



COMPARISON OF FORCE GENERATION AMONG HIGH AND LOW PLAYING ABILITY GROUPS

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ABSTRACT

The study was conceptualized with a purpose to find out the force generation among the players during execution of the skills. The study was delimited to 32 high and low playing ability groups, age ranged between 18 to 24 years. The study was delimited force generation of high and low playing ability groups of two Games: Handball (Jump Shot) and Basketball (Free Throw), who had participated at University level. It was hypothesized that high playing ability groups would have more ground reaction force than low playing ability groups. Prior to the test testing procedure explained to them in the interest of sports concerned. The data for Force generation was collected with the help of Net Force AMTI's Bio-analysis Software. After making all the formalities regarding the testing protocol the subjects were asked to perform the skill and their reading of Ground Reaction Force was recorded in Newton (N). Independent t-test was used in order to find out the Force Generation between High and Low Playing Ability Groups. The level of significance for the entire analysis was set at the 0.05 level of confidence. The data were analyzed by using SPSS Version 17 and statistical finding reveals that force generation in free throw of basketball showed no significant but Ground reaction Force during jump shot in Handball founded significant difference among players of high and low playing ability groups.

KEY WORDS: Force Generation, Playing ability

INTRODUCTION

Sports are no spontaneous inventions. They originate from the basic human drive to investigate and to learn; this is realized by concentrating on certain objects, events and problems of which it is tried to clarify their existence, causes, and effects as well as to formalize this as understanding and knowledge. New sciences are originating in a continuous process of differentiation either by new themes and problems or by separation from already established

theoretical and scientific fields. Sports sciences are considered as a part of pedagogy which helps in the process of scientific development (Schmitz, 1979).

Preparing an athlete for top achievement is a completely dynamic state characterized by a high level of physical and physiological efficiency and degree of perfection of the necessary skills, knowledge, technique and tactical preparation. An athlete arrives at this stage only as a result of appropriate scientific training. In the modern scientific age, in every field of human endeavor, systematic objective and scientific procedures are followed in accordance with principles based on experience, understanding and application of knowledge of science. The field of games and sports is no exception to this. In countries like U.S.A., Germany, Russia, Australia, Britain the rapid progress in the field of games and sports like athletics, soccer, hockey, etc. has taken place and their international achievements have been possible only due to research, experimentation and application of scientific knowledge (Freeman, 1980).

Research findings indicate that high level of technique perfection alone cannot produce success in competitive sports. It also demands a higher level of game specific speed, strength, endurance, flexibility, co-ordination and optimum fitness (Johnson, 1975).

Force platforms or force plates are measuring instruments used to quantify balance, gait and other parameters of biomechanics by measuring the ground reaction forces applied to the platform. Force platforms or force plates are measuring instruments that measure the ground reaction forces generated by a body standing on or moving across them, to quantify balance, gait and other parameters of biomechanics. Most common areas of application are medicine and sports (Peikenkamp, 2002).

Keeping the role of muscles in generation of force and their contribution in the performance of elite players the study was conceptualized with a purpose to find out the force of muscular contraction during execution of the skills and it was also hypothesized that high playing ability groups will have more ground reaction force than low playing ability groups.

METHODOLOGY

32 male players were selected as subjects. Players were selected from two different Games i.e. Handball, and Basketball from L.N.U.P.E., Gwalior for the study. Hence, purposive sampling was considered for selection of subjects. After consulting the coaches about player's high playing ability and low playing ability according to their performance 8 players in each category were selected with age ranged from 18-24 years. All the measurements pertaining to the study were taken by the research scholar under the expert guidance so that data collected for the present study were considered reliable. For establishing the tester's competency several practice sessions were conducted till an acceptable consistency in recording the measurement was achieved. The data for Force generation was collected with the help of Net Force AMTI's Bio-analysis Software. This consists of a Biomechanical Software for analyzing the force generated and a force platform. The data was collected at the time of take-off of the subjects under investigation. The subjects were required to first of all stand on the force platform and all relevant information of the subjects namely, Name, Age, Sex and Height were feed in the Net Force AMTI's Bio-analysis Software. After making all entries of the subjects pertaining to his profile on the software, the subjects were asked to perform the skill and their reading of

Ground Reaction Force was recorded in Newton (N). In order to find out the comparison of Force Generation between High and Low Playing Ability Groups independent t-test was used.

For analysis purpose, the level of significance was set at 0.05. SPSS Version 17 was employed for all statistical techniques.

FINDING AND DISCUSSION

Table - 1
Comparison of force generation of jump shot in handball among high and low plying ability groups

Variables	Group	N	Mean	Std. Dev	t-ratio
Performance	High	8	879.86	70.90	2.532*
	Low	8	786.74	29.16	

* Significant at 0.05 level tab $t_{0.05} (14) = 2.145$

Table- 1 revealed that high playing ability group showed significant difference with low playing ability of handball players because the calculated t value (2.532) was higher than tabulated t value (2.145) at 0.05 level of significance.

Table - 2
Comparison of force generation of free throw in basketball among high and low playing ability groups

Variables	Group	N	Mean	Std. Dev	t-ratio
Performance	High	8	548.71	26.17	0.738
	Low	8	538.57	25.85	

* Significant at 0.05 level tab $t_{0.05} (14) = 2.145$

Table-2 revealed that high playing ability group showed insignificant difference with low playing ability of basketball players because the calculated t value (0.738) was lesser than tabulated t value (2.145) at 0.05 level of significance.

The findings of the study revealed that ground reaction force generation by high playing ability handball players and low playing ability players is significant and it may be due to more explosive strength of legs as they did more strengthening exercise then low playing ability group as well as they trained in a more scientific way for higher level of participation, their skill level were also more better means the movement efficiency were higher and their muscles were also more educated due to lot of practice than low playing ability group. Whereas ground reaction force showed insignificant difference of free throw in basketball among high and low playing ability groups which may be because free throw technique is based on less muscular contraction of lower limb muscles, and more skill and technique oriented. Hence, the

hypothesis as formulated earlier that high playing ability groups will have more force generation than low playing ability groups was partially accepted and partially rejected.

CONCLUSION

After critically examination of the statistical findings, interpretation of statistical findings and based on understanding this was concluded that force generation in free throw of basketball showed no significant difference among players of high and low playing ability groups. Whereas Ground reaction Force during jump shot in Handball founded significant difference among players of high and low playing ability groups.

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