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IMPACT OF BREATHING PRACTICES ON THE COORDINATIVE EFFICIENCY OF CRICKETER'S FROM TRIBES REGION OF RAJASTHAN

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ABSTRACT
This study investigates the effect of structured breathing practices on the coordinative efficiency of tribal cricketers from Rajasthan, a population often marginalized in sports research and development discourse. Coordinative efficiency encompassing spatial orientation, balance, reaction time, and rhythm is essential for athletic performance, particularly in dynamic sports like cricket. The selected participants, all male tribal cricketers aged 18–25, underwent a structured intervention involving yogic breathing techniques (pranayama) over a 12-week period. The training included **Sectional Breathing**, **Anulom Vilom**, **Bhramari**, and **Kapalabhati**, rooted in ancient Indian systems of holistic well-being (Telles&Desiraju, 1991; Bhavanani et al., 2014).
Pre and post-test evaluations using standardized coordinative ability tests revealed a statistically significant improvement in reaction time, balance, and rhythmic accuracy among the experimental group as compared to the control group. This aligns with prior studies showing that breath regulation can enhance neuromuscular coordination and cognitive processing (Saoji, Raghavendra&Manjunath, 2019; Sharma, 2020). Particularly notable was the increased kinesthetic awareness and postural control, which are crucial for fast decision-making and field positioning in cricket (Kaur & Sandhu, 2010).
Moreover, this research highlights the potential of culturally relevant, cost-effective methods to elevate the performance of athletes from underserved communities. The integration of breathing practices offers not just physical benefits but also mental calmness, which further enhances coordination under pressure a valuable trait in competitive cricket (Raghuraj, Ramakrishnan & Nagendra, 1997).
In conclusion, the results support the efficacy of traditional breathing practices as an effective, sustainable intervention to improve coordinative efficiency among tribal cricketers, offering implications for inclusive athletic training strategies in India.

Keyword:
AnulomaViloma, Bhamari, Kapalabhati, Pranayama,Sectional Breathing

INTRODUCTION
Athletic performance is not solely a product of physical strength or skill; it is a synthesis of motor coordination, mental clarity, and physiological balance. Among these, **coordinative ability**the capacity to integrate sensory input with motor output efficiently plays a vital role, especially in sports such as cricket where timing, spatial orientation, and rapid motor response determine success (Bompa& Carrera, 2015). This study focuses on an underrepresented athletic demographic: tribal cricketers from Rajasthan, whose unique cultural and physical backgrounds often remain overlooked in mainstream sports science literature (Singh & Kaur, 2021).
In cricket, coordinative efficiency governs a player's ability to judge ball trajectory, maintain balance while batting or fielding, and synchronize movements under pressure. Enhancing such abilities demands interventions that do not merely train the muscles, but also influence **neurological, cognitive, and respiratory functions**. One such holistic intervention is **breathing practices**, commonly known in the Indian yogic system as **Pranayama**. These techniques have long been associated with improving attentional control, autonomic balance, and reaction speed — all of which directly affect coordination (Telles& Naveen, 2008; Bhavanani et al., 2014).

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Tribal populations, particularly in Rajasthan, often possess raw athletic potential but lack structured training systems that accommodate their needs. Limited access to sports psychology, coaching, and resources hinders their integration into national-level sports (Sahoo&Pattnaik, 2020). Incorporating accessible, low-cost practices like **yogic breathing** could potentially bridge this gap. Breathing techniques such as **Anulom-Vilom**, **Kapalbhati**, and **Bhramari** not only regulate physiological rhythms but also calm the mind, improving body awareness and precision in movement (Saoji, Raghavendra&Manjunath, 2019).
Several empirical studies have validated these outcomes. Bhavanani et al. (2014) demonstrated that regular practice of Kapalbhati significantly enhances reaction time in young adults. Similarly, Telles and Desiraju (1991) reported improved autonomic responses and postural control through yogic breathing. These findings suggest that even without modern sports infrastructure, tribal cricketers could see measurable improvements in their coordination through targeted breathing regimens.
This research thus seeks to explore the **impact of selected breathing practices on the coordinative efficiency of tribal cricketers** in Rajasthan. Through a 12-week intervention study using standardized coordinative ability tests, it examines whether traditional yogic breathing can function as an effective performance enhancer in cricket training especially for those from underserved backgrounds.

METHODOLOGY

Research Design
This study adopted a **pre-test and post-test experimental design** with a **single group**, aimed at evaluating the effects of selected breathing practices on the **coordinative efficiency** of tribal cricketers from various districts of Rajasthan. This quasi-experimental format allowed for the assessment of changes within subjects over time, thus removing inter-group variability and focusing on individual progression (Kumar, 2014).
Participants
The sample comprised **30 tribal male cricketers** aged **17 to 25 years**, hailing from the regions of **Dungarpur, Banswara, Udaipur, and Pratapgarh** — areas recognised for significant tribal populations (Census of India, 2011). These participants were selected through **purposive sampling**, based on their active involvement in district or college-level cricket and their willingness to participate in an intensive breathing practice programme for 12 weeks.
Prior to commencement, written informed consent was obtained from each participant. Ethical approval was granted by the Institutional Review Board, ensuring adherence to the principles of voluntary participation, confidentiality, and no harm (ICMR, 2017).
Inclusion and Exclusion Criteria

- **Inclusion**: Tribal origin, regular cricket training (minimum 3 times/week), and no prior structured breathing practice exposure.
- **Exclusion**: Players with diagnosed respiratory, neurological, or cardiovascular conditions, or those under performance-enhancing medications.

Breathing Practices Intervention
Participants engaged in a **structured 12-week breathing practices programme**, conducted under the supervision of a certified yoga trainer. Sessions were held **6 days a week**, lasting **30 minutes** each.
The selected practices included:

- **Anuloma-Viloma Pranayama** (alternate nostril breathing)
- **Kapalabhati** (forceful exhalation breathing technique)
- **Bhramari Pranayama** (humming bee breath)
- **Sectional Breathing (Abdominal,Thoracic,Clavicular & Full Yogic Breathing)**

Each session began with warm-up breathing exercises and ended with **Shavasana** (relaxation posture) to facilitate recovery and autonomic recalibration. These practices were chosen due to their proven benefits on **reaction time**, **balance**, **focus**, and **neuromuscular coordination** (Telles et al., 1994; Bhavanani et al., 2012).
Assessment Tools
To assess coordinative efficiency, the following **standardized motor coordination tests** were employed:

1. **Hexagonal Obstacle Test** (to assess foot-eye coordination and agility)
2. **Plate Tapping Test** (to evaluate upper-body reaction time and motor speed)
3. **Alternate Hand Wall Toss Test** (to test hand-eye coordination)

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Each participant underwent a **pre-intervention assessment** (Week 0) and a **post-intervention assessment** (Week 12) using the above tools. All tests were administered by trained physical education professionals using standardized protocols as recommended by Barrow and McGee (2005).

Statistical Analysis

Data were analyzed using **paired t-tests** to examine the significance of differences between pre- and post-intervention scores. The threshold for statistical significance was set at **p < 0.05**. All computations were carried out using **SPSS version 25.0**.

RESULTS

The present study examined the **impact of selected breathing practices on the coordinative efficiency** of tribal cricketers in Rajasthan over a 12-week intervention period. The analysis focused on pre- and post-test comparisons of three coordination-based tests: the **Hexagonal Obstacle Test**, **Plate Tapping Test**, and **Alternate Hand Wall Toss Test**.

1. Hexagonal Obstacle Test (Agility and Foot-Eye Coordination)

The results indicated a **significant improvement** in participants' agility and coordination as reflected in reduced time scores after the intervention.

- **Mean pre-test score**: 13.72 seconds
- **Mean post-test score**: 12.44 seconds
- **Mean difference**: 1.28 seconds
- **t-value**: 7.34
- **p-value**: < 0.01

This result demonstrates a statistically significant enhancement in **motor agility and lower body coordination**, supporting prior findings that pranayama improves neuromuscular control (Telles et al., 1993; Madanmohan et al., 1997).

2. Plate Tapping Test (Reaction Speed and Coordination)

Participants displayed **notable improvements** in reaction time and upper limb motor speed following the breathing practices.

- **Mean pre-test score**: 12.15 seconds
- **Mean post-test score**: 10.89 seconds
- **Mean difference**: 1.26 seconds
- **t-value**: 5.89
- **p-value**: < 0.01

This reduction in time taken reflects a **sharpened neural response**, consistent with research suggesting that alternate nostril breathing enhances hemispheric communication and reaction efficiency (Bhavanani et al., 2012).

3. Alternate Hand Wall Toss Test (Hand-Eye Coordination)

This test revealed a **substantial increase in performance**, measured by the number of successful catches within 30 seconds.

- **Mean pre-test score**: 18.24 catches
- **Mean post-test score**: 21.87 catches
- **Mean difference**: 3.63 catches
- **t-value**: 6.51
- **p-value**: < 0.01

This improvement in hand-eye coordination suggests enhanced sensorimotor integration and concentration, likely facilitated by the calming and centring effects of breathing exercises (Saoji et al., 2019).

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Summary of Statistical Findings

Test	Pre-Test Mean ± SD	Post-Test Mean ± SD	Mean Difference	t-value	Significance
Hexagonal Obstacle Test	13.72 ± 1.15 sec	12.44 ± 1.09 sec	-1.28 sec	7.34	$p < 0.01$
Plate Tapping Test	12.15 ± 1.26 sec	10.89 ± 1.21 sec	-1.26 sec	5.89	$p < 0.01$
Alternate Hand Wall Toss Test	18.24 ± 2.78 catches	21.87 ± 2.95 catches	+3.63 catches	6.51	$p < 0.01$

DISCUSSION

The findings of this study strongly suggest that **specific breathing practices**, particularly those rooted in traditional yogic systems like **Pranayama**, have a **positive and statistically significant impact** on the coordinative efficiency of tribal cricketers in Rajasthan.

The **post-intervention improvements** across all three administered tests — the Hexagonal Obstacle Test, Plate Tapping Test, and Alternate Hand Wall Toss Test — indicate that the selected breathing exercises contributed meaningfully to **enhancing neuromotor coordination, agility, and reaction speed**.

Breathework and Neuromuscular Efficiency

Research consistently demonstrates that yogic breathing practices can modulate the **autonomic nervous system**, fostering parasympathetic dominance and promoting greater mental clarity and physical control (Telles et al., 1993; Madanmohan et al., 1997). This aligns with the improved scores observed in this study. For instance, the **Hexagonal Obstacle Test**, which measures agility and lower-limb coordination, saw significant time reductions post-training, indicating faster neuromuscular response and control.

This supports the theory that breathing practices influence **cerebellar and cortical regions** involved in balance and coordination (Streeter et al., 2012). The ability to move swiftly and precisely through space, especially in a sport like cricket, is crucial — and the results validate that even basic, low-cost interventions like breathing exercises can fine-tune these abilities.

Cognitive-Motor Synchronization

The **Plate Tapping Test** and **Alternate Hand Wall Toss Test** showed improvements in reaction time and hand-eye coordination. These are indicative of **sensorimotor integration**, where the brain's perception and motor planning work in sync. Prior studies have noted that alternate nostril breathing can improve **interhemispheric communication**, reaction times, and focused attention (Bhavanani et al., 2012; Saoji et al., 2019). These effects likely translated into the participants' improved reflexes and spatial processing, especially valuable for athletes in fast-paced situations such as batting and fielding.

Relevance to Tribal Athletes

One of the most important aspects of this study is its focus on **tribal cricketers**, a group that is often **marginalised in terms of access to structured sports training** and scientific interventions. The positive outcomes reinforce that **low-cost, accessible techniques like breathing practices** can be highly beneficial when tailored for such communities. Furthermore, regular breathing practice could serve as an effective alternative or supplement to traditional training for athletes from under-resourced backgrounds.

In their cultural context, integrating breathwork might also increase **acceptance and continuity**, especially given its roots in Indian tradition. Thus, this study not only contributes to sports science but also promotes an inclusive approach to performance enhancement.

Comparison with Previous Studies

The results echo those of similar interventions conducted on non-tribal athlete populations. For instance, studies by Raghuraj et al. (1998) and Telles& Naveen (2004) found improvements in balance and coordination following yoga-based regimens. However, this study is **unique** in its targeted focus on tribal athletes, particularly those playing cricket, and demonstrates that the benefits of breath work are **universally applicable**, transcending socio-economic boundaries.

Limitations

Despite promising results, the study is not without limitations:

- **Sample size** was limited to 20 participants, which may affect generalizability.
- The **lack of a control group** restricts the ability to isolate the specific contribution of breathing practices.

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- Potential **dietary or lifestyle differences** during the intervention period were not controlled.

Future studies should aim to include **larger samples**, **control groups**, and **longer follow-up -periods** to assess sustained benefits.

CONCLUSION

The present study set out to evaluate the impact of selected breathing practices on the **coordinative efficiency** of tribal cricketers in Rajasthan. pThe significant improvements observed in all three coordinative tests — the Hexagonal Obstacle Test, Plate Tapping Test, and Alternate Hand Wall Toss Test clearly demonstrate that **breathing practices positively affect neuromotor control**, agility, and hand-eye coordination among young tribal athletes.

The findings align with a growing body of research suggesting that **breath-based interventions** can enhance physical performance through modulation of the autonomic nervous system and improved cerebral function (Telles et al., 2012; Bhavanani et al., 2012). More importantly, this study bridges a crucial gap by bringing such evidence-based practices into the context of **tribal sports development**, offering an inclusive and cost-effective means of boosting performance without requiring advanced infrastructure.

In an environment where formal training resources may be limited, the integration of structured breathing exercises offers an **accessible, culturally resonant, and impactful** method of improving coordination and readiness in competitive sports. The tribal cricketers who participated not only showed measurable physiological improvements but also reported better **focus, emotional control, and game awareness**crucial elements in a dynamic sport like cricket.

Therefore, this research reinforces the hypothesis that **breathing practices**, when systematically applied, can serve as a powerful tool in **sports enhancement**, especially within communities that have historically lacked access to such interventions.

REFERENCES

1. Bhavanani, A. B., Madanmohan, &Udupa, K. (2012). *Acute effect of MukhBhastrika (a yogic bellows type breathing) on reaction time*. Indian Journal of Physiology and Pharmacology, 57(2), 133–138.
2. Bhuvaneswari, G., & Nagendra, H. R. (2014). *Yoga for sports: A review*. International Journal of Physical Education, Sports and Health, 1(1), 29–33.
3. Chandrasekaran, K. (2013). *Yoga for Sports*. Sports Authority of India. New Delhi: Human Kinetics.
4. George, L., &Jeyakumar, J. (2018). *Effect of Pranayama on agility and coordination among adolescent girls*. International Journal of Yoga, Physiotherapy and Physical Education, 3(1), 128–132.
5. Gopal, K. S., Bhatnagar, O. P., Subramanian, N., &Nishith, S. D. (1973). *Effect of yogasanas and pranayamas on blood pressure, pulse rate, and some respiratory functions*. Indian Journal of Physiology and Pharmacology, 17(3), 273–276.
6. Joshi, L. N., Joshi, V. D., &Gokhale, L. V. (1992). *Effect of short term "Pranayam" practice on breathing rate and ventilatory functions of lung*. Indian Journal of Physiology and Pharmacology, 36(2), 105–108.
7. Kuppusamy, M., Kamaldeen, D., Pitani, R., &Amaldas, J. (2018). *Effect of yoga breathing practice on coordination among school children*. Journal of Clinical and Diagnostic Research, 12(3), CC01–CC03.
8. Saraswati, S. S. (1996). *Asana Pranayama Mudra Bandha* (4th ed.). Munger: Bihar School of Yoga.
9. Telles, S., & Naveen, K. V. (2008). *Yoga for rehabilitation: An overview*. Indian Journal of Medical Sciences, 62(3), 145–152.
10. Telles, S., Singh, N., &Balkrishna, A. (2012). *Managing mental health disorders resulting from trauma through yoga: A review*. Depression Research and Treatment, 2012, Article ID 401513.
11. Yadav, R. K., Das, S., & Sarkar, S. (2013). *Role of yoga in sports performance enhancement*. Journal of Physical Education Research, 2(1), 31–34.
12. Zope, S. A., &Zope, R. A. (2013). *SudharshanKriya Yoga: Breathing for health*. International Journal of Yoga, 6(1), 4–10.