

An Integrated Physical, Cognitive, and Skill-Based Talent Identification Model for Specially-Abled Cricket Players

Parth Parmar, Rakesh Bharti

Abstract

The identification of talent is an important aspect in building competitive sports and there are few organized systems of identification of talent in specially-abled cricket players. The increasing popularity of adaptive sports can also drive the necessity to develop comprehensive and evidence-based talent identification guidelines. This research was aimed at devising and testing an integrated model which integrates physical, cognitive as well as skill-based indicators to determine the potential talent in the form of specially-abled players in cricket. The study took the form of quantitative cross-sectional design where 100 specially-abled cricket athletes aged 16-35 years were undergoing adaptive cricket programs. The data were obtained by using standardized tests that were designed to test physical performance (speed, agility, endurance, and strength), cognitive (reaction time, decision-making, and game awareness), and cricket-related technical skills (batting accuracy, bowling consistency, and fielding efficiency). Descriptive statistics, correlation analysis, and multiple regression were used to obtain statistical analysis to ascertain the relative contribution of each variable to the overall score of talent identification. The findings explained that performance on skills was the most proficient predictor of talent identification, then cognitive capabilities and signs of physical fitness. Players with balanced performance with respect to all the three areas were ranked higher. The results indicate that a combined multidimensional assessment model is achievable to enhance the quality of talent identification and the impartiality of the practice in adaptive cricket. This method can help coaches, sports academies and governing institutions to formulate systematic and encompassing strategies on scouting and nurturing of specially-enabled cricket talents.

Keywords: talent, cricket, disability, performance, training

1. Introduction

1.1 Background of Talent Identification on Sports.

One of the basic elements of the modern sports development systems is talent identification. It is defined as the procedure of identifying people who have the potential to excel in a certain sport by an organized evaluation of the physical, psychological, and technical qualities. With good talent identification schemes, the sports organization, coaches, and the governing bodies are able to identify and develop talent who would exhibit high potential at a tender early age and therefore stand better chances of becoming successful in the long run. "In modern sports science, identifying talent no longer depends on the mere observation or subjective assessment of the coaches, but rather depends on organised and evidence-based assessment models, which combine various dimensions of performance.

The conventional methods of talent identification were based on the physical traits that were obvious like speed, strength, endurance and anthropometric features (Parmar et al., 2026). Although these qualities should not be neglected, new studies point to the necessity of multidimensional models of talent, taking into account cognitive skills, psychological stability, technical skills, and specific sport skills. "Such holistic models have the benefit of appreciating the fact that athletic performance is not a single determinant of factors but a complex interaction of factors. Consequently, the contemporary talent identification models focus on physical performance indicators, cognitive decision-making capability, and technical competence analysis. This is a multidimensional methodology that enables coaches and sports scientists to give athletes with balanced competencies necessary to produce elite athletes. Moreover, the development of sports analytics, technologies in performance monitoring and biomechanical measurements has enabled talent identification systems to have much more credibility and objectivity.

1.2 Identification of talent in Cricket.

Cricket is a complicated game which requires special combination of physical condition, technical perfection, tactical consciousness and psychological balance. Contrary to a variety of other sports, cricket has several special positions like batsman, bowler, wicketkeeper, and all-rounder that demand different physical and technical qualities (Bhaisaheb, 2015). Talent identification in cricket is therefore, an endeavor that involves the consideration of different performance metrics such as batting skills, bowling skills, fielding skills, response time, and decision-making skills.

Physical fitness is an important factor in the performance of cricket. Muscular power, stamina, pliability, and agility are the necessary requirements to ensure that players can play throughout the length of games. Speed and power are the two key qualities required by fast bowlers, and good reflexes and reactions are essential in the fielders to catch a fast-moving ball. On the contrary, batsmen have to have a great hand-eye coordination, balance and reaction speed to meet a high-speed delivery. Besides physical abilities, there must be technical skills in batting, bowling, and fielding, to be a successful in competitive cricket. The coaches and selectors usually use skill tests like batting accuracy, bowling line and length consistency and fielding efficiency during the talent scouting programs.

In the modern world, there is a common pattern in identifying talent in cricket that is mainly done by trials in regions, academy trainings and performance appraisal during a competitive match. They are usually done through observation by expert coaches, statistical examination of performance, and structured evaluation of skills (Gupta & Vahid, 2017). Nonetheless, most of the conventional means of scouting are still subjective, and they may fail to identify potential talents among athletes who might be good but might not be well exposed. As a result, there is a growing concern in the coming up with uniform and scientifically based models of talent identification in cricket.

1.3 Challenges for Specially-Abled Athletes

Although inclusive sports participation is increasingly gaining recognition in the global scene, specially-abled athletes in most cases encounter great difficulties in securing organised talent identification programs. Adaptive games like disability cricket have been popular in the recent years, but there are few established structures to define and develop talent among specially-abled sportsmen (Tiwari et al., 2024). Most talent scouting systems were built with able-bodied athletes in mind and might not consider the wide range of physical and functional ability of players with disabilities.

Among them is the absence of standard evaluation programs to adaptive cricket. Conventional performance measurement is not a good measure of the potential of specially-abled players since it could be affected by physical impairments to the traditional performance measures. There is also the fact that the opportunities of specially-abled people to show their skills are also limited due to

a lack of access to training facilities, professional trainers, and competitions. Underrepresentation of talented athletes within formal sporting systems is also caused by social stigma and lack of awareness on disability sporting activities.

The other major hindrance is connected with the lack of complete evaluation models (physical, cognitive, and skill-based) targeting solely specially-abled players of the game of cricket. Although there are disability cricket tournaments and talent camps organized by some organizations, they usually use informal or piecemeal ways of assessment (Lakshmi, 2020). It is in a disorganized and not inclusive structure that most of the talented are not discovered or they are not supported in the development of their sports. Consequently, the inclusive sports systems that can cover various physical disabilities and focus on equal participation should be developed to enhance the culture of participation and outstanding performance in adaptive sports.

1.4 Comprehensive Models of Talent Identification.

Integrated talent identification models are determined to give a comprehensive analysis of the athletes through the amalgamation of various performance dimensions into a solitary assessment framework. These types of models acknowledge that athletic success is determined not only by physical fitness but by cognitive talent, technical skills and a tactical knowledge of the game. When considering the world of cricket, integrated models can comprise of physical performance measures like sprint speed, agility, endurance and muscular strength which indicate the physical fitness of the athlete to play cricket competently.

Another factor that is important in the performance of cricket is cognitive factors. The players have to be quick in analyzing the situations in the game, predicting their strategies, and make correct decisions in a pressured situation (Johnston et al., 2018). Response time, decision making capacity, focus and awareness of the situation are hence essential factors of cognitive performance in cricket. The evaluation of these mental skills can be useful in determining the capability of an athlete to perform well in a dynamic match situation.

Other than physical and cognitive qualities, skill based analysis is crucial in the determination of technical prowess in cricket. The main performance indicators that provide the evaluation of cricket-specific skills are batting accuracy, bowling consistency, fielding efficiency, and catching

ability. A combination of physical, cognitive, and technical tests in the talent identification models can give a full picture of the capabilities and potential of an athlete.

1.5 Research Gap

Despite the substantial amount of literature about multidimensional talent identification frameworks in sports science, a significant gap can be observed in the literature regarding adaptive cricket-specific models. The vast majority of current studies is devoted to the development of talents among able-bodied athletes, and there is an urgent need to find out how the incorporated assessment systems can be used in relation to specially-abled athletes in cricket. Besides, there has been little empirical research conducted on how physical, cognitive, and skill based performance indicators work together to determine talent when used in disability sports.

With the recent fascination with inclusive sporting activities and adaptive forms of cricket, the scientifically supported and inclusive talent identification frameworks that are specifically designed to suit specially-abled athletes are urgently needed. These models would assist coaches, sports academies, and governing bodies on a systematic basis to assess the potential players and provide them with equal opportunities to participate and develop. Thus, this paper aims to fill this gap by suggesting and analyzing a combined physical, cognitive and ability-based talent identification model that is specifically targeted towards specially-abled cricketers.

1.6 Research Objectives

- To establish and test a combined talent identification model on the specially-abled cricket players.
- To evaluate physical performance indicators.
- To assess cognitive decision-making skill.
- To determine specific technical skills in cricket.
- To examine their overall impact on the selection of players.

2. Literature Review

2.1 Physical and Physiological Determinants of Talent Identification in Sport

Physical and physiological traits have been viewed as the basis of talent discovery in sport. Early talent identification systems were based on measurable physical qualities like strength, speed, endurance, flexibility and anthropometric features in the determination of athletic potential (Johnston et al., 2018). The logic that underlies this approach is based on the fact that physical fitness of the body is the biological and functional foundation, which sport specific skills are built. With the growing performance-based nature of competitive sport, there has been a renewed focus by researchers and practitioners on the need to screen athletes based on standardized physical tests to determine athletes with the highest potential to succeed at the elite level (Hamidi & Wazir, 2022).

An existing body of literature presents the significance of both the anthropometric and physiological indicators in forecasting the success in both team and individual sports. Research has always shown that athletes who climb up to the elite levels tend to have high aerobic capacity, muscular strength, power and speed as opposed to sub-elite athletes. Processed review of literature and research in sports science has highlighted that individual systems of talent identification often start with evaluations of bodily wellness since the variables are comparatively objective, they can be gauged and also they are closely linked with performance consequences. In one example, agility, sprint speed, and muscular endurance are the most put-forward benchmarks to assess players in initial talent scouting and development initiatives (Sarmiento et al., 2018).

This has led to the heightened significance of physical fitness in the context of cricket with the sport having transformed into a quicker and increasingly physical game. New varieties of cricket games especially limited overs and T20 games compel players to undergo repetitive high-intensity activities, run between wickets fast and explosive bowling as well as quick directional adjustments in the field (Till et al., 2019). A study of the physiological demands of the game of cricket has shown that professional cricketers need to have a case of both aerobic endurance and anaerobic power to maintain performance during extended playing durations. Fast bowlers are in competition and strong and powerful enough to create ball speed whereas batters are dependent on a high level of coordination, response speed and lower body strength to make useful strokes. Fielders on the other hand rely on agility and velocity to be able to respond promptly to erratic ball paths.

The research of strength and conditioning also confirms the importance of organized physical training to the enhancement of the performance in the game of cricket. There is evidence that the athletes who experience specific strength and conditioning programs show improvement in the speed, agility, and injury prevention of sprinting. The batting power, bowling velocity and the distance of any throw is accompanied by muscular strength especially in the upper and the lower body. Resilience is also important since each game of cricket may take several hours or even days, which involves continuous physical activity and ability to recover. This has led to fitness tests like sprinting, agility and endurance tests being part of the program of identifying talent in cricket.

In addition to cricket, it has been shown that studies done on other team sports (soccer, rugby, and basketball) also support the predictive role of physical qualities in determining talented athletes. Research has revealed that the elite athletes in such sports portray better physical conditioning to their counterparts especially in the aspect of speed, agility and power. These results confirm the hypothesis that physical performance measures could be used as a predictive of athletic potential in various sporting approaches (Dodd & Newans, 2018).

Nevertheless, even though the arguments to support the position of physical fitness in talent recognition are quite overwhelming, researchers are beginning to concede weakness of the approach that solely uses physical collected evidence. Physical qualities cannot solely be attributed to long-term success in sport with many athletes that have extraordinary physical abilities failing at the top. Such other elements as development of technical skills, tactical awareness, decision making, and psychological endurance also have vital roles in performance. Besides, physical traits can vary considerably with time according to training, maturation and environmental factors and therefore can no longer be foretold by just physical features (Hamidi & Wazir, 2022).

An additional constraint is that physical testing in controlled settings may not be a true representation of actual match performance whereby athletes have to combine physical capacity with cognitive and technical skills in pressure situations. As a result, the current talent identification studies suggests a multidimensional strategy to integrate physical tests into additional performance areas.

To conclude, physical and physiological attributes are still the key elements of talent identification systems, especially in the sport that requires considerable physical efforts like cricket. Sports

science always shows that speed, agility, endurance and strength are essential in sports performance (Höner et al., 2023). However, there has been an emergent body of research recommending that physical qualities are not significant enough to accurately decipher the sporting success in the long term. This awareness has attracted an increase in the desire to consider cognitive and psychological aspects in the identification of talents as explained in the next section.

2.2 Cognitive and Psychological Factors in Talent Identification

The studies on talent identification over the last few years have reported the rising trend where talent does not appear to be elucidated by sheer capability in the instance of athletic achievement. Sport today demands rapid decision making, perception and anticipation awareness and psychological strength that are all of significant importance in the execution of performance. The growing intensity of environmental conditions as well as a growing complexity of tactics have elevated cognitive and psychological abilities as a significant variable between the elite athletes who perform highly and those whose performance is lesser (Xiang et al., 2022).

One of the most popular cognition aspects of sport is decision making ability. The fact that the athletes are in a team sport implies that they have to analyze the ever-changing situation and make the appropriate choice in a few seconds. In the game of cricket, batters are required to make choices on whether to receive a delivery or leave it, choose suitable shot placement and predict field placement. Bowlers need to gauge the conditions of the match, inclination of the batsmen, and context of the game to decide on strategy (Murr et al., 2018). Fielders ought to be able to immediately respond to the ball trajectory and the game situations. Sports psychology studies have shown that elite athletes are always able to make decisions with high speed and accuracy as compared to those in sub-elite levels. Such findings suggest that making information fast and efficient and selecting the correct response is a key aspect of sporting expertise.

Reaction time is the other valuable cognitive attribute which can be attributed to athletic performance. The need to respond to stimuli of very high speed particularly when a very high speed bowler throws the ball with a high velocity is found in cricket (Lai & Ishizaka, 2020). The studies of reaction time show that in comparison with their counterparts, elite players are more likely to respond better to visual and auditory stimuli quicker and more efficiently, thus being able to work under pressure. Batting, fielding and bowling strategies are improved due to quick

response. This has led to a rise of reaction time tests; presently they feature in modern talent identifying programmes.

Perceptual cognitive ability, such as anticipation and pattern recognition is also important in distinguishing expert athletes. Elite players are more effective in recognizing the patterns of playing, predicting actions of opponent and analyzing the game subtleties. This skill can enable them to foresee occurrences ahead of occurrence and this gives them a decisive advantage in the dynamic situations in the game. The experienced players on the field of play predict the direction of the ball that will occur in the game based on the action of the bowler, or location of the field to efficiently and quickly respond (Potter, 2019). Research carried out on perceptual expertise has provided evidence that this anticipatory ability can be developed through the assistance of conscious practice and experience, which adds value to the applicability of cognitive training with regard to the physical conditioning.

Situation awareness and intelligence further enhance performance in challenging sports situations. Situational awareness is the notion that an athlete is energized to identify the larger context of a game like the game score, the position of the action, what strategy is being employed by his opponent, and the relationships within a group. Higher levels of game awareness enable athletes to make superior tactical decisions and more efficiently adapt to the changing conditions during the game. The sport performance experiments constantly point how having a good tactical understanding and tactical comprehension of events, sportsmen enjoy a better consistency and succeed in high levels (Barraclough, 2024).

The increasing popularity of perceptual-cognitive training is due to the realization that cognitive skills can be acquired via systematic training. The concept of simulation based on video, a decision making simulation and even a virtual-reality world is also being embraced as a training aid in enhancing the mental functioning of an athlete (Susanto et al., 2024). The strategies will improve anticipation, reaction time and decision making accuracy thereby improving mental aspects of performance.

Even though the evidence around cognitive factors in sport is immense, these competencies have traditionally not been a significant focus of conventional talent identification. The strategies implemented in initial scouting plans were normally more on physical and technical skill that can

be seen rather than the mental model that underpins performance. However, the investigations, which have been carried out in the recent years, have provided evidence that cognitive abilities usually serve as the distinguishing factor between the elite athletes and those, who are at the same physical and technical level. Having superior decision making and perceptions, athletics is better equipped to deal with pressure and be adaptable to complex situations on the field.

Overall speaking there is increasing evidence of the need to bring about the cognitive and psychological dimensions in talent identification models. Decision making, fast response, perceiving skill and awareness of a game are all roles that can make one successful in sport particularly when it is a dynamic game such as cricket (Koopmann et al., 2020). These findings substantiate the fact that the talent identification process should not be limited only to the physical assessment but also cognitive assessment must be provided in order to articulate all the performance determinants. This area of recognition has resulted in multi-dimensional talent identification models as will be seen in the following section.

2.3 Skill-Based and Multidimensional Talent Identification Models in Sport

The history of development of talent identification studies has been slow in shifting toward skill-based and multidimensional strategies to combine physical, cognitive, and technical measures of performance (Durmuş, 2025). However, whereas former approaches to talent identification were guided more by anthropometric and physiological tests, current studies propose the relevance of sport-related technical abilities as well as the interrelation among various areas of performance. This change is especially applicable in the sport of cricket, a sport that demands a sophisticated supply of batting, bowling, fielding and tactical decision making skills.

Talent identification processes in modern contexts have acquired a technical skill assessment as a main element. Technical skill in the batting art, in the operations of the bowler, and in the art of fielding is decisive in a result in cricket. Research works in the field of cricket performance analysis help to stress that metrical consistency, choice of shots, precision in bowling and combination of the field play a significant role in distinguishing elite players and the developing athletes (Johnston et al., 2018). In contrast, to general physical fitness measures, sport-specific technical skills directly affect the performance of a match, thus such skills are helpful predictors of talent identification. It is also shown that technical skills are closely connected with perception

and mind abilities, which also supports the notion of the importance of combined evaluation models.

This increased appreciation towards sport-specific skill assessment has resulted in the creation of multi-dimensional talent assessment models. The models are intended to describe the interplay between physical fitness, psychological qualities, cognitive abilities and technical performance. Multidimensional frameworks hold that athletic success is the dynamic interaction of several factors and that success is predicated not on one domain. To illustrate, even a sports person with good physical ability can find it hard to compete on high standards without superior decision making skills and technical knowhow (Sarmiento et al., 2018). On the other hand, players who have moderate physical traits, yet have better tactical knowledge and technical expertise can be very successful. This has prompted researchers to suggest the adoption of holistic talent identification schemes that measures athletes in several areas.

Talent development systems also complement the multidimensional approach of focus on the long-term athlete development pathways. All these frameworks acknowledge that talent is not an inborn attribute but a dynamic process which is built through training, coaching, and environmental factors (Till et al., 2019). Long-term studies reveal that early specialization based on physical characteristics alone is not a reliable predictor of a high-performance level in the future. Rather, effective talent management channels center on lifelong, competence building, psychological and performance gradual incremental tracking. This transformation in early selection into long-term development has transformed the manner in which researchers and practitioners have been identifying talent.

New research articles published in the last three-five years (2023-2025) support the relevance of multidimensional models in team sports. Such studies illuminate the capability to combine data analytics, performance monitoring technologies, and machine learning techniques to assess athletes based on various performance factors. State-of-the-art performance analysis tools can now be used by the researcher to evaluate technical skills, decision patterns and match performance at real time (Höner et al., 2023). These new technological innovations have also helped lend more weight to the claim that talent identification must be grounded on an overall performance profiling and not individual measures.

Regardless of the innovations, most multidimensional identification of talents models have been created and proven successful with able-bodied athletes. There is very little research in adaptive and disability sport (especially in cricket) within research. Although the number of people participating in sport inclusion has been on the rise worldwide, scientific studies on talent identification in adaptive cricket are still infancy. Current literature on disability sport is more inclined to participation, rehabilitation or social inclusion instead of systematic identification of talents and modelling of performance.

Such a gap is particularly critical considering that the adaptive cricket card is growing at alarming rates and more and more opportunities are available to the specially-abled athletes to play at regional, national and international level (Wang et al., 2022). The multidimensional talent identification frameworks that could best fit adaptive cricket have not been validated, which underscores an urgent research gap. Thus, it is evident that a need to establish and authenticate an unanimous physical, mental and competence-based talent identification framework that is particularly/considerably focus-oriented on specially-abled cricketing players.

3. Methodology

3.1 Research Design

The current research used a quantitative empirical research approach to investigate the effectiveness of an integrated model to determine talent of specially-abled players of cricket. The cross-sectional methodology was used, where responses of participants were captured at a given moment. This design was the right design since the study was to test many performance variables at a time and establish their combined effect on talent identification in adaptive cricket. The objective measure of physical fitness, cognitive abilities and skills in cricket using standardized testing procedures could be measured using quantitative methods to evaluate performance indicators. The application of cross-sectional framework also made it possible to compare the levels of performances of athletes in various dimensions and facilitate the formation of statistical relationships between the variables. The aim of the study was to generate a complex assessment model by incorporating several quantifiable elements that could help to facilitate systematic identification of talent and help to introduce more generous sports developmental initiatives among specially-abled athletes.

3.2 Participants

The study sample was made up of specially-abled players of cricket who were actively engaged in an organized cricketing activity, training program or regional tournament. The recommended sample size of 80 to 120 athletes was deemed decent to give adequate statistics power and sample representation of the population being studied. These players were referred to the cricket academies, disability sports associations and community based adaptive sports programs which encourage players to participate in disability cricket. The athletes were aged between 16 and 35 years and were a representation of either emerging talents or active participants in the adaptive cricket.

In order to be consistent with the research sample, a number of inclusion criteria were set. The participants had to be able to participate in adaptive cricket activities and had to have a known physical disability. Secondly, they had to possess a full year of playing experience in training or competitions of cricket. The study barred players with serious medical conditions that might compromise their involvement in physical testing or players with no previous experience in playing or having no prior experience of playing cricket. They were all included in the research and made to understand the purpose and procedures of the research and got their voluntary consent.

3.3 Sampling Technique

The research employed purposive sampling technique as the researcher picked the respondents based on the exact criteria of the research goals. It was the right approach since the study targeted a specialized group of specially-ability cricket players that are not readily available using random sampling processes. The sports academies and the disability cricket organizations helped in the identification of eligible players who constantly attend trainings and competitions. To make sure that there were balanced representation of various playing roles and disability types, some aspects of stratified sampling were used as well. The participants were selected according to their role in the game like batsmen, bowlers and all-rounders so that the research could be able to record changes in performance attributes of various roles in cricket.

3.4 Variables of the Study

The study has analyzed a number of variables that affect identification of talent in adaptive cricket. The independent variables were the indicators of physical fitness, cognitive abilities, and performance of select skills in cricket. The attributes that were used as physical fitness indicators encompassed speed, agility, endurance and muscular strength that are crucial to being a successful player in cricket. Mental skills were cognitive skills, which players needed in the gameplay, such as the ability to make decisions, reaction time, and situational awareness. Performance of specific skills in cricket involved technical skills in batting, bowling and fielding, which are important when one is participating in the game.

The overall talent identification score or the ranking of performance that was given upon each participant in the study was the dependent variable. This score was an integrated score which was based on the summation of physical, cognitive and skill based performance scores. The effectiveness of the proposed talent identification model was measured using the integrated score to identify the potential cricket talent in specially-abled athletes.

3.5 Measurement Tools

Various standardized measurement instruments were utilized in evaluating the various areas of performance dimensions encompassed in the research. Physical fitness was tested with the help of sprint speed, agility, endurance and muscular strength. The Sprint speed was measured in terms of short distance running tests which were intended to measure acceleration and speed of movement. Agility was assessed by use of change-of-direction exercises and replicate common movements in fielding as in cricket. Endurance was determined by endurance tests involving running and strength was determined by exercises involving upper and lower body muscular power applicable in performance of cricket.

The cognitive skills were evaluated with the help of the structured tests which were created to evaluate the skills of decision-making, reaction time, and the awareness of the game. Reaction meeting tests were done to determine the speed at which players reacted to visual stimulus, and decision making tests were done to determine the ability of the athletes to make the right choice in simulated cricket situations. The game awareness tests were used to assess the knowledge of the participant on match situations and decision-making in a strategy.

The performance based on skills was assessed on cricket specific tests to assess batting accuracy, bowling consistency and fielding efficiency. Batting tests were also given with regards to the capability of the player to hit the ball towards specific target areas. Evaluation of Bowling performance was done in line and line consistency, whereas fielding performance was in the form of catching drills and throwing accuracy exercise.

3.6 Data Collection Procedure

The procedure involved in data collection was structured testing in a standardized training facility of cricket. The participants were taken through planned assessment sessions whereby they completed the physical, cognitive and skill based assessments, under the guidance of trained researchers and cricket coaches. Before the test, the participants were subjected to explicit instructions about the tests to be administered, and trial practice was given to them to ensure they were familiar with the tests. The tests were performed in the same conditions to ensure that the environment was homogeneous in the test process. The ethical considerations were well observed, such as getting the requisite approvals to conduct the exercise and facilitate the confidentiality and voluntary involvement of all athletes.

3.7 Statistical Analysis

The data that were gathered were done through the right statistic techniques to determine the correlations among the variables of the study and the success of the talent identification model suggested. The summaries of characteristics and performance scores of the participants in the form of means, standard deviations, and frequency distributions were presented in descriptive statistics. The correlation analysis was undertaken to test the relationships among the physical fitness measures, cognitive skills, and the skills of playing cricket. A multiple regression analysis tool was used to establish the level to which the variables explained the overall talent identification score. The underlying performance dimensions were also identified by means of a factor analysis, and the structure of the integrated model was justified. The reliability tests were carried out to determine the stability of the measurement tools applied in the study. To provide the best and reliable interpretation of results, all statistical analyses were made using specific software, namely, SPSS, R, or Python.

4. Results

This section gives the results obtained as a result of the evaluation of the specially-abled cricket players through the integrated talent identification model. The findings will contain both demographic information of the subjects and the performance results of the participants in terms of the physical, cognitive, and skill-based tests. Statistical test was used to compare contribution of these variables to the total talent identification scores. Tables have been provided to give a summary of key performance indicators and give a better sense of the results.

The demographic characteristics include the age of the patient and their gender.

4.1 Demographic Characteristics

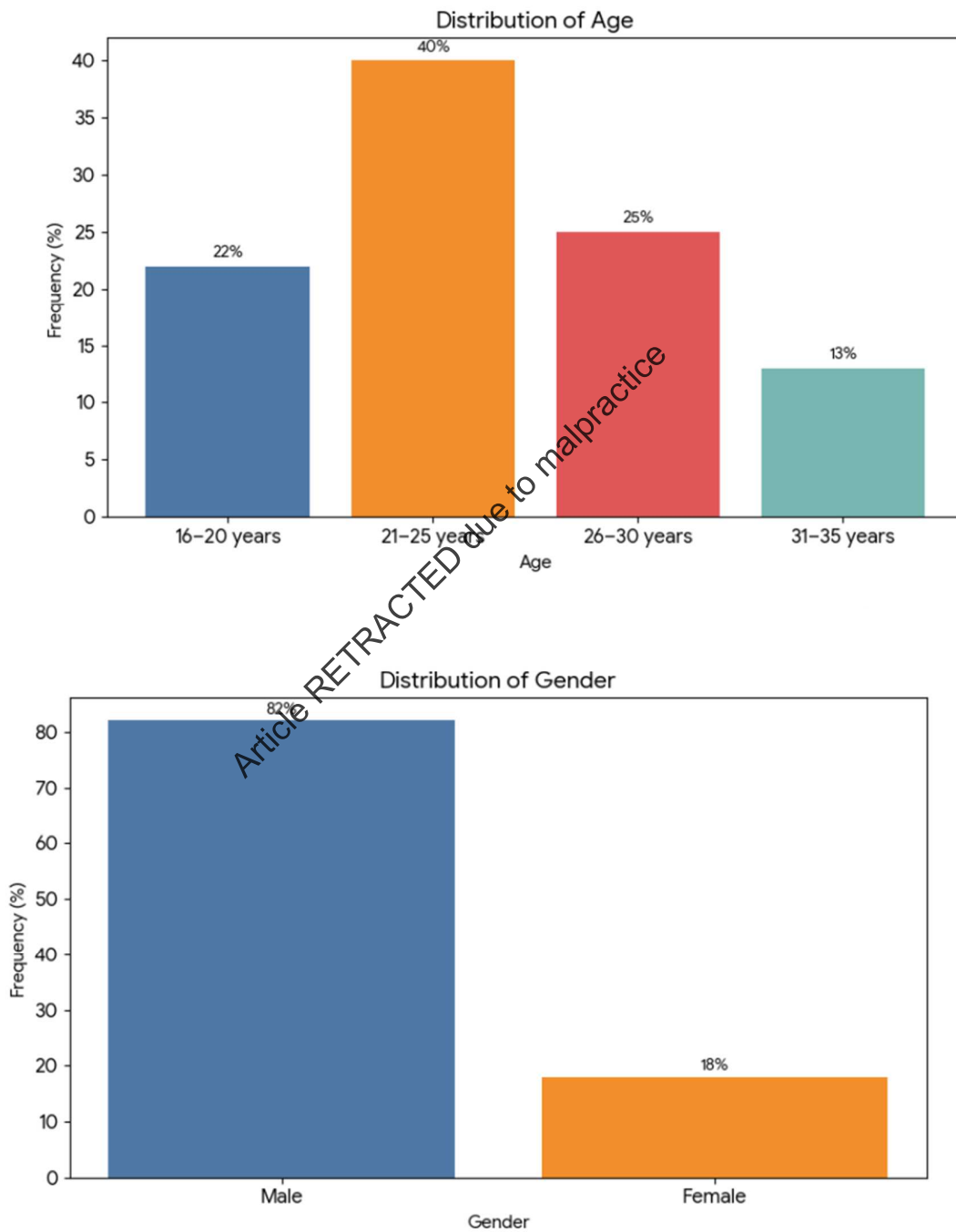
The patient demographics are the age and gender. One hundred specially-abled players of cricket were subjects in the study. The demographic information was gathered to be able to get familiar with the background features of the sample, such as age distribute, sex ratios, disability category, and playing experience. These attributes are significant in that they determine the physical ability, exposure to training and performance in cricket.

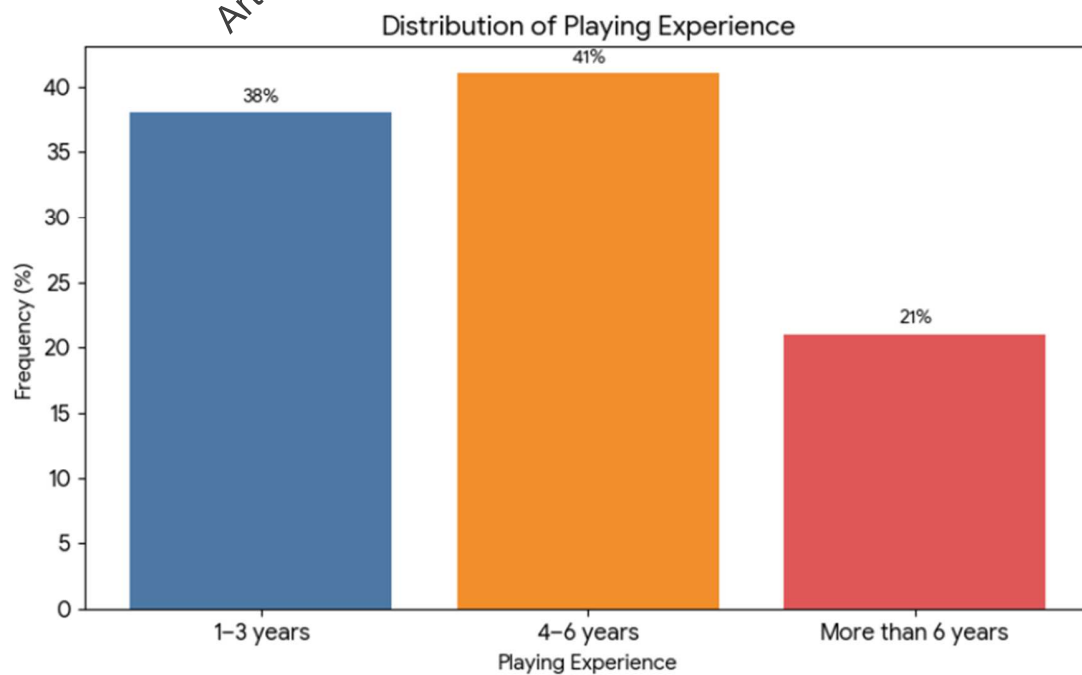
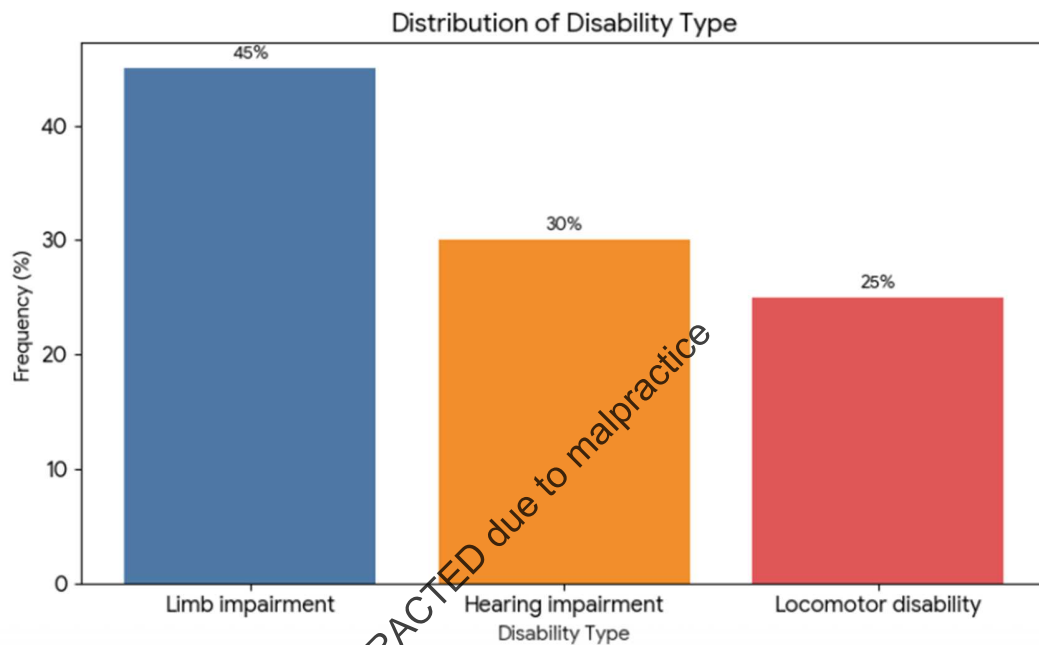
The participants were between 16 and 35 years and majority of players were between 20 and 25 years. It means that the vast majority of participants were young enough to develop their sports abilities. With regard to gender composition, the sample was largely male, whereas there was a few percentage of female players who were also part of the research. The disability classification of the participants comprised of physical limb impairment, hearing impairment, and mild locomotor disabilities. Those categories indicate the variety of adaptive involvement in cricket and indicate the importance of inclusive evaluation systems.

The level of playing experience among the participants was rather different. Others had as much as five years of competitive playing experience with some having one to three years of cricketing training. It was also an opportunity to test the impact of physical, cognitive, and technical abilities on talent identification at different levels of skills due to the presence of players with varying experience levels..

Table 1: Demographic Characteristics of Participants

Variable	Category	Frequency	Percentage
Age	16–20 years	22	22%
	21–25 years	40	40%
	26–30 years	25	25%
	31–35 years	13	13%
Gender	Male	82	82%
	Female	18	18%
Disability Type	Limb impairment	45	45%
	Hearing impairment	30	30%
	Locomotor disability	25	25%
Playing Experience	1–3 years	38	38%
	4–6 years	41	41%
	More than 6 years	21	21%





The demographic results show that the adaptive cricket involvement is mostly clustered around young adults with medium amounts of playing experience.

4.2 Physical Performance Results

Physical fitness tests were done to determine the sprint speed, agility, endurance and muscular strength. These are key qualities to successful play in cricket since they determine running between wickets, speed of the bowling and the movements in the field. The examination showed moderately high and high scores of the performance of the participants especially in the agility and endurance tests.

The sprint speed test was used to measure the capacity of the athletes to accelerate over a very short distance which is significant in running speedily between the wickets. Agility tests measured the speed with which players could turn around and this was a measure of fielding efficiency. Endurance tests were used to determine the capability of the players to continue exerting physical force when playing protracted matches, and strength tests were used to determine the strength of the muscular force required to hit the ball and toss the ball.

Table 2: Physical Performance Test Results

Test	Mean	SD	Performance Level
Sprint Speed (seconds)	5.21	0.48	Moderate
Agility Test (seconds)	12.34	1.12	Good
Endurance Test (minutes)	9.45	1.05	Good
Strength Test (kg)	42.60	5.80	Moderate

The findings are that agility and endurance are also comparatively good physical features among the participants. These are the traits of fielding performance and durability of long matches. There was however moderate variation in the levels of strength meaning that more strength building programs were appropriate in the training of adaptive cricket.

4.3 Cognitive Performance Results

The cognitive performance tests were used to measure decision making, reaction time, and awareness of the game. Cricket is one such game where the players are expected to make fast decisions during a dynamic game, like taking the right shot or change the bowling strategy or even the placement of fielders. The outcomes showed that the majority of the subjects exhibited moderate and high cognitive performance.

Reaction time tests were used to determine the speed at which players reacted to visual cues which represented cricketing situations. The decision-making tests assessed the skill of the player to choose the correct tactical actions to the simulated situations in the match. The knowledge of the strategies in a game and situational understanding during the game was determined by game awareness tests.

Table 3: Cognitive Performance Results

Cognitive Test	Score (Mean)	Interpretation
Reaction Time Test	0.63 sec	Good
Decision-Making Test	74.5	Moderate to Good
Game Awareness Test	78.2	Good

The results depict that the players excelled in game awareness tasks, which means that they are knowledgeable about the cricket strategies and game situations. There was also some degree of cognitive responsiveness exhibited by the reaction time scores, good in batting and fielding performance.

4.4 Skill-Based Assessment Results

The evaluation of the skills was based on the performance that was related to the technical skills in cricket such as batting accuracy, consistency in bowling and fielding efficiency. These are the fundamental skills, which are core competencies of performing well in cricket.

The measuring of batting accuracy was done by determining how well players could hit the ball towards specific scoring areas. Bowling consistency was done through measuring the skills of bowlers to stay straight and straight. The effectiveness of fielding was measured by using catching and throwing exercises which were performed under the conditions of a real match.

Table 4: Skill-Based Assessment Results

Skill Test	Mean Score	Ranking
Batting Accuracy	76.3	1
Bowling Consistency	71.5	2
Fielding Efficiency	69.8	3

The findings demonstrate that batting accuracy was the best technical skill even among the respondents, and then bowling consistency. Fielding efficiency achieved slightly lower scores, which implies that more could be improved in adaptive training programs of cricket.

4.5 Integrated Talent Model Results

The integrated talent identification model was used to combine the outcomes of physical, cognitive and skill based evaluation to come out with a total talent point of each participant. The review of the combined score showed that the players that showed balanced performance in all of the three domains were more likely to obtain higher rankings overall.

A regression analysis was carried out to identify the predictive value of each of the variables on the score of talent identification. The findings showed that performance of skill-based had the highest impact on total talent ranking which was followed by cognitive abilities and physical fitness indicators.

Table 5: Regression Analysis of Talent Identification Predictors

Predictor Variable	Beta Value	Significance
Physical Fitness	0.32	Significant
Cognitive Ability	0.41	Significant
Skill Performance	0.53	Highly Significant

The regression outcomes show that the technical skills of cricket specificity are very important in identification of talent among specially-abled players. But the cognitive abilities were also significantly predictive which emphasized the qualities of decision making and strategic awareness in the performance of cricketing. The variables of physical fitness had a moderate but critical role with regards to sustaining the sports performance.

Altogether, the built-in talent identification model turned out to be efficient in assessing various aspects of athletic performance at the same time. The integrated evaluation method offered a holistic view of the strengths and the weaknesses of every player and the coaches and sports organizations could be able to realize promising talents in a more systematic approach. This research indicates that combination of physical, cognitive and skill based assessment strategies can be of great benefit in scouting and developing talent in adaptive cricket.

5. Discussion

The following model was set to be developed and tested in the present study and designed to identify talent in physically-challenged players of the game of cricket in a combined physical, mental, and skill-based approach. The findings proved that a multidimensional assessment model yields a more in-depth insight into the potential of the athletes than the usual single-factor talent appraisal methods. The analysis of physical fitness, cognitive performance, and cricket-specific skills demonstrates that the combination of several aspects of performance is significant in evaluating potential athletes in adaptive cricket (Baker et al., 2017).

5.1 Physiological Characteristics and Talent Detection.

In most sports, physical fitness has been a central aspect of the performance and talent recognition in sports. This study revealed that agility and endurance were fairly good physical features among the participants whereas the muscular strength exhibited moderate variation (Johnston et al., 2018). These findings are corroborated by the current studies in the field of sports science which underline the significance of agility, speed, and endurance in the performance of the cricket players. It has been demonstrated that the players of cricket games need swift acceleration, effective change-of-direction, and the ability to endure physical activity during prolonged periods of matches. In the case of fielders, agility is of great significance since it allows responding to a moving ball fast and improving the quality of catching and throwing.

The moderate levels of the strength of the participants imply that adaptive cricket players can be characterized by the sufficient level of physical fitness, but the further improvement of performance possibilities may be achieved with the help of other strength training programs. According to studies in sports physiology, muscular strength plays a major role in batting power and bowling speed (Zhao et al., 2024). Thus, special conditioning programs aimed at specially-abled athletes would enhance the performance results and injuries prevention. The results corroborate the argument that physical fitness indicators should be factored in as important elements of talent identification systems within adaptive cricket.

5.2 Role of Cognitive Abilities

The skills of the mind are very essential in the game of cricket as the game necessitates the player to take fast decisions on the dynamic and unpredictable actions. The cognitive test results in the present research indicated a fairly good reaction time and game-awareness assessment task. These results imply the significance of intellectual abilities like rapid information processing, prediction, and strategic action in the gameplay. Cricket players are also faced with issues where they have to make decisions at the spur of the moment like the choice of batting shots, where to change the bowling strategies or where to place the fielders according to the opponent strategies.

The available literature in sports psychology focuses on the fact that cognitive abilities tend to draw the line between star athletes and mediocre ones (Till et al., 2019). Situational awareness and decision-making ability help the players to act effectively to situations in the game especially when it is competitive. The exemplary cognitive performance that has been witnessed among the

participants in this study would give an impression that mental skills training may be a significant part of adaptive cricket development programs. When cognitive assessment is integrated into the talent identification systems, it is important to make sure that the talent is not classified based on physical ability but the capacity to think strategically during matches as well.

5.3 Skill-Based Performance

The analysis presented in this study indicated skill-based performance as the most predictive of identifying talent in the regression analysis (Lascu et al., 2021). The average score was greatest in batting accuracy as compared to the other skill tests which were bowling consistency and fielding efficiency. These results indicate how vital the technical competence in the game of cricket is. Cricket as an activity is basically a skill game and to be successful in it, one has to master the art of batting, bowling and fielding.

The significance of the use of technical skills in talent identification can also be supported by previous studies on the analysis of performance in cricket (Vickery et al., 2018). Players with a good batting style, accurate control of bowling and effective fielding skills have higher chances of performing at a higher level of competition. The findings of this paper affirm that in the assessment of potential cricket talent, skill based assessment should be considered first. Nevertheless, the marginally lower scores of fielding efficiency indicate that there is a possibility that certain training interventions are required to enhance defensive performance in specially-abled athletes.

5.4 Coherent Model Effectiveness.

The creation of an integrated model of talent identification (incorporating physical, cognitive, and skill-based performance indicators) is one of the most important contributions of the present study. The combined score analysis showed that those athletes who portrayed balanced score on the three domains scored better in terms of overall talent rankings (Brown et al., 2023). This result corroborates an idea that athletic performance is multidimensional and cannot be evaluated precisely with the help of a single measure of performance.

The integrated model has some benefits over the conventional methods of talent scouting. The model will minimize the chances of missing out on the talent of the sport when different elements of assessment are used to assess them, as some are able to perform well in one area and fail in

others (Tissera et al., 2022). E.g. a gamer with a high level of cognitive decisions can balance good physical condition, and another player with high physical qualities can be in need of additional training of technical skills. The combined rating system consequently enables coaches and selectors to determine all-round athletes who have been well developed.

5.5 Conclusion on the Implications of the Development of Adaptive Cricket.

The research results in this study have significant implications on the implementation of adaptive cricket programs. The integrated model can be a systematic way of coaches and sports academies identifying and developing specially-abled talent in cricket (Thander & Kundu, 2024). Through the application of uniform performance tests in the physical, cognitive, and technical areas, coaches will be able to come up with a detailed profile of the strengths and weaknesses of every athlete. It can be used to inform personalized training programs and specific skill acquisition programs.

In the case of sports federation and governing bodies, such models can enhance transparency and fairness in the selection of talents. Inclusive assessment systems can also promote more people to join the sport of disability cricket because they are given equal opportunities as other athletes. Moreover, the systematic identification of talents can also be developed, which will help to make adaptive cricket a competitive sport with an international name (Kalén et al., 2021).

4.6 Comparison with the Past Studies.

The results of this work are in line with the prior studies in the field of sports science that stress on the multidimensionality of talent identification. Previous research in sports like soccer, basketball as well as rugby has proven that elite sportsmen generally have a blend of physical fitness, technical abilities as well as mental capabilities (Heppe et al., 2016). Not much has however been done in terms of research specifically on talent identification models of specially-abled cricket players.

The current research will fill this gap and contribute to the expanding literature on the development of inclusive sports (Fadde & Zaichkowsky, 2018). The combined model offered in the present study is consistent with the modern models of talent development that focus on comprehensive assessment of a sportsman. Although the individual performance indicators have frequently been

a dominant topic in the previous research, the present study is able to illustrate the worth of measuring and integrating numerous dimensions of assessment to develop a more effective and comprehensive system of talent identification (Schaefer et al., 2025).

Study Limitations

Although this study is insightful in the development of a comprehensive talent identification model with regards to the specially-abled diplomacy in cricket, it has a number of limitations that it ought to note. It is essential to note such constraints to interpret the results and direct further academic research.

The research design used in the study was cross-sectional research design, which only caters to current information at any one time. Although this method enabled the researchers to study the connections between physical, mental, and skill-based indicators, such a method does not permit conclusions about the long-term development or cause and effect relations. Talent identification and athlete development are dynamic processes, which change over time and a cross-sectional view cannot be able to capture the change in performance, change in training adaptation or change in skill acquisition.

Second, the sample of respondents was reasonable, but due to the necessity to provide statistical analysis, it was restricted by 100 respondents who were selected in a certain geographical spot and participated in adaptive cricket programs. This limits the extrapolation of the results to larger groups of specially-abled cricketing players and especially others in new cultural, socioeconomic, or sporting settings. The number of participants, training centers, and coaching are very different in various regions, which can impact athletes and their performance.

Third, the research was mainly concerned with physical indicators, cognitive and technical skills, and not with other possible factors, which could have been affecting it. Motivation, resilience, confidence, and these are the examples of psychological variables being considered significant contributing factors to sports success. On the same note, the impact of environments and social factors such as the quality of coaching, family support, and facilities accessibility, and exposure to competition was out of this research. The omission of these factors can result in a less comprehensive approach to the proposed model.

Fourth, the instruments of the measurement employed in this study were based on standardized test settings. Standardization testing enhances reliability and objectivity but does not necessarily reflect the match conditions in reality when the performance is affected by the pressure, fatigue, intra-team dynamics, and unpredictable game situations. Thus, ecological soundness of the testing procedures might not be entirely high.

Lastly, the research did not discriminate outcomes in various classes of disabilities in details. Specially-abled athletes are a very heterogeneous group and differences in the type and the degree of impairment might have a different impact on performance results and the talent recognition procedure.

Future Research Directions

The findings of this study can be utilized in various ways in future research. The introduction of longitudinal studies which monitor athletes over a long period should be one of the most valued directions. Long-term follow-ups would enable researchers to analyze the way physical and cognitive and skills-based predictors change and to determine the relationships between the scores of early talent identification and performance and competition success in the future.

The generalization of findings should also be enhanced by expanding the sample size, consideration of participants across regions, countries, and competition level. The cross-cultural and international studies may offer additional understanding of the impact of training environment, sporting system and social support structures on the development of talents in adaptive cricket.

Psychological and socio-environmental variables should also be incorporated in future studies with the aim of incorporating them into talent identification models. Adding such variables as motivation, a psychological ability to stand up, the quality of coaching and access to training would lead to a more holistic and ecologically valid model of talent identification and development.

The other avenue to be explored is incorporation of the new technologies. Monitoring athlete development has the potential to be provided round-the-clock and in real-time by artificial intelligence, wearable performance trackers and by using advanced sports analytics. The implementation of these technologies would help to increase the accuracy and objectivity of the talent identification systems.

Lastly, developments in the future ought to focus on sport-related. It would be desirable to develop customized assessment packages to different impairment groups to enhance equity, inclusiveness and precision in talent founding in adaptive rugby.

Collectively, these prospective ways might lead to the optimization of inclusive and evidence-based talent identification frameworks and encourage the long term development of adaptive cricket globally.

6. Conclusions

6.1 Summary of Findings

The current research designed and tested a comprehensive talent detection model of specially-abled players in cricket through studying physical fitness indicators, cognitive abilities and skill-specific performance in cricket. Following were skill-based performance that proved to be the best predictor of total talent identification scores, then cognitive abilities, and physical fitness indicators. Among the respondents, accuracy of batting turned out to be the most successful skill and agility and endurance were found to be the most pronounced physical features. Reaction time and awareness of the game were also found to be high in cognitive assessments of players. On the whole, the results demonstrate that a multidimensional evaluation model offers a more in-depth insight into athletic potential in adaptive cricket.

6.2 Practical Applications

The combined talent identification model that can be designed in this research can be a significant tool in sports academies, coaches, and training centers that deal with the development of adaptive cricket. Through standardized tests where physical, cognitive, and skill-based performance is measured, coaches are able to select, in a systematic way, potential athletes and develop a specific training program that will improve them. The model can also enhance objectivity and fairness in the way players are selected in the academies and regional competitions of cricket.

6.3 Policy Implications

This research indicates that effective sports policies need to be formulated to facilitate the identification and development of sporting specially-abled athletes. Governing bodies and sports federations can engage in systems of identification of talents to empower equality in disability cricket. Such an approach as integrating scientific methods of performance assessment can also be used to reinforce national and regional adaptive cricket programs.

6.4 Limitations

Although this has contributed to it, the study has a number of limitations. Although the sample size is adequate as a statistical entity, it might not be representative enough of the real population of specially-abled cricket players. Moreover, the study was done over a small geographical area and this could impact the applicability of the results to other situations.

6.5 Future Research Directions

Future research can broaden this study by executing longitudinal talent tracking to ascertain the development of performance of an athlete with time. The researchers can also consider applying new technologies, including artificial intelligence and performance analytics to improve the systems in talent identification. This may improve further accuracy and efficiency of talent scouting in adaptive form of cricket.

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