



CHANGES IN SELECTED BODY COMPOSITION VARIABLES IN MALE KABADDI PLAYERS DURING PERIODIZED TRAINING YEAR

Dr.P.KULOTHUNGAN

Assistant Professor, Department of Physical Education and Sports & Sciences, Annamalai University, Chidambaram, Tamil Nadu, India.

Abstract

The aim of the current study was to obtain changes in selected body composition variables in male kabaddi players during periodized training year and to monitor any changes at designated points within the periodized training year. The subjects employed in the present study were thirty male inter collegiate kabaddi players. Testing took place at five points during the periodized training year; at the beginnings of preparation (T1), end of the specific preparation (T2), and competition phase beginning (T3) end of competition phases of training and peaking (T4) and transitional period (T5). The body composition variables selected for the investigation are body mass index and percent body fat. The repeated measures of analysis of variance (ANOVA) indicated significant differences between testing sessions for body mass index. Post-hoc analysis revealed that the significant differences body mass index.

Keywords: Kabaddi, body mass index, percent body fat, training year.

INTRODUCTION

There are different methods of specific training programmes available for the development of speed, muscular strength, endurance and cardio respiratory endurance to their maximum. Training methods includes weight training, interval training, fartlek training, circuit training, isotonic training, isometric training and isokinetic training. Vigorous training quickens the blood circulation, blood and lymph stream through the muscle supplies oxygen and nutrition to the cells and removes waste products. The heart activity is accelerated by exercise and strengthens its fibers. Exercise also stimulates growth, and strengthens the bones, muscles, ligaments and tendons (Hardayal Singh, 1991). Different activities can be carried out with different intensities which may have different effect in organism. It is better to start gradually and take more time reaching the objectives than to start at a high level drop out because of injury caused by either the intensity or frequency of the programme. (Morehouse and Gross, 1975). Thus, training programmes forms different phases.

Sports training program phases revolve around peaking for major competitions, phases generally progress as follows, and the first phase of training prepares the athlete for more intensive weight training with heavier weight loads. It is referred to as the conditioning phase, the hypertrophy phase, or the starter phase. Fitness training programs typically advance to a more intensive training phase where weight loads are consistently increased until fitness training goals are met under intensive training phase. Then the athlete performs a maintenance or in-season phase in which the athlete stabilize the level of performance which enables for major competition at the right time. The off season phase

permits for an active rest so that the athlete can gain recovery in preparation for the next season phase. To phase at the desired level of strength, (Fleck and Kraemer, 1996) different phases of training progress from low intensity and high volume, to high intensity and low volume. In other words, do more repetitions with lighter weights early in training, and fewer repetitions with heavier weights later in training. Testing after each of the phases of training will help one make sound decisions for adjusting the training programme in subsequent phases. This is how one personalizes the training programme to promote continuous improvement toward the goals. Monitoring of a training programme provides useful information to both scientists and coaches in relation to its effectiveness, the athlete's physical condition and preparation for competition [Johnson et al.,1989]. In order for monitoring to be effective (i.e. providing updated and accurate information on physiological profiling), the tests need to be administered at regular, predetermined intervals based on training cycles. Additionally, testing should be specific to the sport [Pavicic et al., 2000].

MATERIALS AND METHODS

SUBJECTS

The investigator found very few attempts were made to find out the Changes in selected body composition variables in male kabaddi players during periodized training year. The subjects employed in the present study were thirty male inter collegiate kabaddi players from the Annamalai University team (Mean \pm SD: Age 22.0 ± 2.4 years, Height 168.7 ± 7.9 cm, Body Mass 65.9 ± 6.1 kg) preparing for the 2013 state level

inter collegiate kabaddi tournament. All the players had been part of the team for a minimum of 2 years. The study was approved by the Departmental Ethics Committee and the players provided written, informed consent to participate. All subjects were familiar with all the testing that took place, which included both field and laboratory assessments.

TESTING PROCEDURE

Testing took place at four points during the periodized training year; at the beginnings of general preparation (T1), specific preparation (T2), and competition phase beginning (T3) end of competition phases of training and peaking (T4) and transitional period (T5). A full testing battery was conducted at T1 and T5, while three minor testing sessions were conducted at T2 and T4. A schematic figure of the periodized year can be found in Figure 1. The study commenced after the end of the previous competitive season and at the beginning of the general preparation phase of training. The training year was divided into three mesocycles (general preparation, March to May; specific preparation, June to August; competition, September to November). The players trained daily and thus it is not possible to quantify exact training loads.

RESULTS

TABLE 1
RESULTS ON REPEATED ANALYSIS OF VARIANCE ON BODY COMPOSITION VARIABLES

| Calculation of Repeated Analysis of Variance on Body Mass Index (In Index Numbers) | | | | | | | | | |
|--|-------|-------|-------|-------|--------------------|----------------|--------|---------------|-------|
| Means on Completion of Different Phases | | | | | Source of Variance | Sum of Squares | df | Means Squares | F |
| T1 | T2 | T3 | T4 | T5 | | | | | |
| 21.39 | 20.78 | 20.25 | 19.34 | 19.89 | Subjects | 294.11 | 29.00 | | 3.00* |
| | | | | | Trials | 75.54 | 4.00 | 18.89 | |
| | | | | | Residuals | 914.31 | 145.00 | 6.31 | |
| | | | | | Total | 544.66 | 149.00 | | |
| Calculation of Repeated Analysis of Variance on Percent Body Fat (In Percentage) | | | | | | | | | |
| 14.65 | 14.10 | 14.00 | 14.06 | 14.10 | Subjects | 48.83 | 29.00 | | 0.86 |
| | | | | | Trials | 8.52 | 4.00 | 2.13 | |
| | | | | | Residuals | 361.11 | 145.00 | 2.49 | |
| | | | | | Total | 401.42 | 149.00 | | |

Required $F_{(0.05), (4,145)} = 2.35$ *Significant

The battery of tests utilized was based on selected anthropometrical and physiological characteristics, comprising both laboratory and sport-specific protocols. All subjects were familiarized with the procedures prior to testing. Sport-specific testing had been used frequently as part of the training programme, while for the laboratory-based tests the subjects undertook specific familiarization trials prior to the testing sessions. The subjects had been instructed to refrain from strenuous exercise for forty-eight hours prior to testing and to avoid food and caffeine intake for two hours preceding the assessments. All subjects completed testing at the same time of day to avoid any circadian rhythm effects [Atkinson and Reilly, 1996].

STATISTICS TECHNIQUE

Descriptive statistics were calculated for all variables. A repeated measures analysis of variance (ANOVA) was utilized to determine significant differences for each variable between the testing sessions. Tukey's *post-hoc* test was used to locate differences between testing sessions. Significance level was set at $P < 0.05$. All statistical analyses were conducted using SPSSv16.

TABLE II
SCHEFFE'S POST HOC ANALYSIS RESULTS ON BODY MASS INDEX

| Means on Completion of Different Phases | | | | | Mean Difference | Reqd. C. I |
|---|-------|-------|-------|-------|-----------------|------------|
| T1 | T2 | T3 | T4 | T5 | | |
| 21.39 | 20.78 | | | | 0.61 | 2.00 |
| 21.39 | | 20.25 | | | 1.15 | 2.00 |
| 21.39 | | | 19.34 | | 2.06* | 2.00 |
| 21.39 | | | | 19.89 | 1.50 | 2.00 |
| | 20.78 | 20.25 | | | 0.53 | 2.00 |
| | 20.78 | | 19.34 | | 1.44 | 2.00 |
| | 20.78 | | | 19.89 | 0.89 | 2.00 |
| | | 20.25 | 19.34 | | 0.91 | 2.00 |
| | | 20.25 | | 19.89 | 0.36 | 2.00 |
| | | | 19.34 | 19.89 | -0.55 | 2.00 |

RESULTS AND DISCUSSIONS

The results presented in Table I proved that the obtained F value of 3.00 was greater than the required table value of 2.35 with degrees of freedom 4, and 145 at 0.05 level, and it was proved that different phases of training significantly altered the body mass index of the inter collegiate level kabaddi players. Results were subjected to statistical post hoc analysis using Scheffe's confidence interval test and the results presented in Table 2 proved that there was significant difference between (T1) phase scores and (T4) phase scores as the obtained value of 2.06 was greater than the required confidence interval value of 2.00. The results proved that due to different phases of resistance training, the body mass index was gradually altered at every phase of the training comparing to initial scores. Though there was reduction in all the phases comparing to initial scores, the difference between (T1) and (T4) phase alone was significant. The results on percent body fat proved that the obtained F value of 0.86 was less than the required table value of value of 2.35 with degrees of freedom 4, and 145 at 0.05 level. This proved that there was no significant alteration in percent body fat due to different phases of resistance training. Experimental group showed significant reduction in Percent body fat and Total body fat during preparatory Phase II, competition phase and transitional phase as compared to the respective pre-test value, whereas Total body fat showed significant reduction during competition phase as compared to preparatory phase I and preparatory phase II. There was a significant increase in Total body fat during transitional phase as compared to competitive phase.

The result of the study shows significant decrease in percent body fat and total body fat for the preparatory, competitive and transitional phases when compared to the pre-test data of the experimental group. Performance of the kabaddi players is affected by body composition and physique. A low body fat may improve athletic performance by improving the strength-to-

weight ratio (Wilmore & Costill 2005). Excess body fat adds to the load without contributing to the body's force producing capacity (Willmore & Costill, 2005). A significant ($p < 0.05$) reduction in percent body fat and fat mass was noted in preparatory and competitive phases when compared to base line data for the hockey players. (Astorino et al., 2004) found significant reduction in percent body fat and fat mass during in-season and post-season vs. pre-season. (Indranil Manna & others, 2010) conducted a study on effect of training on physiological and biochemical variables of soccer players of different age groups and concluded that significant reduction in percent body fat and total fat mass was noted in preparatory and competitive phases when compared to baseline data of the soccer players. In this study, the investigator arranged the training schedule as suggested by Powers et al., (2006); Schmidt & Wrisberg, (2000) different phases of training progress from low intensity and high volume, to high intensity and low volume, this significantly altered the weight of the subjects which resulted in significant reduction in body mass index. However, the weight reduction has not be observed on the percent body fat, which may take some more time, that is why, though it was noted reduction in percent body fat among the subjects, the differences was not significant. The results of this study is in agreement with the findings of the Padilla et al., (2008) who found load zones reflected the physiological demands of different mass-start cycling stage categories. which could be useful for planning pre-competition training strategies.

CONCLUSIONS

It was concluded that different phases of resistance training can be better utilized for decreasing body composition variables by inter collegiate level kabaddi players.

REFERENCES

1. Astorino TA., P. A. Tam, J. C. Rietschel, S. M. Johnson, T. P. Freedman.,(2004). "Changes in

- Physical Fitness Parameters During a Competitive Field Hockey Season”, *Journal of Strength Conditioning Research*, 2004, 18: 850-854.
2. Atkinson, G., and T. Reilly. (1996). Circadian variation in sports performance. *Sports Medicine*, 21: 292-312.
 3. Fleck, S.J. and Kraemer, W.J. (1996). *Periodization breakthrough!* Ronkonkoma, NY: Advanced Research Press.
 4. Hardayal Singh. (1991). *Science of Sports Training*, New Delhi: D.V.S. Publications P. 13.
 5. Indranil Manna, Gulshan Lal Khanna and Prakash Chandra Dhara.,(2010). “Effect of Training on Physiological and Biochemical Variables of Soccer Players of Different Age Groups”, *Asian Journal of Sports Medicine*, Vol-1, No-1, Pages: 5-22.
 6. Johnson, G.O., L. J. Nebelsick-Gullett, W. G. Thorland, and T. J. Housh. (1989). The effect of a competitive season on the body composition of university female athletes. *J Sports Med Phys Fitness*, 29:314-320.
 7. Morehouse Lawrence E. and Leonard Gross, (1975) *Total Fitness in 30 minutes a Week*, New York: Simon and Schuster,P.35.
 8. Padilla S, Mujika I, Santisteban J, Impellizzeri FM, Goiriena JJ (2008). “Exercise intensity and load during uphill cycling in professional 3-week races.” *Eur. J. Appl. Physiol.* Mar;102(4):431-8.
 9. Pavicic, L., E. Tomany, and V. Lozovina. (2000). A study of anthropometric differences among elite water polo players with different team role assignments. In *Proceedings of the 2000 Pre - Olympic Congress* (p. 503). Brisbane: Australian Sports Commission.
 10. Powers, S.K., Dodd, S.L., & Noland, V.J. (2006). *Total fitness and wellness* (4th ed.). San Francisco: Pearson Education. 11
 11. Schmidt, R.A. & Wrisberg, C.A. (2000). *Motor learning and performance: A problem-based learning approach* (2nd ed.). Champaign, IL: Human Kinetics.
 12. Wilmore. J.H. D.L. Costill, (2005). *Physiology of Sport and Exercise*. (3rd ed.) Champaign IL: Human Kinetics.