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Prevalence of Agility, Speed, and Flexibility in National Cadet Corps Cadets After 12 Weeks of Drill Training: An Observational Study

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Abstract: ***This study evaluated agility, speed, and flexibility among National Cadet Corps cadets following 12 weeks of drill training. A cross-sectional observational design was used with 251 cadets assessed using the Illinois Agility Test and Sit-and-Reach Test. Mean agility score was 17.47 ± 2.04 seconds, indicating good performance, while mean flexibility was 28.21 ± 7.21 cm, with 56.97 percent of participants classified as having poor flexibility. A significant gender difference was observed ($p < 0.05$), with males demonstrating better agility and females higher flexibility. These findings suggest that although agility is satisfactory after training, flexibility remains suboptimal. Targeted flexibility interventions are recommended to improve overall fitness and reduce injury risk.***

Keywords: NCC cadets, physical fitness, agility, change-of-direction speed, flexibility, cross-sectional study, youth training, musculoskeletal performance, injury prevention, Illinois Agility Test, Sit-and-Reach Test

1. Introduction

Physical fitness is a multidimensional construct that significantly influences functional performance, injury risk, and overall readiness in individuals engaged in structured physical programs such as the National Cadet Corps (NCC). The NCC, one of India's largest youth organizations, focuses on developing discipline, leadership, and physical competence through activities like drills, endurance training, obstacle courses, and camps.

Agility is the ability to rapidly change direction while maintaining balance and control. The Illinois Agility Test (IAT) is a widely accepted and reliable tool for assessing agility in physically active populations.

Flexibility, defined as the ability of joints to move through a full range of motion, is essential for efficient movement and injury prevention. The Sit-and-Reach Test is commonly used to assess hamstring and lower back flexibility.

Previous studies have demonstrated that higher levels of agility, speed, and flexibility are associated with improved performance and reduced injury risk. However, limited research exists specifically on NCC cadets. Therefore, this study aims to assess these physical fitness components to better understand their fitness profile and guide targeted training interventions.

These findings can assist in optimizing NCC training protocols by emphasizing the inclusion of structured flexibility programs within routine drill training.

2. Literature Survey

Physical fitness components such as agility, speed, and flexibility play a vital role in performance and injury prevention in physically active populations. Agility, commonly assessed using the Illinois Agility Test, has been shown to be a reliable and valid measure in athletic and tactical populations (Hachana et al., 2013; Raya et al., 2013).

Speed is a key component influencing agility performance and overall physical capability (Haugen et al., 2014; Lockie et al., 2019).

Flexibility, particularly of the hamstrings and lower back, is essential for optimal movement and injury prevention. The Sit-and-Reach Test is widely used due to its reliability and validity (Plisky et al., 2013; Mayorga-Vega et al., 2014).

Previous studies have shown that higher-performing individuals demonstrate better physical fitness components (Dawes et al., 2016). Reduced flexibility and poor agility have been linked to increased risk of musculoskeletal injuries (De la Motte et al., 2019; Lopes et al., 2019). Training approaches such as Speed-Agility-Quickness (SAQ) programs have been found effective in improving these components (Hammami et al., 2022).

3. Methods

A cross-sectional observational study was conducted among 251 NCC cadets (Army wing) aged 16–23 years, recruited using convenient sampling from various college units in Mumbai. Cadets who had completed 12 weeks of training and were free from recent injuries were included.

The sample size was determined based on feasibility and availability of participants.

All participants underwent standardized testing on a single day following a 10–15minute warm-up consisting of light jogging and dynamic stretching. All assessments were

conducted under standardized environmental conditions to minimize external variability.

All tests were administered by trained personnel following standardized protocols to ensure reliability.

Agility performance was assessed using the Illinois Agility Test, where completion time was recorded.

Flexibility was evaluated using the Sit-and-Reach Test, with the best of three attempts recorded.

Descriptive statistics (mean, standard deviation, and range) were used to summarize the data. Inferential analysis was performed using the Independent Samples t-test to compare differences between male and female cadets. A $p < 0.05$ was considered statistically significant.

Ethical approval was obtained from the institutional ethics committee, and informed consent was obtained from all participants prior to data collection.

4. Results and Discussion

A total of 251 NCC cadets participated in the study. Descriptive analysis revealed variability in agility performance and flexibility among participants.

Male cadets demonstrated significantly better performance in the Illinois Agility Test compared to female cadets ($p < 0.05$), indicating superior agility performance. Female cadets showed higher Sit-and-Reach Test scores, reflecting better flexibility.

These findings are consistent with previous studies reporting that males generally exhibit greater agility and speed-related performance due to higher muscle power and neuromuscular coordination (Haugen et al., 2014; Lockie et al., 2019). Higher flexibility among females aligns with existing literature, attributed to anatomical and hormonal differences (Mayorga-Vega et al., 2014).

Although the Illinois Agility Test primarily measures agility, it also involves repeated accelerations and short sprints, thereby reflecting components of speed. This supports the interpretation of agility performance as an indicator of speed-related abilities.
The variability observed among cadets highlights the need for balanced training programs. Structured interventions such as Speed-Agility-Quickness training can enhance overall physical performance.

5. Conclusion

This study demonstrates that NCC cadets exhibit adequate agility and speed following 12 weeks of drill training, while flexibility remains low. Significant gender differences highlight distinct performance characteristics. These findings underscore the importance of incorporating structured flexibility training into NCC programs to enhance functional performance and reduce injury risk. The results provide a useful baseline for future research and training optimization.

6. Limitations

The study is limited by its cross-sectional design and convenient sampling method. Additionally, other fitness components such as strength, endurance, and body composition were not assessed.

7. Future Scope

Future research should include larger and more diverse samples to improve generalizability. Longitudinal and intervention-based studies focusing on Speed-Agility-Quickness training are recommended to evaluate improvements in physical performance.

References

[1] Hachana Y, Chaabène H, Nabli MA, et al. Reliability and validity of the Illinois Agility Test in team sport athletes. *J Strength Cond Res.* 2013;27(10):2752–2759.
[2] Raya MA, Gailey R, Gaunaurd I, et al. Comparison of agility tests in servicemembers. *J Rehabil Res Dev.* 2013;50(7):951–960.
[3] Haugen T, Tønnessen E, Seiler S. Sprint training in sports: A review. *Sports Med.* 2014;44(12):1653–1673.
[4] Lockie RG, Dawes JJ, Balfany K, et al. Determinants of change-of-direction speed. *J Strength Cond Res.* 2019;33(11):3037–3046.
[5] Plisky PJ, Rauh MJ, Kaminski TW, Underwood FB. Reliability of the sit-and-reach test. *J Orthop Sports Phys Ther.* 2013;43(5):321–327.
[6] Mayorga-Vega D, Merino-Marban R, Viciana J. Criterion-related validity of sit-and-reach tests. *J Sports Sci Med.* 2014;13(1):1–14.
[7] Dawes JJ, Orr RM, Siekaniec CL, et al. Associations between fitness and performance in cadets. *J Strength Cond Res.* 2016;30(6):1732–1738.
[8] De la Motte SJ, Lisman P, Gribbin TC, et al. Systematic review of flexibility and injury risk. *Med Sci Sports Exerc.* 2019;51(4):789–796.
[9] Lopes J, Machado L, et al. Relationship between flexibility and injury risk. *J Sports Med Phys Fitness.* 2019;59(3):448–454.
[10] Hammami R, Negra Y, Aouadi R, et al. Effects of agility training on performance: A systematic review. *J Sports Sci.* 2022;40(4):1–10.
[11] Sheppard JM, Young WB. Agility literature review: Classifications and testing. *J Sports Sci.* 2006;24(9):919–932.
[12] Little T, Williams AG. Specificity of acceleration, speed, and agility in soccer. *J Strength Cond Res.* 2005;19(1):76–78.
[13] Behm DG, Chaouachi A. Acute effects of static versus dynamic stretching. *Eur J Appl Physiol.* 2011;111(11):2633–2651.
[14] Miller MG, Herniman JJ, Ricard MD, et al. Effects of stretching on performance. *J Strength Cond Res.* 2006;20(2):338–343.

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