the investigation's conclusions. These results show that RSAT is a reliable predictor of intense sprinting during youth soccer competitions.

Buchheit *et al.,* (2012) identified the fastest 10-meter splitting time (Splitbest) throughout a 40-meter sprinting in accordance with the age group and the maximal sprinting speed of adolescents playing soccer who were well-trained. 967 distinct athletes sprinting from 223

adolescents playing football with extensive training were analyzed. The regular sprinting pace during Splitbest was used to determine the maximal sprint rate. Age altered the overall distribution of the Splitbest distance, with a larger percentage of 30-40-meter Splitbest played by seniors. After correcting for maximal sprinting speed, there was no discernible variation between the groups results. Splitbest's maximal sprinting velocity is the main factor that determines its distance. Because every age category's Splitbest site varies significantly for 10-meter intervals are still necessary to guarantee an adequate estimation of the younger the participant's maximum sprinting speed while using timing barriers.

Green *et al.,* (2011) based on game component analysis, validated the construct validity and reliability of a rugby association field test technique. The respondents were split into two groups according to their present performing scale. Through sessions of 10m and 30m straight speed (LS), shifting directional speed, and reflexive agility speed, the effectiveness of the field assessment technique in distinguishing participants with varying performing skills was assessed. Each of the field test's reliability analysis produced stable data, enabling the comparison of groups using this field assessment approach. All LS and agility elements showed significantly quicker performance from academy players compared to club players. According to such results, the on-field assessment procedure may be used to recognize teammates in rugby union with different skill levels, giving coaches and fitness professionals the opportunity to evaluate the capacity of players to perform vital game functions. It could also be helpful in identifying talent and evaluating efficiency. The study's conclusions suggest that this battery of tests is a suitable measure for identifying the different playing abilities of rugby association players. This makes it possible for coaches and fitness personnel to assess a player's proficiency with key game mechanics, which may be helpful for identifying potential and evaluating performance.

Vicente-Rodríguez *et al.,* (2011) assessed the dependability as well as consistency of the 30m and 4m running speed assessments. 85 teenagers (38 females) between the ages of 13 and 16 who were part of the Healthier Lifestyles across Europe by Nutritional in Adolescence project were included in the study. The duration of the 4-by-10-meter shuttle run and 30m sprinting test was measured using two methods: (a) photoelectric cells were used for dependability investigation, and (b) both skilled and unskilled raters used stopwatches to record by hand the

duration of the test. Bland-Altman maps and repeated measured estimation of variability were used to examine systematic error, spontaneous error, and variability. For both unskilled raters vs skilled raters and unskilled raters versus photodiode cells, the systematic error suggested that unskilled raters took longer notes. Between experienced raters and photodiode cells, no systematic error was found ($p > 0.05$). In all cases, there was no evidence of heteroscedasticity ($p > 0.05$). The findings demonstrate that measurements taken manually by a certified rater using a stopwatch appear to be a realistic approach for measuring speed and agility fitness tests in teenagers. Reducing errors in measurement requires training for researchers.

Barbero-Alvarez *et al.,* (2010) constructed the global positioning system device's test-retest dependability and convergence validity when it comes to assessing all aspects of the repetitive sprinting abilities test (RSAT). Two groups participated in this study: 14 top junior soccer players and 21 athletic students. Using timed lights and a handheld Geolocation device, the relationship between sprinting results was analyzed in order to assess convergent validity. Using a global positioning system, the RSAT test-retest consistency of elite junior football players was assessed; dependability was reported as a coefficient of variability. A week separated from the exam retakes. The GPS-measured peak velocity and the timing light-measured RSAT performance showed a good correlation for the 15-m split. The RSAT revealed a substantial variability for the rate of deterioration score but a small coefficient of variability for the summed speed maximum and maximum speed. These results demonstrate that the proportional decrement grade is not a reliable predictor of RSAT performance, but they additionally endorse the use of GPS tracking equipment as a substitute metric for evaluating repeated sprinting performance.

Buchheit *et al.,* (2010) established the validity and repeatability of an evaluation of repetitive shuttle-sprint and jumping abilities (RSSJA). Six sprints that left every 25 seconds made up the test, and in between each sprint, there was a countermovement leap that was done to recover. Fourteen skilled handball professionals performed the RSSJA exam seven days apart in order to conduct its reliability and utility analysis. The test parameters' repeatability was evaluated using the typical error of assessment. Additionally, the smallest variations in sprinting time and jumping power that were probably "real" were calculated. Men and women participants from seven teams (completed the RSSJA exam as part of the validity research. Poorer

dependability was seen in the percentages of sprinting and jumping decrements. The lowest changes in average sprinting time and jumping peak power that were probably real. The majority of the differences in mean sprinting and jumping achievements across teams were categorized as "almost certain" based on qualitative examination. When assessing repeated intense effort patterns in team sports like handball, the RSSJA test is reliable and dependable. The test findings may be utilized to distinguish between performing norms and track levels of fitness because it is anticipated that they will be predictive of gender and competitiveness level.

Williams *et al.,* (2010) established The repeatability and effectiveness of the Ball-sport Adaptation and Speed Test (BEAST90), a 90-minutely performance in soccer test. Over the course of 10 days, five assessment sessions including fifteen male amateur soccer participants in good health underwent metabolic and game-specific assessments. This included two complete BEAST90 trials spaced out by seven days in addition to familiarization sessions. The BEAST90 measured during a 90-minute period, with an estimated peak oxygen consumption and a mean percent peak heart rate. Trials 1 and 2's measurements did not differ significantly. Measurement reliability during a 90-minute period varied. The BEAST90 regimen included a cardiovascular workload similar to that of a game of football, as well as similar length, rhythms of motion, exertion, distances, and median and HRpeak values. Major physical measurements during BEAST90 had typically great replication, suggesting good dependability. Research on the effects of dietary interventions or training on inconsistent long-lasting athletic performance may make use of the BEAST90.

2.6 Summary of the Literature Reviews

The literature review presents an in-depth analysis of studies related to the development and evaluation of physical fitness tests for school-going children, categorized into key areas: agility, coordinative ability, upper body strength, abdominal strength, and speed tests. It underscores the reliability and validity of various agility tests across different sports, with

particular focus on reactive agility that assesses both physical and cognitive dimensions. The review also examines the effectiveness of coordinative ability tests in enhancing motor coordination, especially in specialized training contexts. The sections on upper body and abdominal strength tests explore the methods for assessing these areas of strength and validate their role as indicators of overall fitness. In reviewing speed tests, the importance of sport-specific testing methods is highlighted, particularly in their application across various sports. The chapter concludes by summarizing the consistent reliability and validity of the tests examined, and identifies a significant research gap: the absence of a recreational physical fitness test for school-going children, which ultimately led to the study's objectives of developing and standardizing such tests, as well as establishing norms for children aged 13-15 years.

CHAPTER III

RESEARCH METHODOLOGY

Methodology plays a critical role in all types of research. The study's goal was to construct a standardised recreational fitness test for school boys. As a result, this section of the thesis goes into detail about the study's design, such as the population of the study, sampling of the study, source of data, selection of subjects, selection of tests, test items, and criterion measures. Furthermore the method used to collect data, as well as the statistical analysis performed on the collected data.

3.1 Selection of Subjects

The aim of this study was to construct a recreational physical fitness test for school going children. The sampling process began by obtaining a comprehensive list of all government high schools in the Jammu district from the Directorate of Youth Services and Sports. This ensured that the entire population of schools was accurately identified. After reviewing the total number of schools, the researcher used random sampling to select specific schools for the study. The random selection was carried out while ensuring demographic representation, so that schools from various regions of the district, including urban, semi-urban, and rural areas, were proportionally covered. This approach guaranteed a diverse and unbiased sample, which would allow for more generalizable findings regarding the population of interest. Following the selection process, the researcher visited the selected schools and met with the physical fitness teachers and principals to discuss the study. During these meetings, the researcher explained the importance of the study and its potential impact on the health and physical fitness of school-going children. This engagement helped in securing permission to conduct the study in the schools. Additionally, the principals and physical education teachers provided detailed information regarding the number of students enrolled in each school, along with their age groups, gender distribution, and participation in physical activities. This information was crucial for the researcher to plan the sampling of students for the physical fitness tests. By building rapport and emphasizing the value of the research, the researcher was able to gain the cooperation and support of school authorities, which was crucial for the successful execution of the study. The selection process was conducted systematically to maintain fairness and validity in

the study's methodology. The subjects for this study were chosen from the various government high schools in the Jammu district. As there are nearly 180 government high schools in the Jammu district out of which 23 schools were randomly selected to carry out this study. The total subjects were 1122 government high school boys who were chosen using a simple random sampling technique and their ages ranged from 13 to 15 years.

3.2 Identification and Selection of Test Items

The process of identifying and selecting test items for the research involved a thorough and systematic approach. Initially, the researcher conducted an extensive review of existing physical fitness tests, examining their structure, objectives, and the specific fitness components they measured. Regardless of personal observation, the researcher conducted extensive related literature searches (Internet, Library, journals, Books, etc.) to select the appropriate physical fitness components. Various test and measurement books, as well as various internet content were used to familiarise him with the test construction procedure. This review provided a comprehensive understanding of the standard practices in assessing physical fitness among school-going children. Based on this analysis, key physical fitness components such as strength, endurance, coordination, speed and agility were identified as critical areas for assessment. Subsequently, the researcher explored various recreational games and activities to understand their potential relationship with the identified physical fitness components.

Table 3.1

Detail of Books Reviewed to Finalize the Physical Fitness Components and Recreational Activities

Category	Books	Author
Physical Fitness Components	1. "Physical Fitness and Wellness"	Dr. A. K. Uppal
	2. "Fitness and Wellness"	Dr. Anoop Srivastava
	3. "Scientific Principles of Physical Fitness"	Dr. J.P. Verma
	4. "Fitness for Life"	Satish Tiwari
	5. "Concept of Physical Fitness"	V.K. Sharma
Test and Measurement	1. "Tests and Measurement in Physical Education"	Dr. J.P. Verma
	2. "Measurement and Evaluation in Physical Education"	Dr. Amrit Kaur
	3. "Tests and Measurement in Physical Education and Sports"	Dr. M.L. Kamlesh
	4. "Evaluation Methods in Physical Education"	Dr. K. Usha
	5. "Essentials of Measurement and Evaluation"	Dr. K.P. Singh
Recreational Physical Activities	1. "Recreational Games and Sports"	Dr. G.L. Khanna
	2. "Fundamentals of Recreation"	Dr. D.K. Sharma
	3. "Physical Activities for Recreation and Fitness"	Dr. Rakesh Malhotra
	4. "Recreational Sports and Physical Activities"	Dr. B.S. Yadav
	5. "Recreation, Fitness, and Health"	Dr. Suresh Gupta

Table 3.2

Detail of Fitness Components Considered as an Essential Part of Various Standardized Physical Fitness Tests

Test Battery	Strength	Endurance	Flexibility	Agility	Speed	Coordination
Khelo India Fitness Assessment in Schools	✓	✓	✓	✓	✓	✓
AAHPER Youth Fitness Test	✓	✓	✓	✓	✓	✓
Fleishman Test	✓	✓	✓	✓		✓
National Physical Efficiency Test	✓	✓	✓			
Indiana Motor Fitness Test	✓	✓	✓	✓	✓	✓
Canadian Home Fitness Test	✓	✓	✓			
KVS Leads in Fitness Testing	✓	✓	✓		✓	
Barrow General Motor Ability Test	✓			✓	✓	✓
Scott Motor Fitness Test	✓			✓	✓	
Newton Motor Ability Test	✓	✓	✓	✓	✓	✓
Philip JCR Test	✓			✓	✓	

The researcher also reviewed the literature on the physical and psychological benefits of recreational games, focusing on how different activities could be aligned with specific fitness components. For references on various recreational games and activities and their relationship with physical fitness, the researcher consulted sources such as "Recreational Games: Their Development and Impact" by Smith & Jones (2015), "The Role of Play in Physical Fitness" by Davis & Williams (2017), and "Innovative Approaches to Physical Fitness Assessment through Recreational Activities" by Clark et al. (2019).

After establishing these connections, the researcher embarked on modifying the selected recreational games and activities to better suit the objectives of the study. This modification process involved adapting the rules, duration, and intensity of the games to ensure that they accurately measured the desired fitness components. These newly constructed recreational physical fitness tests were then designed to be both engaging for the participants and effective in assessing their physical fitness levels in a recreational context. The final test items were carefully identified and the identified test items were closely related to the various selected fitness components. Many studies have found that recreational physical activities are strongly linked to physical fitness. Then the face validity of the tests were developed by taking the suggestions of the experts who had rich knowledge of recreational games and activities. Following were the detail of the experts and their resumes are attached in appendices:

Dr. Joseph Singh

Professor, Department of Sports Biomechanics, LNIPE, Gwalior

Dr. Amandeep Singh

Professor and Head, Guru Nanak Dev University, Amritsar

Dr. Nishan Singh Deol

Professor and Head, Punjabi University, Patiala

Dr. Vinita Bajpai

Associate Professor, Department of Sports Biomechanics, LNIPE, Gwalior

Dr. Yajuvendra Singh Rajpoot

Associate Professor, Physical Education , LNIPE, Gwalior

Dr. Yatendra Kumar Singh

Associate Professor, LNIPE, Gwalior

Based on the extensive literature review and the suggestions from the experts, the following items were tested and finalized for the final recreational physical fitness test items:

Table 3.3

Detail of Test Items and their Objectives

TEST ITEM	COMPONENT	OBJECTIVE
Recreational Agility Test	Agility	To assess agility
Recreational Abdominal Strength Test	Strength and Endurance	To assess strength and endurance
Recreational Upper Body Strength Test	Strength and Endurance	To assess strength and endurance
Recreational Hand Eye Coordination Test	Coordination	To assess coordination
Recreational Speed Test	Speed	To assess speed

3.3 Tools Used for the Study

Following tools were collected from the equipment lab of school of physical education, Lovely Professional University, Jalandhar and were used for the collection of data for different recreational physical fitness tests:

- Tennis Balls
- Cone Markers
- Measuring Tape
- Stopwatch
- Marking Powder (Chuna)

3.4 Data Collection

Before initiating the data collection process for the newly constructed recreational physical fitness tests, the researcher sought and obtained formal permission from the Principals and Physical Education Teachers of various government high schools in the Jammu district. This step was critical in ensuring the smooth and ethical execution of the study. The researcher began by drafting a detailed proposal outlining the purpose of the research, the significance of the study, and the procedures involved in administering the physical fitness tests. This proposal highlighted how the research would benefit the students by providing valuable insights into their physical fitness levels through engaging and scientifically validated recreational activities. Meetings were then scheduled with the school Principals and PETs to discuss the research objectives and address any concerns they might have regarding the testing process. During these meetings, the researcher emphasized the voluntary nature of student participation, the measures in place to ensure student safety, and the confidentiality of the data collected. Additionally, the researcher provided assurances that the tests would be conducted without disrupting regular school activities and that the results would be shared with the schools to help them enhance their physical education programs. After thorough discussions, consent was obtained from the Principals, ensuring institutional approval, while the PETs were briefed in detail about their roles in facilitating the tests. Their cooperation was pivotal, as they not only assisted in organizing the students and providing necessary resources but also ensured that the testing environment was conducive and supportive. The permissions granted by the school authorities were a testament to

their commitment to student welfare and the advancement of educational research, paving the way for the successful collection of data in the schools of the Jammu district.

Then the data collection process for this research was conducted in several critical phases to ensure the accuracy and effectiveness of the newly constructed recreational physical fitness tests. Initially, the researcher gathered preliminary data by administering the newly designed tests to a small group of participants. This phase was crucial for understanding the practical implications of the tests and identifying any challenges or issues in their execution. Through careful observation and feedback, the researcher was able to pinpoint areas that required modification, such as test duration, equipment needs, or instructions clarity. After making the necessary adjustments to address these concerns, the researcher proceeded to the next phase of data collection.

In this second phase, the researcher conducted the standardized tests on a sample of 120 students. This stage was vital for establishing the standardization process, which included assessing the reliability, validity, and objectivity of the tests. By analyzing the results, the researcher ensured that the tests were consistent, accurately measured the intended physical fitness components, and could be administered objectively across different settings.

Following the successful standardization of the tests, the final phase of data collection involved administering the tests to a larger sample of 1,000 students. This extensive data collection was aimed at developing normative values for the newly constructed recreational physical fitness tests. The large sample size allowed the researcher to create comprehensive norms that could be used to assess the physical fitness levels of school-going children effectively. The entire data collection process was meticulously planned and executed to ensure that the newly developed tests were both practical and scientifically sound.

3.5 Criterion Measures for Administration of Test Procedure

Recreational Agility Test

Objective: To assess the agility component through recreational activity

Equipment Required: Measuring tape, marking cones, stopwatch.

Marking Area Dimension: Mark a center circle with radius of 1 meter. From the center point place cones at the distance of 3 meters in south, north, east & west direction. Then place a cone at number 2 such that the distance from cone 1 to cone 2 is 4 meters and from point A to 2 is 5 meters. Similarly place cones at number 4, 6, & 8.

Figure 3A

Marking Area Dimension of Recreational Agility Test

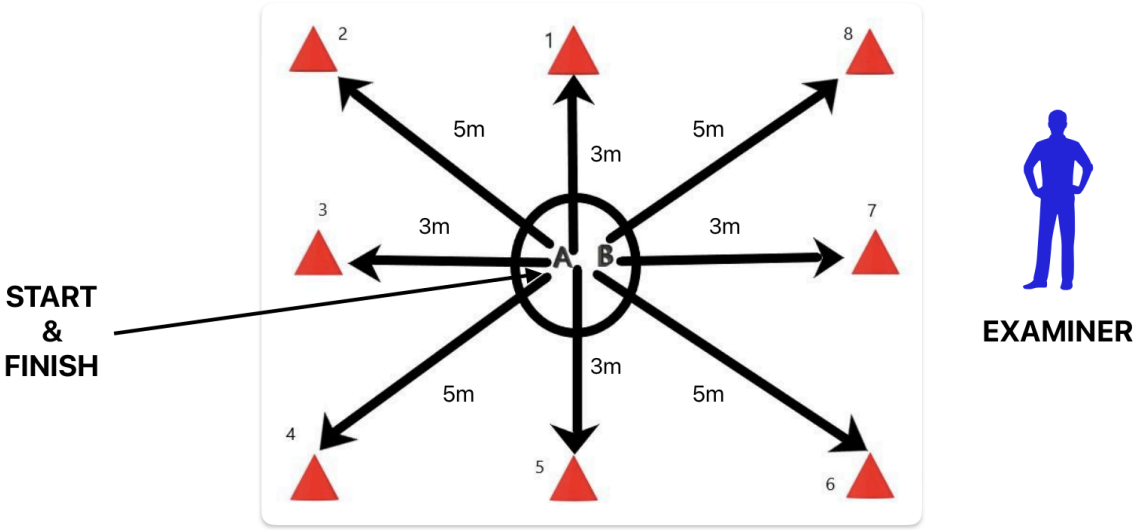
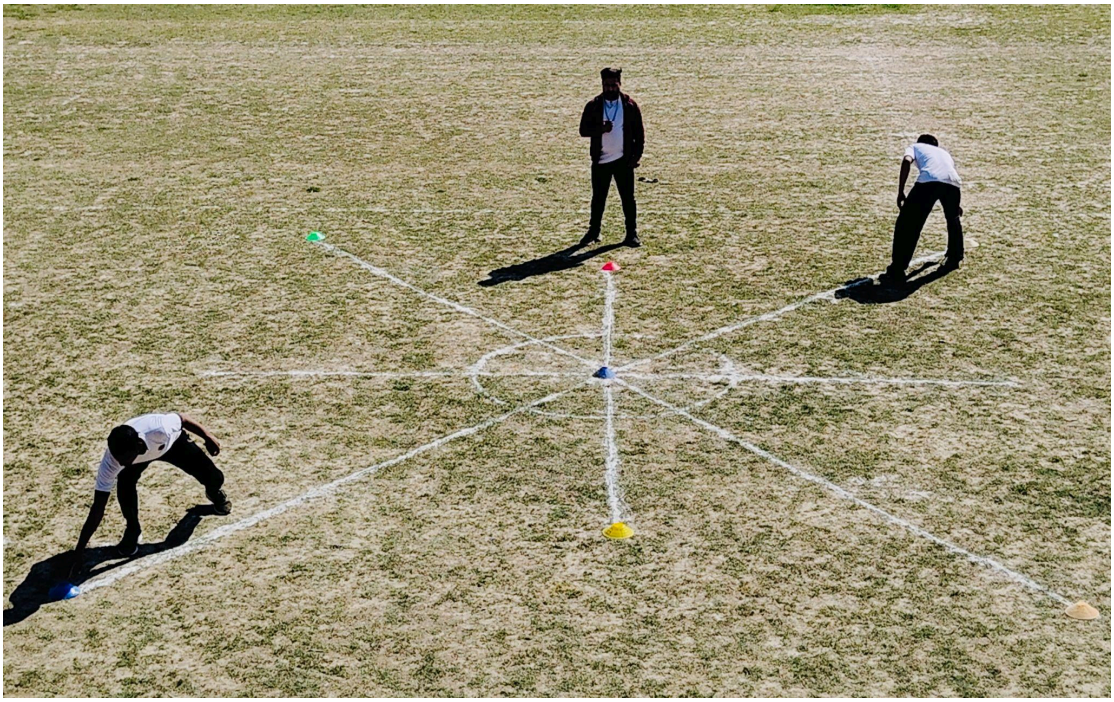


Figure 3Aa

Subjects Performing Recreational Agility Test



Procedure: Two subjects will start running from the center of the circle in opposite directions i.e one subject will run from point A to the cone 1 and the second subject will run from point B to cone 5. Then subjects will pick cones from that point and will place them on point A and B. Then again subjects will run from point A and B towards cones 2 and 6 respectively. From there subjects will pick the cones and place them at point A and B. Similarly the first subject will run again towards point 3 & 4. And the second subject will run towards point 7 & 8.

Scoring: The minimum time of collecting all four cones will be noted for both the players. The player with the minimum time will be considered as the winner. The points will be given on the basis of developed norms which are mentioned in the table 4.12.

Recreational Hand Eye Coordination Test

Objective: To assess the coordination component through recreational activity

Equipment Required: measuring tape, stopwatch, cosco balls

Marking Area Dimension: Mark 5 boxes of 0.5m x 0.5m on opposite sides 2 meters apart.

Figure 3B

Marking Area Dimension of Recreational Hand Eye Coordination Test

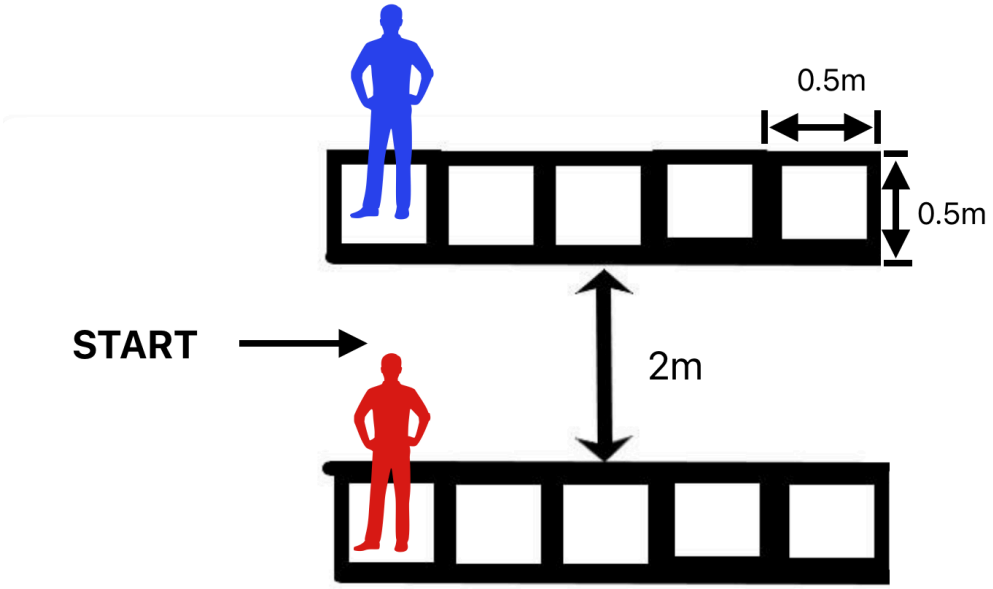


Figure 3Bb

Subjects Performing Recreational Hand Eye Coordination Test

Procedure: The subjects will stand in the first box opposite to each other with a ball in hand. On the command of the examiner, subjects will move towards the left box and then will pass the ball to each other simultaneously and again move to the second box and will pass the ball to each other again. The same movement will continue till 4th box and then the subjects will continue towards the opposite side with the same movement. The main task is to pass and catch the ball simultaneously after moving to different boxes on the command of the examiner.

Scoring: The number of successful catches in one minute for both the subjects will be calculated. The subject having maximum successful catches will be considered as the winner. The points will be given on the basis of developed norms which are mentioned in the table 4.13.

Recreational Upper Body Strength Test

Objective: To assess the strength component through recreational activity

Marking Area Dimension: measuring tape, markers, stopwatch, balls.

Test Area Setup: Two markers are placed 90 cm. apart on opposite sides. From the center point two markers are placed 20 cm. above.

Figure 3C

Marking Area Dimension of Recreational Upper Body Strength Test

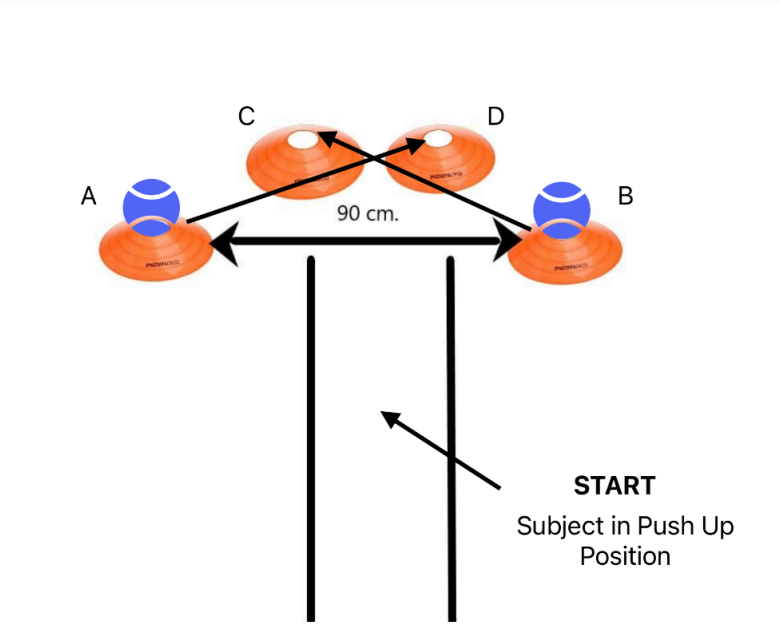


Figure 3Cc

Subjects Performing Recreational Upper Body Strength Test

Procedure: The subject will stay in full arm plank position in the center of 90 cm apart markers. Two balls are placed on top of those markers A & B. The subject needs to displace the ball from A to D and then from B to C with alternate hands while staying in plank position. Then the subject will again displace the ball from D to A and C to B continuously for 1 minute.

Scoring: The number of times the subject will successfully displace the ball in 1 minute will be the score of the subject. The subject with the maximum number of ball displaces will be considered as the winner. The points will be given on the basis of developed norms which are mentioned in the table 4.14.

Recreational Abdominal Strength Test

Objective: To assess the strength component through recreational activity.

Equipment Required: measuring tape, stopwatch, ball, and vertical wall.

Marking Area Dimension: A line is marked 1 meter from the plain vertical wall.

Figure 3D

Marking Area Dimension of Recreational Abdominal Strength Test

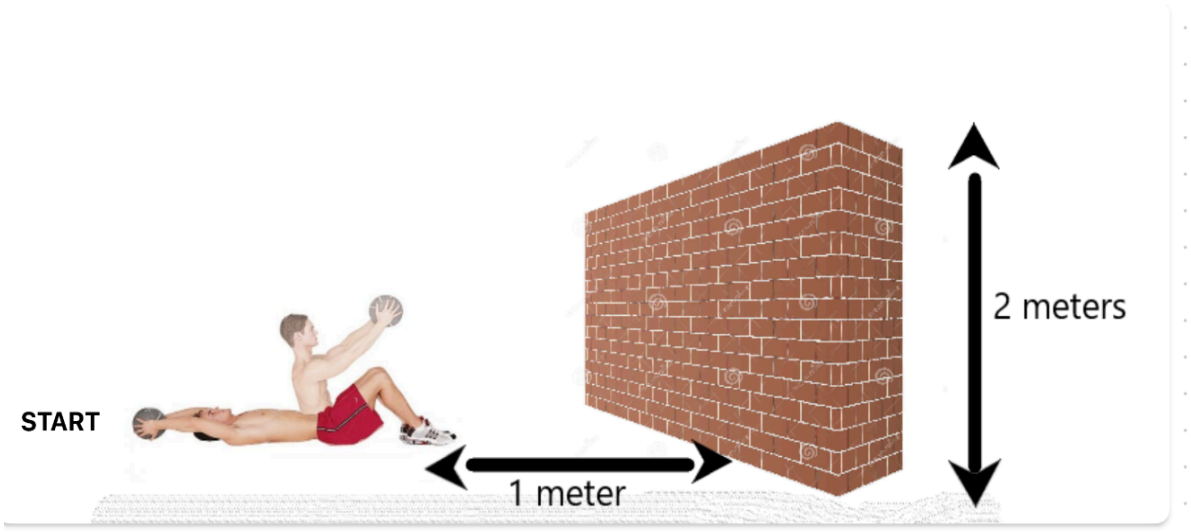


Figure 3Dd

Subjects Performing Recreational Upper Body Strength Test

Procedure: The subject will lay down in a sit up position with legs folded before 1 meter apart line from the wall. The subject will have a ball in his hands and he will be required to do a full abdominal sit up until his back is between 60 to 90 degrees from the ground. Then he will throw the ball on the wall with height 2 meters and will catch the rebound ball and go back to his initial sit up position. Then he will repeat the same activity continuously for 1 minute.

Scoring: The number of successful sit ups with catching the rebound ball in 1 minute will be the score of the subject. The subject with the maximum number of successful catches will be considered the winner. The points will be given on the basis of developed norms which are mentioned in the table 4.15.

Recreational Speed Test

Objective: To assess the speed component through recreational activity

Equipment Required: measuring tape, stopwatch, soft balls and marking white powder.

Marking Area Dimension: Two lines are marked with length of 30 meters apart on the ground and two lines with 10 meters apart width.

Figure 3E

Marking Area Dimension of Recreational Speed Test

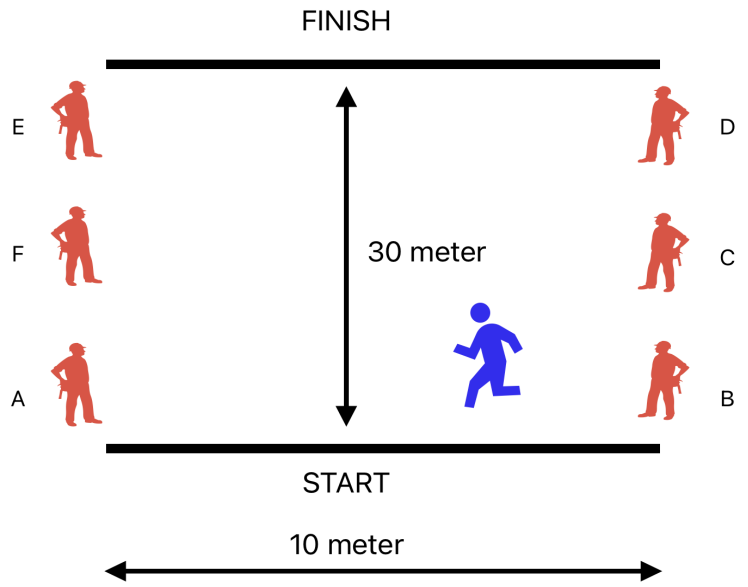


Figure 3Ee

Subjects Performing Recreational Speed Test

Procedure: The subject will stand behind the starting line and wait for the examiner's signal. Six assistants will be positioned along the sidelines—three on the left and three on the right.

- Assistants A and B will be 5 meters from the start line.
- Assistants C and F will be 15 meters from the start line.
- Assistants D and E will be 25 meters from the start line.

Assistants A and D will each hold a tennis ball. When the examiner gives the signal, the participant will run as fast as possible toward the other end of the 30-meter line. At the same time:

- Assistant A will throw the ball to B, who will then pass it to C. C will attempt to hit the running participant with the ball.
- Also the assistant D will throw the ball to E, who will then pass it to F. F will also try to hit the running participant with the ball.

Scoring: The minimum time taken by the subject will be the score. If one ball hits the running subject 0.2 second will be added to the total time and if two balls hit the running subject 0.4 second will be added to the total time. The subject with less time will be considered the winner. The points will be given on the basis of developed norms which are mentioned in the table 4.16.

3.6 Establishment of Validity, Reliability and Objectivity of the Test Items

3.6.1 Reliability of the Recreational Tests

To compute the reliability of the test items, the test and retest method was used. 120 subjects were tested on two separate days, with a one-day break in between. The tests were carried out by the researcher himself on both days. The Pearson product moment correlation coefficient method was used to calculate the test-retest reliability coefficient.

3.6.2 Objectivity of the Recreational Tests

The newly constructed test items were performed by two different testers on the same subjects for establishing objectivity of the test. The two sets of scores were correlated using the Pearson product Moment correlation coefficient method.

3.6.3 Validity of the Recreational Tests

Face validity was established for the test items chosen to serve as the criterion for measuring school children's physical fitness. All recreational fitness tests were chosen based on the reports and recommendations of various officials and experts, as well as information gleaned from available literature and their face values. The criterion validity was also established by correlating the scores of newly developed recreational physical fitness tests with the already standardized physical fitness tests.

Following were the standardized physical fitness tests which were used for the establishment of criterion validity:

Shuttle Run Test

Aim: The objective of the Shuttle run test is to measure the agility of the participant

Required Equipment: Measuring tape, marking tape/chalk, stopwatch, two blocks of wood (2"x2"x4")are required equipment for this test.

Testing Procedure: There will be two wooden blocks positioned behind one of the two parallel lines that have been established on the ground ten meters away from one another. Beginning from behind the opposite line, participants will be instructed to begin. Upon receiving the signal,

the timer will begin recording. The participant will then run towards the blocks, take one, run back to the starting line, place the block behind the line, run back, pick up the second block, and carry it across the starting line. As soon as he or she crosses the starting line, the timer will stop and record the time.

Scoring Procedure: Every participant is permitted two trials, separated by a short time of rest and relaxation. The best time out of the two trials is recorded as the test's score.

Alternate Hand Wall Toss Test

Aim: The objective of the test is to measure hand-eye coordination

Required Equipment: Marking tape, tennis ball or baseball, smooth and solid wall, stopwatch

Testing Procedure: At a certain distance from the wall—for example, two meters or three feet—a mark is created. The person is standing behind the line, facing the wall. One hand throws the ball underarm against the wall while the other hand tries to catch it. The first hand then catches the ball after it has been thrown back into the wall. Run the test for thirty seconds, then note how many catches subjects were able to make.

Scoring Procedure: The best score is recorded after three trials are conducted.

Push Ups Test

Aim: The objective of the test is to measure upper body strength and endurance

Required Equipment: Flat clean cushioned surface/Gym mat

Testing Procedure: A normal push-up begins with both feet spread out, the arms extended and at an equal angle to the body, the legs and torso extended in a line that is straight, and the palms and toes touching the floor. The individual maintains a straight back and legs while lowering their body to a predetermined point, touching something else, or bending their elbows to a

90-degree angle. Following that, they raise their arms once more to the starting position. This exercise is continued until they run out of energy or are unable to perform the action in time.

Scoring Procedure: The number of correctly completed pushups will be the score of the test.

Bent Knee Sit up

Aim: The objective of the test is to measure abdominal strength and endurance

Required Equipment: floor mat or yoga mat, an assistant

Testing Procedure: The participant has to lie on their back with their feet flat on the ground and their knees bent. It is recommended that heels and buttocks be no more than 12 inches apart. The knees should not be at a 90-degree angle. The person will place a straight-elbowed hand on the back of the neck. A partner will hold onto the feet to keep them from falling off the surface. After bringing their head and elbows forward to touch their knees, the person will take a step back and resume their original position. The entire exercise described above counts as one sit-up, and it should be done for the full 60 seconds.

Scoring Procedure: The number of correctly completed sit ups will be the score of the test.

50 Meter Dash

Aim: The objective of the test is to determine acceleration and speed

Required Equipment: Measuring tape or marked track, stopwatch, cone markers

Testing Procedure: Participants are required to time a single sprint of no more than 50 meters during the exam. It's crucial to warm up completely and practice starts and accelerations. Keep your hands off the ground and remain still as you take one step at a time. The front foot needs to be behind the line to begin. "Set" is said by the starter when the contestant is ready and motionless, followed by "Go." The tester could offer advice on how to speed up in addition to urging the participant to avoid slowing down before reaching the finish line.

Scoring Procedure: The best time is noted to the closest two decimal places after two trials are permitted.

3.7 Statistical Procedure

The calculations included descriptive statistics such as the mean, median, and standard deviation. The test retest scores obtained by the researcher on the subjects were correlated using pearson product moment correlation coefficient during the data analysis for the establishment of reliability. In order to establish objectivity, the two sets of scores collected by the two testers from the same subjects were correlated using the Pearson product moment correlation coefficient. In order to establish criterion validity, the scores of newly constructed recreational physical fitness tests were correlated with the standardized physical fitness tests using the Pearson product moment correlation coefficient. The percentile scale and the sigma scale were used to develop norms. The level of significance was set at 0.05.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the analysis of data, the findings, and the discussion based on the calculations and interpretations made by the research scholar to achieve the objectives of this study. The primary aim of this research was to develop and validate recreational physical fitness tests. Additionally, the study aimed to establish percentile norms for the constructed tests.

To achieve the objectives of the study, the researcher proposed five recreational physical fitness tests after reviewing published literature, conducting reviews, and consulting with experts. After collecting data in a step-by-step manner, it was processed through a series of statistical analyses. Descriptive statistics, including the mean, median, and standard deviation, were calculated. Skewness and kurtosis were determined using MS Excel to assess the normality of the scores. Norms were created using the percentile scale and sigma scale. The resulting norms for the five selected test items suggest that the score distributions for almost all items fall within the normal range of a probability curve. Raw data was subsequently converted into standard scores for combining or comparing scores.

The tables below present the statistical findings and analyses from all the methods used in this study.

4.1 Descriptive Analysis of Various Components of Recreational Physical Fitness Tests

Table 4.1

Descriptive Analysis of Various Components of Recreational Physical Fitness Tests

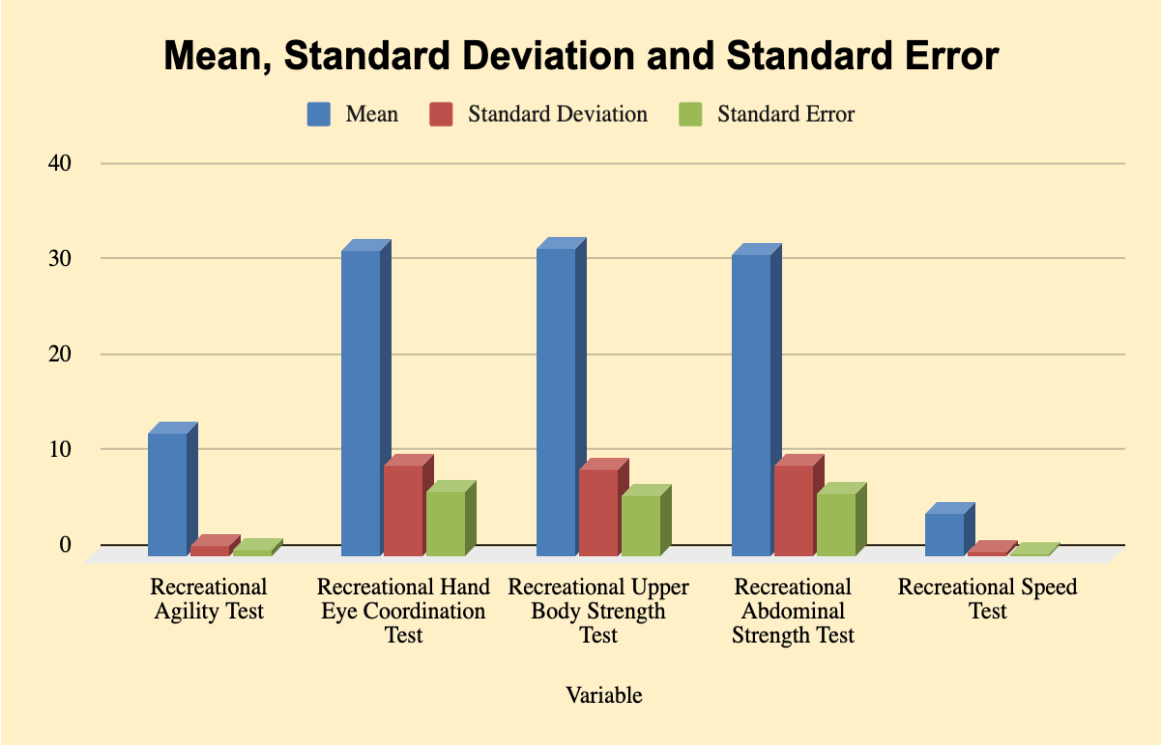
Variable	N	Mean	Minimum	Maximum	Range	Standard Deviation	Standard Error
Recreational Agility Test	1122	13.03	11.04	14.99	3.95	1.17	0.82
Recreational Hand Eye Coordination Test	1122	32.04	16	48	32	9.59	6.78
Recreational Upper Body Strength Test	1122	32.21	16	50	34	9.19	6.50
Recreational Abdominal Strength Test	1122	31.69	14	48	34	9.49	6.71
Recreational Speed Test	1122	4.49	3.51	5.48	1.97	0.55	0.39

Table 4.1 presents the descriptive analysis of the various components of recreational physical fitness tests. The mean scores of 1122 samples for recreational agility test, recreational hand eye coordination test, recreational upper body strength test, recreational abdominal strength test and recreational speed test came out to be 13.03, 32.04, 32.21, 31.69 and 4.49 respectively. The minimum values of recreational agility test, recreational hand eye coordination test, recreational upper body strength test, recreational abdominal strength test and recreational speed test came out to be 11.04, 16, 16, 14 and 3.51 respectively. Further, the maximum values of recreational agility test, recreational hand eye coordination test, recreational upper body strength test, recreational abdominal strength test and recreational speed test came out to be 14.99, 48, 50, 48

and 5.48 respectively. Further, the standard deviation values of recreational agility test, recreational hand eye coordination test, recreational upper body strength test, recreational abdominal strength test and recreational speed test came out to be 1.17, 9.59, 9.19, 9.49 and 0.55 respectively.

Figure 4A

Graphical Representation of Mean, Standard Deviation and Standard Error of Various Components of Recreational Physical Fitness Tests



4.2 Establishment of Reliability of Various Components of Recreational Physical Fitness Tests

The reliability of the various recreational physical fitness tests were determined using the test-retest method. To achieve this, all the tests were administered on two consecutive days under

similar conditions by the same researcher to a group of 122 high school boys. Pearson product moment correlation coefficient was used to analyse the test-retest relationship of various physical fitness tests. To evaluate the reliability coefficient, the criteria established by Kirkendall et al. (1987) were followed, as detailed in Table 4.2.

Table 4.2

Kirkendall et al., (1987) Criterion of Reliability

Reliability Coefficient Value	Rating
0.00 to 0.59	Unacceptable
0.60 to 0.79	Average
0.80 to 0.89	High
0.90 to 1.00	Excellent

Table 4.3

Test-Retest Reliability Coefficient of Various Components of Recreational Physical Fitness Tests

Test-Retest Score	Correlation Coefficient
Recreational Agility Test	0.963
Recreational Hand Eye Coordination Test	0.912
Recreational Upper Body Strength Test	0.946
Recreational Abdominal Strength Test	0.911
Recreational Speed Test	0.853

Table 4.3 shows that the correlation coefficient for the test-retest of the recreational agility test was extremely significant, with an r value of 0.963. The table also revealed that the correlation coefficient for the test-retest of the recreational hand-eye coordination test was extremely significant, with an r value of 0.912. Also, the table showed the correlation coefficient for the test-retest of the recreational upper body strength test was extremely significant, with an r value of 0.946. Further, the table showed that the correlation coefficient for the test-retest of the recreational abdominal strength test was extremely significant, with an r value of 0.911. Further, the table showed that the correlation coefficient for the test-retest of the recreational speed test was significant, with an r value of 0.853. This illustrates that the reliability of recreational agility test, recreational hand-eye coordination test, recreational upper body strength test, recreational abdominal strength tests, and recreational speed test is well established.

4.3 Establishment of Objectivity of Various Components of Recreational Physical Fitness Tests

To establish the objectivity of the various recreational physical fitness tests, two different testers (i.e researcher and physical education teacher) administered the tests on the same subjects. Then

the collected data from both the testers was correlated using Pearson product moment correlation coefficient to establish the objectivity of the various tests.

Table 4.4

Objectivity Correlation Coefficient of Various Components of Recreational Physical Fitness Tests

Variable Score	Correlation Coefficient
Recreational Agility Test	0.902
Recreational Hand Eye Coordination Test	0.949
Recreational Upper Body Strength Test	0.909
Recreational Abdominal Strength Test	0.931
Recreational Speed Test	0.932

Table 4.4 highlights that the objectivity correlation coefficient for the recreational agility test was highly significant, with an r value of 0.902. It also indicated that the recreational hand-eye coordination test had a significant correlation coefficient of 0.949. Additionally, the table showed a strong correlation for the recreational upper body strength test, with an r value of 0.909. The recreational abdominal strength test also demonstrated a significant correlation coefficient of 0.931. Moreover, the table revealed that the recreational speed test had a significant correlation coefficient of 0.932. These findings confirm the well-established objectivity of the recreational agility, hand-eye coordination, upper body strength, abdominal strength, and speed tests.

4.4 Establishment of Criterion Validity of Various Components of Recreational Physical Fitness Tests

To establish the criterion related validity, the scores of various newly constructed tests were correlated with the score of standardized tests.

Table 4.5

Correlation Coefficient of Various Components of Recreational Physical Fitness Tests with the Standardized Tests

Newly Constructed Tests	Standardized Tests	Correlation Coefficient
Recreational Agility Test	Shuttle run	0.828
Recreational Hand Eye Coordination Test	Alternate Hand Wall Toss Test	0.856
Recreational Upper Body Strength Test	Push Ups	0.855
Recreational Abdominal Strength Test	Bent Knee Sit up	0.943
Recreational Speed Test	50 Meter Dash	0.914

Table 4.5 shows that the correlation coefficient for the newly constructed recreational agility with the standardized agility test was 0.828, which was highly significant. It also revealed that the newly constructed recreational hand-eye coordination test had a significant correlation coefficient of 0.856 with the standardized hand eye coordination test. The table also indicated a good association for the newly constructed recreational upper body strength test and standardized upper body strength test, with a r value of 0.855. The newly constructed recreational abdominal strength test also showed a significant correlation with standardized abdominal strength having a

value of 0.943. The table also showed that the newly constructed recreational speed test and standardized speed test had a significant correlation coefficient of 0.914. These findings support the well established criterion validity of recreational agility, hand-eye coordination, upper body strength, abdominal strength, and speed tests.

4.5 Development of Norms for Various Components of Recreational Physical Fitness Tests

In order to provide meaningful assessment of performance, norms for the various recreational physical fitness tests were developed. The percentile and six sigma scale were applied in the development of the norms. The normality of the data was assessed with the help of skewness and kurtosis. As a general guideline, a skewness and kurtosis value between −1 and +1 is considered excellent, while values between −2 and +2 are generally considered acceptable. Values beyond −2 and +2 are indicative of significant non-normality. (Hair et al., 2022, p. 66)

Table 4.6

Skewness and Kurtosis Analysis for Normality of Data

Newly Constructed Test	Skewness	Kurtosis
Recreational Agility Test	-0.0129	-1.2543
Recreational Hand Eye Coordination	-0.0278	-1.1865

Test		
Recreational Upper Body Strength Test	0.0055	-1.1312
Recreational Abdominal Strength Test	0.0574	-1.2213
Recreational Speed Test	0.0147	-1.1153

The above table 4.6 shows the values of skewness and kurtosis for analyzing the normality of the data. The values of skewness for all the newly constructed recreational physical fitness tests comes in between -1 to +1 and the values of kurtosis for all the newly constructed recreational physical fitness tests comes in between -2 to +2, which indicates the normality of the data.

Table 4.7

Percentile Norms for Recreational Agility Test

S.No.	Percentile	Score (seconds)
1	10	11.418
2	20	11.806

3	30	12.23
4	40	12.602
5	50	13.01
6	60	13.45
7	70	13.88
8	80	14.284
9	90	14.65
10	100	14.99

Table 4.7 presents the norms for recreational agility test on the basis of percentile scores. In this recreational agility test, the subjects were required to complete the test in the minimum possible time. Thus, the subjects completing the test in the minimum time will get the maximum points. If a subject completes the test in 11.418 seconds or less, then he will get 100 points, if he completes the test in 13.01 seconds, then he will get 50 points and if the subject completes the test in more than 14.99 seconds, then he will get 0 points.

Table 4.8

Percentile Norms of Recreational Hand Eye Coordination Test

S.No.	Percentile	Score (number)
1	10	19
2	20	22

3	30	26
4	40	29
5	50	32
6	60	35
7	70	39
8	80	42
9	90	45
10	100	48

Table 4.8 presents the norms for recreational hand-eye coordination test on the basis of percentile scores. In this recreational hand-eye coordination test, the subjects were required to take the maximum number of catches. Thus, the subjects having more successful catches will get the maximum points. The subject who takes 48 or more successful catches will get 100 points; if he takes 32 successful catches, then he will get 50 points; and if the subject takes 19 successful catches, then he will get 10 points.

Table 4.9

Percentile Norms of Recreational Upper Body Strength Test

S.No.	Percentile	Score (number)
1	10	20

2	20	23
3	30	26
4	40	29
5	50	32
6	60	35
7	70	38
8	80	41
9	90	45
19	100	50

Table 4.9 presents the norms for recreational upper body strength test on the basis of percentile scores. In this recreational upper body strength test, the subjects were required to displace the ball for a maximum number of times. Thus, the subjects having more ball displace will get the maximum points. The subject who displaces the ball for 48 or more times will get 100 points; if he displaces the ball for 32 times, then he will get 50 points; and if the subject displaces the ball for 20 times, then he will get 10 points.

Table 4.10

Percentile Norms of Recreational Abdominal Strength Test

S.No.	Percentile	Score (number)
1	10	19

2	20	22
3	30	25
4	40	28
5	50	32
6	60	35
7	70	38
8	80	42
9	90	45
10	100	48

Table 4.10 presents the norms for recreational abdominal strength test on the basis of percentile scores. In this recreational abdominal strength test, the subjects were required to do a maximum number of sit ups with successful catches. Thus, the subjects having more successful sit ups with catches will get the maximum points. The subject who will do 48 or more successful sit ups with catches will get 100 points; if he will do 32 successful sit ups with catches, then he will get 50 points; and if the subject do 19 successful sit ups with catches, then he will get 10 points.

Table 4.11

Percentile Norms of Recreational Speed Test

S.No.	Percentile	Score (seconds)
1	10	3.728

2	20	3.93
3	30	4.12
4	40	4.29
5	50	4.5
6	60	4.67
7	70	4.85
8	80	5.034
9	90	5.27
10	100	5.48

Table 4.11 presents the norms for recreational speed test on the basis of percentile scores. In this recreational speed test, the subjects were required to complete the test in the minimum possible time. Thus, the subjects completing the test in the minimum time will get the maximum points. If a subject completes the test in 3.738 seconds or less, then he will get 100 points, if he completes the test in 4.50 seconds, then he will get 50 points and if the subject completes the test in more than 5.48 seconds, then he will get 0 points.

4.6 Formulation of a Grading Scale for Various Recreational Physical Fitness Tests

A grading scale was created in order to provide a more precise and comprehensive assessment of physical fitness. Grading scales are more suitable for use in teaching and research applications because they offer improved criteria for judging performance levels. Six Sigma scale standards were used to build the grading scale, which took three sigma above and below the mean for different grading categories into consideration. More specifically, grading scales based on Six Sigma standards were developed for all five newly constructed recreational physical fitness tests.

Table 4.12

Grading Norms for Recreational Agility Test

Grade	Alphabetical Grade	Score (seconds)
Excellent	A	10.69 and Less
Good	B	10.70 to 11.85
Satisfactory	C	11.86 to 13.02
Average	D	13.03 to 14.18
Poor	E	14.19 to 15.35
Very Poor	F	15.36 and More

The table 4.12 above presents the grading norms for recreational agility test. The score 10.62 and less in seconds was classified as an excellent, score between 10.70 and 11.85 is classified as good, score between 11.86 and 13.02 was classified as satisfactory, score between 13.03 and 14.18 was classified as average, score between 14.19 and 15.35 was classified as poor and the score of 15.36 and more was considered as very poor.

Table 4.13

Grading Norms for Recreational Hand Eye Coordination Test

Grade	Alphabetical Grade	Score (number)
Excellent	A	51 and More
Good	B	50 to 41
Satisfactory	C	40 to 32
Average	D	31 to 22
Poor	E	21 to 12
Very Poor	F	11 and Less

The table 4.13 above presents the grading norms for recreational hand eye coordination test. The score 51 and more was classified as excellent, the score between 50 and 41 is classified as good, score between 40 and 32 was classified as satisfactory, score between 31 and 22 was classified as average, score between 21 and 12 was classified as poor and the score of 11 and less was considered as very poor.

Table 4.14

Grading Norms for Recreational Upper Body Strength Test

Grade	Alphabetical Grade	Score (number)
Excellent	A	50 and More
Good	B	49 to 41

Satisfactory	C	40 to 32
Average	D	31 to 22
Poor	E	21 to 13
Very Poor	F	12 and Less

The table 4.14 above presents the grading norms for recreational upper body strength test. The score 50 and more was classified as excellent, the score between 49 and 41 was classified as good, score between 40 and 32 was classified as satisfactory, score between 31 and 22 was classified as average, score between 21 and 12 was classified as poor and the score of 12 and less was considered as very poor.

Table 4.15

Grading Norms for Recreational Abdominal Strength Test

Grade	Alphabetical Grade	Score (number)
Excellent	A	50 and More

Good	B	49 to 41
Satisfactory	C	40 to 31
Average	D	30 to 22
Poor	E	21 to 12
Very Poor	F	11 and Less

The table 4.15 above presents the grading norms for recreational abdominal test. The score 50 and more was classified as excellent, the score between 49 and 41 was classified as good, score between 40 and 31 was classified as satisfactory, score between 30 and 22 was classified as average, score between 21 and 12 was classified as poor and the score of 11 and less was considered as very poor.

Table 4.16

Grading Norms for Recreational Speed Test

Grade	Alphabetical Grade	Score (seconds)
Excellent	A	3.38 and Less

Good	B	3.39 to 3.93
Satisfactory	C	3.94 to 4.48
Average	D	4.49 to 5.04
Poor	E	5.05 to 5.59
Very Poor	F	5.60 and More

The table 4.16 above presents the grading norms for recreational speed test. The score 3.38 and less in seconds was classified as an excellent, score between 3.39 and 3.93 was classified as good, score between 3.94 and 4.48 was classified as satisfactory, score between 4.49 and 5.04 was classified as average, score between 5.05 and 5.59 was classified as poor and the score of 5.60 and more was considered as very poor.

4.7 Discussion on Findings

This research conducted on construction and standardization of recreational physical fitness tests provides significant contributions to the field of physical fitness assessment. By establishing standardized norms, this study aims to offer reliable benchmarks that can be widely adopted for evaluating physical fitness levels of high school students. In this study, the researcher constructed five recreational tests on different physical fitness components. For all the newly constructed recreational physical fitness tests, reliability, objectivity and validity was established. Also the norms were developed for all the newly constructed tests using percentile and sigma scales. The discussion on findings of different recreational physical fitness tests was mentioned below:

4.7.1 Discussion on Results of Recreational Agility Test

The statistical findings for the recreational agility test presented a reliability coefficient of 0.963, an objectivity correlation of 0.912, and a criterion validity correlation coefficient of 0.828. Agility is commonly defined as the ability to rapidly change the position of the entire body in space with speed and accuracy which includes elements such as quickness, coordination, balance, sudden stops, starts, and changes in direction (Schmidt and Wrisberg, 2008). The newly constructed recreational agility test involves the subjects running from center to different points at different directions and coming back while picking up the cone and placing it at the starting point. This test evaluates the subject's ability to quickly change directions, pick up objects, and return to the starting point with speed, balance and coordination. If compared with the standardized AAPHER agility test which focuses on straight-line speed and the ability to quickly change direction at the end of each 30-foot segment. The newly constructed agility test offers a comprehensive evaluation of agility compared to the AAHPER agility test by incorporating multi-directional movements and object handling. Also by incorporating elements such as two participants to perform simultaneously, picking up and placing cones, the test adds a layer of complexity and fun, making it more engaging and recreational. This setup encourages social interaction, cooperation, and healthy competition, which are key aspects of recreational activities as mentioned by McLean and Hurd (2011). This test aligns well with the broader definition of agility defined by Schmidt and Wrisberg (2008) as the ability to rapidly change body position in space with speed and accuracy. It tests not only speed and direction change but also coordination and spatial awareness through the requirement to pick up and place cones. The newly constructed recreational agility test aligns with established methodologies by incorporating elements of speed, directional changes, and cognitive components. Studies by Sheppard and Young (2006), Miller et al. (2006), Pauole et al. (2000), and Hachana et al. (2014) confirm agility as a crucial component of physical fitness, measured effectively through tests involving rapid direction changes and speed. The new test builds on these principles, adding interactive and dynamic elements to provide a comprehensive assessment of agility in a recreational setting.

4.7.2 Discussion on Results of Recreational Hand Eye Coordination Test

The recreational hand-eye coordination test shows a reliability coefficient of 0.912, an objectivity correlation of 0.949, and a criterion validity correlation coefficient of 0.856.

Hand-eye coordination refers to the ability to synchronize visual input with hand movements to perform tasks efficiently and accurately (Loran and Griffiths, 2001). The newly constructed hand-eye coordination test involves two subjects standing opposite to each other while moving and passing the ball to each other simultaneously. This test evaluates the subject's ability to coordinate their movements with visual cues and accurately pass and catch the ball while moving through different positions. If compared with the standardized alternate hand wall toss test which focuses on the subject's ability to coordinate hand movements with visual tracking and precise timing in a repetitive motion. The newly constructed hand-eye coordination test provides a comprehensive assessment of hand-eye coordination by incorporating elements of movement, teamwork, and multi-tasking. Also the newly constructed hand-eye coordination test effectively integrates recreational elements, making the testing process enjoyable and engaging. The requirement for participants to pass and catch the ball simultaneously introduces a playful challenge. This cooperative task encourages teamwork and coordination, making the test more interactive and enjoyable. By incorporating dynamic movement, teamwork, variability, and a game-like structure, the test enhances participant's motivation, enjoyment, and overall experience. This test aligns well with the broader definition of hand-eye coordination as stated by Loran and Griffiths (2001), as it requires precise timing, spatial awareness, and motor control in a dynamic environment. It simulates real-world scenarios where individuals must perform coordinated tasks while moving, making it particularly relevant for sports and activities that require agility and coordination. The newly constructed recreational hand-eye coordination test aligns with established methodologies by incorporating dynamic ball-handling tasks and movement coordination. Studies by Williams et al. (1999), Abernethy et al. (2001), Afonso et al. (2012), and Zwicker et al. (2009) confirm hand-eye coordination as a crucial component of physical fitness, measured effectively through tasks involving reaction time, object tracking, and dynamic movement. The new test builds on these principles, adding continuous lateral movement and coordinated ball passing to provide a thorough assessment of hand-eye coordination in a recreational setting

4.7.3 Discussion on Results of Recreational Upper Body Strength Test

The recreational upper body strength test has a reliability coefficient of 0.946, an objectivity correlation of 0.909, and a criterion validity correlation coefficient of 0.855. Upper body strength refers to the ability of the muscles in the upper body to exert force such as the chest, shoulders, arms, and back (Kraemer & Ratamess, 2004). The newly constructed upper body strength test involves subjects starting in a full arm plank position and then moving the ball from place to next place using both arms alternatively. This test evaluates the subject's upper body strength, endurance, and stability, as well as coordination while performing a dynamic task. If compared with the standardized AAPHER push up test which assesses the strength and endurance of the upper body muscles, primarily targeting the chest, shoulders, and triceps. The newly constructed recreational upper body strength test offers a comprehensive assessment of upper body strength, incorporating core stability and coordination. Also the newly constructed upper body strength test exemplifies a recreational activity through its dynamic engagement, fun challenge, variety in movement, and time-based competitiveness. These elements make the test enjoyable and beneficial, aligning with the broader definition of recreational activities that provide enjoyment, engagement, and comprehensive physical exercise (Leisure and Recreation Association, 2020). This test aligns well with the broader definition of upper body strength given by Kraemer & Ratamess (2004), as it evaluates the ability to exert force while maintaining stability and performing coordinated movements. Thus the newly constructed test provides a more holistic assessment by incorporating dynamic movements and core stability, making it suitable for functional fitness evaluations. The newly constructed recreational upper body strength test aligns with established methodologies by incorporating elements of endurance, strength, and dynamic movement. Studies by Faigenbaum et al. (1996), Vispute et al. (2012), Kenney et al. (2012), and Harman et al. (1998) confirm upper body strength as a crucial component of physical fitness, effectively measured through resistance exercises, plank positions, and dynamic movements. The new test builds on these principles, adding continuous plank holds and ball displacement to provide a comprehensive assessment of upper body strength in a recreational setting.

4.7.4 Discussion on Results of Recreational Abdominal Strength Test

The recreational abdominal strength test presents a reliability coefficient of 0.911, an objectivity correlation of 0.931, and a criterion validity correlation coefficient of 0.943. Abdominal strength

refers to the ability of the muscles in the abdominal region, including the rectus abdominis, obliques, and transverse abdominis, to generate force (McGill, 2007). The newly constructed abdominal strength test involves the subject lying in a sit-up position with legs folded performs a full abdominal sit-up until their back is at 70-90 degree angle from the ground while throwing the ball against the wall at a height of 2 meters and catches the rebound. This test evaluates the subject's abdominal strength, endurance, and coordination while incorporating dynamic movements and ball handling. If compared with the standardized AAPHER sit ups test which measures the strength and endurance of the abdominal muscles through repetitive trunk flexion. The newly constructed recreational abdominal strength test offers a comprehensive assessment of abdominal strength by incorporating dynamic movements and coordination. Also the combination of a sit-up with a ball throw and catch introduces a fun and challenging element. The inclusion of a ball throw and catch in addition to the sit-up adds variety to the exercise, preventing monotony and keeping participants mentally and physically engaged. Variety is a key feature of recreational activities, contributing to their appeal and effectiveness (Iso-Ahola, 1980). This test aligns well with the broader definition of abdominal strength given by McGill (2007) as it evaluates the ability to generate force while performing a coordinated, compound movement. The newly developed test gives a detailed evaluation by adding dynamic movements and coordination, making it appropriate for functional fitness assessments. The newly constructed recreational abdominal strength test aligns with established methodologies by incorporating elements of sit-up exercises and dynamic movements. Studies by Cowley et al. (2009), Kibler et al. (2006), Nesser et al. (2008), and Willardson (2007) confirm abdominal strength as a crucial component of physical fitness, measured effectively through sit-ups, planks, and dynamic core exercises. The new test builds on these principles, adding continuous sit-ups with ball throws to provide a comprehensive assessment of abdominal strength in a recreational setting.

4.7.5 Discussion on Results of Recreational Speed Test

The recreational speed test exhibits a reliability coefficient of 0.853, an objectivity correlation of 0.932, and a criterion validity correlation coefficient of 0.914. Speed is defined as the ability to move quickly across the ground or move limbs rapidly to grab or throw (Magill and Anderson, 2017). The newly constructed speed test involves the subjects to start running as fast as possible

towards the other end of a 30-meter track while the subjects on the sidelines attempt to hit the running subject with the ball as they run past. This test evaluates the subject's speed, reaction time, and ability to maintain speed while under potential distraction or interference. If compared with the AAPHER speed test which assesses the subject's straight-line running speed over a set distance, focusing purely on the time taken to cover the distance. The newly constructed recreational speed test offers a comprehensive assessment of speed by incorporating elements of reaction time, agility, and focus. Also the addition of other participants throwing balls to hit the running subject introduces a fun and challenging element. The newly designed speed test includes a recreation due to its dynamic engagement, enjoyable challenge, social connection, variety of movement, and time-based competitiveness. These elements make the test enjoyable and beneficial, aligning with the broader definition of recreational activities that provide enjoyment, engagement, and comprehensive physical exercise (Edginton et al., 2004; Kleiber et al., 2011). This test aligns well with the broader definition of speed given by authors like Magill and Anderson (2017) and Schmidt and Lee (2011), as it evaluates the ability to move quickly while responding to external stimuli. It simulates real-world scenarios where individuals must perform at high speed while being aware of potential obstacles or distractions, making it particularly relevant for sports and activities that require both speed and quick decision-making. The newly constructed recreational speed test aligns with established methodologies by incorporating elements of sprinting and agility. Studies by Barnes et al. (2013), Young et al. (2001), Chelly et al. (2010), and Gabbett (2002) confirm speed as a crucial component of physical fitness, measured effectively through sprint tests. The new test builds on these principles, adding the challenge of evading thrown balls to provide a more dynamic and recreational assessment of speed. This combination offers a comprehensive evaluation of speed in a setting that simulates real-world activities and sports.

To summarize, the overall findings showed that all of the newly developed recreational physical fitness tests were reliable and valid for boys aged 13 to 15. The grading scale norms developed are suitable and will effectively evaluate the physical fitness of high school boys.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Summary

Chapter 1 outlines the importance, objectives, and framework of a study focused on developing a recreational physical fitness test for school-going children aged 13-15 years. The significance of the study emphasizes that recreational physical activities improve overall well-being, including cardiovascular health, sleep quality, self-esteem, stamina, and stress reduction. The research aims to develop a standardized recreational fitness test that not only assesses physical fitness but also promotes recreational activities to foster a positive attitude toward physical exercise among children. The study is particularly significant because no standardized recreational fitness test exists in the present time. The statement of the problem highlights the need for fitness assessments tailored to the unique needs of children, as conventional fitness tests often fail to engage them effectively. The study's primary objective is to construct and standardize a recreational physical fitness test, along with developing fitness norms for the target age group.

Operational definitions clarify key terms such as construction, standardization, and recreational physical fitness tests. The study's scope is delimited to male students aged 13-15 from government high schools in Jammu, with a sample size of 1,100 students. The fitness components assessed include strength, agility, speed, endurance and coordination. The chapter also addresses the limitations of the study, including variations in socioeconomic backgrounds, lifestyles, and psychological states among the subjects, which could impact the results. Despite these limitations, the study aims to contribute valuable knowledge to the field of physical education by creating a standardized, engaging fitness test for school children.

Chapter 2 of literature review outlines and categorizes a comprehensive analysis of related studies pertinent to the development and assessment of physical fitness tests for school-going children. The literature is organized into several key areas: agility tests, coordinative ability tests, upper body strength tests, abdominal strength tests, and speed tests.

1. **Agility Tests:** This section reviews studies focused on various agility tests, including those designed for wheelchair tennis, soccer goalies, and volleyball players. Key findings demonstrate high reliability and validity across different agility tests, with a particular emphasis on reactive agility tests that measure both physical and cognitive aspects of agility.
2. **Coordinative Ability Tests:** The literature in this section explores how coordinative skills can be measured and improved, particularly in online learning environments and using specialized training methods like teaching games for understanding. The studies generally support the idea that these tests are effective in measuring and enhancing motor coordination in various settings.
3. **Upper Body Strength Tests:** This section would likely cover studies focused on the assessment and importance of upper body strength in physical fitness. It might include discussions on different methods to measure strength and the reliability of these tests.
4. **Abdominal Strength Tests:** Similar to the section on upper body strength, this part would examine tests designed to assess core strength, a key component of overall physical fitness. It reviewed studies that validate these tests and their role in predicting fitness levels.
5. **Speed Tests:** Literature in this area likely reviewed the studies on speed and physical fitness testing across different sports and age groups, emphasizing their validity, reliability, and application in performance assessment. These studies focused on the validity and reliability of various sprint and speed tests in sports like soccer, rugby, and handball. These studies underscore the importance of accurate and sport-specific testing methods for evaluating speed and agility, with applications in talent identification, performance evaluation, and training optimization.

The chapter concludes by summarizing the reviewed literature, emphasizing the importance of understanding previous work to inform future research efforts. The summary likely highlights the key findings from each section, noting the consistent reliability and validity of the tests reviewed. On the basis of these reviewed studies, the research gap was found which stated that in present time there is no recreational physical fitness test. This research gap became an initiative to develop and standardize the recreational physical fitness test for school going children. Following were the objectives framed for the conduct of present study:

1. To construct and standardize recreational physical fitness tests for school children aged 13-15 years.
2. To develop the norms of physical fitness for school children aged 13-15 years.

Chapter 3 of the research methodology provides a comprehensive overview of the procedures followed to develop and standardize a recreational physical fitness test for school boys. The chapter outlines the study design, including subject selection, test item identification, data collection, and statistical analysis. Subjects, boys aged 13-15, were selected through simple random sampling from government high schools in Jammu, with a final sample of 1100 students drawn from 23 schools for the standardization phase. Test items were meticulously chosen based on an extensive literature review and included components such as agility, abdominal strength, upper body strength, hand-eye coordination, and speed. The selection process involved reviewing various sources, including internet content, books, and test measurement literature. Data collection utilized tools like tennis balls, cone markers, measuring tapes, stopwatches, and marking powder, with the process divided into phases: an initial pilot study with 60 students, a larger pilot with 120 students, and the final standardization involving 1000 students. The validity and reliability of the tests were rigorously evaluated. Reliability was measured using the test-retest method, with scores obtained on two separate days, and objectivity was assessed by comparing scores from different testers. Criterion validity was established by correlating scores from the new tests with those from established fitness tests. Statistical analysis included descriptive statistics, Pearson correlation coefficients for reliability and validity, and norm development using percentile and sigma scales. The level of significance for all tests was set at 0.05, ensuring accurate results for the standardized recreational physical fitness test.

Chapter 4 detailed the analysis and interpretation of data related to the recreational physical fitness tests developed and standardized in the study. This chapter focuses on the data analysis, findings, and discussions to meet the study's objectives of validating these tests and establishing percentile norms. The chapter begins with a descriptive analysis of the five recreational fitness tests, summarizing mean scores, minimum and maximum values, and standard deviations for each test component. The tests assessed include agility, hand-eye coordination, upper body strength, abdominal strength, and speed. For instance, the mean scores for these tests were 13.03 seconds (agility), 32.04 (hand-eye coordination), 32.21 (upper body strength), 31.69 (abdominal

strength), and 4.49 seconds (speed), with standard deviations ranging from 0.55 to 9.59. These values provide a snapshot of performance distribution among the 1122 subjects.

Reliability

Reliability was assessed using the test-retest method. Tests were administered twice under similar conditions to a subset of 122 students, and Pearson correlation coefficients were calculated. The results showed high reliability for all tests, with correlation coefficients ranging from 0.853 to 0.963, indicating excellent consistency.

Objectivity

To ensure objectivity, two testers (the researcher and a physical education teacher) administered the tests to the same subjects. The resulting data showed high correlation coefficient. The recreational abdominal strength test requires participants to perform sit-ups while catching and throwing a ball, demonstrating a high level of reliability and strong criterion validity. This test's innovative approach combines abdominal strength with coordination, providing a comprehensive measure of core strength. The methodology is consistent with established definitions of abdominal strength and offers a practical assessment method that enhances the traditional sit-up test, making it suitable for recreational fitness evaluations.

The newly constructed speed test involves running 30 meters while being targeted by balls thrown by other participants. This test shows significant reliability and criterion validity confirming its effectiveness in measuring speed. The test's dynamic nature and real-time challenge effectively capture the concept of speed, as defined in fitness assessments. By incorporating elements of evasion and speed, this test provides a comprehensive measure of speed in a recreational way, offering a valuable tool for assessing this fitness component in various settings.ents (ranging from 0.902 to 0.949), confirming that the tests were consistently scored across different evaluators.

Criterion Validity

Criterion validity was determined by correlating the new tests with established standardized tests. The results revealed strong correlations, with values ranging from 0.828 to 0.943, demonstrating that the new tests effectively measure the same constructs as the standardized tests.

Development of Norms

Norms were developed using percentile and sigma scales. The data's normality was confirmed by skewness and kurtosis values within acceptable ranges. Percentile norms for each test were provided, allowing for performance assessment relative to peers. For example, in the agility test, scores below 11.418 seconds were classified as excellent, while those above 14.99 seconds were considered poor.

Grading Scale

A grading scale based on Six Sigma standards was created to offer detailed performance assessments. The scale categorized performance into six grades from 'Excellent' to 'Very Poor' for each test, providing a clear framework for interpreting scores. For instance, in the speed test, scores under 3.38 seconds were graded as excellent, while scores over 5.60 seconds were classified as very poor.

5.2 Conclusions

1. The newly constructed recreational agility test effectively measures agility by requiring participants to navigate a series of cones while performing tasks that involve rapid direction changes and object manipulation. The high reliability and significant criterion validity of the test suggest it is a robust tool for assessing agility in recreational contexts. The test's ability to evaluate agility through a series of dynamic movements aligns well with accepted definitions of agility, and its design mirrors effective methodologies found in existing agility tests. Thus, this test is a valuable addition to recreational physical fitness assessments.
2. The newly developed hand-eye coordination test assesses the ability of participants to pass and catch a ball while moving between boxes. This test shows a strong reliability and significant criterion validity indicating its effectiveness in measuring hand-eye coordination. The methodology aligns with established practices in assessing hand-eye coordination, similar to those found in the AAPHER test. The test's focus on simultaneous ball handling and movement effectively captures the essence of hand-eye coordination as defined in the literature, making it a reliable tool for recreational fitness evaluations.

3. The upper body strength test, which involves displacing balls while maintaining a plank position, demonstrates high reliability and significant criterion validity. This test's methodology, which emphasizes dynamic strength and endurance, aligns well with the accepted definitions of upper body strength. Compared to traditional tests like push-ups, this test provides a more dynamic and functional measure of upper body strength, making it a valuable addition to physical fitness assessments for recreational contexts.
4. The recreational abdominal strength test requires participants to perform sit-ups while catching and throwing a ball, demonstrating a high level of reliability and strong criterion validity. This test's innovative approach combines abdominal strength with coordination, providing a comprehensive measure of core strength. The methodology is consistent with established definitions of abdominal strength and offers a practical assessment method that enhances the traditional sit-up test, making it suitable for recreational fitness evaluations.

5. The newly constructed speed test involves running 30 meters while being targeted by balls thrown by other participants. This test shows significant reliability and criterion validity confirming its effectiveness in measuring speed. The test's dynamic nature and real-time challenge effectively capture the concept of speed, as defined in fitness assessments. By incorporating elements of evasion and speed, this test provides a comprehensive measure of speed in a recreational way, offering a valuable tool for assessing this fitness component in various settings.

5.3 Suggestions

1. As the present study was conducted on high school boys, it is suggested that a similar study may be conducted on high school girls.
2. As the present study was conducted on high school boys having age between 13 to 15, it is suggested that a similar study may be conducted on different age groups too.
3. As this study was conducted only on high school boys, it is suggested that a similar study may be conducted on primary, secondary and tertiary education students too.
4. As the present study was conducted on selected physical fitness components i.e agility, coordination, strength, endurance and speed, it is suggested that similar study may be

conducted on other components of physical fitness i.e flexibility, balance, reaction time and cardiovascular endurance too.

5. As this study was conducted on the subjects of jammu district only, it is suggested that a similar study may be conducted on different districts and states of India.
6. It is also suggested that a similar study may be conducted on the sports persons to assess their physical fitness too.
7. It is suggested to conduct a longitudinal study to assess the long-term effectiveness and reliability of the newly constructed tests over multiple years.
8. It is suggested to include a more diverse group of students, encompassing various socioeconomic backgrounds, geographic locations, and fitness levels to enhance the study's applicability.
9. It is suggested to include assessments of psychological factors such as motivation and stress, which can influence test performance and overall fitness levels.
10. As the present study had used only one standardized test to establish validity, it is suggested to validate the newly constructed tests against multiple standardized fitness tests to ensure consistency and reliability.

5.4 Application / Recommendation of the Research

1. Integration of the test into school PE curricula to assess and monitor the physical fitness levels of students, helping to tailor fitness programs to individual needs.
2. The test can be used to evaluate the fitness levels of young athletes, guiding coaches in developing training regimens that target specific areas for improvement.
3. The tests can be Implemented in community centers and recreational programs to encourage physical activity and assess the fitness levels of participants of various ages.
4. Employment of the tests in corporate wellness programs to assess employee’s fitness levels, helping to design effective health interventions and track progress over time.
5. Utilization of the tests in academic and clinical research to study the effects of various interventions on physical fitness and to establish normative data for different populations.
6. Incorporation of the tests into the selection and evaluation processes for school and amateur sports teams to identify individuals with superior fitness levels and potential.

7. Organizing the fitness challenges and competitions using the test to engage the community and promote healthy lifestyles through friendly competition.
8. The tests can be used in physical therapy and rehabilitation settings to assess baseline fitness levels and track improvements in patients recovering from injuries.
9. The tests can be implemented in youth development programs to promote physical fitness, teamwork, and healthy habits among young participants.
10. The tests can be adopted for use by personal trainers and fitness coaches to evaluate client's fitness levels, set goals, and track progress in a structured and measurable way.

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APPENDICES

Curriculum Vitae of the Experts

Dr. Amandeep Singh
Associate Professor and Head
NIS Diploma in Sports Coaching in Athletics
Punjab, 9463310537

Specialization : Sports Training, Sports Psychology, Athletics

Research Scholars : Guided : 6 Registered : 6 **Experience :** 14 Years 9 Months

Journals	Conference Papers	Books Chapters
84	12	0

Research Projects	Memberships	Honors/Awards
0	0	0

Positions Books Scholarly Achievements Conferences/Symposia/Workshops National/Inter. Fora Research Exposure Adminstrative Experience Research Experience Articles (Magazine/Newspapers)

FDP Details Other Info

Journals(Total Filled Till Now : 84)

Year	Title	Impact Factor	Peer Reviewed	Journal	Volume	Issue	Start Page	End Page	Scopus Indexed	UGC Indexed	Link

Name: **Dr. Vinita Bajpai Mishra**

Photo

Designation **Assistant Professor**
Department **Department of Sports Biomechanics**
Email: **vinitadivyansh@rediffmail.com**
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Qualifications: M.P.E., M.Phil., Ph.D

Research Interest: Swimming,Anthropometry, Kinesiology & Biomechanics and women related issues

Profile: Dr. Vinita Bajpai Mishra, a faculty under the department of sports biomechanics is in the profession of teaching for more than thirteen years.

Presently ,in charge swimming and also associated with teaching and coaching swimming for last twenty years.

Dr. vinita has been a meritorious student and was awarded M.P state merit scholarship, college merit scholarship (LNCPE), and was the topper in Master's in Philosophy with specialization in Kinesiology and Biomechanics.

Dr. Vinita has written books in the field of her specialization (Kinesiology, Biomechanics and Swimming).

She has also written several research papers which have been published in National and International journals. She has also participated and presented

research papers in International and National conferences and seminars in India and abroad.

- **List of Seminar/Conference/Workshop attended**

SEMINAR/CONFERENCE ATTENDED

International Conferences-

- Presented the paper entitled "*The Role of Traditional Games Sports and Plays in the Development of Human Being*" in the International Conference held at **Bangkok, Thailand**, February 4- 7, 2004.

- Presented paper entitled "*Effect of Yogic Practices on the Performance of Target Games Players*" in the International Conference organized by Kaivalyadhama Yoga Training Centre, Bhopal, January 7- 9, 2005.
- Presented paper entitled "*Indian Art, Yoga and Spiritualism*" in the International Congress organized by Alumni Association of LNIPE, Gwalior, February 12- 15, 2008.
- Presented paper entitled "*Effect of kapalbhati on hypertension*" in the International Congress organized by LNIPE, Gwalior, February 12- 15, 2008.
- Presented paper entitled Fighting anxiety with Progressive Relaxation Technique in International Conference, organized by 6th ASPAS at Taipei, **Taiwan**. November 2011.
- Presented paper entitled "The study of attitude of female students of different colleges of Jhansi towards Health Practices " in International Conference organized by IPS College, Gwalior, November 2011.
- Presented paper entitled "Comparative study of swimming performance of floaters and non floaters "in International Conference organized by Department of Physical Education, BHU, Varanasi January 2012

National Conferences/Seminars

- Presented Paper in All India Seminar organized by the Aryan's Institute of Education, Bhopal, May 21-22, 2002.
- Presented the paper entitled "***Exercise and ageing*** and acted as Co-chairperson in the **National Conference-cum Workshop** held at Punjab University, Chandigarh, February 22 - 23, 2003.
- Attended National Research Seminar sponsored by Higher Education Department of M.P. held at M.L.B. College, Bhopal, February 27- 28, 2003.
- Presented the paper entitled "***Drugs in Sports***" in the Seminar organized by Sports Time Bhopal, 2004.
- Presented paper entitled "Socio- Cultural Dimensions of ICT " in the **National Conference** organized by Academic Staff College of LNIPE, Gwalior, September 25- 26 , 2008.
- Presented paper entitled "Overcoming Fear – A Great Hindrance in Swimming" in the **National Convention in Physical Education** organized by LNUPE, Gwalior, January 13-15, 2011.
- Presented paper entitled " The study of attitude of students of B.U. towards health practices" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled " Social support for women in games and sports" " organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled "Effects of exercise on pregnancy – A review" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled Politics and Sports, in the National Seminar organized by Academic Staff College, L.N.U.P.E., Gwalior 11 &12 October 2011 .
- Presented paper entitled Antenatal Exercises- A Dilemma in National Conference on Exercise Physiology and Sport Sciences January 31 to February 2, 2013. Organized by Department of Exercise Physiology, at LNIPE, Gwalior.

National Conferences/Seminars

- Presented Paper in All India Seminar organized by the Aryan's Institute of Education, Bhopal, May 21-22, 2002.
- Presented the paper entitled "***Exercise and ageing*** and acted as Co-chairperson in the **National Conference-cum Workshop** held at Punjab University, Chandigarh, February 22 - 23, 2003.
- Attended National Research Seminar sponsored by Higher Education Department of M.P. held at M.L.B. College, Bhopal, February 27- 28, 2003.
- Presented the paper entitled "***Drugs in Sports***" in the Seminar organized by Sports Time Bhopal, 2004.
- Presented paper entitled "Socio- Cultural Dimensions of ICT " in the **National Conference** organized by Academic Staff College of LNIPE, Gwalior, September 25- 26 , 2008.
- Presented paper entitled "Overcoming Fear – A Great Hindrance in Swimming" in the **National Convention in Physical Education** organized by LNUPE, Gwalior, January 13-15, 2011.
- Presented paper entitled " The study of attitude of students of B.U. towards health practices" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled " Social support for women in games and sports" " organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled "Effects of exercise on pregnancy – A review" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled Politics and Sports, in the National Seminar organized by Academic Staff College, L.N.U.P.E., Gwalior 11 &12 October 2011 .
- Presented paper entitled Antenatal Exercises- A Dilemma in National Conference on Exercise Physiology and Sport Sciences January 31 to February 2, 2013. Organized by Department of Exercise Physiology, at LNIPE, Gwalior.

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- Presented the paper entitled "***Exercise and ageing*** and acted as Co-chairperson in the **National Conference-cum Workshop** held at Punjab University, Chandigarh, February 22 - 23, 2003.
- Attended National Research Seminar sponsored by Higher Education Department of M.P. held at M.L.B. College, Bhopal, February 27- 28, 2003.
- Presented the paper entitled "***Drugs in Sports***" in the Seminar organized by Sports Time Bhopal, 2004.
- Presented paper entitled "Socio- Cultural Dimensions of ICT " in the **National Conference** organized by Academic Staff College of LNIPE, Gwalior, September 25- 26 , 2008.
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- Presented paper entitled " The study of attitude of students of B.U. towards health practices" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled " Social support for women in games and sports" " organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled "Effects of exercise on pregnancy – A review" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
- Presented paper entitled Politics and Sports, in the National Seminar organized by Academic Staff College, L.N.U.P.E., Gwalior 11 &12 October 2011 .
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- Attended National Research Seminar sponsored by Higher Education Department of M.P. held at M.L.B. College, Bhopal, February 27- 28, 2003.
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- Presented paper entitled "Overcoming Fear – A Great Hindrance in Swimming" in the **National Convention in Physical Education** organized by LNUPE, Gwalior, January 13-15, 2011.
- Presented paper entitled " The study of attitude of students of B.U. towards health practices" organized by Government Meera Girls College, Udaipur, September 9-11 2011.
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- Presented paper entitled Politics and Sports, in the National Seminar organized by Academic Staff College, L.N.U.P.E., Gwalior 11 &12 October 2011 .
- Presented paper entitled Antenatal Exercises- A Dilemma in National Conference on Exercise Physiology and Sport Sciences January 31 to February 2, 2013. Organized by Department of Exercise Physiology, at LNIPE, Gwalior.

				education Vol-3, No.-1 July 2014		
8	Floatation and anthropometric variables of sinkers	yes	Nil	Sports Research (quarterly)	National	2321-6557
9	Effects of Kapalbhati on Hand steadiness and eye – hand- coordination	yes	nil	International Journal of Physical Education& sports sciences April 2014	International	2231-3745

10	An assessment of Mental Toughness of Intervarsity Swimmers	Main	Nil	Vyavam Vidnyan, HVPM Amravati **Feb 2012**	National	**0975-8895**
11	Effect of Progressive Relaxation Technique in the Management of State Anxiety of Swimmers	Main	Nil	Vyavam Vidnyan, HVPM Amravati **Nov. 2012**	National	**0975-8895**
12	A study of Buoyant vs Non-Buoyant	Main	Nil	WELLNESS, **Journal of Health, Physical Education& Sports**	National	**0975-136X**
13	"Physique characteristics of floaters and their swimming performance"	Main	Nil	Vyavam Vidnyan, HVPM Amravati Vol47,no1Feb2014	National	**0975-8895**

Full paper published in the proceedings of Conference

S.no.	**Title of the article**	**Author**	**Co-author (S)**	**Name of the Programme & Organizer**	**Date**	**ISBN / ISSN**
1	Comparative study of selected anthropometrical variables of sprinters, middle distance and long distance runners	Main	one	National Conference on Physical Education and Sport Sciences	30-31 Jan ,2014	978-81-7524-743-7

				, LNIPE Gwalior		
2	"Comparative study of endurance performance on different phases of menstruation cycle of long distance athletes "	second	one	National Seminar on Fitness and Wellness , LNIPE Gwalior	25-27 February , 2014.	. 978-81-7879-801-1.

b. Books

- **Kinesiology and Biomechanics in Physical Education**
- **The Study of Human Motion**
- **Textbook of Kinesiology**
- **Basics of Swimming**
- जैव गति विज्ञान एवं जैव यांत्रिकी विज्ञान (किन्सियोलौजी एवं बायौमिकैनिक्स)

- **Achievements**

a. Academic

Name of Exam	Board/University	Year of passing
Intermediate	C.B.S.E.,New Delhi	1989
B.P.E.	L.N.C.P.E. Gwalior	1992
M.P.E.	L.N.C.P.E. Gwalior	1994
M.Phil.	L.N.C.P.E. Gwalior	1995
Ph.D.	Jiwaji University, Gwalior	1998
N.E.T.	U.G.C.	December 1995

b. Sports

1 All India Swimming Inter University, held at Calcutta, 1992.

2. National Aerobics Championship, held at Gwalior, 1994.

3. State Level Women's Swimming Championship held at Rewa, 1995.

- **PhD Thesis Guidance**
  1.Presently guiding three candidates.

JOB EXPERIENCE / PROFESSIONAL OFFICES HELD

1. Lecturer in Physical Education at S.L. Bawa D.A.V. College, Batala from July 1994 to March 1995.
2. Director of Physical Education at SGGS Khalsa College Mahilpur from July 1995 to July1996.
3. Lecturer in Physical Education at Govind National College Narangwal, Ludhiana from July 1996 to September 2005.
4. Associate Professor in Physical Education at Punjabi University, Patiala, Punjab from September 2005 to till date.
5. **Professor In Physical Education At Punjabi University, Patiala, Punjab From October 2011 To Till Date**.

INVITED SPEAKER:-

- Hayward University U.S.A.
- Alberta University Canada.
- Guru Nanak Dev University, Amritsar.
- Harvard campus, Boston, U.S.A.

COORDINATOR and CO - COORDINATOR:

- Co - coordinator for Orientation Course held at Academic Staff College (2013), Punjabi University Patiala.
- Coordinator for Refresher Course in Physical Education (2014), held at Academic Staff College, Punjabi University Patiala.

MEMBER- Board of Studies: Panjab University Chandigarh, MDU Rohtak, Delhi University Delhi, Guru Nanak Dev University Amritsar, Shimla University Shimla, Guru Kashi University Talwandi Sabo.

SEMINAR/ CONFERENCES/ WORKSHOP ATTENDED

S.No	Seminar/ Conferences/ Workshop	Venue	Period
1	Sex Education- A Paradox in Indian Context	Gwalior (M.P)	September(2001)
2	National Seminar on Application of statistics and Computers in Physical Education and Sports	Gwalior (M.P)	March (2005)
3	Akhand Dia - Shops on Gats and Education	Patiala(Punjab)	December(2005)
4	International Conference on Gats & Education	Punjabi University Patiala	December(2005)
5	National Seminar on Emerging Trends in Physical Education.	Punjabi University, Patiala	December(2006)

CURRICULUM VITAE

NAME Dr. Nishan Singh Deol

DESIGNATION Professor and Head

QUALIFICATION Ph.D., NET (UGC), M.Phil, M.P.E., B.P.E.

INSTITUTION Punjabi University, Patiala (Punjab) India, 147002.

CONTACT Department of Physical Education, Punjabi University, Patiala, (Punjab) India

(M) 09417602626, e-mail: *drnsdeol@gmail.com*

EXAMINATION	SCHOOL/ INSTITUTE	BOARD/ UNIVERSITY	YEAR	DIVISION
Ph.D.	LNIPE, Gwalior	Jiwaji University, Gwalior	2004	Cleared
NET (UGC)	LNIPE, Gwalior	U.G.C.	1995	Cleared
M.Phil.	LNIPE, Gwalior	LNIPE, Gwalior	1994	First
M.P.E.	LNIPE, Gwalior	LNIPE, Gwalior	1993	First
B.P.E.	LNIPE, Gwalior	LNIPE, Gwalior	1991	Second

RESEARCH INTEREST: Sports Biomechanics, Exercise Physiology, Science of Sports Training.

POSITIONS HELD

(a) Presently working as Dean, Faculty of Education and Information Science, Punjabi University, Patiala.

(b) Presently working as Provost, Punjabi University, Patiala since 2014.

(c) Presently working as Co-Coordinator Centralized Admission Cell since 2012, Punjabi University, Patiala.

(d) Acted as Co-Coordinator Ph.D./M. Phil Entrance Test 2012, 2013, 2014, 2015, 2016 Punjabi University, Patiala.

CONFERENCE DIRECTOR: - International Conference on Futuristic Trends in Physical Education – Icft-2013, held on 24,25 & 26th January 2013 at Punjabi University, Patiala, Punjab, INDIA.

- National Conference on Wellness Through Physical Activity: Future Perspective, held on 17th and 18th January ,2014 at Punjabi University, Patiala, Punjab, INDIA.

7	National Workshop on Sports Excellence	G.N.D.U. Amritsar, Punjab	October(2007)
8	National Conference on Holistic Approach to Health & fitness	Punjabi University, Patiala	February(2008)
9	Workshop on Kin anthropometry and Soft Tissue Manipulations	Punjabi University, Patiala	February(2008)
10	National Seminar on "Sports, Exercise, Health Connections"	Punjab University, Chandigarh	February(2008)
11	National Seminar on Yoga Therapy	Koviloor, Karaikudi	November(2008)
12	National Conference on Scientific Temperaments	Bhagho Majra, Punjab	November(2008)
13	SPAI Sponsored National Conference In Sports Psychology	Bhagho Majra, Punjab	January (2012)
14	International Forum of Physical Education and Sports Sciences	Punjab University, Chandigarh	October(2012)
15	National Conference on 'Role of Physical Activities and Sports in Balancing Education	I.G.I.P.E.S.S, Delhi	January (2013)
16	Global scientific conference on physical education, health & sports science.	G.N.D.U. Amritsar, Punjab	January (2013)

SESSION CHAIRPERSON/CO-CHAIRPERSON AT CONFERENCES

1. Chair the Session at *National Seminar on Sports, Exercise, Health Connections* Organized by Panjab University Chandigarh in March 2008.

2. Co-Chair the Session at *National Conference onScientific Temperaments in Physical Education and Sports* Organized by S.K.R.C.of Physical Education, Bhagoo Majra, Mohali, Punjab in November 2008.

3. Chair the Session at *National Seminar on Yogic Parameters for Healthy Happy Life* Organized by G.G.N. Khalsa college Ludhiana in September 2009.

4. Chair the Session at *National Conference on Physical Education in the 21st Century,* Organized by Arya College Ludhiana Punjab in March 2009.

5. Chair the Session at *Global scientific conference on physical education, health & sports sciences, organized by Guru Nanak Dev University, Amritsar.*

6. Chair the Session at International Journal of Arts and Sciences' (*IJAS*) *conference in* Harvard campus, Boston , USA.

7. Acted as chairperson in National Conference on "Health Sports and Society: Recent Trends and Challenges" organized by *Indian Association of Health and Fitness,* 3-4 December 2011.

8. Acted as chairperson in UGC sponsored National Conference on "Role of Physical Activities and Sport in Balancing Education", 15-16 February, 2013.

9. Acted as chairperson in "International Congress on Contemporary Enrichment in Physical Education and Sports" organized by University of Mumbai, Department of Physical Education, ICCEPES, 2012.

10. Acted as chairperson in "International Conference on Sports, Health and Sports Economics" organized at Guru Granth Sahib World University, Fatehgarh Sahib on 3 & 4 March, 2015.

11. Acted as Chairperson in "International Conference on Physical Education & Sports Science" Organized by IECRC University, Jaipur on 6 & 7 January, 2015.

12. Acted as Chairperson in "International Seminar on Scientific Approach in Physical Education and Sports" organized by P.G.S. Government College of Physical Education, Patiala on 14th January 2012.

BOOKS PUBLISHED

1. An Introduction to Health and Physical Education, 21st Century Publication, Patiala, 2008.
2. An Introduction to Health and Physical Education, 21st Century Publication, Patiala, (Hindi) 2008.
3. Practical File for Physical Education (English), Pearl Publication, Patiala, 2007.
4. Physical Education and Sports for Class XI, Kalyani Publishers, Ludhiana, 2004-2005.
5. Physical Education and Sports for Class XII, Kalyani Publishers, Ludhiana, 2004-2005.
6. Research Methodology and Statistics in Physical Education, (In Press).
7. Physical Education and Sports for (B.A-I) A.P. Publishers, 2008-09, (In Press).
8. Physical Education and Sports for (B.A-II) A.P. Publishers, 2008-09, (In Press).
9. Physical Education and Sports for (B.A-III) A.P. Publishers, 2008-09, (In Press).
10. Text book of physical education and sports(B.A-I) A.P. Publishers,Jalandhar,2013-14.

11. Text book of physical education and sports(B.A-II) A.P. Publishers,Jalandhar,2013-14.
12. Text book of physical education and sports(B.A-III) A.P. Publishers,Jalandhar,2013-14.
13. Text book of Futuristic Trends in Physical Education. Vol: I, 21st Century Publication, Patiala, 2013.
14. Text book of Futuristic Trends in Physical Education. Vol: II, 21st Century Publication, Patiala, 2013.
15. Text book of Futuristic Trends in Physical Education. Vol: III, 21st Century Publication, Patiala, 2013.
16. Text book of Futuristic Trends in Physical Education. Vol: IV, 21st Century Publication, Patiala, 2013.
17. Text book of Wellness Through Physical Activity: Future Perspective. 21st Century Publication, Patiala, 2014.
18. Handbook of Sports Training, Friends Publications (India), New Delhi, 2018.
19. Yog Vashtunishth Prashan, Om Shree Divine Publications, Sirsa Haryana.

PAPER PUBLISHED

(INTERNATIONAL LEVEL)

1 Baljinder Singh ,Sukhbir Singh and **Nishan Singh Deol** (2008) "Analysis of the Personality Traits of Medalist and Non-Medalist Atheletes" The Sheild – Research Journal of Physical Education and Sports Science, Vol- 3, Sindh, Pakistan.

2 Baljinder Singh, **Nishan Singh Deol** and Parminder Jeet Kaur(2008) " Eco friendly analysis of an electro gymnasium to generate electricity" Vol-8 (1)Bangladesh Journal of Sports Science , Dhaka, Bangladesh.

3 Mandeep Singh, **Nishan Singh** and Manmeet Gill **(2008)** "Physical Education for Special People: A Kinematical Analysis" Vol-8 (1-2),H.P.E. Forum Pokhara, Nepal.

4 Rekha Bhardwaj and **Nishan Singh Deol** (2008) "A Comparative Kinematical Analysis ofVertical Jump of Boys of Different Age Groups" Vol-8 (2) Bangladesh Journal of Sports Science, Dhaka, Bangladesh.

5 Baljinder Singh , **Nishan Singh Deol** and Parminder Jeet kaur (2009) "Relationship of Kinematic Variables with the Performance of Basketball Players in Lay Up Shot" Journal of Physical Education and Sport ,University of Petisti Vol-24(3), Romania.

6 Parminder Singh and **Nishan Singh** (2009) " Anthropometric determinants of performance in handball players" Vol-9 (1-2) H.P.E. Forum Pokhara, Nepal.

7 Anil.R , **Nishan Singh Deol** and Manmeet Gill (2009) "Assessment of Body Mass Index and Health Related fitness among School Children" Journal of Physical Education and Sport ,University of Petisti Vol-24(4), Romania.

8 Kanwaljit Singh, Baljinder Singh and **Nishan Singh Deol** (2009) "Effects of Selected Meditative Asanas on Kinesthetic Perception and Speed of Movement" Journal of Biomedical Human Kinetics University of Physical Education, Warsaw , Poland. Biomedical Human Kinetics. Volume 1, Pages 92–94, ISSN (Online) 2080-2234, ISSN (Print).

9 **Dr. Nishan Singh Deol,** Baljinder Singh Bal and Perminder Jeet**(2012)** Kaur Relationship Of Kinematic Variables With The Performance Of Basketball players In Lay-Up Shot ISSN: 1582-8131 *International Journal Citius Altius Fortius*

10 **Nishan Singh Deol (2012) "**Swara Yoga: An Analysis" *Journal of Physical Education & Allied Sciences* Vol 2nd, Chandigarh, India.

11 **Nishan Singh Deol** and Pushpinder Singh (2013) "Comparative study of endurance level among the entrants and outgoing physical education students of professional colleges affiliated of punjabi university, Patiala" Kuala Lumpur, Malaysia.

12 **Nishan Singh Deol (2013) "**A Comparative Study of Personality Traits Among Combative(Judo) and Non Combative (Athletics) Sports Players" *Journal of Physical Education & Allied Sciences* vol 3rd, Chandigarh, India.

13 **Nishan Singh Deol (2013) "**Comparison of Vital Capacity Between Soccer and Basketball Players" *Journal of Physical Education & Allied Sciences* vol 3rd, Chandigarh, India.

14 Lect. Kamaljeet Kaur & **Dr. Nishan Singh Deol (2014)** Changing Face of Sports Marketing. International conference of futuristic trends in Physical Education, Punjabi university Patiala.

15 Navdeep Singh, **Dr. Nishan Singh Deol** and DR. A.G.K. Sinha **(2014)** Comparison of Physical Fitness Variables Between Injured And Non Injured Athletes. *International Journal of behavioral Social and Movement Sciences,* Vol. 3, Issue 23, ISSN 2277-7547.

16 Pushpinder Singh and **Dr. Nishan Singh Deol** Comparative Study of Depth Perception Among the Male Players of Hockey at Inter College and Intervarsity Level. *International Journal Of Behavioral Social And Movement Sciences* (ISSN: 2277-7547)

17 Dr. Amarpreet Singh and **Dr. Nishan Singh Deol (2012)** Study of Physiological Variables of Basketball Players at Different Levels of Competitions International Journal of Behavioral Social and Movement Sciences (ISSN: 2277-7547)

18 **Dr. Nishan Singh Deol (2014)** Effect Of Eight - Week Aerobic Training Program On Selected Hematological Parameters Of Deaf Male Students At Higher Secondary School Level at International Journal of Arts and Sciences' (*IJAS*) conference in Harvard campus, Boston , USA.

19 **Dr. Nishan Singh Deol** and Gurvir Singh (2014) Comparative Analysis of Progressive Muscular Relaxation Training and Stretching Relaxation Exercise on Concentration of Lactic Acid in College Level Athletes *Indian journal of sports science And Physical education,* Vol. 22, ISSN 0971– 0140

20 **Dr. Nishan Singh Deol** and Pushpinder Singh (2014) Effect of Eight - Week Aerobic Training Program on Blood Ph Level of Deaf Male Students At Higher Secondary School Level *Indian journal of sports science And Physical education,* Vol. 22, ISSN 0971– 0140

21 **Dr. Nishan Singh Deol,** Akwinder Kaur and Dr Manmeet Gill (2014) Comparative Study Of 100 Meter Performance And Cardiovascular Endurance Of University Level Male and Female Sprinters. *International Journal of Research Pedagogy And Technology in Education and Movement Sciences* ISBN: 978-93-80144-62-7

22 **Dr. Nishan Singh Deol** and Pushpinder Singh (2014) An Experimental Study on the Effect of Aerobic Training Protocol on Thrombocytes Count Among School Going Deaf Male Students *International Educational E-Journal,* Vol. 3, ISSN 2277-2456.

23 **Dr. Nishan Singh Deol** and Akwinder Kaur and Karanjot Kaur (2013) Effects of Four Week Plyometric Training on Explosive Strength of Volleyball Players, *International Journal of Human Movements Sports & Allied Science,* Vol. 1, No. 1, pp 55-59, ISSN 2347-4262.

24 Baljinder Singh Bal, **Dr. Nishan Singh Deol** and Gurmej Singh Dhaliwal (2014) Half Man and Half Women: The Duality of the Sexes in Sports – Concern for the 21st Century, *International Journal of Motor Learning & Sports Performance,* Vol. 3, No. 1, pp. 17-21, ISSN 2230-8628.

25 **Dr. Nishan Singh Deol**, Dr. Amarpreet Singh and Navdeep (2013), Comparison of Vital Capacity between Succor and Basket Ball Player, *Journal of Physical Education and Allied Science,* Vol. 3, No. 2, ISSN 2230-7397.

26 Chandni Jaswal, **Dr. Nishan Singh Deol** and Gurvir Singh (2013), Comparison of Vital Capacity between Cyclist and Yoga Participants, *Journal of Physical Education and Allied Science,* Vol. 3, No. 2, ISSN 2230-7397.

27 Pushpinder Singh and **Dr. Nishan Singh Deol** (2013), Effect of Eight Week Aerobic Training Programme on Selected Hematological Parameters of Deaf Male Student, *International Journal of Research Pedogogy and Technology in Education and Movement Science,* Vol. 2, issue 3, ISSN 2319-3050.

28 Gurpreet Singh, **Dr. Nishan Singh Deol** (2014), Comparative Study of the Football Players at Deferent Playing Position of Punjabi University, Patiala: An Anthropometric Analysis, *International Journal of Behavioural Social & Movement Science,* Vol. 3, Issue 2, ISSN 2277-7547.

29 Gurpreet Singh, **Dr. Nishan Singh Deol** and Pankaj Sasan (2014), Effect of Imagery Intervention on Performance of the Soccer Players, *International Journal of Behavioural Social and Movement Science,* Vol. 3, Issue 2, ISSN 2277-7547.

30 Chandni Jaswal, Amarpreet Singh and **Dr. Nishan Singh Deol** (2014), Comparative Study of Selected Somatotype and Anthropometric Variables of Active and Sedentary Females of Punjabi University Patiala, *International Journal of Behavioural Social and Movement Science,* Vol. 3, Issue 2, ISSN 2277-7547.

31 Pushpinder Singh and **Dr. Nishan Singh Deol** (2014), Comparative Study of Depth Perception among the Male Players of Hockey inter College and Intervarsity, *International Journal of Behavioural Social Movement Science,* Vol. 3, Issue 1, ISSN 2277-7547.

32 Ashutosh and **Dr. Nishan Singh Deol** (2014), Comparative Study of Perceptual Motor Coordination between Intellectual Children and Children with Mild Intellectual Disability, *International Journal of Research Pedagogy Technology in Education and Movement Science,* Vol. 2, Issue 3, ISSN 2319-3050.

33 Akwinder Kaur and **Dr. Nishan Singh Deol** (2014), Assessment of Performance & Cardiovascular Endurance of University Level Male Sprinters, *International Journal of Human Movements Sports and Allied Science,* Vol. 1, Issue II, ISSN 2247-4262.

34 Jaspreet Kaur and **Dr. Nishan Singh Deol** (2014), Analytical Study of Health Related Fitness of Rural Urban and Slum Girls, *Assian Academic Research Journal of Social Science & Humanities,* Vol. I, Issue 24, ISSN 2278-859.

35 **Dr. Nishan Singh Deol**, Jaspreet Kaur and Dr. Raj Kumar Sharma (2013), Comparison the body Composition Selected Physiology Variables between Active & Inactive Students, *Journal of Physical Education and Allied Science,* Vol. 3, No. 2, ISSN 2230-7397.

36 Dr. Laxmi Narayan Joshi and **Dr. Nishan Singh Deol** (2012), Swara Yoga: An Analysis, *Journal of Physical Education and Allied Science,* Vol. 2, No. 2, ISSN 2230-7397.

37 Gurvir Singh, Kuljinder Singh and **Dr. Nishan Singh Deol** (2013), A Comparative Study of Personality Traits Among Combative (judo) and non-combative (Athletics) Sports Players, *Journal of Physical Education and Allied Science,* Vol. 3, No. 1, ISSN 2230-7397.

38 Gurvir Singh and **Dr. Nishan Singh Deol** (2014), Comparative Analysis of Progressive Muscular Relaxation Training and Stretching Relaxation Exercise on Concentration of Lactic Acid in College Level Athletes, *Indian Journal of Sports Science and Physical Education,* Vol. 22, No. 1&2, ISSN 0971-0140.

39 Pushpinder Singh and **Dr. Nishan Singh Deol** (2014), Effect of Eight-Week Aerobic Training Program on Blood pH Level of Deaf Male Students at Higher Secondary School Level, *Indian Journal of Sports Science and Physical Education,* Vol. 22, No. 1&2, ISSN 0971-0140.

40 Jaspreet Kaur and **Dr. Nishan Singh Deol** (2015), Analytical Study of Mental Health of Rural, Urban and Slum Children, *International Journal of Research Pedagogy and Technology in Education and Movement Sciences,* Vol. 3, No. 3, ISSN 2319-3050.

41 Sukhdev Singh and **Dr. Nishan Singh Deol** (2015), Internationalship between Leadership Behaviour and Team Cohesion with Performance in Hockey, *International Journal of Asian Academic Research Associates,* Vol. 1, No. 31, ISSN 2319-2801.

42 Upma Bhagat and **Dr. Nishan Singh Deol** (2015), Comparative Study of Depth Perception between Softball and Cricket State Level Boys Players, *Global Journal for Research Analysis,* Vol. 4, No. 4, ISSN 2277-8160.

43 Upma Bhagat, Dr. Amarpreet Singh and **Dr. Nishan Singh Deol** (2015), Comparative Study of Depth Perception between Softball and Cricket State Level Boys Players, *Global Journal for Research Analysis,* Vol. 4, No. 4, ISSN No. 2277-8160.

44 Upma Bhagat, Dr. Amarpreet Singh and **Dr. Nishan Singh Deol** (2015), Comparative Study of Selected Anthropometric Physical Fitness and Psychological Variables between Softball and Cricket State Level Boys Players, *Indian Journal of Applied Research,* Vol. 5, No. 6.

45 Ravinder Kaur and **Dr. Nishan Singh Deol** (2014), Evaluation of Sports Performance in the Universities of Jammu and Kashmir, *International Journal of Behavioural Social and Movement Sciences,* Vol. 4, No. 3, ISSN 2277-7547.

46 **Dr. Nishan Singh Deol** and Davinder Singh (2015), An Analysis of the Components of Superstitions behavior and will to win in Basketball Performance, *American Journal of Applied Psychology,* Vol. 4, No. 5, pp. 129-136 ISSN 2328-5664.

47 Seema Rani and **Dr. Nishan Singh Deol** (2015), Comparison of Health Status between Active and Non Active Girls Student of Punjabi University, Patiala, *International Journal of Physical Education, Sports and Health,* Vol. 2, No. 1, pp. 137-139.

48 Seema Rani and **Dr. Nishan Singh Deol** (2015), Biomechanical Analysis of Javelin Throw, *International Journal of Physical Education, Sports and Health,* Vol. 2, No. 2, pp. 19-20.

49 Nishan Singh **and Dr. Nishan Singh Deol** (2016), The Study of Effect of Sand Training on Jump Abilities of University Level Volleyball Players, *Online International Interdisciplinary Research Journal*, Vol. VI, ISSN 2249-9598.

50 Nishan Singh and **Dr. Nishan Singh Deol** (2016), The Study of Effect of Sand Training on Speed Abilities of University Level Volleyball Players, *Journal of International Academic Research for Multisciplindy,* Vol. 4, NO. 1, ISSN 2320-5083.

51 Akwinder Kaur and **Dr. Nishan Singh Deol** (2016), Should Women train Differently from Men?, *2nd International Conference on Recent Technological Advancement & Entrepreneurship in Sports,* Vol. I, ISBN 978-81-923943-2-9.

52 Parmjit Kaur and **Dr. Nishan Singh Deol** (2016), Emotional Intelligence (EI) Among Female Baseball, Softball and Cricket Players: A Cross Sectional Analysis, *International Journal of Physical Education, Sports and Health,* Vol. 3(2): 437-439, ISSN 2394-1685.

53 Parmjit Kaur and **Dr. Nishan Singh Deol** (2016), An Analysis of Psychological Parameter Among Female Baseball Softball and Cricket Players, *Research Inspiration An International Multidisciplinary e-Journal,* Vol. 1, Isssue III, ISSN 2455-443.

54 Akwinder Kaur and **Dr. Nishan Singh Deol** (2016), Kinematical Analysis of Javelin Throw, *International Journal of Physiology Nutrition and Physical Education,* Vol. 1, No. 1, 86-88, ISSN 2456-0057.

55 Sukhdev Singh **Dr. Nishan Singh Deol** (2016), A Study of Anxiety Level of Female Athletes from Different Levels, *Journal of International Academic Research for Multidisciplinary,* Vol. 4, Issue 6, ISSN 2320-5083.

56 **Dr. Nishan Singh Deol** and Davinder Singh (2016), An Analysis of the Components of Sport Imagery in Basketball Players, *Education and Linguistics Research,* Vol. 2, No. 1, ISSN 2377-1356.

57 **Dr. Nishan Singh Deol** and Davinder Singh, American Journal of Sports Science and Medicine, *Social Intelligence and Social Support in Basketball Players: A Key to Success,* Vol. 3, No. 3, ISSN 2333-4592.

58 **Dr. Nishan Singh Deol** and Davinder Singh (2016), A Comparative Analysis of Flow State in Basketball Performance: A Psychological Probe, *Medical-Biological Problems of Physical Training and Spots,* Vol. 1, ISSN 2308-7269.

59 **Dr. Nishan Singh Deol** and Davinder Singh (2017), Superstitious Behaviour : The Invincible and Invisible Phenomenon in Basketball Sports, *European Journal of Physical Education and Sports Sciences,* Vol. 3, Issue 10, ISSN 2501-1235.

60 Lalit M. Tiwari and **Dr. Nishan Singh Deol** (2016), Diural Location on the Performance of Co-ordinative abilities of Soccer Players, *European Journal of Physical Education and Sports Science,* Vol. 2, Issue 3, ISSN 2505-1235.

61 Lalit Mohan Tiwari and **Dr. Nishan Singh Deol** (2016), Effect of Diveral Variation on the Performance of Selected Moto Fitness components of Soccer Players, *International Journal of Research in Economics and Social Sciences*, Vol. 1-6, Issue 9, ISSN 5236-2015.

62 Akwinder Kaur and **Dr. Nishan Singh Deol** (2016), Diagnostic Study of Prevalence of Obesity among Female Employers of Punjabi University, Patiala, *Scholars World-International Referred Multidisciplinary Journal of Contemporary Research,* Vol. IV, No. IV.

63 Habtamu Tesfaye and **Dr. Nishan Singh Deol** (2016), Analytical Study of Attitude and Infrastructure of Physical Education Sport in Addis Ababa, Ethiopia, *International Journal of Physical Education Sports and Health,* Vol. 3, No. 6.

64 Gursharan Singh Gill and **Dr. Nishan Singh Deol** (2017), Polymeric Training: A Boon for Physical Fitness of Handball Players, *Online International Internal Sciplinary Research Journal,* Vol. VII, No. II, ISSN 2249-9598.

65 **Dr. Nishan Singh Deol** and Davinder Singh (2015), Social Intelligence and Social Support in Basketball Players: A Key to Success, *American Journal of Sports Science and Medicine,* Vol. 3, No. 3, ISSN 2333-4606.

66 **Dr. Nishan Singh Deol** and Akwinder Kaur (2017), Study of Energy Intake and Expenditure of Inter University Kabaddi and Judo Female Players, *Global Innovation and Research in Education Sports Sciences and Yoga under the proceedings,* Vol. 1, Akinik Publications, ISBN 978-93-87072-17-6.

67 Amandeep Kaur and **Dr. Nishan Singh Deol** (2018), Effect of Three Week Javelin Skill Training on the Javelin Throw, *International Journal of Yogic, Human Movement and Sports Sciences,* ISSN 2456-4419.

68 Gurpreet Singh and **Dr. Nishan Singh Deol** (2018), Effect of SAQ Training Program on Systolic and Diastolic Blood Pressure of Soccer Players, *International Journal of Advanced Research and Development,* Vol. 3, Issue 1, ISSN 2455-4030.

69 Gurpreet Singh and **Dr. Nishan Singh Deol** (2018), Effect of S.A.Q. Training Program on Selected Physical Fitness Variables of Soccer Players, *International Journal of Academic Research Development,* Vol. 3, Issue 1, ISSN 2455-4192.

70 Amrik Singh and **Dr. Nishan Singh Deol** (2018), An Analysis of Anxiety and Worm Management, Concentration Ability and Relaxation ability among National Level Sprinter and Long Distance Runner, *International Journal of Physiology, Nutrition and Physical Education,* Vol. 3(1), 596-600, ISSN 2456-0057.

71 Kiran Inder Singh and **Dr. Nishan Singh Deol** (2018), Effect of Six Weeks Conditioning Workout Plan on Physiological Variables of Track Cyclists, *International Journal of physiology Nutrition and Physical Education,* Vol. 3(1), 815-817, ISSN 2456-9057.

72 Krishna Kumar Vaishnoy and **Dr. Nishan Singh Deol** (2018), Socio-Economic Factor of Down Fall Hockey in Punjab, *International Journal of Yoga Physiotherapy and Physical Education,* Vol. 3, Issue 1, ISSN 2456-5062.

73 Mittar Pal Singh Sidhu and **Dr. Nishan Singh Deol** (2018), Analytical Study of Psychological Parameters: Locus of Control Communal Tension and Stress of Cyclists in Compact Time Situations, *International Journal of Physiology, Nutrition and Physical Education,* Vol. 3(1): 1679-1682.

74 Mittar Pal Singh Sidhu and **Dr. Nishan Singh Deol** (2018), Analytical Study of Psychological Cultural and Gender Factors Contributory Stress Among Cyclists in Competitive Situations, *International Journal of Physiology, Nutrition and Physical Education,* Vol. 3(1): 1683-1688.

(NATIONAL LEVEL)

1. **Nishan Singh** and Manmeet Gill (2008): Development of Psychomotor Evaluation Criteria in Volleyball: Vyayam-Vidnyan, H.V.P.Mandal Amravati, India.
2. **Nishan Singh**, Hardeep Singh and Amarpreet Singh (2008) "Comparative Study of Anxiety and Motivation between players and Non-players of Punjabi University." Journal of Health, Physical Education, Recreation January 2008, Bhopal-M.P.
3. Baljinder Singh and **Nishan Singh** (2008) "What is Essentially Wrong if performance is Enhanced." Bhopal - M.P.
4. **Nishan Singh** and Manmeet Gill (2008): "Job Satisfaction of Physical Education Teachers in government, Middle, High and Senior Secondary Schools of Punjab" , Coimbatore (India)
5. Sukhraj Singh, G.S. Kang and **Nishan Singh** (2008) Study of Physical Fitness Profile of National Level Indian Men Discuss and Hammer Throwers, Journal of Movement Education and Sports. Patiala, Punjab.
6. **Nishan Singh Deol**, Manmeet Gill and Anil Vinayak (2008) "Relationship of selected Anthropometric Variables of Upper Limbs to the performance in female hockey Players" Indian journal of Sports Science and Physical Education, Patiala, Punjab.
7. Baljinder Singh, **Nishan Singh** and Manmeet Gill (2008) "Comparative Study of Selected Physical Fitness Components of Rural and Urban male Students'' Research Digest, Bilaspur, Chattisgarh.
8. **Nishan Singh** and Gurwinder Kaur (2008) "The Athlete and Sudden Death" Penalty Corner : Vol.8 Issue-1.

9. **Nishan Singh**, Manmeet Gill, Poonam Rana: (2008) Comparative Analysis of Effect of Exercise on Physical Fitness between Active and Inactive Females, Gyan Vidnayan. H.V.P.Mandal Amravati, India.
10. Mandeep Singh**, Nishan Singh** and Sukhdev Singh (2008) "Survey of Selected Health Related Fitness Components of High School Boys in Kerela, Madhya Pardesh, Punjab, Rajasthan, Maharashtra and Jammu and Kashmir''Indian Journal of Yaga , Exercise & Sport Science and Physical Education , West Bengal.
11. Paramjit Kaur, Gurdev Singh and **Nishan Singh** (2009) "Study of Personality Traits of Cyclist at Various level of Participation'' Indian Journal of Psychology and Mental Health, Malerkotla , Punjab.

SPORTS ACHIEVEMENTS

1. Represented Kendriya Vidyalaya Begdubi, Guwahati region in Basketball of the K.V.S. **National Sports Meet**, 1987 held at Kendriya Vidyalaya Vishakhapatnam.
2. Represented Jiwaji University, Gwalior in Basketball (Men) team West Zone **Inter-varsity** for the year 1992-1993.
3. Represented Jiwaji University, Gwalior in Basketball (Men) team West Zone **Inter-varsity** for the year 1993-1994.

BRIEF RESUME

Prof. JOSEPH SINGH

Dean (Faculty of Sports Sciences), **HOD** (Sports Biomechanics), **LNIPE, Gwalior (M. P.) INDIA (NAAC A++ Accredited, Category-1,** Deemed to be University) **Government of India, Ministry of Youth Affairs and Sports**

Email: josephlnipe@gmail.com

Phone: 7409081660, 9935523938

ACADEMIC QUALIFICATION

Name of the Exam/Degree	Year Passed / Completed	Area / specialization	Name of the Board/University
B. P. E.	1995	Football	JIWAJI UNIVERSITY
M. P. E.	1997	Football	L.N.I.P.E. (DEEMED UNIVERSITY)
UGC NET	Dec.1997 & June 1998	Physical Education	U.G. C
SET	1997	Physical Education	MAHARASHTRA
Ph. D.	2008	Physical Education	UNIVERSIYTY OF LUCKNOW

PROFESSIONAL EXPERIENCE

S. No.	Designation	Institute / University	Experience		Teaching
			From	To	
1	**Professor**	LNIPE Gwalior	2018	Till date	BPEd, MPEd, M.Sc. (Sports Biomechanics & Ph.D.)
2	**Assistant Professor**	HNBGU (A Central University) Srinagar Garhwal	2013	2018	BPEd & MPEd
3	**Lecturer**	LCC, Lucknow	1997	2013	BPEd &MPEd

Scopus Author Identifier: 57415665600

S. No.	Article (Open Access)	Scopus Journal	Year, volume & page no.
1	Effect of different jab techniques on peak activation of upper-body muscles in youth boxers	Physical Education Theory and Methodology	2022, 22(4), 583–588
2	Relationship of selected physical and angular kinematical variables with the performance of toe-touch skill in kabaddi	Physical Education Theory and Methodology	2022, 22(4), 516–521
3	A statistical model for prediction of lower limb injury of active sportsperson	International Journal of Human Movement and Sports Sciences	2021, 9(6), 1219–1229
4	Relationship of selected anthropometric and linear kinematical variables with the performance of toe-touch skill in kabaddi	Physical Education Theory and Methodology	2021, 21(4), 304–309

ORCID: https://orcid.org/0000-0003-4906-688X

Citations Index

Google Scholar	All	Since 2018
Citations	152	114
h-index	6	6
i 10-index	4	3

Ongoing Research

Doctoral: Successfully guided 9 Ph.D. Scholars, at present Supervising 7 Research Scholar of LNIPE, Gwalior.

Research related

1. **Admin** of Anti Plagiarism Software **(Ouriginal)** for LNIPE, Gwalior.
2. **President** of Information & technological solutions society for sports.
3. Conducted online lecture of E-Khel Pathshala for PE teachers & Community Coaches across India (Feb. 2023).
4. All India association for education research (**Individual life member**).
5. Society for research of movement education (**Life member**).
6. **Member of Editorial Board** "International Educational E - Journal" A refereed Journal with **impact factor of 3.017**.
7. **Member of Panel of Peer Reviews "**International Research Journal of Physical Education and Sports Sciences (Online) & International Research Journal of Sports Glimpses (Print/offline).
8. **Member of Panel of Referees "**Journal of Physical Education Research".
9. **Member of Panel of Referees "**International Journal of Movement Education and Sports Sciences.

Resume

Name: Dr. Yajuvendra Singh Rajpoot, Associate Professor
Lakshmibai National Institute of Physical Education, Gwalior (M.P)
Email - yajupitu25@gmail.com - Phone number: 8989103418, 8253025079

Versatile, charismatic, highly regarded for a proven history of faculty collaboration and commitment to research, illustrated over a lengthy tenure in academic roles. Adept in driving thought-provoking class debates to promote student engagement and learning. strong communication skills to foster meaningful and trusting relationships with students, colleagues, and administrators. Student-centric instructor, academic facilitator, and motivational coach who champions student achievements while promoting a safe and positive learning environment.

CORE COMPETENCIES

- Higher Education
- Academic Research
- Communications
- Relationship Building
- Student Evaluations
- Faculty Collaboration
- Program Development
- Program Evaluation
- Student Assessments

WORK EXPERIENCE

Associate Professor- LNIPE, Gwalior **2007– till date**

- Tracked student assignments, attendance and test scores.
- Integrated technology into classroom instruction for a well-rounded and modern approach.
- Completed and submitted reports detailing course activities.
- Recorded lessons for online instruction.
- Developed and implemented lesson plans that covered all required topics.
- Selected appropriate materials to support student learning needs.

EDUCATION

- Bachelor of Physical Education, Lakshmibai National Institute of Physical Education, Gwalior
- Master's of Physical Education, Lakshmibai National Institute of Physical Education, Gwalior
- Master of Philosophy in Physical Education, Lakshmibai National Institute of Physical Education, Gwalior
- Doctor of Philosophy (PhD) in Physical Education, Lakshmibai National Institute of Physical Education, Gwalior

CERTIFICATION

- Technical Official (TO) for Hockey India
- Certified Level "1" Coach World Squash Federation (WSO)

PAPER PRESENTATION

- A Prospective cohort study to predict Running-Related Lower Limb Sports Injuries Using Gait Analysis, Teoria ta Metodika Fizicnogo vihovanna
- A Statistical Model for Prediction of Lower Limb Injury of Active Sportsperson Vol. 9(6), International Journal of Human Movement and Sports Sciences
- Sports Specific Injury Pattern of Sports Persons Vol. 8(5), Sports Specific Injury Pattern of Sports Persons Vol. 8(5)
- Comparative Effect of Different Conditioning Programmes on Aerobic and Anaerobic Capacity of School going Children's Vol. 10 (10), International Research Journal of Management Sociology & Humanities
- Kinematic Analysis of Different Group in Basketball with the technique of Jump shot. Vol.8 Issue 1, International Journal for Research in Applied Sciences and Biotechnology
- A Comparative study of selected Kinematic Variables among different Heights in Basketball, Vol-9(3), Online International Research Journal
- Comparative Effect of Freehand Exercise & Resistance Exercise on Cardiorespiratory Endurance and Motor Fitness of Senior Citizens Vol. 10 (2), International Journal of All Research Education and Scientific Methods (IJARESM)
- A Comparative Analysis of Back Handspring and Forward Handspring with Angular Kinematics Variables. m, 30.01.22, Journal of Advances in Sports and Physical Education
- Relationship of Coordinative Abilities to Performance in Badminton, Vol. 12 (01), Online International Interdisciplinary Research Journal

- Effect of Calisthenic strength Training Exercise on Upper Body Strength of Senior Citizen., Vol. 11 Issue 2, International Journal of Science and Research (IJSR)
- Construction of Skill related fitness test for tennis player – An Overview, Vol. 10, Issue 4, International Journal of All Research Education and Scientific Methods (IJARESM)

BOOK PUBLISHED

- Introduction to Teaching and Learning in Adapted Physical Education, Friends Publication (India)
- Elementary Physical Education Pedagogy, Friends Publication (India)

RESEARCH GUIDANCE

- Development of Discriminant Model for Cricketers on the Basis of Anthropometric & Physical Variables. Mr. Amritashish Bagchi
- Analytical Study of Close Leg Press Handstand on Selected Apparatuses in Artistic Gymnastics: A Biomechanical Approach. Mr.Hemchandra Joshi
- Gait Kinematics : A Predictor for Lower Limb Injury Among Sportsperson, Mr. Hemantajit Gogai
- Two Dimensional Kinematic Analysis of Jump Shot Among Basketball Players on Different Heights, Mr. Pankaj Arya
- Comparative Effects of two different training programmes on Functional Capacity of Senior Citizens, Mr. Mukesh Narwariya

REFRESHER/ ORIENTATION/ WORKSHOP

- UGC Sponsored Orientation Program, Academic Staff College, LNIPE, Gwalior, 28 Days, 15/11/11 to12/12/11
- UGC Sponsored Refresher Course, Academic Staff College, LNIPE, Gwalior, 21Days, 04/07/14 to24/07/14
- UGC Sponsored- Short Term Course on Research Methodology, UGC HRDC, LNIPE, Gwalior, 7 Days, (15/12/17 to21/12/17)
- UGC Sponsored- Short Term Course on Disaster Management, UGC HRDC, LNIPE, Gwalior, 7 Days, (06/03/19 to12/03/19)
- Training of Trainers workshop on UGC-Faculty Induction Programme (FIP), IISER, Pune on behalf of UGC, New-Delhi, 7 Days, (27/03/19to29/03/19)
- Sports Science and Coaching Program, University of Birmingham, 15 days, 18-08-17 to 01/09/17, Ministry of Youth Affairs and Sports

ADMINISTRATIVE RESPONSIBILITY

- Head of the Department, Sports Management and Coaching (LNIPE, Gwalior)
- Director, Extension Services (LNIPE, Gwalior)
- Director, Khelo India, (LNIPE, Gwalior)
- In-charge Academics, (LNIPE, Gwalior)
- Member IQAC, IQAC, (LNIPE, Gwalior)

Lakshmibai National Institute of Physical Education, Gwalior
Deemed to be University
(Declared vide Government of India, Ministry of Human Resource Development Notification No.F.9-14/92-U.3 dated 21.09.1995 under section 3 of UGC Act, 1956)
Government of India, Ministry of Youth Affairs and Sports

CURRICULUM-VITAE

Personnel Profile

S.N.	TITLE	DESCRIPTION
1	Name	**Dr. Yatendra Kumar Singh**
2	Designation	Associate Professor
3	Organisation	Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
4	Address (Res)	House No. 06, LNIPE Campus, Race Course Road, Gwalior, 474 002 (MP)
5	Mobile No.	+91 999 91563 33
6	Email id	toyasi3@gmail.com, yatendra@gwalior.lnipe.edu
7	Google Scholar	https://scholar.google.co.in/citations?hl=en&pli=1&user=9xs0KRIAAAAJ
8	Research Gate	https://www.researchgate.net/profile/Yatendra_Kumar_Singh2

Career Objectives

- Creative & Resourceful Pedagogue with 14+ years of varied instructional experience and possesses an Effective, Positive and Flexible Teaching Style with Willingness and Zeal to deliver beyond comfort zone.
- Highly Passionate, Hardworking Physical Educator with a focus on Teacher's Pedagogy of Physical Education at Higher Education Institution.

Professional Qualifications

- Doctoral Degree (Ph.D.) in Physical Education in 2008 from BHU, Varanasi, U.P.
- Master of Physical Education (MPE – 2 Year) in 2005 from BHU, Varanasi, U.P., with 70.7%.
- Bachelor of Physical Education (BPE – 3Year) in 2003 from BHU, Varanasi, UP, with 64.4%.
- UGC - NET in Physical Education.

Academic Qualifications

- Senior Secondary School in 1999 from Central Hindu School, BHU, Varanasi, UP.
- Matriculation passed in 1997 from Central Hindu School, BHU, Varanasi, UP.

CV – Dr. Yatendra K Singh, LNIPE, Gwalior, M.P.

Sports Specialization

- **Hockey –** Bachelor of Physical Education (B.P.E.) & Master of Physical Education (M.P.E.)

Research Problem of Dissertation for Master of Physical Education

"STUDY OF ATTITUDE TOWARDS MODERNIZATION AND RELIGION OF PLAYERS"

Research Problem for Ph.D.

"STUDY OF POSTURAL DEFORMITIES AND SUGGESTED REMEDIAL MEASURES OF SCHOOL CHILDREN"

Awards & Honors

1. **"APPRECIATION AWARD"**, expressed by Jawaharlal Nehru Hockey Tournament Society, New Delhi for dynamic Leadership extended towards smooth conduct of SNBP 26th & 27th Nehru All India Inter University Tournament 2018-19 & 2019-20 as Venue Coordinator of the Tournament.
2. **"PROGRESSIVE EDUCATOR AWARD 2019"** conferred for Leadership in Education & Empowerment, given by "Community Education & Development Foundation Trust", New Delhi during the Award Ceremony held at India Habitat Centre, New Delhi on July 13th 2019.
3. **"SHIKSHAK ABHINANDAN SAMMAN 2019",** conferred during 41st "Shikshak Abhinandan Samaroh 2019", by Gwalior Vikas Samiti, Gwalior, Madhya Pradesh on 5th Sept. 2019.

Sports Achievements

1. Represented Banaras Hindu University, Varanasi, U.P. in East Zone Inter University Hockey (Men) Tournament from the session **2000-2001 to 2005-2006 (Six Consecutive Sessions).**
2. Nominated as a **CAPTAIN** of Banaras Hindu University, Varanasi, U.P. of Hockey Team (Men) for the Inter University Tournament during the session **2004-2005**.
3. Represented Banaras Hindu University**,** Varanasi, U.P. in All India Inter University Hockey (Men) Tournament in the session **2000-2001**, **2001-2002** & **2005-2006**.
4. Represented Banaras Hindu University, Varanasi, U.P. in All India Inter University competition of **Cross-Country** during the session 2002-2003. Organised at Banaras Hindu University, Varanasi.

CV – Dr. Yatendra K Singh, LNIPE, Gwalior, M.P.

Publications - Books & Chapters in Books

1. Principal author of book entitled, **"Postural Deformities and Remedial Measures – Critical Survey of School Children"** has been published with **ISBN - 978-93-84743-87-1,** copyright © 2015 by Bonfring Publication, 309, 2nd Floor, 5th Street Extension, Gandhipuram, Coimbatore-641 012, Tamilnadu, India.

2. Author of Book entitled, **"Research Methods for Beginners – Principles and Concepts"** has been published with **ISBN - 978-3-659-78797-3,** copyright © 2015 by LAP LAMBERT Academic Publishing, OmniScriptum GmbH & Co. KG, Heinrich-Böcking-Str. 6-8, 66121, Saarbrücken, Germany.

3. A chapter in an edited book entitled, "Yoga & Wellbeing: Awareness, Benefits, Opportunity & Challenges in the Contemporary Society", published as corresponding author, topic of the chapter is, **"Relationship of Kinematic Variables with Performance during Sweep Shot in Cricket"**, with ISBN: 978-81-936899-2-9 of Rekha Publication, New Delhi in the year 2018.

Publications - National/International Journals/Proceedings

1. Paper published in the Research Journal of Indian Cultural, Social & Philosophical Stream, "ANUSILANA" with ISSN–0973-8762 in the Volume-IV, 2007 at page nos.17-20, paper entitled, "Study of Occupational Stress between Teachers".

2. Paper published in the Research Journal of Indian Cultural, Social & Philosophical Stream, "ANUSILANA" with ISSN–0973-8762 in the Volume-XVIII, 2009 at page nos.23-26, paper entitled, "Gandhian Basic Education: Need for Rural Reconstruction".

3. Paper published in "Scientific Journal in Sports and Exercises" with ISSN-0974-2964 in the Volume-6, No.1, Jan. – June 2010 at page nos.19-22, published by Laxmibai Sports Education and Welfare Society, paper entitled, "Effects of Asana and Pranayama on Lipid Profile and Sugar Level of Senior Citizen".

4. Paper published in "Journal of Physical Education & Yoga" with ISSN-0975-9301 in the Volume-1, No.1, 2010 at page nos.44-48, published by Noida College of Physical Education, paper entitled, "Comparison of Competitive state anxiety Among Individual, Dual and Team Sports".

5. Paper published in "AKASH - Journal of Physical Education, Sports and Yoga Sciences" with ISSN-2250-1398 in the Volume-1, No.1, 2011 at page nos.67-69, published by Department of Physical Education, R.V. Higher Education & Technical Institute, Dadri, Gautam Budh Nagar, UP, paper entitled, "Effect of Specific Training Program on the Explosive Strength Development of Hockey Players".

6. Paper published in the proceedings with ISBN-978-81-902282-0-6, of International Conference on, "Physical Activities & Sports for Global Peace & Development", organized by

Department of Physical Education & Sports Sciences and Indira Gandhi Institute of Physical Education & Sports Sciences, University of Delhi held on 19th to 21st October, 2011 at page nos.142-146, paper entitled, "Comparison of the Effect of Diurnal Variation on VO_2 Max & Cardiovascular Efficiency among Individual and Team Game Players".

7. Paper published in "South Asian Journal of Physical Education and Sports Sciences" with ISSN – 2277-8500 in the Volume-1, No.1, 2012 at page nos.12-14, published & produced by Sports Strive under the aegis of SANJOG – An NGO working for promotion of education to underprivileged children, paper entitled, "Emotional Intelligence & Personality Characteristics of College level Students".
8. Paper published in "The Eternity – Research Journal of Humanities and Social Science Stream" with ISSN-0972-8690 in the Volume III, Issue – II, July 2012 at page nos.74-80, paper entitled, "CWG – 2010: A Cultural Ambassador for India".
9. Paper published in the proceedings with ISBN-978-81-7873-3050-3, of National Conference on, "Role of Physical Activities and Sports in Balancing Education", organized by Department of Physical Education & Sports Sciences and Indira Gandhi Institute of Physical Education & Sports Sciences, University of Delhi held on 15th to 16th February, 2013 at page no.23, paper entitled, "SWOT Analysis for Teachers : An Overview".
10. Paper published in "CAPITAL – Research Journal of Physical Education and Sports" with ISSN – 2277-8519 in the Volume II, Issue – II, December 2013 at page nos.124-127, paper entitled, "The Rise of BYOD: Future of Physical Education in India".
11. Paper published in the proceedings with ISBN-978-81-7524-740-6, of National Conference on, "Youth Enrichment through Sports and Physical Education", organized by Amity School of Physical Education & Sports Sciences, Amity University, UP held on 20th to 21st January, 2014 at page no.99, paper entitled, "Descriptive Analytics of Wellness Assessment among Low Income Neighborhood Youths through School Education".
12. Paper published in "The Eternity – Research Journal of Humanities and Social Science Stream" with ISSN-0972-8690 Volume V, Issue – II, July 2014, at page nos.55-58, paper entitled, "Relationship between the Achievement Motivation and pre-competitive among Soccer Player".
13. Paper published in VYAYAM SETU - International Journal of Physical Education and Sports Sciences with ISSN-2349-3992 in the Volume I, No. II, December 2014, paper entitled, "Comparison of Social Adjustment between Physical Education Students of Amity University".

14. Paper published in VYAYAM SETU - International Journal of Physical Education and Sports Sciences with ISSN-2349-3992 in the Volume II, No. I, July 2015, paper entitled, "Role of Sports to Understand Social Harmony".

15. Paper published in VYAYAM SETU - International Journal of Physical Education and Sports Sciences with ISSN-2349-3992 in the Volume II, No. I, July 2015, paper entitled, "A Comparison of Stress between Male and Female Volleyball Players of Amity University".

16. Paper published in VYAYAM SETU - International Journal of Physical Education and Sports Sciences with ISSN-2349-3992 in the Volume II, No. II, December 2015, paper entitled, "Comparative Effects of Two Different Training Programmes on Speed and Strength of Bowlers in Cricket".

17. Paper published in VYAYAM SETU - International Journal of Physical Education and Sports Sciences with ISSN-2349-3992 in the Volume II, No. II, December 2015, paper entitled, "Comparative Study on Selected Yogic Variables of Dribbling Ability in Hockey".

18. Paper published in SHODH PRERAK - A Multidisciplinary Quarterly International Refereed Research Journal with ISSN-2231-413X in the Volume VI, Issue I, Jan 2016, paper entitled, "Status of Mental Health in the Students of Various Academic Courses".

19. Paper published in Annals of Multi-Disciplinary Research - A Quarterly International Refereed Research Journal with ISSN-2249-8893 in the Volume VI, Issue I, March 2016, paper entitled, "Effect of the Activity Programme in Fitness if the Professional Students".

20. Paper published in Indian Journal of Physical Education Sports Medicine & Exercise Science with ISSN-0976-1101 in the Volume XVIII, Issue I & II (Combined), June & December 2018, paper entitled, "Comparison of Aggression and Mental Toughness between Successful and Unsuccessful Netball Players of Amity University Uttar Pradesh".

Paper Presentation - International Seminar & Conferences

1. Paper presented in the International Symposium on, **"Global Trends of Physical Education and Sports in 21st Century"**, organized by Noida College of Physical Education, Dhoom Manikpur, Dadri, Gautam Budh Nagar, UP, India during April 2nd to 3rd, 2011. Paper entitled, **"Effect of Training on Psychological and Physiological variables of University Level Field Hockey Players".**

2. Paper presented in the International Symposium on, **"Global Trends of Physical Education and Sports in 21st Century"**, organized by Noida College of Physical Education, Dhoom Manikpur, Dadri, Gautam Budh Nagar, UP, India during April 2nd to 3rd, 2011. Paper entitled, **"A Comparative Study of Grip Strength, Arm Strength and Wrist Flexibility between College and School Level Hockey Players".**

3. Paper presented in the International Conference on, **"Current Trends in Education, Physical Education and Sports"**, Organized by Faculty of Physical Education, Shri Shivaji College of Education, Amravati, Maharashtra, India, during March 12th to 13th, 2011. Paper entitled, **"Effect of Plyometric Exercises on Vertical Jump of Basketball Players".**

4. Paper presented in the International Seminar on, **"Physical Education Recreation and Yogic Sciences"**, organized by Department of Physical Education, Faculty of Arts, Banaras Hindu University, Varanasi, UP during February 19th to 21st, 2012. Paper entitled, **"Assessment of Work Load, Emotional Stress Vulnerability and Physical Stress of Teacher working in Government School".**

5. Paper presented in the International Conference on, **"Sports Economics and Vision of London Olympics 2012"**, Organized by Delhi University Sports Council, University of Delhi, during April 17th to 19th, 2012. Paper entitled, **"Consciousness towards Sports and Physical Education Program through Mega Sports Event: A Lesson from CWG 2010".**

6. Poster presented in the International Conference on, **"Sports Economics and Vision of London Olympics 2012"**, Organized by Delhi University Sports Council, University of Delhi, during April 17th to 19th, 2012. Poster entitled, **"Olympic Values".**

7. Paper presented in the "**XII ASFAA Congress 2012 (Asiana Sport for All Association)"**, Joint Organization by Amity University, Uttar Pradesh, and University of Delhi, Delhi, India, during September 26th to 30th, 2012. Paper entitled, **"Sports Peace and International Understanding".**

Paper Presentation - National Seminar & Conferences

1. Paper presented in National Conference on, **"New Dimensions in Physical Education and Sports"**, organized by Department of Physical Education, Banaras Hindu University, Varanasi, UP, during January 23rd to 25th, 2005. Paper entitled, **"Recreational Programme for Mentally Retarded Learners"**.

2. Paper presented in National Seminar on, **"Globalization, Structural Change and Small Scale Industry – Need For New Approach"**, organized by Jagatpur PG college, Varanasi, UP, during March, 5th to 6th, 2005. Paper entitled, **"Small Scale Industries in Rural Areas: Effect on Physical Education and Sports"**.

3. Paper presented in the Seminar on, **"Physical Education and Sports Sciences"**, organized by Department of Physical Education, Banaras Hindu University, Varanasi, UP, on 18th March, 2008. Paper entitled, **"Effect of Circuit Training on Selected Basketball Skill and Physical Fitness Variables"**.

4. Paper presented in the National Seminar on, **"Issues and Challenges in Teacher Education"**, organized by Department of Education, Noida College of Physical Education, Dhoom Manikpur, Gautam Budh Nagar, UP, on 24th January, 2009. Paper entitled, **"Role of ICT in Physical Education, Games and Sports"**.
5. Paper presented in the National Seminar on, **"Role of IQAC in the Improvement of Academic and Administrative Performance in the Institution"**, organized by Faculty of Physical Education, Shri Shivaji College of Education, Amravati, Maharashtra, during January 30th to 31st, 2009. Paper entitled, **"Infrastructure Innovation and Development"**.
6. Paper presented in the National Seminar on, **"Role of Yoga Therapy and Allied Therapies in Prevention Cure & Rehabilitation of Psycho - Somatic Disorders"**, organized by Degree College of Physical Education (An Autonomous College), Shri Hanuman Vyayam Prasarak Mandal, Amravati, Maharashtra, during February 7th to 8th, 2009. Paper entitled, **"Role of Yoga and Old Age People"**.
7. Paper presented in the National conference and Exhibition on, **"Recent Trends in Physical Education, Health Education and Sport Technology"**, organized by Noida College of Physical Education, Dhoom Manikpur, Dadri, Gautam Budh Nagar, UP during February 5th to 7th, 2010. Paper entitled, **"Importance of Health & Sports for Corporate World".**
8. Paper presented in the National conference on, **"Scientific Innovations in Sports"**, organized by The Department of Physical Health & Sports Education, under University Grant Commission's SAP DRS-1 Program, Aligarh Muslim University, Aligarh held at Aligarh, U.P., on February 13-14, 2010, Paper entitled, **"Relationship between Achievement Motivation and Pre-Competitive Anxiety of Performance in Basketball".**
9. Paper presented in the National conference on, **"Recent Trends & Future of Physical Education and Sports Sciences"**, organized by Department of Physical Education, Mahatma Gandhi Kashi Vidyapith, Varanasi, UP during December 28th to 29th, 2010. Paper entitled, **"Job Stress among Physical Education Teachers of Urban & Rural Schools of Uttar Pradesh".**
10. Paper presented as Co-Chairperson in the National conference on, **"Recent Trends & Future of Physical Education and Sports Sciences"**, organized by Department of Physical Education, Mahatma Gandhi Kashi Vidyapith, Varanasi, UP during December 28th to 29th, 2010. Paper entitled, **"Comparison between Motor Components of University Level Volleyball and Basketball Players".**
11. Paper presented in the National conference on, **"Emerging Trends in Physical Education and Yoga for All Round Development of youths"**, organized by Department of Physical

Education, J.S. (PG) College, Sikandrabad, Bulandshahr, UP during February 27th to 28th, 2011. Paper entitled, **"Cardio Internal Training".**

12. Paper presented in the National conference on, **"Changing Perception About the Old age People and Violation of Human Rights"**, organized by K.K.M. College (Affiliated to T.M. Bhagalpur University), Bhagalpur, Bihar during November 8th to 9th, 2011. Paper entitled, **"Fitness Program through various Yogic Exercises for Old Age People".**
13. Paper presented in the "**94th Annual Conference of Indian Economic Association, New Delhi"**, Organized by Bharati Vidyapeeth University, Pune, Maharashtra, during December 27th to 29th, 2011. Paper entitled, **"The Economic Consequences on Performance of Indian Athlete at International Level Competition".**
14. Paper presented in the National conference on, **"Enhancing the Use of Technology for Ensuring Quality Teaching"**, Organized by Department of Education, Noida College of Physical Education, Dhoom Manikpur, Dadri, Gautam Budh Nagar, UP during February 27th to 28th, 2011. Paper entitled, **"Using SPSS to Understand Research and Data Analysis in Physical Education and Sports Sciences".**
15. Paper presented in the National conference on, **"Economic Development and Mobility of Agricultural Laborers in Eastern Uttar Pradesh: Problems and Prospects"**, organized by Hindu P. G. College (Affiliated to V.B.S. Purvanchal University, Jaunpur, UP) Zamania, Ghazipur, Uttar Pradesh, during Sept. 29th to 30th, 2012. Paper entitled, **"Indigenous Sports: A Medium to Uplift Life Quality in Villages".**
16. Paper presented as Recourse Speaker in the National conference on, **"Economic Development and Mobility of Agricultural Laborers in Eastern Uttar Pradesh: Problems and Prospects"**, organized by Hindu P. G. College (Affiliated to V.B.S. Purvanchal University, Jaunpur, UP) Zamania, Ghazipur, Uttar Pradesh, during Sept. 29th to 30th, 2012. Paper entitled, **"Sports as Developing Model for Economic Development in Rural Areas".**
17. Poster presented in the National Conference on, **"Education for Social Reconstruction"**, Organized by R.V. Higher Education & Technical Institute (Affiliated to CCS University, Meerut), Dadri, Gautam Budh Nagar, Uttar Pradesh, during April 20th to 21st, 2013. Poster entitled, **"Structure and Function of Education in Primitive Society".**
18. Paper presented as chairperson of scientific session in the National Conference on, **"Education for Social Reconstruction"**, Organized by R.V. Higher Education & Technical Institute (Affiliated to CCS University, Meerut), Dadri, Gautam Budh Nagar, Uttar Pradesh, during April 20th to 21st, 2013. Paper entitled, **"Significant Role of Linguistic in Education".**
19. Poster presented in the National Conference on, **"Futuristic Trends in Physical Education & Sports"**, Organized by Amity School of Physical Education & Sports Sciences, Amity

University, Uttar Pradesh, on January 19th, 2013. Poster entitled, **"Imagery Skill Training for Sports Performance".**

20. Paper presented in the National Conference on, **"Novel & Emerging Approaches in Pharmaceutical Sciences & Research"**, Organized by R.V. Northland Institute (Sponsored by: Science and Engineering Research Board, Department of Science & Technology), on May 31st, 2014. Paper entitled, **"Ergogenic Aids as Performance Enhancer: A Critical Review".**
21. Paper presented in the National Seminar on, **"अम्बेडकर और सामाजिक समरसता"**, Organized by Ambedkar Study Centre, Harischandra Post Graduate College, Varanasi, Uttar Pradesh, form June 28th to 29th, 2015. Paper entitled, **"योग द्वारा सामाजिक पुनरुत्थान: एक रूपरेखा".**
22. Paper presented in the National Seminar on, **"स्वावलम्बन एवं कौशल विकास : गांधी दृष्टि"**, Organized by Ambedkar Study Centre, Harischandra Post Graduate College, Varanasi, Uttar Pradesh, form June 28th to 29th, 2015. Paper entitled, **"खेल तथा कौशल विकास".**
23. Paper presented in the National Workshop on, **"अंबेडकर और सामाजिक न्याय : वर्तमान परिदृश्य"**, Organized by Ambedkar Study Centre, Harischandra Post Graduate College, Varanasi, Uttar Pradesh, form Feb 15th to 21st, 2016. Paper entitled, **"Social Cohesion through Sport: A Contemporary View".**
24. Paper presented in the National Seminar on, **"भोजपुरी साहित्य में सामजिक, सांस्कृतिक एवं राष्ट्रीय चेतना"**, Organized by Ambedkar Study Centre, Harischandra Post Graduate College, Varanasi, Uttar Pradesh, form Feb 28th to 29th, 2016. Paper entitled, **"Role of Sport for Regional Culture Development".**
25. Paper presented in Seven Days National Workshop on, **"अंबेडकर और सामाजिक न्याय : वर्तमान परिदृश्य"**, Organized by Ambedkar Study Centre, Harischandra Post Graduate College, Varanasi, Uttar Pradesh, form Feb 15th to 21st, 2016. Paper entitled, **"Social Cohesion through Sport: A Contemporary View".**

Attended Seminar, Conferences and Workshops

1. Attended International conference on, ***"Stress"***, organized by Academic Committee, Mahatma Gandhi Kashi Vidyapeeth, Varanasi, UP, during February 20th to 22nd, 2005.
2. Attended, **"14th Commonwealth International Sports Congress - 2010"**, organized by Manav Rachna International University, Faridabad, Haryana, India, during September 27th to 30th, 2010.

3. Attended, **"SAI – AIFF Football Coaching Conference (IFCC 2017)",** jointly organized by Amity University Uttar Pradesh and All India Football Federation in Collaboration with "Sports Authority of India", on October 11th to 12th, 2017 as **Professional Delegate**.
4. Invited & attended as **Resource Person / Lead Speaker** in International Conference on Issues & New Ideas in Sports Management, organised by Lakshmibai National Institute of Physical Education, Gwalior, MP on 8-10 March, 2018.
5. Invited & attended as **Resource Person / Lead Speaker** in National Conference on Fitness, Health and Sports Sciences, organised by School of Studies Physical Education and Sports Sciences, Jiwaji University, Gwalior, MP on 16-17 March, 2019.

Participation in Workshops

1. Participated in a workshop on, **"Physical Education, health Education and Sports in the Present Millennium"**, at R. V. Higher Education and Technical Institute, Dadri, Gautam Budh Nagar, UP on April 18th, 2010.
2. Participated in a workshop on, **"Development of Audio-Visual Materials"**, at Noida College of Physical Education, Dhoom Manikpur, Dadri, Gautam Budh Nagar, UP on April 24th, 2010.
3. Attended Faculty Development program on, **"Sensitization of Faculty to Deal with Students' Concerns More Effectively"**, at Amity University, UP on May 10th & 11th, 2010.
4. Attended Faculty Development program on, **"Usage of Amizone** (An Intranet facility for the Faculty, Students & Staff of the Amity University)", at Amity University, UP on June 15th, 2011.
5. Attended Faculty Development program on, **"Enhancing Emotional Competencies for Effective Teaching"**, held at Amity University, UP on June 29th & 30th, 2011.
6. Attended the "**Training of Trainers"** workshop on, **"UGC – Faculty Induction Programme (FIP)"**, held at Indian Institute of Science Education and Research (IISER), Pune from March 27 - 29, 2019. The workshop was organised by the MHRD – Funded Center of Excellence in Science and Mathematics Education (CoESME) at IISER, Pune on behalf of UGC, New Delhi, India.

Orientation & Refresher Courses

1. Attended Twenty Eight days, **"Orientation Course",** Organized by UGC - Academic Staff College, Banaras Hindu University, Varanasi, UP from May 15th to June 11th 2012 and secure **Grade 'A'.**

2. Attended Twenty One days, **"Refresher Course"**, Organized by UGC - Academic Staff College, Banaras Hindu University, Varanasi, UP from December 1st to 21st 2012 and secure **Grade 'A'.**

Research Guidance Experiences

1. Guided more than twenty five M.Phil. Scholars to complete their Dissertation since 2008 and till date.
2. Supervised more than thirty dissertation of M.P.Ed. Since 2008 and till date.

Academic Experiences

1. Assigned theory and practical classes of B.P.E. (Three Year) in the Department of Physical Education, Banaras Hindu University, Varanasi, during the session 2005-06, by competent authority during Ph.D.
2. Assigned theory and practical classes of B.P.Ed. at Rajiv Gandhi South Campus of Banaras Hindu University, Varanasi, during the session 2006-07 by competent authority during Ph.D..
3. Assigned theory and practical classes of B.P.E., B.P.Ed and M.P.Ed. in the Department of Physical Education, BHU, Varanasi, during the session 2006-07 by competent authority during Ph.D.
4. Worked as a Lecturer in Physical Education from **March 26th, 2008** to **July 4th, 2009** in Noida College of Physical Education *(Affiliated to Chaudhary Charan Singh University, Meerut)*, Dhoom Manikpur, Dadri, Gautam Budha Nagar, Uttar Pradesh.
5. Worked as an **Assistant Professor** in Amity School of Physical Education and Sports Sciences (ASPESS), **Amity University,** Sector-125, Noida, Gautam Budh Nagar, Uttar Pradesh from **July 6th, 2009 to 25 Apr 2018.**
6. Organised Seven days National Research Workshop, Global Research Orientation & Its Utility in Physical Education (GROUP) – 2014 as Organising Secretary.
7. **Member – Board of Management** of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
8. **Member – Academic Council** of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
9. **Member – DRC** of Department of Physical Education Pedagogy, Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
10. **Member – Board of Studies (BoS)** of Department of Physical Education Pedagogy, Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
11. **Member Secretary - Department Research Committee (DRC)** of Amity School of Physical Education & Sports Sciences, Faculty of Education, Amity University Uttar Pradesh.

12. **Member Secretary - Faculty Research Committee (FRC)** of Faculty of Education, Amity University Uttar Pradesh.
13. **Dy. Examination Superintendent** - Amity School of Physical Education & Sports Sciences, Amity University Uttar Pradesh during the session 2016-17.
14. **Member – IQAC** of Amity School of Physical Education & Sports Sciences, Amity University Uttar Pradesh and Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
15. **Representative Member & Quality Support** of Amity School of Physical Education & Sports Sciences in the University **Quality Assurance & Enhancement Department** of Amity University and Member Secretary of IQAC, Department of Physical Education & Pedagogy, Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
16. **Member – Area Advisory Board** – A committee constituted by the university to review the curriculum to meet the international standard.
17. **Member – Student Research Committee –** A committee constituted by institution to extend research support for existing research scholar of institution.
18. **Member** Editorial Board of Research Journal and Library Core Committee of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
19. **Member of Core Committee & Nodal Officer** for preparing Sports Literacy & Physical Education Curriculum for Madhya Pradesh School Education. The team working in collaboration with Rajya Shiksha Kendra, Bhopal, MP LNIPE, Gwalior, MP.
20. Presently working as **Associate Professor** in Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. since **May 3rd, 2018.**
21. **Member** of various Academic Committees, Board of Studies, Subject Expert, Examiner etc. of Universities / Commission like Banaras Hindu University, Varanasi, UP, Amity University, Noida, Ch. Charan Singh University, Meerut, Uttarakhand Public Service Commission, Dehradun, Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior, Deen Dayal Upadhyay University, Gorakhpur, Hemwati Nandan Bahuguna Garhwal University, Srinagar, Uttarakhand etc.
22. **Examination Superintendent** to conduct various examination (Internal/External) of Department of Physical Education & Pedagogy, Lakshmibai National Institute of Physical Education, Gwalior, Madhya Pradesh.
23. **Editor in Chief** of a national multilateral Research Journal "The Eternity" published biannually with ISSN – 0975-8690 by K R Publishers, Varanasi, UP.
24. **Member** of a Editorial Board of a "Indian Journal of Physical Education, Sports Medicine & Exercise Science" published biannually by Lakshmibai National Institute of Physical Education, Gwalior, MP.

25. **In – Charge –** Teaching Practice (theory) of B.P.Ed. for the session 2019-20.
26. **Member –** Library Advisory Committee of Padmshri P M Joseph Central Library, LNIPE, Gwalior for the session 2019-20.
27. **Member –** Organising Committee of 62nd Foundation Day Celebration of Lakshmibai National Institute of Physical Education, Gwalior.

Professional & Administrative Experiences

1. Served as a trainer (Hockey) in Sainik School, Purulia, West Bengal in 2003.
2. Acted as an official in **"Annual Athletic Meet"**, of Deen Dayal Upadhyay University, Gorakhpur, Uttar Pradesh.
3. Acted as an official in various Sports competitions organized by City Delegacies, Banaras Hindu University, Varanasi, Uttar Pradesh.
4. Acted as an official in the Inter class football competition, organized by **"Institute of Agriculture Sciences",** Banaras Hindu University, Varanasi, Uttar Pradesh.
5. Acted as an official in **East Zone Intervarsity and Inter Zonal Intervarsity Tournament of Hockey, (Men)** in 2006-07, organized by University Sports Board, Banaras Hindu University, Varanasi, Uttar Pradesh.
6. Member of "Sports Psychology Association of India **(SPAI)**", since 2007 **(Registration No. – 399)**.
7. Accompanied the students of UG and PG of Amity School of Physical Education & Sports Sciences to **Military Training Camp** organized by Amity Education Valley, Manesar, Gurgaon, Haryana in 2010, 2011, 2012, 2013, 2014 and 2015.
8. Worked as a **Technical Coordinator** of various sports (e.g. Hockey – Boys & Girls, Cricket – Boys & Girls, Handball – Boys & Girls etc.) and a member of various committee (e.g. Draw Committee, Sports Store Committee, Awards & Medals Committee, Coordinator – Control Room etc.) in the annual sports meet **"SANGATHAN- Amity Inter Institutions Sports Meet"** in 2009, 2010, 2011, 2012, 2013, 2014, 2015 and 2016.
9. Acted as a trainer of volunteer for Common Wealth Games – 2010 and successfully produced more than 20,000 trained volunteers to the organizing committee CWG – 2010 with the team trainer and Amity Institute of Training and Development.
10. Worked as a member of Organising Committee in annual sports meet, "SPARDHA – Inter Collegiate Sports Competitions", organized by Amity School of Physical Education & Sports Sciences, Amity University, UP in 2010, 2011, 2012, 2013, 2014 and 2015.
11. Conducted one week National Workshop on, "Global Research Orientation in Physical Education & Sports – GROUP" as an **Organising Secretary**, from January 29th to February 4th, 2014 at Amity School of Physical Education & Sports Sciences, Amity University, UP.

12. Contribute a significant role as a coordinator and a member of organizing team in the successful organization of a National Conference on, **"Futuristic Trends in Physical Education & Sports"**, organized by "Amity School of Physical Education & Sports Sciences", held on January 19th, 2013.
13. Contribute a significant role as a coordinator and a member of organizing team in the successful organization of a National Conference on, **"Youth Enrichment through Sports and Physical Education – YES PE"**, organized by "Amity School of Physical Education & Sports Sciences", on January 20th to 21st, 2014.
14. Contribute a significant role as a member of organizing team in the successful organization of a National Conference on, **"Sports and Physical Education: A Medium for Skill Development and Women Empowerment"**, organized by "Amity School of Physical Education & Sports Sciences", on January 19th, 2017.
15. Accompanied Amity University team of Hockey and Cricket in North Zone Intervarsity tournament to University of Jammu, Jammu & Kashmir and C. S. J. M. University, Kanpur, UP.
16. Member of organizing team in the successful organization of a various AIU Inter University & Inter Zone Inter University Tournament during recent past:
    - ***i.*** *Chess Inter University & Inter Zone Inter University Tournament – 2013-14*
    - ***ii.*** *Tennis (Women) Inter University & Inter Zone Inter University Tournament – 2014-15*
    - ***iii.*** *Football (Men) Inter University & Inter Zone Inter University Tournament - 2015-16*
    - ***iv.*** *Kho-Kho (Men) Inter University & Inter Zone Inter University Tournament – 2015-16*
    - ***v.*** *Tennis (Women) Inter University & Inter Zone Inter University Tournament – 2016-17*
17. **Coordinator** of Smart Campus, Smart Classes & Vitual Classes and Attendance Committee of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. (2018-19).
18. **Assistant Coordinator** of IQAC of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. (2018-19).
19. **Warden** Pt. Deen Dayal Upadhyay Hostel of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. (2018-19).
20. **Organising Secretary** of West Zone Inter University Hockey (Men & Women) Tournament 2018-19 to be organised by Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P.
21. **Member – Organising Committee & Coordinator** of 26th Nehru All India Inter University Hockey Tournament (Men) 2018-19 jointly organised by Nehru Hockey Tournament Society, New Delhi, Association of Indian Universities, New Delhi and Lakshmibai National Institute

of Physical Education, Gwalior from 24th Dec 2018 to 3rd Jan 2019 at LNIPE, Gwalior. (2018-19)

22. **Member** of Organising Committee for West Zone & Inter Zone Inter University Basketball (Women) Tournament 2018-19 to be organised by Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. (2018-19)
23. Conducted various activities, evaluated lesson plans and took theory classes of Master Trainer for Khelo India Scheme at Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P. (2018-19)
24. Appointed as **Selector** for Indian Universities Hockey Team (Men) for 2018-19 by Association of Indian Universities (AIU), New Delhi, India.
25. Appointed as **Manager** of Indian Universities Hockey (Men) Team for 2018-19 by Association of Indian Universities (AIU), New Delhi, India.
26. Appointed as **Certified City Coordinator** *(Id : NTA-TA-C-02380)* by National Testing Agency, Department of Higher Education, Ministry of Human Resource & Development, Government of India in the various competitive examinations e.g. UGC (NET), JEE – Mains, CMAT, GPAT, NCHM JEE, NEET UG (offline) etc.
27. **Member & Faculty Advisor** of Annual Youth Fest, "JASHN 2018-19" of Lakshmibai National Institute of Physical Education (Deemed to be University), Gwalior, M.P., (2018-19).
28. **Member - Organising Committee & Venue Coordinator** of 9th Hockey India Senior National (A Division) Championship – 2019 (Men), Organised by Hockey Madhya Bharat at Gwalior, Madhya Pradesh from 31st Jan to 10th Feb 2019.
29. **Organising Secretary & Subject Expert** of Three Days Workshop on "Sports Literacy & Physical Education Curriculum Development" for Madhya Pradesh School Education organised by Lakshmibai National Institute of Physical Education, Gwalior & MP SCERT, Rajya Shiksha Kendra, Bhopal at LNIPE, Gwalior from 13th to 15th March 2019.
30. Appointed as Director (I/c) for 45 days Summer Coaching Camp conducted in 25 disciplines for more than 2500 participants at LNIPE, Gwalior from May 7th to June 22nd 2019.
31. **Member** – Core Committee for M.P.Ed. Entrance Examination (Written & Skill Proficiency) of LNIPE at Gwalior & Guwahati Centre for the session 2019-20.
32. **Member –** Committee for Preparing Preliminary Admission Test Result of B.P.Ed. Entrance Examination of LNIPE for the session 2019-20.
33. **Member –** Committee for Scrutinize the eligibility / application forms of Foreign National / N.R.I. / Tibet citizen etc. for the admission in B.P.Ed. and to conduct the written examination and skill proficiency for the session 2019-20.

CV – Dr. Yatendra K Singh, LNIPE, Gwalior, M.P.

Area of Special Interest

- Sports Management, Physical Education Curriculum Development & Teaching Pedagogy, Research Methodology etc.
- To Coaching and Officiating Hockey.
- Taking sincere interest in managing various sports events.

Strength

- Optimistic
- Will power and confidence
- An eager learner

Hobbies

- Vocabulary building
- Reading contemporary books
- Visiting new places and meet new people

Declaration

I hereby declare that the above mentioned information furnished by me is true to the best of my knowledge.

Experts Suggestions and Recommendations

Construction and Standardization of Recreational Physical Fitness Test for School Going Children

Name: Sunil Singh
University: Lovely Professional University, Jalandhar
Research Scholar
Reg. No. 42000127

Supervisor Name: Dr. Neelam K Sharma (11933)
Professor and Head of Department, Physical Education
University: Lovely Professional University, Jalandhar

Respected Sir/Madam

I am currently pursuing PhD from Lovely Professional University, Jalandhar, India. In this regard I have constructed recreational physical fitness test for school going children having age 13-15 years. The purpose of the study is to construct and standardize recreational physical fitness test. I believe that the results will be helpful to evaluate the various physical fitness components of school going children in a recreational way.

Therefore, it is my humble request to you that, please give your valuable opinion on the said recreational physical fitness tests for the betterment of my research.

Please take your valuable time to provide your input to improve my study. I will recognize the value of your time, and sincerely appreciate your efforts.

Thank you

Your sincerely
Sunil Singh
Research Scholar
Reg. No. 42000127

Expert Suggestion

In agility test, mention the place of examiner.

Expert Name – Dr. Amardeep Singh

Address – G.N.D.U, Amritsar

Expert Signature- Amandeep 31/7/23

Expert Suggestion

In hand eye coordination test, add negative score for dropped catches.

Expert Name – Dr. YAJUVENDRA SINGH RAJPOOT

Address – 22, LNIPE CAMPUS, MELA ROAD GWALIOR (M.P) - 474002

Expert Signature- ysingh

Expert Suggestion

In Speed test, reduce the penalty time.

Expert Name – Dr. Yatendra Kumar Singh

Address – L.N.I.P.E, Gwalior

Expert Signature- yendra 9/7/23

Expert Suggestion

No changes required

Expert Name – Dr. Nishan Singh Deol

Address – Punjabi University, Patiala

Expert Signature- NSD 1

Expert Suggestion

No change required

Expert Name – Dr Vinita Bajpai Mishra

Address – H. No. 27
L.N.I.P.E.
Gwalior

Expert Signature- Mishra

Expert Suggestion

In abdominal Strength test, allow the sit ups angle in between 60 – 90 degrees.

Expert Name – Dr. Joseph Singh

Address – L.N.I.P.E, Gwalior

Expert Signature- Singh

Data Collection Pictures