5.1 Summary

According to Maharshi Patanjali, although pranayama is known as voluntary but controlled breathing, pranayama gives more stress on *kumbhaka* phase (i.e., retention of breath). Physiologically this *kumbhaka* phase of pranayama gives extra load on both the respiratory and cardiovascular system. Therefore, it was assumed that pranayama training may improve peak expiratory flow rate, vital capacity and cardiovascular efficiency. Therefore, this study has formulated three null hypotheses and accordingly an experiment was conducted to evaluate the impact of pranayama training on circulo-respiratory system in human.

The experiment was conducted considering a parallel group design, where there was a control group parallel to the experimental one. Seventy male students ($n=70$) were selected randomly from the J.S.P.M. College of Physical Education, Pusad, Dist. Yewatmal for this study. The subject’s age group was ranged from 18 to 21 years. The selected seventy students were randomly assigned into two parallel groups, viz., one experimental group (Group A; $n_1=35$) and one control group (Group B; $n_2 = 35$).

To record pretest data, all the subjects of experimental and control groups were exposed to standard physiological tests viz., PEFR (Peak expiratory flow rate), Vital capacity and 12 min. run/walk test. All the subjects of the experimental group were then exposed to a two months (8 week) training of selected pranayama practices for one hour daily in the morning from 6.30 to 7.30 except Sunday and holidays, whereas the control group students were involved simultaneously with certain non-exhaustive recreational activities. Finally, a post test on all the selected variables was conducted on all the
subjects of both control and experimental groups. The drop-out of subjects from the experiment was also recorded.

The result of 2 x 2 x 3 Factorial ANOVA followed by Scheffe’s post hoc test revealed that –

- “Pranayama training” showed significant superiority over the “Controls” in improving Peak Expiratory Flow Rate (CD=0.35, p<0.05) (Fig. 4.1).
- “Pranayama training” showed better result than the “Control” in Vital capacity (CD=0.24, p<0.05) (Fig. 4.2).
- “Pranayama training” showed better result than the “Control” in Cardiovascular Efficiency (CD=0.25, p<0.05) (Fig. 4.3).

The above results indicate that three null-hypotheses as formulated in this study have been refuted.

5.2 Conclusion

This study, on the basis of the results, warrants the following conclusion:

- 8 weeks pranayama training was found effective in improving peak expiratory flow rate.
- The pranayama training showed significant improvement in vital capacity of students.
- Eight weeks of pranayama training was effective in enhancing cardiovascular efficiency.
- Overall from the results as obtained it can be concluded that eight weeks of pranayama training was effective in improving functional abilities of lungs and heart i.e. circulo-respiratory functions.
5.3 Recommendations

Based on the results and conclusion, the present study made following recommendations –

- Practice of pranayama with regularity is recommended to improve functional abilities of lungs and heart of low-fit College students. This also suggests that further research especially on common people in general may be conducted in the similar lines.

- The athletes representing a college or an university especially who are practicing in power games like weight lifting, wrestling etc., and anaerobic type of activities e.g., swimming, 100M dash, throwing events etc., may take advantage of pranayama training to improve controlled circulo-respiratory function as needed for.

- Although this study was conducted on male students; similar studies can be repeated for both female and male subjects of different age-group to determine the consistency in results of this experiment.

- Since pranayama helps to improve both lungs and heart functions, this study recommends for conducting future studies on pranayama as a therapeutic intervention for the patients suffering from asthma, high blood pressure or other circulo-respiratory problems.

5.4 Contribution to the Knowledge

Ample of research studies revealed the role of pranayama in improving health and fitness for common people. However, in research literature, role of pranayama on lungs and cardiac functions especially for College level students is absent. This study, therefore, made a significant contribution to the area of physical education, sports, yoga and allied disciplines about the impact of pranayama, a yoga practice, towards improvement of cardiorespiratory fitness of students belonging to college or tertiary level of education.