



## **Comparative Analysis of Hand–Eye Coordination among National-Level Karate, Judo, and Taekwondo Athletes**

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### **Abstract**

**Aim:** The aim of the present study was to compare hand–eye coordination among national-level Karate, Judo, and Taekwondo athletes. **Material and Methods:** Ninety (N=90) male national-level combat sports athletes between the ages of 18 and 25 years voluntarily participated in the study. The participants were equally divided into Karate (n=30), Judo (n=30), and Taekwondo (n=30) groups. Hand–eye coordination was assessed by using the Alternate Hand Wall Toss Test. Descriptive statistics, one-way analysis of variance (ANOVA), and LSD post-hoc test were applied for statistical analysis. **Results:** The mean hand–eye coordination score of Karate athletes was  $33.12 \pm 3.18$ , Taekwondo athletes was  $29.46 \pm 3.74$ , and Judo athletes was  $26.83 \pm 3.92$  respectively. The results of ANOVA showed that there was a statistically significant difference ( $F=7.86$ ,  $p<0.05$ ) among Karate, Taekwondo, and Judo athletes in hand–eye coordination performance. Further, LSD post-hoc analysis revealed significant pairwise differences among all groups. **Conclusion:** It was concluded that Karate athletes possessed superior hand–eye coordination compared with Taekwondo and Judo athletes. The findings suggest that sport-specific training and technical demands significantly influence visuomotor performance among combat sports athletes.

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### **Introduction**

Combat sports are among the most scientifically demanding athletic disciplines requiring a complex interaction of physiological, biomechanical, psychological, and neuromuscular abilities for successful performance. Among the various combat sports practiced worldwide, Karate, Judo, and Taekwondo have gained substantial international recognition due to their competitive structure, technical sophistication, and inclusion in major international sporting events. These martial arts demand rapid motor responses, perceptual accuracy, anticipation skills, agility, balance, reaction