Nutritional status body mass index and achievement motivation of intercollege and interuniversity male volleyball players

Sushmita Kumari, Barkha Bhatnagar and AK Uppal

Abstract
The purpose of the study was to ascertain the assessment of nutritional status, body mass index and achievement motivation of intercollegiate (N=48) and interuniversity (N=48) level male volleyball players. Number of calories consumed was calculated as per the procedure mentioned in the book entitled Nutritive Value of the Indian Foods published by National Institute of Nutrition, Hyderabad. Achievement Motivation was computed using the Achievement Motivation Scale prepared and standardized by M. L. Kamlesh. The analysis of data using mean difference method (t-ratio) shows that the nutritional intake in terms of calories as well as achievement motivation score of the interuniversity level male volleyball players is significantly higher as compared to intercollegiate male volleyball players. The t-values obtained were 5.30 with respect to calories consumed and 2.85 in the case of achievement motivation. Both these values were higher than the table value of 1.98 with 94 degrees of freedom. With respect to body mass index t t-value of 1.24 reveals that the male volleyball players of interuniversity and intercollegiate level do not significantly differ from each other in body- mass index.

Keywords: Nutritional Status, Body mass Index, Achievement Motivation

1. Introduction
Nutrition is an important component of any physical fitness program. The main dietary goal for active individuals is to obtain adequate nutrition to optimize health and fitness or sports performance. This is not only important to help to improve performance but also to promote healthy dietary practices in the long term. Young sports persons have more nutritional needs because they are in the process of active growth and development. Optimal sports performance results from a combination of factors including training, body composition, and nutrition. Nutrition plays a very important role in attaining high level of achievements in sports (Kreider et al. 2009) [8]. Nutritional status has a direct bearing on the level of physical performance, that’s why sports nutrition is considered as an integral part of sports medicine (Kerksick et al. 2008) [9]. Hence, physical fitness and training are very much dependent on nutritional status of sports persons (Rodriguez et al. 2009) [10]. Nutritional supplements are widely used by athletes for the enhancement of performance in international competitions (Buford et al. 2007; Harger-Domitrovich et al. 2007; Willoughby et al. 2007; Dalbo et al. 2008; Holm et al. 2008; Wilson et al. 2008; Jeukens et al. 2009; Hoffman et al. 2009) [12, 13, 14, 5, 15, 17, 16]. In spite of deep interest and effort in research related to maximal performance, the dietary regime to support such achievements requires a high level of knowledge (Aubertin-Leheudre et al. 2007; Storer et al. 2008) [12].

Body weight is the most widely used and sensitive and simplest reproducible anthropometric measurement for the evaluation of nutritional status of individuals. It indicates the body mass and is a composite of all body constituents like water, mineral, fat, protein and bone. It reflects more recent nutrition as compared to height. Height is affected only by long term nutritional deprivation.

In games and sports, psychological and physiological factors play an important role in determining the performance level (Grange & Kerr, 2010; Schilling & Hyashi, 2001). Numerous studies have demonstrated the impact of psychological factors on sports performance (Crespo, 2002). Achievement motivation has been one of those factors under consideration. Taylor (1994) treated motivation as the base of a pyramid towards success in sports.
Other important factors in this area include ‘goal orientation’. There are many studies conducted in the respect of achievement motivation and its effect on performance. Studies suggest that achievement motivation is most significant predictor of performance and essential to participate in a competition (Huschle, et.al. 2008; Carey, et. al. 2000) [7, 3]. Several motivation theories in the academic area have been adopted in the quest for greater understanding of achievement motivation in sport (Ames, 1984, 1992; Dweck, 1986; Nicholls, 1989) [1, 4]. Motivation is an essential element of human personality. It directs a person’s activity and makes it more or less dynamic. Without the desire to succeed other psychological features and abilities do not provide nearly so much influence on performance. Achievement motivation influences other factors affecting performance in sport like: physical preparation, technique, tactics and even life style.

Methodology

Selection of subjects

The subjects for the study were ninety-six male volleyball players and their break up is given in table 1.

Break up of Subjects

<table>
<thead>
<tr>
<th>Performance Level</th>
<th>Round Played</th>
<th>Number of Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercollegiate</td>
<td>Semi Final</td>
<td>48 (Top four teams)</td>
</tr>
<tr>
<td>Interuniversity</td>
<td>Semi Final</td>
<td>48 (Top four teams)</td>
</tr>
</tbody>
</table>

Data Collection

Dietary Survey

Dietary survey was conducted to gather information regarding dietary habits through 24 hours dietary recall method. The athletes were provided with a food and activity questionnaire along with verbal and written instructions for its completion. Information provided focused on average portion for common foods (bread, rice, cereals) and a guide to universal household measures (for example, teaspoon, tablespoon, cup) to improve the estimation of daily intake. The questionnaire included the following headings; meal, food/beverage description, quantity, food type to facilitate accurate analysis.

Variables

i) Nutritional status

In order to compute nutritional status the total amount of proteins, fats and carbohydrates consumed within 24 hours were converted into total calories by multiplying proteins and carbohydrate in grams by 4 and multiplying fats in grams multiplied by 9.

ii) BMI

Two anthropometric characteristics i.e. height in meters and weight in kilograms were recorded and using the following formula, BMI of the subjects was computed.

\[ \text{BMI} = \frac{\text{Weight in kilograms}}{\text{Height in meters}^2} \]

iii) Achievement Motivation

Achievement Motivation Questionnaire developed and standardized by M.L. Kamlesh was used (1990). This questionnaire has 20 statements. Questions 1a, 2b, 3a, 4a, 5b, 6b,7b, 8b, 9a, 10a, 11a, 12a, 13a, 14b, 15b,16a, 17a, 18a, 19b and 20a were correct answers and for each of them two marks were awarded. Each wrong answer was scored as zero.

<table>
<thead>
<tr>
<th>Raw/Mean Score</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 24</td>
<td>Low</td>
</tr>
<tr>
<td>24 - 30</td>
<td>Moderate</td>
</tr>
<tr>
<td>30 above</td>
<td>High</td>
</tr>
</tbody>
</table>

Statistical procedure

The data collected was analyzed computing means, standard deviations, standard error of difference between means and t-ratio for each of the variables selected in the study. The data is presented in the following tables.

Table 1: Significance of difference in the means of total calories consumed in respect of Intercollegiate and Interuniversity Male Volleyball Players

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Diff.</th>
<th>Standard Error</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercollegiate</td>
<td>2893.03</td>
<td>1070.0</td>
<td>1156.73</td>
<td>217.9</td>
<td>5.30*</td>
</tr>
<tr>
<td>Interuniversity</td>
<td>4049.76</td>
<td>1065.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 0.05 level

From table 1 it is evident that a mean difference of 1156.73 in the means of total calories consumed by intercollegiate and interuniversity male volleyball players within 24 hours is statistically significant at 0.05 level of confidence. The t-value of 5.30 is higher than the table value of 1.98 with 94 degrees of freedom.

Table 2: Significance of difference in the means of body-mass index in respect of Intercollegiate and Interuniversity Male Volleyball Players

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Diff.</th>
<th>Standard Error</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercollegiate</td>
<td>22.32</td>
<td>2.50</td>
<td>0.62</td>
<td>0.5</td>
<td>1.24*</td>
</tr>
<tr>
<td>Interuniversity</td>
<td>23.94</td>
<td>2.41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Not Significant at 0.05 level

From above table it is evident that the male all india interuniversity and intercollegiate level volleyball player do not significantly differ in respect of body mass index. The obtained t-value of 1.24 which is less than the table value of 1.98 with 94 degrees of freedom.
Table 3: Significance of difference in the means of Achievement Motivation in respect of Intercollegiate and Interuniversity Male Volleyball Players

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Diff.</th>
<th>Standard Error</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercollegiate</td>
<td>25.12</td>
<td>5.28</td>
<td>4.04</td>
<td>1.42</td>
<td>2.85</td>
</tr>
<tr>
<td>Interuniversity</td>
<td>29.16</td>
<td>5.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 0.05 level

The statistical analysis of data in the above table shows that a difference between the means of achievement motivation of intercollegiate and interuniversity level volleyball male players is significant at 0.05 levels. The t-value of 2.85 is more than the table value of 1.98 with the 94 degrees of freedom.

The means of intercollegiate and interuniversity levels male volleyball players in respect of achievement motivation are graphically presented in figure…

Discussion of Findings

The analysis of data pertaining to difference between interuniversity and intercollegiate male volleyball players with respect to total calories consumed within 24 hours shows that the total calories consumed by the interuniversity male volleyball players were significantly higher than the calories consumed by the intercollegiate male volleyball players. This could be explained by the fact that the competition at the interuniversity level is of a much higher standard as compared to intercollegiate level competition and also the training session of the interuniversity male volleyball players are not only much more strenuous but also of comparatively of longer duration. This justifies that interuniversity male volleyball players require higher energy as compared to intercollegiate male volleyball players so that they could train more effectively as well as perform well in the interuniversity volleyball matches where each set may be more contesting and may last for a comparatively longer duration. The analysis of data further showed that the interuniversity and intercollegiate male volleyball players did not significantly differ in body-mass index. No significant difference between the two groups of male volleyball players could be due to the fact that volleyball players at different levels of performance are generally of ecto-mesomorph body type i.e. they are tall as well as possess a body weight which they can overcome while executing jumps to smash a ball or jump to execute skills of blocking. Findings of the present study are in consonance with the results arrived at by Gamage and De Silva (2014) and Koley and Sharma (2013) [11].

From the analysis of data it is evident that the interuniversity level volleyball players have significantly better achievement motivation as compared to intercollegiate level volleyball players. Achievement motivation can be described as the need for success or the attainment of excellence. Those who have high achievement motivation are able to satisfy their needs through different means and are driven towards success due to both internal and external reasons. One of the characteristic of achievement motivate person is that he/she appears to be more concerned about his personal achievement. Highly achievement motivated individual constantly seeks improvement and looks for the ways of doing things in a better way. It is an accepted fact that the players of the interuniversity level, in view of their better performance, are more concerned about their personal achievement and possibly they have risen to higher level of performance as a result of hard work. In this regard interuniversity level players might have resorted to adoption of different means and methods in order to excel. The methods adopted and the hard training done by interuniversity level volleyball players probably have helped them in satisfying their need to excel in performance. The reason for higher achievement motivation in interuniversity level male volleyball players as compared to intercollegiate level male volleyball players could be attributed to the above factors.

References

10. Rodriguez NR, Di Marco NM, Langley S. American College of Sports Medicine position stand: Nutrition and...


