

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Anxiety is a basic human emotion consisting of fear and uncertainty that typically appears when an individual perceives an event as being a threat to the ego or self-esteem (Sarason, 1988). In some instances, such as avoiding dangerous situations, anxiety can be helpful. However when taken to extremes, it may produce unwarranted results. In fact, academic examinations have been considered as one of the most acute stresses experienced by students (Lacey *et al.*, 2000; Deinzer *et al.*, 2000). Acute stress has been reported to increase the activity of the hypothalamus-pituitary adrenal (HPA) axis with subsequent rise in cortisol level (Kirschbaum and Hellhammer 1994).

Previous research reports suggest that cortisol concentration and its rates of excretion increase in students during periods of examination stress (McEwen 1998). As stress levels increase, the adrenal glands respond by increasing cortisol production and decreasing DHEA (Dehydroepiandrosterone) production. Research conducted by Boudarine, Legros and Timsit-Berthier (2002) demonstrated that high level of anxiety was associated with an increase in cortisol, while low level was related to an exclusive rise in DHEAS.

Nevertheless, examination anxiety affects all of us and it is perfectly natural to experience it. When it goes beyond limit, it causes depression and sometimes may cause suicidal ideation. In this context, yoga seems to be effective for reduction of excessive stress, depression and anxiety. Although practice of yoga, has received less attention in the medical literature but it has

become increasingly popular in recent decades. By reducing perceived stress and anxiety, yoga appears to modulate stress response systems. This, in turn decreases physiological arousal for example, reducing the heart rate, lowering blood pressure, easing respiration etc (Kirkwood *et al.*,2005). There is also evidence that yoga practices help increase heart rate variability, an indicator of the body's ability to respond to stress more flexibly (Ray, Kaplan & Jovanov, 1999). Additionally, it has been stated that stress from psychological, physically external and physically internal sources results in allostatic load, which can be reduced by yoga based practices that shift regulatory systems towards optimal homeostasis (Streeter *et al.*, 2012). Hence, the objectives of this study were as follows:

- To assess the pre-examination anxiety and associated psychophysiological attributes of the students appearing in State level Board examination.
- To assess the hormonal changes in students prior to State level Board examination.
- To develop a yoga programme for reduction of pre-examination anxiety and restoring hormonal balance.
- To see the effect of the yoga programme on pre-examination anxiety and the selected attributes such as stress, anxiety, relaxation, concentration, pulse rate, blood pressure, electrodermal activity, stress mediated hormones etc.

To achieve these objectives, following hypotheses have been tested statistically:

HO₁: Yoga training may not help to control pre-examination anxiety and associated psychological variables and thereby may not restore relaxation as well as concentration.

HO₂: Yoga training may not be effective in reinstating hormonal balance in students appearing for final examination.

HO₃: Yoga training may not be effective in reinstating physiological homeostasis in students appearing in the state level Board examination.

The participants for this study were 10th standard students. The participants were selected based on their scores on the examination anxiety just before 3 months of final examination. The entire class completed the inventory and target students i.e. sixty male students (n=60), age ranging from 16-18 years were selected based on their scores. The students were selected from Government High School Naisela, P.O. Bel via Patwadanger, Block Bheemtal, Dist. Nainital. All the subjects were divided randomly into two groups viz; Group –A (Yoga) and Group – B (Control) with equal in numbers. The design of the experiment has been planned in three phases viz., Phase-I (pre-test), Phase-II (training or treatment) and Phase III (post test). All the subjects were pre-tested with number of variables, discussed later, as selected in this study. The subjects of group A underwent specified yoga training, whereas the Group B was treated as control. Since the subjects of all the groups were school children, they were directed to continue their daily activities in the school. Training period was for six weeks. After the training was over, all the subjects were exposed to post test, where all the variables were measured for the subjects of all the groups.

The dependent variables being selected in this piece of research are:

- **Psychological variables** includes examination anxiety, **stress**, *depression, mental health and concentration*.
- **Physiological variables includes** blood pressure, heart rate, respiratory rate and electrodermal activity.

- **Biochemical variables** includes cortisol and dehydroepiandrosterone (DHEAs).

Standard tests were used to measure the above variables. The collected data were processed for descriptive statistics followed by Factorial ANOVA (Analysis of Variance) and Scheffe's post-hoc test¹.

Major Findings

- In case of psychological variables, **“Yoga training”** showed significant superiority over the “Controls” in lowering **Examination Anxiety** (CD=0.38, $p<0.05$), **Stress** (CD=0.36, $p<0.05$), **Depression** (CD=0.42, $p<0.01$) and in improving **concentration** (CD=0.43, $p<0.01$), and **Overall Mental Health** (CD=0.33, $p<0.05$). This result infers that yoga training is found effective in tackling pre-examination-related psychological attributes.
- The result on physiological variables revealed that, prior to board examination, **“Yoga training”** helped to maintain normal level of **systolic blood pressure** (CD=0.24, $p<0.05$), **diastolic blood pressure** (CD=0.09, $p>0.05$) better than the control group and reduced pulse rate (CD=0.43, $p<0.01$), respiratory rate (CD=0.25, $p<0.05$) and electrodermal activity (CD=0.32, $p<0.05$).
- For biochemical variables, the result indicates that yoga training reduces **Salivary Cortisol level** (CD=0.26, $p<0.05$) and **Salivary DHEAs level** (CD=0.31, $p<0.05$).

¹A.L.Rothstein, *Research design and statistics in physical education*. (New Jersey: Prentice-Hall, Inc., 1985):208.

5.2 Conclusion

Based on the results, this study draws following conclusion:

Yoga training for a short period of 6 weeks contributes to reduce examination anxiety and brings physiological homeostasis in balancing corticosteroid hormones among students appearing for the board examination.

5.3 Recommendation

The present study recommends the followings:

- The secondary schools must implement Yoga, at least for 6 weeks, especially for standard 10th students appearing for state board examinations.
- Parents should also take care that their children, appearing for board examination, are giving time to practice yoga.
- Anticipating good results in the school, along with regular study, a specialized yoga teacher must be involved in the school and yoga is to be given a place in the school-time-table.
- Repeated experiments are suggested to reconfirm the obtained results.
- Similar further studies, especially for 12th standard students, have a social relevance.

5.4 Contribution to the Knowledge

Student community, around the globe, is nowadays facing lot of problems in managing academic anxiety and associated psycho-physiological as well as hormonal imbalances. Many incidences about suicidal tendency of the student population are frequently reminding that there is a need of suitable means to bring a proper state of homeostasis within an individual. This study could present a schedule of yoga which is found to be beneficial for the student population for enhancing psycho-physiological and hormonal balance prior to academic examination for career development. This investigation contributes a “Yoga training schedule” which is found beneficial for them. This knowledge as evolved in this study could add quantum of knowledge to the field of physical education and medical education too.