Reliability of Visual Stimuli Technology to Measure Reaction Time in Adolescent Taekwondo Athletes

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Summary

This study aimed to evaluate the test-retest reliability of the visual stimuli technology device (BlazePod™) for assessing side kick reaction time in adolescent Taekwondo athletes. Fifty adolescent elite Taekwondo athletes (23 females, 27 males; age, 15.1±1.56) participated. Results demonstrated excellent reliability for side kick reaction time (ICC=0.95) and the number of hits (ICC=0.91). The BlazePod™ device is a reliable device for improving and evaluating the kicking ability of adolescent Taekwondo athletes.

Introduction

Reaction time is a critical parameter in Taekwondo, directly influencing an athlete's performance during competition [1]. This study focuses on the reliability of the visual stimuli device as a field-based tool for measuring side kick reaction time and number of hits in adolescent Taekwondo athletes.

Methods

Fifty adolescent Taekwondo athletes (age, 15.1±1.56; height, 170.12±7.57 cm; body mass index, 19.78±2.87 kg/m^2) who were free of injuries participated in this study. All the participants (23 females and 27 males) were elite Taekwondo athletes. The two assessments were performed 1 week apart and participants side-kicked the mechanism set up with the BlazePod^{TM} device for 30 seconds. For each extremity, 3 tests were performed with a 1-minute rest interval between tests, and the best value, along with the number of hits and the average reaction time provided by the device, was recorded. Reaction time data of both dominant and non-dominant extremities of the participants were used in the analysis.

Results and Discussion

With the inclusion of both extremities of the participants in the analysis, the side kick reaction time test performed using the visual stimuli device demonstrated excellent test-retest reliability for measuring side kick reaction time (ICC=0.95) and the number of hits (ICC=0.91). The standard error of measurement (SEM) and minimal detectable change (MDC) values are presented in Table 1.

Previous studies have evaluated the whole-body reactions of Taekwondo athletes using various methods, without conducting an assessment specific to the extremities [2,3]. Considering the importance of kicking techniques and their execution time in Taekwondo, a practical and reliable field-based method is needed to assess this parameter.

Conclusions

The results of this study show that the visual stimuli device is an excellently reliable device for assessing kick reaction time and hit count. This device can be preferred to improve and evaluate the kicking ability of adolescent Taekwondo athletes.

Acknowledgments

This research project was supported by Hacettepe University Scientific Research Projects Coordination Unit (Project No: THD-2023-20662).

References

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Table 1: Test-Retest Reliability of Kick Reaction Time Assessment with the Blazepod^{TM} Device.

	First test	Second test	ICC (95% CI)	SEM	MDC
Reaction time (ms)	697.63 ± 161.75	684.63 ± 185.52	0.95 (0.90 – 0.97)	41.30	114.47
Number of hits	36.80 ± 6.13	37.77 ±7.91	0.91 (0.83 – 0.95)	1.95	5.40