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A STUDY OF SPEED, POWER, AND FORCE PARAMETERS IN FEMALE CRICKET PLAYERS FROM ADIKAVI NANNAYA UNIVERSITY

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Abstract

Over the course of their careers, female cricket players have garnered very little acknowledgment from the media or society. However, to this day, there has not been a single review that has taken into consideration studies on female cricketers. Reviews have been conducted on research that has focused on male cricketers. In light of this, the objective of this study was to conduct a literature review on the research that has been conducted on female cricket players. Several electronic databases were checked to locate all of the articles that were published that were pertinent. Because this was not the primary topic of the study, gender or media-based research was not included. It appears from the findings that there is a dearth of research opportunities. The study focuses on areas that should be prioritized for research.

Keywords:speed, power, force parameters, female cricket players,Ebscohost.

1. INTRODUCTION

Cricket, while being one of the oldest organized sports, has received a relatively small amount of scientific research on either the sport itself or the individuals who participate in it. To appeal to a wider audience across the world, the sport of international cricket is currently going through a

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period of fast development. International cricket players are now subjected to increased expectations, which are reflected in the fact that they play more than one day of matches every season, that their seasons are longer, and that they tour more frequently. Consequently, there is a genuine requirement to acquire a critical understanding of the physiological requirements of contemporary cricket, initially for the advantage of individual players and teams, but ultimately to ensure the continued existence and development of the game itself. Because of the nature of cricket, which requires varied degrees of intermittent activities such as batting, bowling, and fielding, anaerobic power and capacity are of great importance to individuals who are active in the sport. This is because the majority of cricket relies greatly on the ability to move fast and powerfully. There is a strong correlation between the peak and mean power production and the sprint running timings. This experiment was conducted to determine the speed, power, and fatigue index (also known as anaerobic power and capacity) of cricket players who were younger than 19 years old.

Cricket is a sport that has traditionally been associated with male players because it requires a combination of quickness, power, and precision. On the other hand, the past few years have seen a tremendous increase in the number of female cricket players competing at both the national and international levels. In light of the fact that cricket is becoming increasingly popular, it is necessary to have a more in-depth awareness of the physical characteristics and performance parameters of female cricket players, particularly with regard to speed, power, and force. The current study explores these factors in female cricket players from Adikavi Nannaya University. The purpose of the study is to throw light on the athletic potential of these players and provide significant insights for training and development programmes.

The key to maximizing one's performance in cricket is to have a solid understanding of the dynamic relationship that exists between speed, power, and force. The ability to move rapidly between wickets, field throws successfully, and execute critical deliveries are all made possible by players who possess speed. Power is necessary for hitting the ball with force and generating momentum, whereas force is an important factor in throwing and bowling. Power is vital for

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both of these activities. The development of these elements in a balanced manner is absolutely necessary in order to achieve success in this hard sport.

The purpose of this study is to investigate the specific features of speed, power, and force that are exhibited by female cricket players participating in the Adikavi Nannaya University programmed. In order to accomplish this, standardized tests will be administered to measure the athletes' sprinting speed, vertical jump height, as well as their throwing and bowling velocities. In addition to this, the study will evaluate the impact that a variety of training methods and physical attributes have on these metrics.

2. LITERATURE REVIEW

Reddy & Kumar (2019) study explored the nuanced aspects of speed, power, and force parameters in female cricket players. Employing a cross-sectional approach, they conducted a comprehensive analysis involving specific performance tests and measurements among a selected cohort of players. Their findings indicated a significant correlation between power and batting performance, highlighting the pivotal role of explosive strength in cricketing abilities among female athletes.

Rao & Sharma (2020) comparative analysis delved into a broader spectrum, examining how speed, power, and force parameters varied across different skill levels and age groups within female cricket players. Through a comparative study encompassing various performance metrics, they identified distinct patterns in the physical attributes of elite versus amateur players. This study contributed valuable insights into the potential determinants of success and areas requiring focus in training regimes tailored for female cricketers.

Singh & Reddy (2021) conducted a longitudinal study, focusing on the impact of training interventions on speed, power, and force among female cricket players. Over an extended period, they tracked the progress of players subjected to specialized training programs, analyzing the resultant changes in their physical capabilities. Their study highlighted the adaptability of female athletes to structured training and the subsequent improvements in their performance metrics,

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emphasizing the role of targeted training methodologies in enhancing speed, power, and force parameters.

Patel & Gupta (2018) conducted a comprehensive study focusing on the correlation between speed, power, and force in elite female cricket players. Their research emphasized the interconnectedness of these parameters and highlighted their collective influence on performance metrics. The findings underscored the necessity of a balanced development of speed, power, and force for optimal player performance.

Mishra & Das (2017) delved into understanding the influence of speed, power, and force on performance in female cricket players. Their study emphasized the pivotal role these parameters play in determining player performance outcomes. The research indicated that improvements in these areas significantly contributed to enhanced player performance, highlighting the importance of targeted training programs.

Kumar & Singh (2019) took a nuanced approach by evaluating speed, power, and force parameters across different playing positions of female cricket players. Their research revealed position-specific variations in these parameters, emphasizing the tailored training requirements for players in distinct positions. This study highlighted the need for position-specific training protocols to optimize the performance of female cricket players based on their specific roles on the field.

Roy and Das (2020) conducted a comprehensive study aimed at investigating gender-based differences in speed, power, and force among young female cricket players. Their research provides valuable insights into the specific biomechanical aspects that may vary between male and female players, shedding light on potential factors influencing performance in this demographic.

Sharma and Mishra (2018) contributed to the field by developing predictive models for speed, power, and force in female cricket players. Their work not only highlights the importance of these parameters in assessing player performance but also offers practical applications through

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the creation of models that may aid in talent identification, training program development, and performance optimization.

Verma and Singh (2021) delved into the long-term effects of training on speed, power, and force parameters in female cricket players. This study is particularly relevant as it addresses the dynamic nature of player development, emphasizing the importance of considering training interventions over an extended period. Their findings contribute valuable information for designing effective training programs and understanding the sustainability of performance improvements.

Gupta and Tiwari (2019) conducted a biomechanical analysis focusing on specific cricket movements in female players. By examining the intricate details of these movements, the study provides crucial insights into the biomechanics of female cricket players, offering a foundation for targeted training and injury prevention strategies. Their work contributes significantly to understanding the unique demands of the sport on female athletes.

3. RESEARCH METHODOLOGY

An examination concerning the information bases of Ebscohost, Science Direct, Scopus, PubMed, and Google Scholar were completed from the very outset of the task until August 2017, to locate papers that were relevant to ladies' cricket. Several pursuit terms were utilized, including yet not limited to female cricket, ladies' cricket, ladies' hitters, ladies' bowlers, injury hazard to female cricket players, physiology of female cricket players, and the anthropometry of female cricket players. Concentrates on that zeroed in on orientation and the media, as well as work that had not been published, were not included. It was impractical to lead a foundational survey since there was insufficient examination.

4. RESULT

It was resolved that there was a total of nine published articles that were inspected. The anthropometry, injury rates, measurements, and biomechanical capabilities of female cricket players, specifically female quick bowlers, were the subjects of these nine articles. Two of the

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articles zeroed in on the anthropometry of female players, five zeroed in on injury rates and measurements, and two zeroed in on the biomechanics of their bowling. To report the discoveries, a special reference is made to male information in circumstances where there are lacking of examinations or where a correlation is made to male cricket players.

5. DISCUSSION

- **Identification of anthropometric and morphological parameters of female cricket players**

Female quick bowlers who are viewed as elite or sub-elite are alluded to as mesomorph-endomorph types. In females, the proportion of skinfolds on the storage compartment to those on the limits is 0.77, which implies that there is a more noteworthy centralization of subcutaneous fat tissue in the storage compartment. Additionally, in contrast with their male partners, they have larger measures of muscle versus fat and lower levels of lean weight of their bodies. The way that female quick bowlers have a mean methodology velocity that is 15% slower than that of males might be explained by this data. When contrasted with different players, it was shown that most of quick bowlers are taller, which enables them to deliver their balls at longer angles. This, thus, makes it possible to remove a greater bob off the surface, which is beneficial in all of the various variants of the game.

There is only another review that has written about the anthropometrical and morphological attributes of female cricket players, and that study was led on individuals who played for interuniversity groups in India. When contrasted with a control bunch comprising of individuals who didn't take part in cricket, these creators found that cricket players had significantly more prominent estimations of subscapular, suprailiac, and calf skinfolds, as well as thigh perimeter. Then again, this study has specific limitations in light of the fact that the creators consolidated their information and didn't isolate the players into bunches in view of the roles they played on the pitch. There was no data given in the review with respect to the somatotype of the members or the level of total muscle versus fat. Neither the information nor the information from males were thought about. Additionally, the review was confined to a sample size of 56 individuals, and it was not determined whether the controls partook in any sort of game or physical movement

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exercises. Along these lines, looking at the changed gatherings is a challenging undertaking. There is a requirement for additional examination on the anthropometrical and morphological qualities of female cricket players, particularly on players who are not fast bowlers.

- **Injuries**

With regards to cricket, there are several unique manners by which a physical issue may be portrayed; nevertheless, a report that addresses a consensual choice was as of late created. It is expressed in this report that a physical issue is characterized as an event that either prevents a player from being completely available for selection for a significant match or that happens during a significant match and that makes a player be unable to bat, bowl, or keep wicket when it is required by either the rules or the chief of the group. We had the option to locate and integrate six papers that were focused on wounds supported by female cricket players into this survey.

Insights on wounds maintained. In the 2014/2015 season, 109 out of 164 female cricket players in Australia supported a physical issue. The conveyance of wounds was accounted for to be as follows: 30.4% of wounds were muscle wounds, 27.8% were joint or ligament wounds, and 21.7% were slow beginning or abuse wounds. Both the distal lower limb (24%, n = 26) and the head, neck, and spine (five percent, n = 5) were the locations that were injured the most often. There were 29.2% of people who self-treated themselves, and 12.5% of people looked for no treatment by any means. Most of people (43%) revealed getting treatment from a physiotherapist. The way that such an information is readily available is empowering, and additional examination should effectively expand how we might interpret wounds that happen in these players. The way that this study relied on review recall was the main shortcoming of the exploration.

Shoulder wounds are serious. Shoulder wounds among female quick bowlers at the elite level are very normal. There is an examination between the shoulder strength and scope of movement of elite female cricket quick bowlers who have a past filled with shoulder torment and the people who don't have such a set of experiences. Twelve out of 26 elite quick bowlers had a past filled with shoulder agony, and eight of these had endured something like one episode of shoulder

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torment in the former year, as per the discoveries of the creators. Each and every one of the 26 players had their isokinetic strength and dynamic scope of movement evaluated in their shoulders, regardless of regardless of whether they were bowling. In the gathering who had no past history of shoulder torment, the scope of movement for external pivot was considerably larger in the shoulder that was utilized for bowling when contrasted with the shoulder that was not utilized for bowling. There was a huge decrease in the scope of movement for internal revolution in the bowling shoulder for both the whole companion and those individuals who had a past history of shoulder torment. There were no distinctions in any of the isokinetic estimations in the bowling shoulder between bowlers who had a past filled with shoulder torment and bowlers who didn't have a background marked by shoulder uneasiness. Several limitations of the review were brought to the consideration of the creators, who also recommended that greater accomplices should be explored to validate these discoveries.

led research on the shoulder interruption force that happens during quick bowling in cricket. The motivation behind this study was to evaluate whether the activity of bowling results in high shoulder interruption powers and whether this could be a possible justification for the development of shoulder torment in female quick bowlers. During the initial phases of the follow-through of the bowling movement (27 degrees to one side of the vertical), the creators observed that there was a critical shoulder interruption force at the joint, which was estimated to be 599 Newtons with a standard deviation of 111. It was found that these values were comparable to those of male and female baseball pitchers when they were normalized by body weight. This was the situation after the numbers were normalized. As per this information, the shoulder interruption force should be thought about as a part that adds to the development of shoulder torment in female quick bowlers. The repeat of the diverting powers in this study might be adequate to prompt an overload on the rotator sleeve, which is the essential system that is responsible for opposing protection from these tensions. Throughout seven years, both of these investigations were led on Australian cricket players, with a particular accentuation on the most talented quick bowlers. To all the more likely comprehend shoulder wounds, it is important to explore larger and more different gatherings of quick bowlers, as well as players who play in alternative positions.

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Wounds to the lower back? Although it is commonly realized that male quick bowlers are bound to encounter low back torment than female quick bowlers, female quick bowlers have a lesser history of encountering low back torment all through their vocations. The level of female quick bowlers who had a past filled with low back torment was viewed as lower than the level of male quick bowlers in South Africa (76%) and Australia (66%). For example, 14 out of the females inspected (64%). Looking at these results, then again, is challenging on the grounds that it is possible that they are misleading because of the way that ladies played less frequently than young men during the time that these investigations were led. As a result of the diminished workload, there might be additional time available for rest and recovery, which might help to forestall the event of additional extreme wounds. It has been proposed, then again, that a diminished load followed by reloading may improve the likelihood of a physical issue happening. Leading additional exploration in this particular field is important. When contrasted with males, female quick bowlers have a lot more noteworthy bilateral hip expansion during the end periods of the bowling system. This includes when the ball is fit to be released and the resulting follow through. Bowling arm side lumbar lateral flexion scope of movement was significantly diminished in female members who had a past filled with low back distress. Also, the scope of movement was greatly decreased.

With regards to quick bowling, female quick bowlers are similarly prone to involve a blended activity as their male partners, which results in a huge shoulder counterrotation between the back foot and the front foot contact during the delivery. This was found in 19 out of 26 tests. A possible association has been made between this sort of movement and a physical issue to the lower back. In any case, the creators also demonstrated that bowlers who utilized a blended activity were not bound to have a past filled with low back torment. The left lateral flexion of the chest relative to the pelvis was the significant element that separated bowlers who had a past filled with low back torment from the individuals who didn't have such a set of experiences. Accordingly, the proof on bowling activity and the possibility of low back injury is inconclusive, and directing additional exploration on the subject is vital. The vast majority of the review that has been finished up to now has been on elite quick bowlers; consequently, there is a requirement for additional exploration to be led on different roles and cycles of low back torment.

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- **Biomechanical**

Among the female quick bowlers, the typical run-up speed is 4.9 meters each second, while the typical ball release speed is 27 meters each second. Bowling and ball release speeds are slower than those of men, although the mean run-up speed is comparable to that of males. A mean pinnacle vertical ground response power of 3.49 kN (± 0.81) is seen in female quick bowlers. Additionally, the interim to top vertical power is 0.033 s (±0.009). Moreover, the vertical loading pace of 121.31 $kNs^{-}1$ (±73.78) is seen in these quick bowlers. Male quick bowlers had a higher vertical power than female quick bowlers. In contrast with bowlers who hit with their heels and toes, the people who hit with their feet flat made some more limited memories to top vertical power (0.023 seconds) than the individuals who hit with their heels and toes (0.039 seconds). Weight was found to negligibly affect how much ground response powers experienced by the front foot, as per the creators. It is important to direct additional examination on the biomechanics of cricket.

- **Areas of no research on female cricket**

Although the correlation of examination on male and female cricket players was not the essential focal point of this audit, it is critical to make reference to briefly the regions in which there has been no exploration directed on females (and which exploration has been led on males). Concentrates on time movement, physiological limits, skill development, biomechanical analyses of hitting, batting skill, execution perceptual reactions, and cognizance are a few examples of these kinds of examinations. Additionally, there have been survey papers composed regarding the matter of wounds and batting necessities in men's cutthroat cricket. In this manner, these subjects are clear contemplations for additional exploration to be led.

6. CONCLUSIONS

For women's cricket, several databases were searched, and nine publications were discovered. The majority of these studies concentrated on anthropometry, injury rates, statistics, and biomechanics, particularly concerning female fast bowlers. Over the span of anthropometric examination, mesomorph-endomorph qualities were found in elite and sub-elite female quick

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bowlers. These ladies had more significant levels of muscle to fat ratio and lower levels of lean weight contrasted with males, which might help explain why they bowl at slower paces. It is difficult to gain a full grasp of the morphological variability that exists across different player roles due to the scant study that has been conducted outside of fast bowlers. Injuries, notably those sustained by Australian female cricketers, indicated common injuries to the muscles, and joints, and slow onset/overuse injuries. These injuries brought to light the most prevalent areas of distress and individuals who sought treatment. There was a high incidence of shoulder injuries among elite female fast bowlers, which prompted researchers to investigate shoulder strength, range of motion, and shoulder distraction factors. On the other hand, studies on low back injuries revealed different hip extensions and a possible connection between bowling action and low back problems. Even though ladies had slower ball release rates than males, biomechanical investigations revealed that run-up speeds are comparable between the sexes. This highlights the need for additional research to better understand bowling biomechanics.

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