INTRODUCTION:

Training: The word ‘Training’ has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. The term ‘training’ is widely used in sports. The regular and systematic use of physical exercise, however, does not guarantee maximum improvement in performance. The effect of these exercises is increased or decreased by a multitude of factors. Some of these factors, if ignored, lead to a drastic reduction in the efficacy of physical exercise. The complex nature of sports training involving physical exercise along with other means becomes obvious when one looks at the training of advanced sports persons. The training of advanced sports persons is significantly supported by means and measures from several sports science disciplines e.g., sports medicine, sports physiology, nutrition, physiotherapy, sports psychology, sports biomechanics and so on. The training for specific sports is based on motor abilities viz. strength, speed, endurance, flexibility and coordinative abilities. Few sports are dominated by specific motor ability along with all other in supportive action. In this study the scholar is specified to only endurance ability, which is the one in VOLLEYBALL sport.

Endurance: Endurance is a very important ability in sports. Endurance is the product of all psychic and physical organs and systems. No other motor ability depends so much on the working capacity of complete psycho-physical apparatus of humans as endurance. All other performance factors depend on one or more parts of this psycho-physical apparatus and as a result are directly or indirectly affected by endurance.
Endurance like any other motor ability is a conditional ability. It is primarily determined by energy liberation processes. The ability of the human body to maintain a certain level of energy production forms the physiological basis of endurance. Endurance is directly or indirectly of high importance in all sports. It is however not easy to define endurance, but there is agreement regarding the following aspects: it related to doing work for a long time of period, it relates to working under fatigue conditions, it involves a large number of muscles and it involves work efficiency. Harre (1986) defines endurance as the ability to resist fatigue, Thiess and Schnable (1987) also defines endurance as the resistance ability to fatigue. Martin (1979) and Matwejew (1981) have also used to the concept of ability to resist fatigue, for defining endurance. “Endurance is the ability to do sports movements, with the desired quality and speed, under conditions of fatigue.”

There are many types of endurance which are classified according to nature of activity viz. basic endurance, general endurance and specific endurance; classification according to duration of activity viz. speed endurance, short time endurance, medium time endurance and long time endurance. Endurance is determine with various factors as: (1) Aerobic capacity - (a) Oxygen intake; (b) Oxygen transport; (c) Oxygen uptake; (d) Energy reserves, (2) Anaerobic capacity - (a) Phosphogens stores; (b) Buffer capacity; (c) Lactic acid tolerance; (d) Aerobic capacity, (3) Movement economy and (4) Psychic factors.

Pranayama: In simple terms pranayama may be called the control of the breath. Its essence lies in the modification of our normal process of breathing. Breathing is an act in which we take air from the atmosphere into our lungs, absorb the oxygen from it into our blood, and expel the air again into the atmosphere together with carbon dioxide and water vapors. This act of inhalation and exhalation is repeated every four to five seconds. Thus normally we breathe about fifteen times every minute. Every modification of this normal breathing process would not count as pranayama. Pranayama consists of modifications of the breathing process which we bring about deliberately and consciously. The process of breathing is modified in
three different ways: (1) by inhaling and exhaling rapidly, taking shallow breaths, (2) By inhaling and exhaling slowly, taking long and deep breaths and (3) by stopping the act of breathing altogether. Many names are given to the variations to the breathing processes and are carried out along with two different endurance training methods for the development of endurance in VOLLEYBALL players.

STATEMENT OF THE PROBLEM:

“A Diagnostic Study of Development of Endurance in volleyball Players by Using Two Different Training Methods Along With Pranayama” is considered for the study.

DELIMITATIONS:

1. The study is delimited to the male students only.
2. The study is further delimited to the age group between 18 to 25 years.
3. The study is delimited to students from Aurangabad District, Maharashtra.
4. The study is delimited to the standard endurance training and tests applicable for specific age groups and sex.
5. The study is further delimited to the college going students.
6. The study is delimited to few types of pranayama.

LIMITATIONS:

1. Diet and rest of the college students was a limitation.
2. Involvement of students during endurance training and endurance test was a limitation.
3. Involvement of students during pranayama training during the sessions is a limitation.
4. Physical, mental, weather, college, house and surrounding conditions were a limitation.
5. The present research work had various limitations which were beyond the control of researcher and were considered as one of the major limitations of the study.

REVIEW OF RELATED LITERATURE

Reddy et al. (2009) The effect of pranayama a controlled breathing practice, on exercise tests was studied in athletes in two phases; sub-maximal and maximal exercise tests. At the end of phase I (one year) both the groups (control and experimental) achieved significantly higher work rate and reduction in oxygen consumption per unit work. There was a significant reduction in blood lactate and an increase in P/L ratio in the experimental group, at rest. At the end of phase II (two years), the oxygen consumption per unit work was found to be significantly reduced and the work rate significantly increased in the experimental group. Blood lactate decreased significantly at rest in the experimental group only. Pyruvate and Pyruvate-lactate ratio increased significantly in both the groups after exercise and at rest in the experimental group. The results in both phases showed that the subjects who practiced pranayama could achieve higher work rates with reduced oxygen consumption per unit work and without increase in blood lactate levels. The blood lactate levels were significantly low at rest.

Kumar et al. (2009) Twelve normal healthy volunteers (6 males and 6 females) undergoing yoga training for 90 days were studied for the effect of yoga on exercise tolerance. Their ages ranged from 18 to 28 years. The volunteers were taught only Pranayama for the first 20 days and later on yogic asanas were added. Sub-maximal exercise tolerance test was done on a motorized treadmill by using Balke's modified protocol, initially, after 20 days (Phase-I) and after 90 days of yoga training (Phase-II). Pyruvate and lactate in venous blood and blood gases in capillary blood were estimated immediately before and after the exercise. Minute ventilation and oxygen consumption were estimated before and during the test. Post exercise blood lactate was
elevated significantly during initial and Phase-I, but not in Phase-II. There
was significant reduction of minute ventilation and oxygen consumption only
in males in Phase-I and II at the time when the volunteers reached their 80%
of the predicted heart rate. Female volunteers were able to go to higher loads
of exercise in Phase-I and II.

Whipp et al. (2008) The pattern of lactate increase and its relation to
Pyruvate and lactate-to-Pyruvate (L/P) ratio were studied during exercise and
early recovery in 10 normal subjects for incremental exercise on a cycle
ergometer. Gas exchange was measured breath by breath. Lactate and
Pyruvate were measured by enzymatic techniques. Lactate and log lactate
changed only slightly at low levels of O2 uptake (VO2) but both began to
abruptly increase at approximately 40-55% of the maximal VO2. However, the
point of abrupt increase in Pyruvate occurred at higher work rates and the rate
of increase was not as great as that for lactate. Thus L/P ratio increased at the
same VO2 as the log lactate increase. Following the exercise, Pyruvate
continued to increase steeply for at least the first 5 recovery min, whereas at 2
min lactate increased only slightly or decreased. Thus arterial L/P ratio
reversed its direction of change and decreased toward the resting value by 2
min of recovery. Lactate, as well as L/P ratios, decreased in all subjects by 5
min. This study demonstrates that lactate and Pyruvate concentrations increase
slightly at low levels of exercise without a change in L/P ratio until a
threshold work rate at which lactate abruptly increases without Pyruvate. The
resulting increase in L/P ratio is progressive as work rate is incremented and
abruptly reverses when exercise stops.

Stringer et al. (2007) Oxygen uptake (VO2) kinetics has been reported
to be modified when lactic acid accumulates; however little attention has been
given to the simultaneous carbon dioxide production (VCO2) kinetics. To
demonstrate how VCO2 changes as a function of VO2 when lactic acid is
buffered by bicarbonate, eight healthy subjects performed 6-min constant
work rate cycle ergometer exercise tests at moderate, heavy and very heavy
exercise intensities. VCO₂ and VO₂ were measured breath-by-breath, and arterial blood samples were obtained every 7.5 s during the first 3 min of exercise, and were analyzed for pH, partial pressure of carbon dioxide, standard bicarbonate, and lactate. VCO₂ abruptly increased relative to VO₂ between 40 and 50 s after the start of exercise for the high exercise intensities. These gas exchange events were observed to correlate well with the time and VO₂ at which lactic acid increased and plasma bicarbonate decreased (r = 0.90, r = 0.95, respectively). We conclude that bicarbonate buffering of lactic acid can be determined from the acceleration of VCO₂ relative to VO₂ kinetics in response to constant work rate exercise and the increase is quantitatively related to the magnitude of the lactic acid increase. This is easily visualized from a plot of VCO₂ as a function of VO₂.

Chow et al. (2007) The purpose of this study was to determine the effect of fitness and work level on the O₂ uptake and CO₂ output kinetics when the increase in work rate step is adjusted to the subject's maximum work capacity. Nine normal male subjects performed progressive incremental cycle ergometer exercise tests in 3-min steps to their maximum tolerance. The work rate step size was selected so that the symptom-limited maximum work rate would be reached in four steps at 12 min in all subjects. Oxygen consumption (VO₂) and carbon dioxide production (VCO₂) were calculated breath by breath. For the group, the time (mean, SEM) to reach 75% of the 3-min response (T0.75) for VO₂ increased significantly (P less than 0.01) at progressively higher work rate steps, being 53.3 (5.5) s, 63.5 (4.6) s, 79.5 (5.0) s, and 94.5 (5.8) s, respectively. In contrast, T0.75 for VCO₂ did not change significantly [74.9 (7.4) s, 75.6 (5.0) s, 85.1 (5.3) s, and 89.4 (6.3) s, respectively]. VCO₂ kinetics were slower than VO₂ kinetics at the low fractions of the subjects' work capacities but were the same or faster at the high fractions because of the slowing of VO₂ kinetics. The first step showed the fastest rise in VO₂. While VO₂ kinetics slowed at each step, they were faster at each fraction of the work capacity in the fitter subjects. The step pattern in VO₂ disappeared at high work rates for the less fit subjects.
OBJECTIVES OF THE STUDY:

1. To find out, assess and analyze the developments taking in endurance ability among college students at particular age group.
2. To understand if any specific endurance development method is helpful for the college volleyball players.
3. To understand various parameters of endurance ability associated with pranayama in certain age group of certain sport.
4. To understand scientific base for methods of training in endurance for volleyball along with the traditional means of pranayama.
5. To understand how the endurance ability will enhance with any specific training methods of endurance.

HYPOTHESIS:

H1: According to the researcher, there may be significant difference of development of endurance through continuous method in experimental group of volleyball players when compared to the control group.

H2: According to the researcher, there may be significant difference of development of endurance through interval method in experimental group of volleyball players when compared to the control group.

H3: According to the researcher, there may be significant difference of development of endurance through continuous method supplemented with pranayama in experimental group of volleyball players when compared to the control group.

H4: According to the researcher, there may be significant difference of development of endurance through interval method in experimental group of volleyball players when compared to the control group.

H5: According to the researcher, there may be significant difference of development of endurance through continuous method supplemented with pranayama
in experimental group of volleyball players when compared to the experimental group imparted with only continuous training method.

H6: According to the researcher, there may be significant difference of development of endurance through interval method supplemented with pranayama in experimental group of volleyball players when compared to the experimental group imparted with only interval training method.

H7: According to the researcher, there may be significant difference of development of endurance through continuous method supplemented with pranayama in experimental group of volleyball players when compared to the experimental group imparted with interval training method supplemented with pranayama.

H8: According to the researcher, there may be significant difference of development of endurance through continuous method supplemented with pranayama in experimental group of volleyball players when compared to the experimental group imparted only interval training method.

H9: According to the researcher, there may be significant difference of development of endurance through interval method supplemented with pranayama in experimental group of volleyball players when compared to the experimental group imparted with only continuous training method.

H10: According to the researcher, there may be significant difference of development of endurance through interval method in experimental group of volleyball players when compared to the experimental group imparted with only continuous training method.

METHODOLOGY

SAMPLE:

The samples of this study will be volleyball players ranging between 18 to 25 years of age and are studying in undergraduate and postgraduate college. In all 75 players will be selected for the study in which 15 volleyball players will be imparted continuous endurance training method along with pranayama, 15 volleyball players
will be imparted with only continuous training, 15 volleyball players will be imparted with interval training along with pranayama, 15 volleyball players will be imparted with only interval training and remaining 15 volleyball players will not be provided with any endurance training but are made to play volleyball regularly.

The initial tests will be administered on each individual considering all the required conditions for the standard tests. All the subjects will be regularly trained according to the weekly training scheduled prepared considering the science of training. In all 5 groups of 15 will be trained regularly according to their experimental groups and control group.

After every month the same tests will be administered on all the subjects for noting the development accordingly. In all 7 times the tests will be conducted and the results will be noted for statistical calculation and analysis.

STATISTICAL METHODS:

To analyze the collected data the scores are arranged according to the comparison and in sequential order so as to find out the statistical values. The following statistical variables are selected for comparing, analyzing and interpretation of numerical values and basing on which the findings are discussed.

Mean is computed by adding all the scores and then dividing by the number of scores involved. The mean is used in the study to measure the average in growth and development.

Standard Deviation is computed in the study for the measures of variability. Standard deviation reflected the magnitude of the deviations of the scores from their mean.

Correlation is computed in the study to find out the relationship of one variable to another and also to determine the validity, reliability, and objectivity of the tests.
For testing the null hypothesis for the difference between various sample means the t-Test is used at significance of .05 levels.

For testing the null hypothesis for the difference between sample means, the F-Test is used and also to evaluate the significance of the difference.

The obtained values of the mean, standard deviation, correlation, t-Test, and F-Test are given in the tables below followed by the graphical representation.

REFERENCES


Reddy; Raju; Ps; Madhavi S; Prasad Kv; Reddy Me; Sahay Bk and Murthy Kj. (2009) Comparison of effects of yoga and physical exercise in athletes [Jur.PubMed - indexed for Medline]. Vol.94