The main objective of this thesis is to measure the metabolic changes during yoga practices, which includes Āsana, Relaxation postures and a popular meditation technique, which includes Āsana and relaxation postures called "Cyclic meditation".

Secondary objective was to relate the results of the experiments to what is stated in the ancient yoga texts.

Literature survey reveals that yoga is done basically to bring in a balance in the system by calming down the mind, relaxing the body, slowing down of breaths, to reach higher levels of consciousness, which is psychologically, physically, and bio-chemically different than the three most well-defined states of consciousness, i.e., the wakefulness, dream state and the deep sleep state of being. Yoga scriptures also defines these three states but goes further to say that there is a fourth state called the "Turīya" which is just being "Aware". Though few studies on meditation have established that there is fourth state of consciousness, it is yet to be totally established. Certain yoga texts describe that even while doing the Āsana or the physical posture one can go to higher levels of consciousness. Hence the veracity of these statements was tested in this thesis by measuring certain physiological parameters, which can also be interpreted for certain psychological changes. Since yoga training over a period of time has certain effects on the mind-body complex, and BMR and sleep are indicators of such change, we also studied the effect of Yoga on BMR and sleep effects.
For the BMR studies 104 subjects were selected after screening 140 persons, they were matched for age, sex and body weight; yoga group consisted of subjects who practised yoga for a period of six months and were residents of Yoga Research Foundation and non-yoga group consisted of subjects who did not practise yoga but were working in different departments of the same Yoga Research Foundation. For the sleep studies too 88 subjects divided into yoga and non-yoga group, and were selected from the same yoga research foundation. They were assessed before sleep and after sleep but not during the sleep.

To find out the metabolic cost of the Āsanas and relaxation postures only experienced 30-35 yoga practitioners were selected as training has effect on the metabolic cost of Āsanas and relaxation postures. All the assessments were taken after 3-4 hours after meals, and after resting in supine posture for 30 minutes.

The assessments were done using indirect calorimetry method using OXYCON PRO, metabolic analyzer from Jaeger Germany (EU). Breath by breath analysis of the inhaled and exhaled air were done.

Results show that the BMR of yoga practitioners was lower than that of the non-yoga practitioners, and when compared to the predicted equations using WHO equations based on body weight, sex and age. The BMR of the non-yoga group was comparable with predicted equations of WHO. Further the BMR of non-yoga practitioners was comparable with the literature on the BMR of Bangalore dwellers. The gender differences existed in the BMR of Yoga
group even after adjusting for body weight by analysis of covariance using Ancova, but such gender differences were not seen in the non-yoga group.

Sleep study results show that the metabolic rate of yoga group was lower when compared to non-yoga group before sleep itself. Since there were initial differences in the before sleep values under most of the parameters, the initial values were used as a covariate to arrive at the differences in after sleep values. Such analysis shows that yoga group had lower metabolic rate after sleep when compared with the non-yoga group. Even the heart rate was lower in yoga group before sleep when compared to non-yoga group.

The results of the relaxation postures show that different relaxation postures have different effect on the metabolic cost. Though during IRT there was an increase of 24% in energy expenditure, the relaxation component of IRT is similar to Šavāsana (7% reduction in energy expenditure in IRT, and 8% reduction after Šavāsana). There was progressive reduction in metabolic rate during QRT and DRT (11% reduction in energy expenditure during the practice). The post-values suggest that DRT (14%) gives deeper relaxation than the QRT (11%).

There was varied stimulation effect of the Āsana, Pādahastāsana done with counts being highest in metabolic rate (60% increase in metabolic rate during the practice) followed by Ardha Cakrāsana done with instructions awareness (51% increase in metabolic rate). The least increase in metabolic rate was during the practice of Ardhakati Cakrāsana done with awareness and instructions. (26% increase in metabolic rate).

The relaxation component of each Āsana was also different. Ardha
Cakrāsana done with counts was highest in the metabolic cost (16% decrease in metabolic rate), followed by AKC done with awareness and instructions (12% decrease in metabolic cost). The rest of the Āsanās had similar energy cost (11% decrease in metabolic rate).

There were gender differences in the way men and women expended their energy while doing the Āsanās, and the relaxation component that followed after performing the Āsana. Highest energy cost for women was in Ardha cakrāsana with awareness (53% increase in metabolic cost), and men (51% increase in metabolic cost) during the practice.

Under the relaxation component women had maximum reduction in metabolic rate after the practice of AKC with Awareness (19% reduction in metabolic rate) followed by men in Ardha cakrāsana done in with counts (17% reduction in metabolic rate). In the rest of the Āsanās the reduction varied between 11 and 13% with a difference of 1 or 2% between men and women.

During CYCLIC meditation, there was an increase in metabolic rate to the extent of 30% during the practice of 23 minutes and a decrease of 10% in metabolic rate after the practice. Since most of the subjects were beginners for the practice of CM, that may be the possible reason for lesser reduction in the metabolic rate after the practice of CM. However the post-metabolic rate is comparable with the BMR of the subjects.

There were gender differences in metabolic rates both during and after the practice of CM, men spending 29% more during the practice while women spending 38% more energy during the practice, when compared to their pre-levels.
There were gender differences in the relaxation component also. Women show 5% decrease in metabolic cost while men showed 10% decrease in metabolic cost after the practice.

The present study has broad implications for the psychologists, physiologist, educators, therapists, doctors, health professionals, nutritionists and counsellors. This will help health professionals and nutritionist to develop a sound programme, in terms of diet and exercise. Since this is the first study on the BMR of the yoga practitioners, it will help develop a diet based on the energy requirements of yoga practitioners.

Further the reduction of metabolic rates, and thereby decreased arousal of the sympathetic nervous system activity and reduction of stress symptoms in all the aspects of yoga, throw more light on the relaxation components of yoga, which have therapeutic values for all stress-related ailments, and all stress management programme.

Apart from the therapeutic, and stress reduction, Yoga has even more application for the normal healthy people as preventive measure for all the physical and mental health. Those who regularly practise report improved mental abilities, with respect to their personal and professional endeavors, increased sensitivity to the issues around while being very stable in their emotional and behavioral response and a general sense of joy and well-being while enjoying the life more.