Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS
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5.1. Summary

The secret behind being a good swimmer lies not only on one’s gift, dedication, physical strength. It has an integral part that serves as its core, which coordinates everything, from one’s strength, flexibility and respiration. The one responsible for heightening one’s swimming prowess is none other than yoga. This is a common practice for people who like to lose weight but aside from cutting one’s love handles and unwanted fats in a healthy way, this is fast becoming the standard workout for swimmers.

Nowadays, yoga exercises are recognized as a major part of the training regimen of swimmers. This dryland training offers lots of benefits for swimmers, which extremely helps in boosting their performance. It greatly helps in relaxing muscles that are not used. In shorter term, yoga helps swimmers conserve their energy. Yoga is also capable of enhancing one’s breathing pattern, which obviously plays an important role in the life of a swimmer. It also helps developing one’s balance, which makes one glide in the water in a smooth and effortless manner. But that’s not all; yoga is also good in making all parts of one’s body flexible. Thus, stretching for swimmers is vital in extending one’s arms, shoulder blades, legs and feet easier than before.
Yoga for swimming enthusiasts is without a doubt their top secret not only in maintaining a fat body but also in their competitiveness. It’s different from doing tons of lapses but the effect is much fruitful. This relaxing workout looks very simple yet it is beneficial to all swimmers. It’s true that yoga helps in developing muscles, breathing and usage of energy but its true objective is to help one coordinate all those things.

Explosive movements require a strength base, while throwing, striking and hitting actions also require strength. Players who are leaner have less weight to carry around and so (all other things being equal) experience less fatigue. Players who have a greater VO$_2$ max (maximum oxygen uptake capacity) can recover more quickly between these repeated bouts of work. Strength is usually improved by coordination of the motor unit within the muscle, the rate of firing of motor neurons within the muscle spindles and an increase in cross sectional area of the muscle. Endurance is improved by the ability to take up more oxygen (VO$_2$ max) through central processes such as an increase in stroke volume as well as at the cellular level through an increase in capillarisation and the number and size of mitochondria within the cell. Endurance training on its own has not been shown to improve strength training and strength training on its own has not been shown to improve oxygen uptake.
Given the above, it makes sense that training for a particular sport should (at least some of the time) reflect the demands of that sport and that means working on endurance, strength, and muscular endurance at the same time. Concurrent training is the integration of aerobic type work and resistance type work in the same session. This is a very time-efficient method of training, allowing a lot of activity in different formats to be performed in a short space of time. Coaches have known this for a long time; go to most combat sport gyms and one will see fighters working on bags, followed by circuit type exercises, followed by sparring or combinations of all three. Rugby League players often play small games, which require running around, followed by some partner resistance work or tackling bags or getting up and down off the floor, followed by more games.

The purpose of the study was to find out the relative effects of yoga and concurrent training on selected biochemical, physiological and psychological variables of swimmers. To achieve this purpose of the study, 45 male intercollegiate swimmers were selected at random from the affiliated colleges of Madurai Kamaraj University, Madurai, Tamil Nadu, India. The age of the subjects ranged between 18 and 25 years. The selected subjects were divided into two experimental groups and a control group with fifteen subjects in (n=15) each. Experimental group I underwent yoga training (YTG), Group II underwent concurrent
training (CTG) and Group III served as control group (CG) for the training period of 12 weeks.

Subjects of the three groups (YG, CTG & CG) were tested on selected criterion HDL-C, LDL-C, TG, resting heart rate, breathe holding time, VO$_2$max, stress, anxiety and self-concept prior to and after the 12 weeks of training period. The data pertaining to the variables in this study were statistically examined by using one way univariate analysis of covariance (ANCOVA) for each variable separately, whenever ‘F’ ratio of adjusted post-test was found to be significant, the Scheffe’s test was used as post-hoc test to determine the paired mean differences.

The biochemical variables namely LDL-C, HDL-C and TG were tested by blood test. VO$_2$max was measured by using Astrand – Astrand Nomogram method. Resting heart rate and breathe holding time were assessed by radial pulse and calibrated stop time respectively. The psychological variables namely stress, anxiety, and self concept were assessed by John D. and Catherine T. Macarthur, Sports Competition Anxiety Test (SCAT) and Self-Concept Scale questionnaires respectively.

The data collected from the three groups before and after the experimental period were statistically examined for significant improvement by using analysis of covariance. The data collected from the four groups before and after the experimental period were statistically examined for significant improvement by using analysis of covariance.
Whenever the 'F' ratio was found to be significant, Scheffe's test was used as post-hoc test to determine which of the paired means differed significantly. In all cases the criterion for statistical significance was set at 0.05 level of confidence (P<0.05).

5.2. Conclusions

In the present investigation, as a result of executing two different training programmes the following improvements occurred on selected dependent variables.

The present study concludes that, decreased level of LDL-C from pre-test to end of the yoga and concurrent training programme, which, may reflect decreased level of triglycerides along with enhanced functional lipoprotein i.e. high density lipoprotein.

The observation of an increased VO$_2$\text{max} in the yoga and concurrent training from pre-test to end of the training programme, which, may reflect improved VO$_2$\text{max} along with enhanced respiratory parameter i.e. breathe holding time.

Yoga and concurrent training group subject’s stress and anxiety level was decreased along with reduction of resting heart rate from pre-test to end of the training programme, which may reflect improve the level of self concept.
Although there was a significant differences found among the experimental groups in this study on selected variables. The result of this study suggests that yoga training is slightly effective means of improving the selected biochemical, physiological and psychological variables than the concurrent training.

5.3. Recommendations to the Society

The results of the study necessitate suggesting the following recommendations to the society.

1. The present study concludes that yoga training was identified as the best training, it was recommended to the doctors, physiotherapists and psychiatrists to include it in their remedial programme to improve the mental and physical health.

2. Yoga training can be integrated with their life style to develop moderately in physiological and biochemical parameters in turn it will improve the overall fitness and health of the subjects.

3. The findings of the study concludes that concurrent training also significantly influence the selected biochemical, physiological and psychological variables, it was recommended to the coaches and physical education teachers to include it in their regular schedule of coaching programme.
5.4. **Recommendations to the Researchers**

The following recommendations are made with a strong feeling that they would further encourage other professional colleagues and pave a way for further studies in this area.

1. Similar study may be designed to investigate the effects of training programmes based on gender at different age levels.
2. Similar study may be conducted on other variables.
3. Yoga and concurrent training will be of great use for the trained subjects by increasing both the intensity of training and number of training sessions in a week.
4. Training intensity and the number of training sessions can be fixed according to the age, gender, and performance level of the subjects.
5. Studies on concurrent training on female subjects are very scarce in India. So similar studies may be conducted for female subjects.
6. The present study thus, needs to be strengthened or supported by more relevant research studies.