Body Composition, Somatotype, Physical-Physiological Performance and Playing Ability of Male Zimbabwean League Basketball Players

By

Daga Makaza
BSc and BEd

Department of Sports Science and Coaching
Faculty of Applied Sciences
National University of Science and Technology

In Fulfillment of the Requirements for the Degree
Of
Master of Philosophy
In
Sports Science and Coaching

July 2012

Abstract

This project presents a profile of the body composition, somatotype, physical-physiological characteristics and playing ability of male Zimbabwean League basketball players. The project also presents relationships between body composition and physical-physiological performance variables and goes further to develop prediction models for basketball playing ability from body composition and physical-physiological performance variables. Twenty six players aged 22.0±5.3 years were purposively sampled from the first 5 teams in the 2008/2009 log standings of the Bulawayo Basketball Association. Anthropometric variables were measured using standardized procedures of the International Society for the Advancement of Kinanthropometry. Measurements included body mass, stretch stature, 8 skinfolds, 5 girths and 2 bone breadths. Body mass index, body density, waist-to-hip ratio, percentage body fat, fat mass, fat-free mass, fat mass index and fat-free mass index were calculated as body composition variables. Heath-Carter somatotype method was used in determining the somatotype of the participants. Physical-physiological performance variables measured were isometric strength, leg muscular power, speed, agility, flexibility, local muscular endurance, hand and eye coordination and aerobic capacity. All physical-physiological measurements were taken using standard protocols. For analysis purposes players were grouped by playing positions into point guards (n=7), shooting guards(n=7), forwards(n=9) and centres(n=4). Descriptive, comparative (analysis of variance), correlational and multiple regression analysis of body composition, physical-physiological performance variables and playing ability was done using SPSS version 17.0. The results indicated body mass of 68.39±9.73kg, height 1.79±0.07m, sum of 8 skinfolds 63.0±45.12mm, percentage body fat 8.92±5.88, body mass index 21.21±2.36, waist to hip ratio 0.80±0.02, fat mass 6.61±6.05kg, fat free mass 61.78±6.95kg, fat mass index 2.01±1.69, and fat free mass index 19.13±1.65 among the participants. The somatotype values of the players who participated in this study fell into only 6 categories of the 13 conventional categories. Fifty four percent of the players were either Ectomorphic Mesomorphs or Mesomorphic Ectomorphs. The mean somatotype values for all the players were 1.74-3.94-3.68 Ectomorph- Mesomorph. There were no significant differences in body composition, somatotype and physical physiological performance among players at different positions except for height. The physical-physiological performance results indicated leg strength 92.3±31.7kg, back strength 111.0±24.7kg, handgrip left 51.23±9.4kg, handgrip right 52.1±13.9kg, leg power 108.1±13kg, speed 3.1±1.1s, trunk flexion 30.7±7.3cm, trunk extension 35.2±9.7cm, shoulder extension 29.3±14.2cm, hand and eye coordination 27±3 successful catches, agility 12.3±0.9s, muscle endurance 30±10 push ups, 39±6 sit ups, 16±2 burpees and aerobic capacity 45 ±3.5ml/kg/min. Significant linear relationships between several body composition and physical-physiological variables were found. Significant relationships were also found between playing ability and some physical-physiological performance variables. Six physical-physiological variables were significant ($F_{5,20}$ =13.391, p <0.001) predictors of basketball playing ability. These variables accounted for 77.4% of the variance in playing ability. The basketball players were found to be shorter and lighter when compared with players elsewhere. Generally, the physical and physiological characteristics of the basketball players were average to poor when compared to players elsewhere. The results demonstrated the importance of physical-performance variables in determining playing ability though determinants of playing ability are multifactorial. The variables should therefore be considered by coaches when designing their training programmes. It is recommended that this study be recreated with a larger sample size and that position specific training in physical fitness and other programmes be incorporated in the league.