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Functional Theory on Physical Fitness and Playing Ability of Handball Players at University Level

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Abstract – Physical process refers to the learning and practice of a skill if one is to succeed in sports and competition. Handball is a team game wherein a group of players having excellent physical fitness, mastery over the skills and tactical capabilities together with high order of mental functioning collectively strive to outsmart their rivals in a competition. It is a game that requires nerves of steel to tolerate the critical competition load Even when individuals have no interest in sport, the influence from relatives and friends can be significant, to the point where sport is included in their lives, sometimes only for the duration of a tournament.

Keywords: Player, Sports, Handball, Physical, Skills

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INTRODUCTION

The functional theory seemingly possesses several research possibilities, which can be used in support of the dominant cultural values in societies. It is necessary, however, to determine the extent to which the functional theory could serve as an instrument to identify and describe the trends in a society and in specific school sports. The management and specialist competencies required by the contemporary school sport manager in society can also be identified.

When proponents of the functional theory assess the role of sport in the maintenance of the basic systems in society, sport is negated as a social construct that is created by groups of people. The role of groups that contribute to the inequality in society, as for example those with the economic power in the sport world is not researched.

Ignoring the role of those with power in the sport world, assumes that social problems, change and inequality in society, are not taken as the focus of the research. Further theories would have to be investigated to reach scientific conclusions concerning specialist professional competencies of the school sport manager in a diversity of schools, as currently manifested in the wider society.

The school sport manager should therefore, without a doubt, take into consideration the social and market environment because sport is seen as a popular and unique commodity, which can be used to improve one's position in the society.

Programs have expanded from the traditional school setting to the community, home, and work site, commercial and medical settings. School- community partnerships bring sport instruction and fitness programs to learners in the community and offer increased opportunities for youth involvement. Community recreation programs offer a variety of instruction and sporting activities for learners of all ages and abilities. Tennis, golf, gymnastics, and karate clubs offer instruction to learners of all ages.

Coupled herewith, the utilization of school sport and sport facilities of schools can be seen as a part of sport business, because athletes and the sport facilities of schools are identified as revenue-generating possibilities Modern stadiums and other facilities have been built and developed in numerous schools all over the world. These stadiums and facilities can generate revenue for their schools if managed successfully.

The approach of Hensley to the study of community presupposes that the functional theory negates conflict as a social phenomenon. In relation to the current study, this would mean that the school sport manager, who supports the functional theory, assumes that all the different functions within a school need to work together in harmony towards a common goal, or else the school might have to close down. As such, it would not have to cope with conflict when school sport is offered as a service to the community.

METHODS

Physiological measurements were taken of 60 players during the final week of their preparatory training for competition. According to positional roles, players were categorized as guards {n = 20), forwards in = 20), and centers in = 20). All subjects were assessed on the same day, and the tests were performed in the same order. Seven days before the experiment, all subjects consumed the same diet (55% of the calories were derived from carbohydrate, 25% from fat, and 20% from protein), and the last meal was undertaken 3 hours before the test. After that period, all subjects drank only plain water as necessary. In the 24 hours before the experiment, the subjects did not participate in any prolonged exercise.

When these preliminary measurements were finished, subjects completed a warm-up (15 minutes of sprints and individual exercise). Vertical jump height and percentage of muscle fiber types of leg extensor muscles were estimated using a force platform. All subjects had a preparatory bounce before measurement; the computer, which was connected to the platform, calculated jump height from the time the subject was off the mat.

Table 1: Characteristics of Handball players

Variable	Guards (n = 20)	Forwards (n = 20)	Centers (n = 20)	Total (n = 60)	Range
Age (y)	25.6 ± 3.2‡§	21.4 ± 2.8	23.2 ± 3.2	23.4 ± 3.5	16.8–32.4
Professional experience (y)	9.6 ± 3.2‡§	5.0 ± 2.7	7.1 ± 3.3	7.2 ± 3.6	2.1–13.8
Height (cm)	190.7 ± 6.0‡§	200.2 ± 3.4‖	207.6 ± 2.9	199.5 ± 8.2	180.3–220.5
Weight (kg)	88.6 ± 8.1‡§	95.7 ± 7.1‖	105.1 ± 11.5	96.5 ± 11.2	75.6–121.2
Body fat (%)	9.9 ± 3.1§	10.1 ± 3.2‖	14.4 ± 5.6	11.5 ± 4.6	3.1–20.4
Hemoglobin ($mmol \cdot L^{-1}$)	131.7 ± 10.9	132.3 ± 10.4	132.1 ± 10.7	132.0 ± 10.7	119.2–145.7
Hematocrit (%)	0.41 ± 0.03	0.41 ± 0.04	0.41 ± 0.04	0.41 ± 0.04	0.39–0.44
Forced vital capacity (L)	6.5 ± 0.8	6.6 ± 1.0	6.6 ± 0.9	6.6 ± 0.9	5.5–7.6
Forced expiratory volume in 1 s (L)	5.4 ± 1.1	5.7 ± 0.9	5.8 ± 1.1	5.6 ± 1.0	4.9–6.8
Estimated $\dot{V}o_2max$ ($ml \cdot kg^{-1} \cdot min^{-1}$)	52.5 ± 4.8§	50.7 ± 2.3‖	46.3 ± 4.9	49.8 ± 4.9	41.3–63.9
HRmax ($b \cdot min^{-1}$)	193 ± 2‡§	196 ± 5	195 ± 3	195 ± 3	186–208
Vertical jump height (cm)	59.7 ± 9.6	57.8 ± 6.5	54.6 ± 6.9	57.4 ± 7.7	31.1–89.6
Vertical jump power (W)	1,484.9 ± 200.0§	1,578.6 ± 137.5	1,683.0 ± 191.7	1,582.1 ± 193.6	1,256.1–1,889.5
Fast twitch† (%)	65.1 ± 10.2	64.7 ± 8.9	62.4 ± 9.1	64.1 ± 9.4	45.2–79.5

The calculation of jump height assumed that the takeoff and landing positions of the body's center of gravity were the same. Subjects were instructed to keep the trunk as straight as possible and to try to land on the platform on the same spot and with the same body position as during takeoff (i.e., trunk and legs straight).

RESULTS

All results are shown in Table 1. Guards were older {p < 0.01) and more experienced {p < 0.01) than both forwards and centers were. Centers were taller and heavier than guards and forwards {p < 0.01), whereas forwards were taller and heavier than guards (p < 0.01). Centers had more body fat (p < 0.01) as compared with forwards and guards.

Values for Hb, Hct, FVC, and FEVi were not significantly different among positions. Centers also bad significantly lower estimated Vo^msLX values (p < 0.01) compared with forwards and guards. In addition, the highest HR frequencies during the last minute of the shuttle run test were lower in guards (p < 0.01) than in forwards and centers. Average vertical jump height was not statistically different between different positional roles, although vertical jump power was significantly higher in centers (p < 0.01) than in guards. Estimated percentage of fast muscle fibers (fast twitch) was similar in all positional roles.

Positive correlation was found between weight and body fat (r = 0.92, p < 0.01) and height and body fat (r = 0.85, p < 0.01) during the study. Moreover, strong negative correlation was found between weight and vertical jump (r = -0.99, p < 0.01), weight, and estimated VOamax (r = —0.99, p < 0.01), height and vertical jump (r = -0.98, p < 0.01), and height and estimated VOamax (r = -0.95, p < 0.01). When we analyzed the intra class correlation, we found no significant relationships between variables for guards (p > 0.05). Moreover, for centers and forwards, we found no significant relationships between most variables (p > 0.05) except for a significant positive correlation between weight and body fat (r = 0.80 for centers, r = 0.61 for forwards p < 0.01).

N	Height (cm)	Weight (kg)	Body fat (%)	VJ (cm)	$\dot{V}o_2max$ ($ml \cdot kg^{-1} \cdot min^{-1}$)
34	C: 214.0 ± 5.2	C: 109.2 ± 13.8	7.1–13.5	—	C: 41.9 ± 4.9
	F: 200.6 ± 5.0	F: 96.9 ± 7.3		—	F: 45.9 ± 4.3
	G: 188.0 ± 10.3	G: 83.6 ± 6.3		—	G: 50.0 ± 5.4
21	C: 206.6 ± 4.1	C: 102.1 ± 17.6	—	C: 55.9 ± 8.1	C: 59.7 ± 6.9
	F: 196.9 ± 4.6	F: 92.0 ± 6.9	—	F: 66.8 ± 8.3	F: 59.9 ± 5.1
	G: 185.4 ± 8.6	G: 79.3 ± 7.3	—	G: 61.6 ± 8.5	G: 74.4 ± 6.8
9	196.4 ± 11.9	89.0 ± 11.3	—	64.3 ± 7.9	—
437	C: 205.5 ± 6.1	101.9 ± 9.7	C: 11.2 ± 4.5	C: 66.8 ± 10.7	C: 55.0
	F: 198.4 ± 3.8	95.1 ± 8.3	F: 9.7 ± 3.9	F: 71.4 ± 10.4	F: 56.0
	G: 187.4 ± 5.8	82.9 ± 6.8	G: 8.4 ± 3.0	G: 73.4 ± 9.6	G: 56.0
9	—	87.7 ± 6.7	9.8 ± 1.9	—	65.2 ± 6.2
29	197.9 ± 8.1	91.9 ± 10.1	—	67.3 ± 6.0	—
9	—	92.2 ± 8.2	5.9 ± 3.1	—	53.0 ± 4.7
20	194.2 ± 6.0	88.4 ± 8.0	12.9 ± 3.1	—	50.2 ± 3.8

CONCLUSION

The results of this study show there are differences in physical and physiological Characteristics in different positional roles of Handball players. Consequently, the athletes in various positional roles are inherently different, train differently, or both. The demands of the different positional roles appear to be unique, and thus training, as well as recruiting, should reflect the differences. Coaches can use this information to determine what type of profile is needed for specific positions and to design training programs to maximize fitness development in their athletes and to achieve success in Handball.

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