

Analysis of Effects of Motor Variables on the Sport Performance of Male University Champion-Handballers in West Africa

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Abstract

This study focused on analysis of effects of motor variables on the sport performance variables among University male champion-handballers in West Africa. The objective of the study was to analyze the motor performance variables of male University champion-handballers in West Africa. Ex-post facto research design was adopted for the study. All the male handball players from the three Universities (University of Ilorin, University of Ghana and University of Abomey-calavi) that participated in the West Africa University games (WAUG) constituted the population. Purposive sampling technique was used to select all the thirty-seven players that are available during the competition for the study. Standardized instruments were used for the study. One major hypothesis and one sub-hypothesis were formulated and tested using both the Descriptive and inferential statistics of t-test and ANOVA Scheffe post hoc multiple comparison tests were used to test for significant difference between the groups. The alpha level for the rejection or acceptance of the hypothesis was set at 0.05 alpha level of significance. The findings revealed that the Male players had significant differences in motor variable (Agility ($F=839.225 > 3.32(0.05)$ $df36$) while there is no significant differences in shooting ability ($F=1.076 < 3.32(0.05)$ $df 36$). It was therefore recommended that coaches should focus on these variables (Agility and Shooting) in their selection and coaching processes.

Key words: *Motor variables, Agility, Shooting.*

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I. Introduction:

Handball players have a greater overload of the force component in the medicine ball throw and a greater overload of the velocity component in handball throws (Gorostiaga, Izquierdo, Iturralde, Ruesta & Ibanez (1999), Skoufas, Kofzamanidis, Hatzikotoylas, Bebetos and Patikas; (2003) ;Van de Tillaar 2004). On the basis of force-velocity relationship, it can be derived that slow movements are ideal for generating high mechanical force; at the same time many functional activities are performed at fast velocities which are less conducive to high force generation which partially influences the role of general anthropometrical parameters in different throwing and static strength tests.

In handball, the players predominantly use only one arm and it could be presumed that training in different sports will induce different effects on arm strength (Bencke et al. 2002). The higher relationship between throwing tests' results with dominant hand and anthropometrical variables could be explained by better technical performance (Van de Tillaar & Ettema, 2004) which allows to take better advantage of body height and body composition. This enables better energy transfer through the Kinematical chain during the handball throw (Skoufas et al. 2002, Gorostiaga et al. 2005). Barata (1992) found in an earlier study with adolescent handball players that technique rather than force will influence the handball throw velocity which was also confirmed by Gorostiaga et al. (2005) in a study with elite and amateur handball players.

Many field and court sports involve some straight sprinting but more often repeated short sprinting with changes of direction (Sheppard & Young 2006). Most court sports require 180 degrees turns over a small distance (Barnes, Shilling, Falvo, Weiss, Creasy and Fry, 2007) and such sports to great extent demand agility. There are two main components of agility – change of direction, speed and perceptual and decision-making factors (Sheppard & Young 2006). Agility is often described as the quality of possessing the ability to change direction and start and stop quickly (Parsons & Jones 1998, Little & Williams 2005). The straight sprint and agility tests assess specific qualities which do not transfer one to the other (Young, McDowell and Scarlett, 2001a, Little & Williams 2005).

This study investigated and analysed each university handballer's motor characteristics among the male handballers in West Africa. It further assessed the influence of motor variables, and to compare and analyse male university champion-handballer's motor variables.

Hypotheses:

Main Hypothesis:

1. There is no significant difference in the analysis of effects of motor variables on the sports performance of male University Champion- handballers in West Africa.

Sub-Ho.

1. There is no significant difference in the Motor sport performance variables (Agility, Shooting Ability) of University Male- Champion handballers in West Africa.
2. There is no significant influence of the motor Variables on sport performances among University male-champion handballers in West Africa.
3. There is no significant influence of the motor Variables on sport performances in Handball among University Male -Champion handballers in West Africa.

II. Methodology:

The research design for this study is ex-post facto research, all the handballers representing their universities at the 13th West Africa Games (WAUG) who volunteered for this study, a consent form was signed for ethical consideration. 36 players were sampled through stratified and purposively sampling techniques. Three Universities handball team consisting of twelve players each were sampled. (University of Ilorin, University of Ghana and UACBenin) all the players had official medical clearance (WAUG Accreditations Committee). The tools used for the study are standardized instruments and facilities which include: measuring tape, stop watch, weighing scale and a standard handball courts. Reliability of the instrument was done by carrying out a pilot study by using the instruments on University of Ilorin second team players. Data collection was done by taking the measurements of the subjects and recording the performances in the appropriate columns. Researcher and two trained research assistants the measurements according to the guidelines stated for the conduct of the research.

Day 1. Shooting Ability (throwing and catching), Agility (T-shuttle run).

A. Measurement of Motor Variables.

All measurements were in accordance with standard procedure (Visnapau, (2009).For the measurement of motor variables the following tests were used.

Shooting ability: speed and accuracy (reps):

Equipment: A line for making the pass was drawn on the floor, 3m from the wall and a 40 × 40cm square was drawn on the wall with the lower side at 180cm from the floor.

Procedure: Subjects stood behind the line for the pass in a comfortable position and started shooting with the dominant hand on the target wall with maximum speed for 30seconds.

Only shots that the subjects performed accurately on the target during the 30seconds were counted and recorded. All tests were performed in the same place. The best of two trials was used for the study.

Agility Test: T-shuttle runs

Equipment: Three lines were marked on the floor with a distance of five meters between them, and labeled as “A”, “B”, “C” and “D” respectively as shown in Figure: 5.

Procedure: The subject started from point “A” (a timer start), then moved fast to point “B”, touched the ball at “B” with a single hand, returned to point “A”, followed by run from point “A” to point “C”, after touching the ball at “C” with a single hand then run back to Point “A”, and finally, moved from point “A” to point “D”. The total time spent was recorded in the nearest second. Each participant attempted the test twice with an interval of 2- 3 minutes and the better time of the two trials was used.

III. Results of Findings:

Table 1: Descriptive statistics on motor sportperformancevariables among university champion-handballers in West Africa.

Variables	A(Benin)				B(Ghana)				C(Ilorin)				Total (ABC)			
	N	x	SD	Range	N	X	SD	Rang e	N	X	SD	Rang e	N	X	SD	Range
Shooting (rep)	13	39.23	4.15	32-47	12	37.66	3.11	31-41	12	37.33	2.96	31-41	37	38.11	3.47	31-47
Agility (sec)	13	18.15	.555	16.40- 18.00	12	17.02	.71	16.00 - 18.00	12	17.01	.62	15.8- 18.00	37	13.90	4.33	15.8- 18.00

Table one, presents the means and standard deviations results of the motorsport performance variables for the male university champion- handballers. There are also wider variations in Agility, Shooting among male

University champion handballers .This could suggest the suitability of handball game to wide variations of motor sport performance variables values.That may also mean that handball game allows a wide range of values in both anthropometric and motor variables to be champion players.

Table 2: The Summary of Motorsport performance Variables for the University Male Champion-Handballers in West Africa.

Variable (units)	Source of variation	Sum square	Df	Mean square	Fratio	Fcal.val	Decision
Shooting (reps)	Between Group	25.927	2	12.963	1.076	3.32	R
	Within Group	409.641	34	12.048			
	Total	435.568	36				
Agility(sec)	Between Groups	662.552	2	331.276	839.225	3.32	R
	Within Groups	13.421	34	.395			
	Total	675.973	36				

Table two is the analysis of variance (ANOVA) result for the motor sport performance variables of male university champion-handballers in West Africa. Motor variable were significantly different in Agility (F=839.225>3.32, while ShootingAbility (F=1.076<3.32) at 0.05level of significant set for this study

Table 3: Scheffes post hoc tests results on the motorsport performance variables among male University champion-handballers in West Africa.

Variables (units)	Indep	Dep	Mean Difference	S	Sig.
Agility(sec)	Uni-Ghana	Uni-Ilorin	.012	.256	.999
	UACBenin		8.87	.251	.000

In table three, the Scheffe post hoc analysis on the motor sport performance variables among the universities result showed where the significant differences exists among the players from participating universities. The scheffe post hoc analysis clearly showedthat the Universities of Ghana male handballers were significantly different from the other universities handballers in Agility.

Table 4: Summary of Item by Item analysis of motorsport performance variables among male university champion –handballers in west Africa.

motor variables performance (units)	1 st Position UACBenin X	2 nd Position Uni-Ghana X	3 rd Position Uni-Ilorin X
Shooting ability(reps)	39.23	37.66	37.33
Agility(sec)	18.15	17.02	17.01

IV. Discussion of finding:

Sub-Hypothesis 1: There is no significant difference in motor sport performances variables among male university handball in West Africa.The motor variables examined in this study are agility, and shooting ability.

Agility (sec): The mean Agility for the male handballers is 13.90±4.33sec and a range of 15.8-18.00sec. The F-ratio of 839.225(Table 2) is not significant at 0.05(F-0.05=3.32). The null hypothesis that Agility of the male handballer players is not significantly different among this group of players is upheld. That is the handballer in this study had very similar Agility values. That all the university players, from the West Africa sub-region have relatively the same Agility of 13.90sec, with the range from 15.8-18sec, one can therefore assume that any Agility value from 15.8-18sec could be good enough to make an elite handballer, since all players are champions from their respective Universities.

The mean Agility of 13.90sec for this study is similar to the Agility of a study of 30male handball players aged between 15 to 25years who are selected from University level, state and National level of 16.8sec (Waghmare, 2012). Agility is a crucial factor of an athlete in making a fast, precise and accurate decision which is necessary in the game of handball and that quick start, stops and changes in direction which are all attributes of Agility are fundamental to good performance in all court and ball games. (Olaitan, Bakinde, Ajayi-Vincent and Adeshina (2012)), (Ajayi-Vincent, (2005)) the Scheffe post hoc test also confirms that there were no significant differences in the agility values among the universities.

Shooting ability (reps): The mean Shooting ability for the male handballers is 38.11±3.47 and a range of 31-47.the F-ratio of 1.076(table 2) is statistically significant at 0.05(F-0.05=3.32).The null hypothesis that shooting ability of the male handball players is not significantly different is accepted. That is the handballers in this study have a very significantly different shooting ability.

The shooting ability of 38.11 for this group is different to the shooting ability of male and female young

handball player's ball velocity with higher value of 70.72 ± 7.00 . According to Hoff & Almasbakk (1995), Van de Tillar (2004), Gabbett (2005) throwing velocity in handball and rugby, which is dependent on the ability to produce power, is important for success. Muijtjens et al. (1991) also noted that the combination of ball velocity and accuracy in throwing is one of the most important factors and has a decisive role in scoring. Trewartha et al (2008) also explained that players demonstrated greater accuracy at shorter throwing distances than during throws over longer distances.

V. Conclusions:

1. Motor Variables:-Male

- There is a significant difference in the Agility of the University Male champion handballers. UAC Benin with 18.15, Uni-Ghana with 17.02 and Uni-Ilorin with 17.01 sec.
- There is no significant difference in the Shooting ability of the University male champion handballers.

Recommendations

1. Coaches should adopt this information to determine the type of profile needed for specific position in Handballer.
2. Coaches should be enlightened to use profiling information of handball players in the process of designing training programme to maximize fitness development of players.

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