



A study of throw for accuracy in handball

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Abstract

In sports, the victor or victories are determined by a set of standards. Sport each sport, the standard differs. Depending on the sport, this criteria may be established in terms of a given number of points or a certain amount of time. Games, athletics, swimming, cycling, gymnastics, shooting, archery, boxing, and other activities fall under the umbrella of "sports." Two teams are usually involved in a game. Players may be part of a team of any number. Here, the winner is determined by the number of points scored or the amount of time it takes. Generally speaking, the better teams win. Consistent outcomes from the team/individuals are used as a measure of team performance.

Keywords: sport throw, accuracy, game, handball etc

Introduction

Handball-like games have been played for centuries in a wide variety of variants by people from all over the globe. These games had their own distinct set of regulations, ranging from entering a zone with control of the ball, shooting the ball at a hoop or net, to tossing at a goal in a similar manner to the current game. The earliest Regulations for sports comparable to handball were developed at the beginning of the 20th century, particularly in Denmark (Handball), Czechia (Házená) and Germany (Handball) (Feld handball). First national and international organisations were founded to control, promote, and grow the sport.

Throw for accuracy

“Accuracy and throwing velocity in handball are regarded as basic parameters of performance during competition. Several investigators have studied the relationship between the velocity of movement of the upper limbs and accuracy in hitting the target, which has led to interesting theories. In general, the results of these studies suggest the existence of a significant negative relationship between speed and accuracy.

In order to measure accuracy, an innovative electronic device was used which was placed on the inner side of a goal post and functioned as a target pointer (by means of a red light) and 'hit-detector'. The ball velocity was measured by means of another innovative device, which consisted of a laser beam emitter and an electronic circuit laser beam receiver.

The determination of ball velocity was made based on the diameter of the ball and the time (in μ sec) that the laser beam was interrupted by the passing of the ball. Three groups of subjects took part in the experiments: one group of 15 handball athletes, the best League A1 scorers (age 24.86 ± 2.91 yrs), another group of 12 handball athletes, the best League A2 scorers (age 26.84 ± 5.67 yrs) and a random sample of 15 physical education students (21.72 ± 0.89 yrs). Accuracy and ball velocity were examined in three types of throw: (a) on the spot, (b) with a crossover step and (c) with a vertical jump. The results were analyzed using one-way ANOVA and Pearson correlation (SPSS package).

Table 1: Mean values (\pm SD) of deviation from the accuracy (in cm) and of ball velocity (in m/s), in the three types of throw for the three groups of subjects”.

		On the spot	With a cross-over step	with a vertical Jump
Group A1	Accuracy	20.90 \pm 7.79 cm	18.45 \pm 7.57 cm	22.62 \pm 7.14 cm
	Ball velocity	23.51 \pm 2.23 m/sec	26.27 \pm 3.21 m/sec	22.74 \pm 2.16 m/sec
Group A2	Accuracy	22.94 \pm 5.44 cm	19.57 \pm 8.84 cm	24.31 \pm 8.39 cm
	Ball velocity	20.08 \pm 1.12 m/sec	23.22 \pm 1.86 m/sec *	20.54 \pm 1.63 m/sec
Students	Accuracy	38.91 \pm 12.57 cm*+	41.55 \pm 13.70 cm *1-	35.88 \pm 14.34 cm *+
	Ball velocity	16.85 \pm m/sec *+	18.90 \pm 1.98 m/sec *+	15.54 \pm 1.42 m/sec *+

“* = significantly different from group A1 (p<0.05)

+ = significantly different from group A2 (p<0.05)”

Results

Table shows the accuracy and ball velocity for each set of individuals and each kind of throw. A1 and A2 had the best accuracy in the cross-over step throw, with mean values under 20 cm. In contrast to the two teams of athletes, the students' group had the lowest accuracy in the throw using a cross-over stride (mean value 41.55 cm) "One way ANOVA performed for the three groups of subjects in each type of throw revealed that in all three types of throw examined, there was a significant difference in accuracy among groups, attributed to the higher deviation from the target observed in the student group (on the spot: F-ratio= 16.422, $p \leq 0.001$; with a cross-over step: F-ratio= 22.493, $p \leq 0.001$; with a vertical jump: F-ratio= 6.825, $p \leq 0.003$). With regard to throwing velocity, a significant difference among groups was found in all types of throw examined (on the spot: F-ratio= 54.585, $p \leq 0.001$; with a crossover step: F-ratio= 33.578, $p \leq 0.001$; with an a vertical jump: F-ratio= 20.795, $p \leq 0.001$), which was attributable to the fact that all three groups differed significantly from each other. In all the three types of throw the A1 group threw the ball with higher velocity compared to the A2 group and the students group, while ball velocity in the A2 group was higher than in the student group. This observation is consistent with the quantitative and qualitative level of the three groups of subjects. In all groups the highest ball velocity was achieved in the throw with a cross-over step. An explanation for this may be that the throw with a cross-over step involves an initial run-up and, thus, a higher elastic energy transferred from the feet to the fingers of the upper limb (Atwater 1979). The ball velocity values attained in the throw on the spot and in the throw with a vertical jump were very similar in all groups of subjects. This was probably due to the fact that in the throw on the spot there is no initial run-up to benefit the ball velocity, but the ground forces give a certain advantage, whereas during a throw with a vertical jump the lack of ground forces is counteracted by the speed gained with the initial run-up".

Conclusion

The accuracy and velocity of the throws of three groups of individuals were evaluated in this research, and the results were compared. League A1's top scorers outperformed the other groups in all three forms of throwing considered in this research, with respect to the factors measured. There was a significant correlation between throwing velocity and accuracy in two of the three kinds of throws tested in group A1, but not in group A2. In the student group, a smaller correlation was identified in one of the three types of throws tested. If a handball player can successfully combine the highest possible ball velocity and best accuracy in all sorts of throws, independent of technique, he or she will make a significant contribution in a game.

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