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Novel Physiotherapy Management and its Effects on Ulnar Styloid Process Fracture Recovery- A Case Report

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Abstract

Cricket, particularly in fast-paced formats such as T20 and One-Day matches, demands quick And repeated sprinting between the wickets. A batsman's sprinting ability is important for Increasing scoring opportunities and avoiding run-outs during the game. Core muscles play a Major role in sports performance as they help maintain body stability and allow effective Transfer of force between the upper and lower body during movement. Although core strength and endurance are considered important for athletic activities, there is limited research Examining their relationship with sprint speed in amateur cricket batsmen. Therefore, the present study aims to determine the correlation between core endurance, core Strength, and sprint speed among amateur cricket batsmen. The study will include 80 male Participants aged 18–25 years, selected through convenient sampling from various cricket Clubs. Core endurance will be assessed using the McGill Torso Endurance Tests, core strength Will be measured using the Plank Test, and sprint performance will be evaluated using the Repeated Sprint Ability (RSA) Test. Data will be analyzed using statistical software to determine the relationship between these Variables. It is expected that core strength will show a stronger correlation with sprint Performance compared to core endurance. The findings of this study may help in designing better training programs focusing on core strengthening to enhance sprint ability and overall Performance in amateur cricketers.

***Keywords**: Amateur Cricket Batsmen, Core Strength, Core Endurance, Sprint Speed, Repeated Sprint Ability, McGill Torso Endurance Test, Plank Test, Athletic Performance, Sprint Performance*

1. Introduction:

Cricket is popular sport played by millions of individual world wide. With a rich history and wide range of physical demands. In cricket to achieve high score of runs batsman meed to take single and double runs which need to have run as much fast (1). The shorter game formats tend to be more physically intensive when related to match duration, Incorporating more maximal sprints when batting (2). Batting requires the ability to run between the wickets effectively. An increase in scoring rate is seen with effective running between the wickets, which allows batsmen to get full value for their shots while

batting sprint speed is the maximum speed at which a person can run (3). There is a need for batsmen to maximize scoring in popular shorter formats of the game like T-20 cricket and one day cricket. Batsmen take greater risks to increase the run scoring rate due to limited availability of overs in formats like T-20, and run between the wickets as an attempt to score the most. (4) An amateur cricket batsman is a player who participates in the sport primarily for enjoyment and personal development rather than for financial gain or professional status. They play local leagues and not participate in professional league the core muscles, which include the abdominals, lower back, and hip stabilizers, are essential for maintaining stability, generating power, and ensuring efficient movement Patterns during dynamic sports activities core endurance is defined as the ability to maintain a position or perform multiple repetition (3). Adequate core muscle endurance may play an important role in injury free performance among athletes. Core strength referrer to the ability of the musculature to produce force through contractile force and intra-abdominal pressure (4). It has been theorized that a strong core will allow a transfer of forces from the lower body to the Upper body with a minimal dissipation of energy.(2 There for purpose of this study is correlation of core endurance and core strength with sprint speed in amateur cricket batsman.

In cricket batsman best way to score more runs is by strike rotation. Which need fast running between the wickets. Cricket batting requires rapid movements, quick changes of direction, and explosive acceleration, making core endurance and strength crucial. Sprint performance is one of the key indicators to success in various of sports either for Individual or team sports (7). In batsman fast sprint speed and good core muscle endurance and core strength play Important role to become successful in cricket. With the high sprint speed batsman can Reduce chance of run out and can give his contribution in the improve high score run. Amateur cricketers often do not receive specialized physical training compared to Professional players. Understanding the relationship between core endurance, core Strength, and sprinting ability may help coaches and physiotherapists develop more Effective conditioning programs. Limited research exists on the correlation between Core endurance, core strength, and sprint speed specifically in amateur cricket batsmen. So the aim of the study is to establish a correlation between core endurance and core strength with sprint speed in amateur cricket batsman?

2. Methodology:

After getting approval from the institutional ethical committee the study was conducted the study design was correlational study the sample size of the study was n = 60, the sample size was calculated using G* power analysis. The sampling method used was convenient sampling, the target population for the study was amateur cricket batsman the study was conducted in cricket clubs around Pune city the duration of the study was 6 months. The individuals were screed based on the inclusion criteria male cricket batsman, age 18 to 25, playing cricket for minimum 2 years, players practicing minimum 4 times a week, BMI falling in the normal range(18.5 to 24.9) and individuals with normal cardiovascular and pulmonary function (Yo – Yo Test). Individuals with following parameters were excluded from the study, females, players undergoing core strengthening and endurance training, history of recent lower limb fracture, lower limb pain, players with reconstructive surgery or any soft tissue injury in past 6 months, pathological conditions of heart and lungs. The material s required for the study included pen, paper, cones, measuring tapes, stopwatch, yoga mat. The outcomes used in the study were

1. A. McGill Torso Endurance Test (6).
    - Trunk flexor tests,
    - Trunk extensor test,
    - left side bridge test,
    - Right side bridge test. (fig 1)
2. Core Muscle Strength Test: that is plank test (figure 2)
3. Repeated Sprint Ability (Figure 3)

Figure 1: McGill Torso Endurance Test

Figure 2: Plank Test

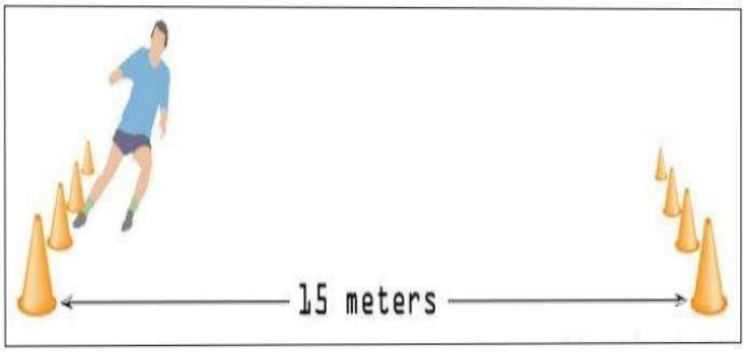

Figure 3: Repeated Sprint Ability.

3. Procedure: the procedure and the steps of the study are mentioned in figure 4 (flow chart below)

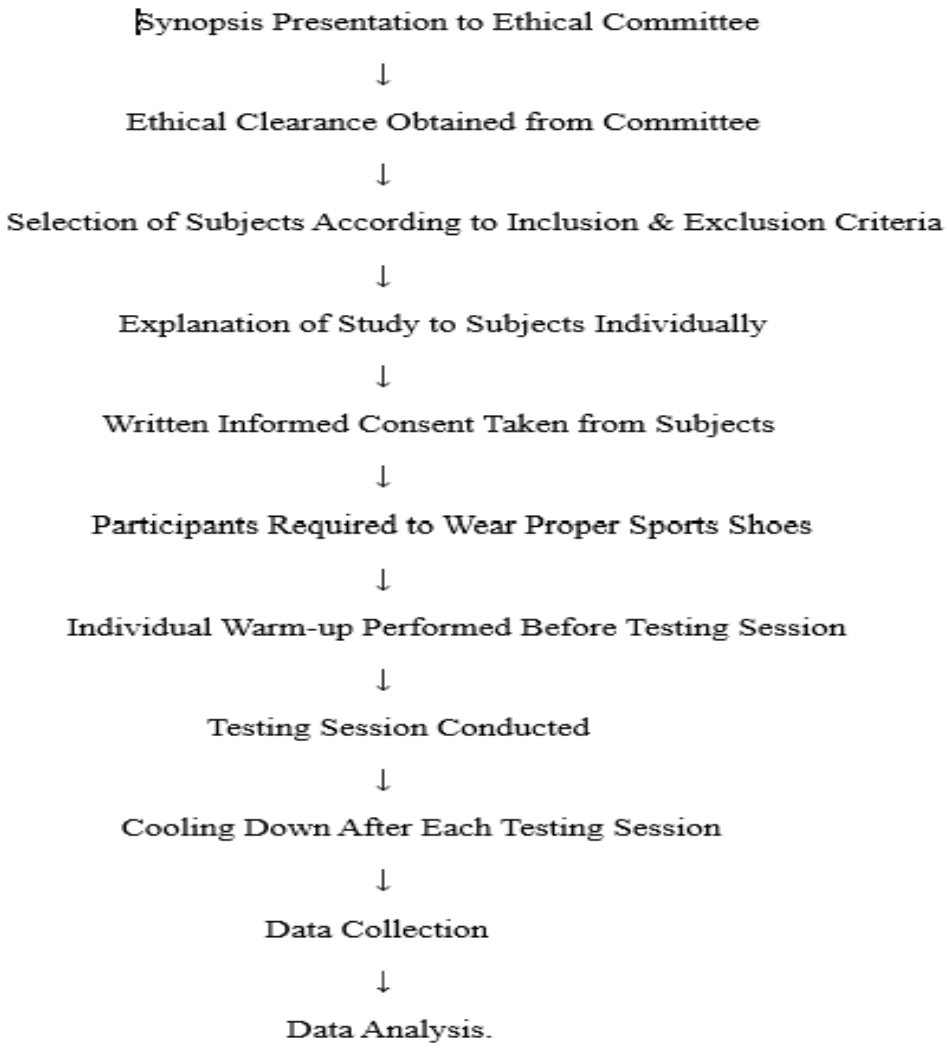

Figure 4: Flowchart of the procedure

4. Data Analysis:

In this study 80 individuals were assessed for core strength , core endurance and sprint Speed using plank test, McGill core endurance test and Repeated sprint speed ability test. Data collected was entered in excel spread sheet, tabulated and subjected to statistical analysis. Correlation between core strength and sprint speed was correlated by using Pearson correlation Coefficient(r): Correlation between core endurance and sprint speed was correlated by using Pearson correlation coefficient (r).

Graph 1 :- Age wise distribution.

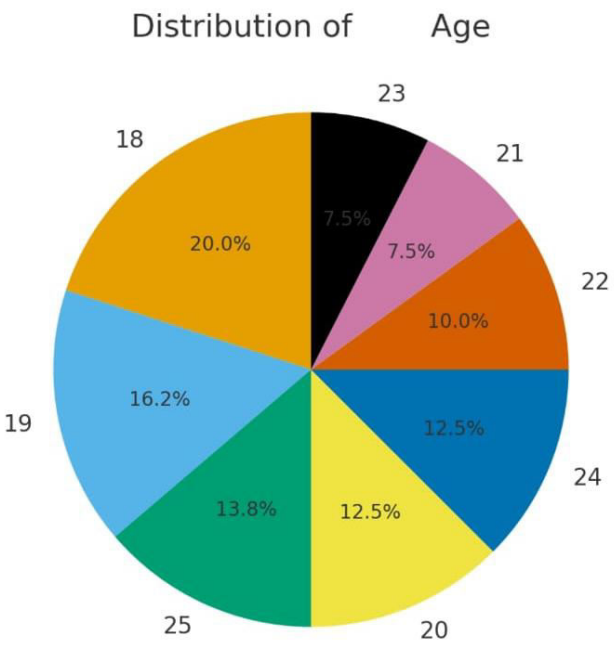

Table 1 :- Age wise distribution

Age	Percentage of participant
18	20.0%
19	16.2%
20	12.5%
21	7.5%
22	10.0%
23	7.5%
24	12.5%
25	13.8%

Graph 2: BMI Distribution

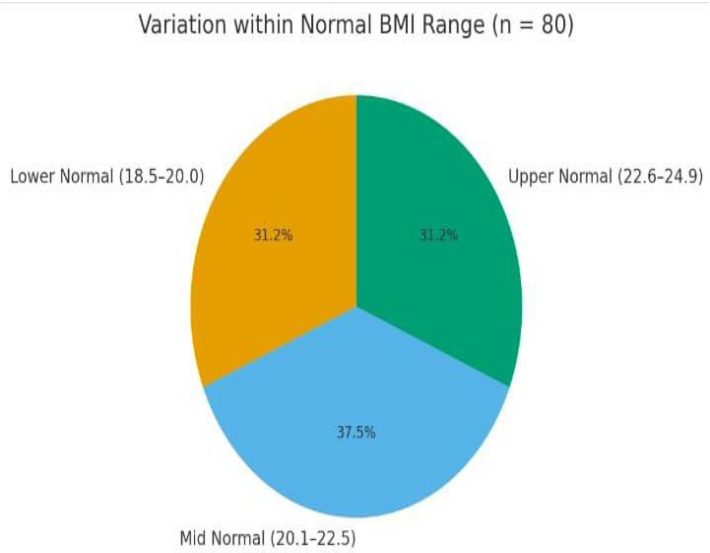

table 2 BMI Distribution

BMI level	No.of participate(%)
Lower normal (18.5-20)	31.2%
Mid normal (20.1- 22.5)	37.5%
Upper normal (22.6-24.9)	31.2%

Graph 3: HEIGHT WISE DISTRIBUTION

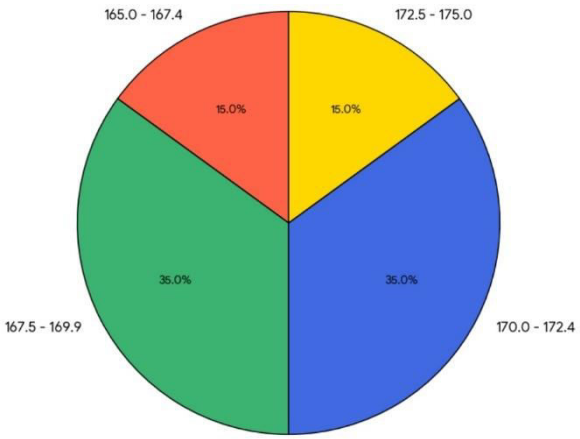

Table 3 : HEIGHT WISE DISTRIBUTION

Height	Percentage of participants
165- 167	15.0%
167.5- 169.9	36.0%
170-172.4	36.0%
172.5- 175.0	15.0%

Graph 4: Weight wise distribution

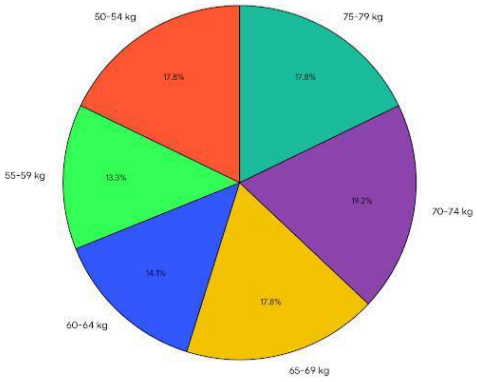

Table 4:Weight wise distribution

Weight range	Percentage of participants
50-54 kg	17.5%
55-59kg	13.0%
55-59kg	13.0%
65-69 kg	17.5%
70-74 kg	18.8%
75-79kg	17.5%

Graph 5: Correlation Between core strength and

Percent sprint decrement in amateur cricket batsman.

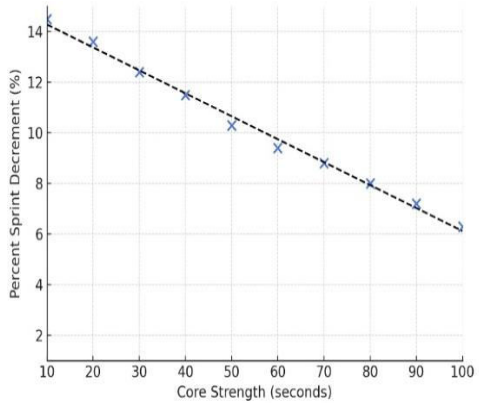

Table 5: core strength vs PSD

Variable	Correlation with sprint decrement (r)	P- value	Correlation
Core strength	-0.15	>0.5	Weak negative correlation (not significant)

Interpretation – significant correlation between core strength and sprint speed . Negative correlation means: as core strength/endurance improves, percent sprint decrement decreases (i.e., better sprint performance).

Graph 6 :- Correlation between core endurance

Percent sprint decrement And Percent sprint Decrement

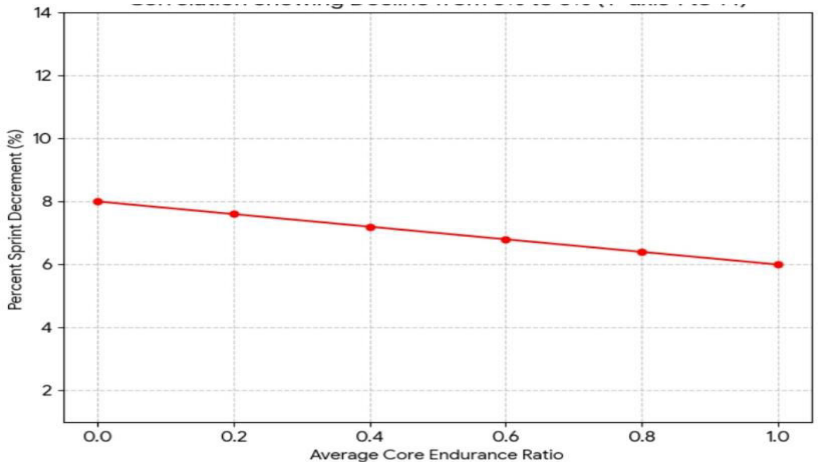

Table 6:core endurance

Parameter	Correlation with percent sprint decrement(r)	P-value	Correlation
Core endurance	-0.15	>0.5	Weak negative correlation (not significant)

Interpretation :- No significant correlation between core endurance and sprint speed

Graph 7 :- Comparison of core strength and core endurance with sprint speed.

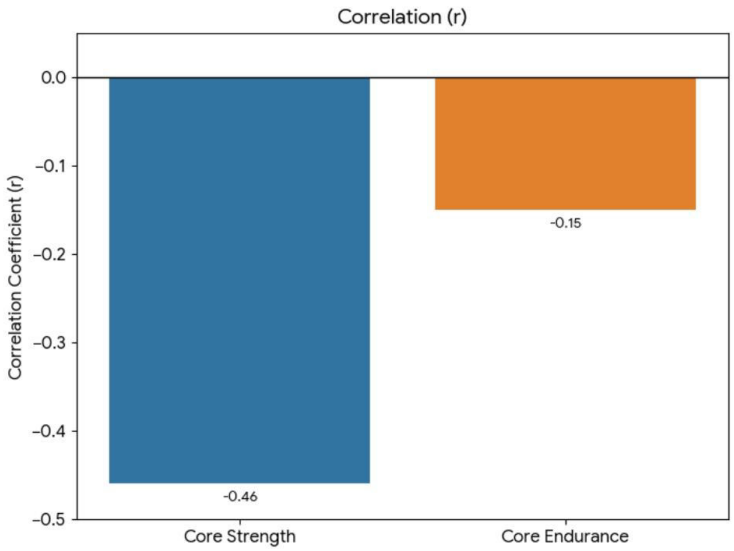

Table7 : core endurance vs core strength

Parameter	Correlation(r)with percent sprint decrement%	Interpretation
Core endurance	-0.15	Weak correlation(Not significant)
Core Strength	-0.46	Moderate correlation (better predictor)

Interpretation- Core strength had moderate significant correlation. Core endurance had weak, non-significant correlations.

5. Results

The following study was conducted to check the correlation between core endurance and core strengths with sprint speed in amateur cricket batsman. The values of the core endurance, core strength and sprint speed are correlated using Python statistical tools and IBM SPSS Software. The Mean values for core strength and sprint speed (PSD value) where 106.8 and 8.7% respectively. Mean value of core endurance ratio Flexion: Extension, Right side bridge: Left Side bridge and side bridge: Extension is -0.17,-0.13 and -0.15 respectively. The core strength showed the strongest and significant correlation with sprint speed. Core endurance had weak, non-significant correlation with sprint speed.

6. Discussion:

The following study was done to assess the correlation between core strength, core endurance and sprint speed in amateur cricket batsman. In this study total 80 male subjects were included in the age group of 18 to 25 years. The findings revealed that players with better core strength demonstrated better sprint Performance compared to core endurance. A strong core acts like the body's powerhouse—it connects

the upper and lower body, allowing Smooth transfer of energy during running and batting. When this connection is strong, athletes Can sprint faster and more efficiently without unnecessary movements or energy leaks. The core muscles are often considered the “powerhouse” of the body because they help maintain stability and balance of the trunk during movement. These muscles assist in Transferring force between the upper and lower limbs, support proper posture, and contribute to smooth and coordinated body movements. A strong and stable core allows the body to move more efficiently, improves physical performance, and provides better control during athletic activities (10). These findings are aligned with those of Afandi et al. (2021), who found that strong core Muscles help improve acceleration and running technique by stabilizing the pelvis and Enhancing ground force use (10). On the other hand, core endurance, which refers to the ability of the core muscles to maintain Stability and support the body for a prolonged period, showed a weaker association with sprint Performance. Because endurance is more about sustaining posture and preventing fatigue over long Durations, rather than generating explosive bursts of power. Abdelraouf and AbdelAziem (2016) made a similar observation—core endurance is valuable for reducing injury risk and Maintaining balance, but it doesn’t necessarily make sprint speed faster (3). The participants showed an average sprint decrement of around 8.7%, which indicates a good ability to maintain speed across repeated efforts. This supports the idea that core strength plays a role in maintaining sprint performance and delaying fatigue during short, high-intensity Bouts—something that’s crucial in cricket where players often need to sprint multiple times in Quick succession (11). These findings are also consistent with the study conducted by Robert G. Lockie et al. (2013), Which highlighted the importance of sprinting and acceleration abilities in cricket performance. Based on these observations, coaches and trainers should place greater emphasis on exercises That improve core strength, such as planks, side bridges, and stability training, as these exercises Can enhance trunk stability and improve running efficiency during sprinting. Although core Endurance exercises remain important, their role may be more related to maintaining overall Fitness, posture, and muscular stability throughout prolonged periods of play rather than directly improving sprint speed. This study suggests that building a strong, stable core can help amateur cricket players run Faster and more consistently between wickets. It may also improve overall athletic Performance. The limitation of the study are the individuals practicing on turf and ground were excluded. Future study may assess te effectiveness of different core strengthening program in the said population.

7. Conclusion:

In this study the aim is to establish correlation between core strength and core endurance in amateur batsman upon data collection and analysis the study suggest core strength has stastical significant correction with sprint speed core endurance and there is no correlation between sprint speed and core strength.

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