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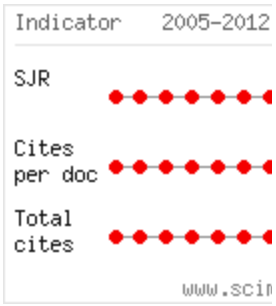

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Reliability & linearity of an electronic body protector employed in taekwondo games: a preliminary study

Niki Tasika

Abstract

An officialelectronic body protector (EBP) requires both, the necessary degree of accuracyand consistency in securing the same result under similar conditions. Thepurpose of this study was to assess the repeatability and linearity of a taekwondoEBP. A commercially available EBP that registers the energy (E) of a hit inJoules was placed unfolded on a hard non-deformable surface. Ten potential"hit" areas were marked on the EBP's surface. To simulate kickingconditions a 4 kg iron shot attached to a switch operated

electromagnet wassystematically released against the EBP from three randomly selected heights(1.78m, 1.92m, and 2.00m). The shot was released 5 times repeatedly from eachheight on each of the 10 areas. The procedure was repeated after a 30mininterval. Reliability was assessed by the test-retest method using Chronbach'salpha, Guttman split half and ICC, and the coefficient of variation (%CV). Theoverall (10 sites pooled together) CV was 4.8%. The CV ' s for the three heightsof release were 5.47%, 4.77%, and 4.18%, respectively. For the 10 separateanalyses (one for each of the 10 EBP sites) CV ranged from 2.5% to 11.6%. Forthe 10 separate analyses (one for each of the 10 trials) CV ranged from 6.8% to11.6%. The overall reliability between the 30 trials (across the three heightsof release) was: Chronbach's α = 0.979, single measure ICC = 0.572, averagemeasure ICC = 0.976

(p<0.001). Testing revealed that the inter-trial andinter-site reliability of the EBP is poor. Further research is required intesting the reliability of a variety of body protectors used in officialcompetitions today so as to assure fairness among contestants.

Key words: EBP; TKD; scoring; WTF

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