CHAPTER II

REVIEW OF RELATED LITERATURE

The review of related literature described and analysis what has already been done related to the problem. The term review of related literature refers to the knowledge of particular area of investigation of any discipline which includes theoretical, practical and its research studies. The term 'review' means to organize the knowledge of the specific area of research to evolve an edifice of knowledge to show that would be an addition to this field. The task of review of literature is highly creative and tedious because research has to synthesize the knowledge of the filed in a unique way to provide the rational for this study.

The research scholar has gone through several books, periodicals, journals, internet sources and unpublished thesis while searching for relevant fact and finding that are related to this present study. Such findings are given below for a better understanding and to justify this study. The phrase 'Review of Literature' consists of two words 'review' and 'Literature'. In research methodology, the term literature refers to the knowledge of studies. The literature in any field forms the foundation upon which all future work will be likely to be more authentic. A good source of information may be forgotten completely in future. In order to add strength and back ground to the present study, quoting suitable reviews is of permanent importance.

Literature survey comprises locating, reading and evaluating reports of research as well as reports of casual observation and opinion that are related to the individual's planned research report. A study of relevant literature is an essential step to get a full picture of what has been done with regard to the problem under study. The investigator has made an attempt to bring a review of research related to the present study to from the background for the present study and has presented the same with appropriate headings.

2.1 REVIEWS RELATED TO RESISTANCE TRAINING

Baljit Singh Sekhon and Shelvam (2017) found out that the effect of aerobic training, resistance training and concurrent training on VO_2 max among college boys. To achieve this purpose of the study, sixty college students were selected as subjects who were from the Nagaland University. The selected subjects were aged between 18 to 22 years. They were divided into four equal groups of fifteen each, Group I underwent aerobic training, Group II underwent resistance training, Group III underwent concurrent training and Group IV acted as control that did not participate in any special training apart from their regular curricular activities. The selected criterion variable such as VO_2 max was determined through using Treadmill. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. The result of the present study has revealed that there wasa significant difference among the experimental and control group on VO_2 max.

Cholewa et al., (2017) conducted a study on twenty young women without prior structured resistance training experiences were recruited for this study. Body composition, compartmental water (Bioelectrical Impedance), 7-site skinfold, and arm and thigh CSA were assessed pre- and post- 8 week training. Performance testing consisted of vertical jump, 3 kg chest pass initial velocity, squat 1RM and overhead press 1RM. Following 2 weeks of familiarization training, subjects were matched for body composition and relative squat strength, and randomly assigned to either a high- (HL: n=10; 4 sets of 5-7 repetitions) or moderate-load (ML: n=10; 2 sets of 10-14 repetitions) group that completed 6-7 exercises per day performed to momentary muscular failure. Training was divided into two lower and one upper body training sessions per week performed on non-consecutive days for 8 weeks. There were no statistically significant main effects for group or group x time interactions for any variable assessed. Both HL and ML resulted in similar significant increases in lean body mass (1.5 + .83 kg), lean dry mass (1.32 + 0.62 kg), thigh CSA (6.6 + 5.6 cm), vertical jump (2.9 + 3.2 cm), chest pass velocity (0.334 + 1.67 m/s), back squat 1 RM (22.5 + 8.1 kg), and overhead press (3.0 + 0.8 kg). HL and ML also both resulted in significant decreases in percent body fat (1.3 + 1.3 %), total body water (0.73 + 0.70 L), and intracellular water (0.43 + 0.38 L). The results of this study indicate that both moderate- and high-load training are effective at improving muscle growth, body composition, strength and power in untrained young women.

Crewther et al., (2013) conducted a study on the effects of a resistance-training programme on strength, body composition and baseline hormones in male athletes training concurrently for rugby union 7's. Participants (N.=12) completed a six-week resistance-training programme focusing on general strength development while still performing additional rugby union 7's training involving agility, speed and cardiovascular fitness. Significant improvements in bench press (11%), back squat (13%), deadlift (13%), military press (10%) and chin-up (6%) 1RM strength were observed after training ($P < 0.05$). These findings support the use of resistance exercise as a supplement to sport-specific training for improving the performance capacity of 7's rugby players.

Hayao Ozaki et al., (2013) conducted a study on an undeniable fact that resistance training (RT) is a potent stimulus for muscle hypertrophy and strength gain, but it is less understood whether RT can increase maximal aerobic capacity (VO_2 max). The purpose of this brief review is to discuss whether or not RT enhances VO_2 max in young (20–40 years) and older subjects (>60 years). Only 3 of 17 studies involving young subjects have indicated significant increases in VO_2 max following

RT, while six of nine studies in older subjects have reported significant improvements in VO_2max following RT. Thus, RT can be expected to improve concurrently both muscular and cardiovascular fitnesses within a single mode of RT when young and old persons have initially low fitness levels.

Khosravi et al., (2013) conducted a study on the effects of resistance training (RT) and resistance plus endurance training (ERT) on respiratory system, thirty seven volunteer healthy inactive women were randomly divided into 4 groups: without training as control (C), Endurance Training (ET), RT, and ERT. The training period (8 weeks, 3 sessions/week) for ET was 20-26 min/session running with 60-80% maximum heart rate (HR max); for RT two circuits/session, 40-60s for each exercise with 60-80% one repetition maximum (1RM), and 1 and 3 minutes active rest between exercises and circuits respectively; and for ERT was in agreement with either ET or RT protocols, but the times of running and circuits were half of ET and RT. ANCOVA showed that ET and ERT increased significantly ($P < 0.05$) vital capacity (VC), forced vital capacity (FVC), and forced expiratory flows to 25%-75%; ET, RT and ERT increased significantly ($P < 0.05$) maximum voluntary ventilation (MVV); and only ET increased significantly ($P<0.05$) peak expiratory flows (PEF); but ET, RT and ERT had no significant effect ($P>0.05$) on forced expiratory volume in one second (FEV1) and FEV1/FVC ratio In conclusion, ET combined with RT (ERT) has greater effect on VC, FVC, FEF rating at25%-75%, and also on PEF except MVV, rather than RT, and just ET has greater effect rather than ERT.

Maryam Khosravi et al., (2013) conducted a study on the effects of resistance training (RT) and resistance plus endurance training (ERT) on respiratory system, thirty seven volunteer healthy inactive women were randomly divided into 4 groups: without training as control (C), Endurance Training (ET), RT, and ERT. The training period (8 weeks, 3 sessions/week) for ET was 20-26 min/session running with 60-80% maximum heart rate (HR max); for RT two circuits/session, 40-60s for each exercise with 60-80% one repetition maximum (1RM), and 1 and 3 minutes active rest between exercises and circuits respectively; and for ERT was in agreement with either ET or RT protocols, but the times of running and circuits were half of ET and RT. ANCOVA showed that ET and ERT increased significantly ($P< 0.05$) vital capacity (VC), forced vital capacity (FVC), and forced expiratory flows to 25%-75%; ET, RT and ERT increased significantly ($P< 0.05$) maximum voluntary ventilation (MVV); and only ET increased significantly ($P<0.05$) peak expiratory flows (PEF); but ET, RT and ERT had no significant effect ($P>0.05$) on forced expiratory volume in one second (FEV1) and FEV1/FVC ratio. In conclusion, ET combined with RT (ERT) has greater effect on VC, FVC, FEF rating at25%-75%, and also on PEF except MVV, rather than RT, and just ET has greater effect rather than ERT.

Pereira et al., (2013) conducted a study on the effects of 8 weeks of strength training programme alone or combined exercise (step aerobics exercise and strength training) on Body Mass Index (BMI), waist circumference (WC), and maximal strength (1RM) in lower- and upper-body extremities. Thirty-six women were randomized into three groups: strength training (S, N.=13; age: 61.0±9.3 years, BMI: 27.3±4.7 kg/m2), combined step aerobics training and strength training (SE, N.=11; age: 58.3±8.1 years, BMI: 27.8±3.7 kg/m2), or control (C, N.=12; age: 59.0±7.2 years, BMI: 29.5±4.8 kg/m2) groups. Subjects from both experimental groups performed 3 training sessions per week for 45-60 minutes per session. The S was submitted to a high-speed training that consisted of 40% to 75% of 1RM (3 sets 4–12 reps). The SE group combined aerobic exercise using step platform plus strength training.Both training groups significantly improved leg press (S, 80.7% and SE, 42.4%, $P<0.001$ respectively) and leg extension strength (S, 71% and SE, 35.7%, $P=0.000$ respectively). However, only the S group showed a significant increase in seated bench press maximal strength (S, +116.7%, SE, +13.6%, $P=0.266$ and $P=0.000$ respectively). Over the 8-week training period, the SE group showed significant changes in BMI and in waist circumference (-5.3%, $P=0.016$ and -3.0%, -2.5 cm, $P=0.005$, respectively). No significant differences were found in the S or C groups. Decreases in body fat and waist circumference were more evident following combined training. In contrast, higher strength gains particularly for the upper body occurred following 8 weeks of strength training alone compared to combined training.

Ramirez Campillo et al., (2013) examined the effects of a localized muscle endurance resistance training programme on total body and regional tissue composition. Seven men and 4 women (aged 23 ± 1 years) were trained with their non dominant leg during 12 weeks, 3 sessions per week. Each session consisted of 1 set of 960-1,200 repetitions (leg press exercise), at 10-30% 1 repetition maximum. Before and after training, body mass, bone mass, bone mineral density (BMD), lean mass, fat mass, and fat percentage were determined by dual-emission x-ray absorptiometry. Energy intakes were registered using a food recall questionnaire. At the whole-body level, body mass, bone mass, BMD, lean mass, or body fat percentage were not significantly changed. However, body fat mass significantly decreased by 5.1% (preexercise: 13.5 ± 6.3 kg; postexercise: 12.8 ± 5.4 kg, $p < 0.05$). No significant changes in bone mass, lean mass, fat mass, or fat percentage were observed in both the control and trained leg. A significant ($p < 0.05$) decrease in fat mass was observed in the upper extremities and trunk (10.2 and 6.9%, respectively, $p < 0.05$). The reduction of fat mass in the upper extremities and trunk was significantly greater ($p < 0.05$) than the fat mass change observed in the trained leg but not in the control leg.

No significant changes were observed in energy intake pre- and postexercise intervention (2,646 ± 444 kcal·d-1 and 2,677 ± 617 kcal·d-1, respectively). In conclusion, the training programme was effective in reducing fat mass, but this reduction was not achieved in the trained body segment. The present results expand the limited knowledge available about the plastic heterogeneity of regional body tissues when a localized resistance training programme is applied.

Treuth et al., (1994) conducted a study on the effects of a 16-week strength-training programme on total and regional body composition were assessed by dual-energy X-ray absorptiometry (DEXA), magnetic resonance imaging (MRI), and hydrodensitometry in 13 untrained healthy men [60 +/- 4 (SD) yr]. Nine additional men (62 +/- 6 yr) served as inactive controls. The strength-training programme resulted in substantial increases in both upper (39 +/- 8%; P < 0.001) and lower (42 +/- 14%; P < 0.001) body strength. Total fat-free mass (FFM) increased by 2 kg (62.0 +/- 7.1 to 64.0 +/- 7.2 kg; P < 0.001), and total fat mass decreased by the same amount (23.8 +/- 6.7 to 21.8 +/- 6.0 kg; P < 0.001) when measured by DEXA. When measured by hydrodensitometry, similar increases in FFM (61.3 +/- 7.8 to 63.0 +/- 7.6 kg; P < 0.01) and decreases in fat mass (23.8 +/- 7.9 to 22.1 +/- 7.7 kg; P < 0.001) were observed. When measured by DEXA, FFM was increased in the arms (6.045 +/- 0.860 to 6.418 +/- 0.803 kg; P < 0.01), legs (19.416 +/- 2.228 to 20.131 +/- 2.303 kg; P < 0.001), and trunk (29.229 +/- 4.108 to 30.134 +/- 4.184 kg; P < 0.01), whereas fat mass was reduced in the arms (2.383 +/- 0.830 to 2.128 +/- 0.714 kg; P < 0.01), legs (7.583 +/- 1.675 to 6.945 +/- 1.551 kg; P < 0.001), and trunk (12.216 +/- 4.143 to 11.281 +/- 3.653 kg; P < 0.01) as a result of training.

2.2 REVIEWS RELATED TO AEROBIC TRAINING

Mora Rodriguez et al., (2017) determined the effects of high-intensity aerobic interval training (AIT) on exercise hemodynamics in metabolic syndrome (MetS) volunteers. Thirty-eight, MetS participants were randomly assigned to a training (TRAIN) or to a non-training control (CONT) group. TRAIN consisted of stationary interval cycling alternating bouts at 70-90% of maximal heart rate during 45 min day 1 for 6 months. CONT maintained baseline physical activity and no changes in cardiovascular function or MetS factors were detected. In contrast, TRAIN increased cardiorespiratory fitness (14% in VO_{2PEAK}; 95% CI 9-18%) and improved metabolic syndrome (-42% in Z score; 95% CI 83-1%). After TRAIN, the workload that elicited a VO_2 of 1500 ml min^{-1} increased 15% (95% CI 5-25%; $P < 0.001$). After TRAIN when subjects pedaled at an identical submaximal rate of oxygen consumption, cardiac output increased by 8% (95% CI 4-11%; $P < 0.01$) and stroke volume by 10% (95% CI, 6-14%; $P < 0.005$) being above the CONT group values at that time point. TRAIN reduced submaximal exercise heart rate (109 ± 15-106 ± 13 beats min^{-1}; $P < 0.05$), diastolic blood pressure (83 ± 8-75 ± 8 mmHg; $P < 0.001$) and systemic vascular resistances ($P < 0.01$) below CONT values. Double product was reduced only after TRAIN (18.2 ± 3.2-17.4 ± 2.4 bt min^{-1} mmHg 10^{-3}; $P < 0.05$).The reduction in double product, suggests decreased myocardial oxygen demands which could prevent the occurrence of adverse cardiovascular events during exercise in this population.

Moriki et al., (2017) conducted a study to determine the effect of aerobic training under non-invasive positive pressure ventilation (NPPV) on maximal oxygen uptake. Ten healthy young male volunteers participated in the study. Before the training, stroke volume (SV) and cardiac output (CO) were measured in all subjects under 0, 4, 8, and 12 cmH2O NPPV at rest. Then, the subjects exercised on a cycle ergometer at 60% of pre-training for 30 min daily for 5 consecutive days with/without NPPV. The 5-day exercise protocol was repeated after a three-week washout period without/with NPPV. The primary endpoint was changes in. The secondary endpoints were changes in SV, CO, maximum heart rate (HRmax), maximum respiratory rate (RRmax), maximum expiratory minute volume (VEmax) and the percent change in plasma volume (PV). NPPV at 12 cmH2O significantly reduced SV and CO at rest. Significantly increased after 5 days training with and without NPPV, but the magnitude of increase in after training under 12 cmH2O NPPV was significantly higher than after training without NPPV. VE max significantly increased after training under NPPV, but not after training without NPPV. HR max and RR max did not change during training irrespective of NPPV. The percent change in PV was similar between training with and without NPPV. The 5-day training programme with NPPV resulted in greater improvement in than without NPPV. Aerobic training under NPPV has add-on effects on and exercise-related health benefits in healthy young men.

Moradians et al., (2016) evaluated and compared the effects of eight-week aerobic, resistance, and interval exercise routines on respiratory parameters in non-athlete women. Thirty-six non-athlete women between 18-25 years old participated in this prospective quasi-experimental trial. The subjects were randomly divided into three groups (aerobic, resistance and interval exercise, 12 in each group). Each group exercised three times a week for a total of eight weeks (24 sessions in total). Pulmonary function tests (PFT), including tidal volume (VT), inspiratory reserve volume (IRV), expiratory reserve volume (ERV), inspiratory capacity (IC), vital capacity (VC), forced vital capacity (FVC), forced expiratory volume in the first seconds (FEV_1), the ratio of FEV_1/FVC, peak inspiratory flow (PIF), and forced expiratory flow (FEF 25-75%) were recorded before and after the implementation of the exercise programme for all participants. Data were analyzed using paired t-test and one-way ANOVA.Ourthe results showed that interval and aerobic exercise routines could improve pulmonary functions and aerobic and interval training can be used to increase VC, IC, PIF, in non-athlete women.

Anju Madan Gupt et al., (2015) conducted a study to see the effect of moderate aerobic exercise training on pulmo-nary functions and its correlation with antioxidant status. 30 healthy volunteers in the age group of 18-22 years were screened. They underwent short term moderate aerobic exercise training. Various Pulmonary function tests including FVC, MVV &SVC were taken prior to aerobic exercise training and later after the exercise period. Antioxidant status was assessed by the level of malondialdehyde in plasma. FVC showed a significant increase while PEFR, IRV, MVV and MRF showed a highly significant increase after the aerobic exercise training. Physical exercise also provided a favorable change in the bio-chemical parameters such as MDA.

Biruk Amare Sorate (2015) examined the relationship of aerobic exercises and body weight reduction among regular physical fitness participants. The researcher used longitudinal experimental research design because participants were tested more than once test and trained for 12 weeks. Twenty subjects were purposively selected as a subject and randomly assigned in high intensity and moderate intensity group; whose age is in between twenty up to fifty years old and their body mass index (BMI) is 25kg/m2 and above. Both groups participated in high intensity and moderate intensity aerobics exercise in their respective groups three days per week for three consecutive months. Paired sample T-tests indicated a significant reduction of BWt and BMI in both groups of female and male participants at p-value ($p < 0.01$). Based on the results, it was concluded that both moderate intensity and high intensity aerobics exercise group had a positive effect on body weight reduction. It showed that aerobic exercise has a positive relationship on body weight reduction.

Roopam Bassi et al., (2015) investigated the effect of aerobic exercises on peak expiratory flow rate (PEFR), body mass index (BMI), and physical fitness index (PFI) in apparently healthy female subjects. The subjects were divided into two groups depending upon the aerobic exercise regimen they followed. They were assessed for height, weight, BMI, body surface area (BSA), PEFR, and PFI by Harvard step test at three different time intervals: 0 week, 6 weeks, and 10 weeks. The mean values of all the parameters were compared and evaluated. There were significant changes ($p<0.001$) in all the parameters while comparing with the baseline values at the three time intervals; an increase in PEFR, fall in BMI, and rise in PFI was seen. While comparing the values between the two groups, no significant difference could be found. Any form of aerobic exercise proves to be beneficial if followed consistently. Both the Groups experienced an improvement in PEFR, BMI, and PFI, but labeling as which aerobic regimen was better could not be done.

Ghorbani et al., (2014) evaluated the effects of six-week aerobic training programme including running and rope skipping on cardiovascular fitness, body mass index (BMI), and mental health among female students at the University of Isfahan, Iran. In this interventional study we included 30 female students in academic year 2011-12. The participants were randomly assigned in experimental group (n=15, mean±SD for age=26.06±1.18, weight (kg)=57.43±5.67, height (cm)=160.06±4.16) and control group (n=15, mean±SD for age=26.33±1.30, weight=57.66±5.08, height=161.86±3.29). Pre-test and post-test measurements include VO_2 max with Queen Step test; BMI and General Health Questionnaire-28 as a measure of mental health were done. Analysis of covariance (ANCOVA) was used to test the effects of aerobic training as intervention ($P<0.05$). There was statistically significance difference between experimental and control groups after adjustment for their own baseline values concerning cardiovascular fitness ($P=0.004$), BMI ($P<0.001$) and mental health indices ($P<0.001$). A six-week aerobic practice improves cardiovascular strength, mental health and BMI considerably and could be more encouraged at universities.

Seron et al., (2014) conducted a study on the effects of a 12 weeks aerobic and resistance exercise on body composition of adolescents with Down syndrome. A quasi-experimental study with 41 adolescents with Down syndrome, aged 15.5±2.7 years, divided into three groups: Aerobic Training Group (ATG; n=16), Resisted Training Group (RTG; n=15) and Control Group (CG; n=10). There were two types of training: aerobic, with intensity of 50-70% of the heart rate reserve 3 times/week, and resisted, with intensity of 12 maximum repetitions 2 times week. Both trainings were applied during a 12-week period. The percentage of fat evaluation was performed using plethysmography with Bod Pod equipment. Waist circumference (WC), body weight and height were also measured. Paired t-test was used to compare variables before and after the exercise program. The percentage of body fat did not change significantly for both groups that participated in the training intervention. However, CG showed a significant increase in this variable (31.3±7.2 versus 34.0±7.9). On the other hand, body mass index (BMI) and WC were significantly reduced for ATG (BMI: 27.0±4.4 and 26.5±4.2; WC: 87.3±11.1 and 86.2±9.7), while RTG and GC showed no differences in these variables. The aerobic and resisted training programs maintained body fat levels. ATG significantly reduced BMI and

WC measures. Individuals who did not attend the training intervention increased their percentage of fat.

Sigal et al., (2014) conducted a study on the effects of aerobic training, resistance training, and combined training on percentage body fat in overweight and obese adolescents. Randomized, parallel-group clinical trial at community-based exercise facilities in Ottawa (Ontario) and Gatineau (Quebec), Canada, among previously inactive postpubertal adolescents aged 14 to 18 years (Tanner stage IV or V) with body mass index at or above the 95th percentile for age and sex or at or above the 85th percentile plus an additional diabetes mellitus or cardiovascular risk factor. After a 4-week run-in period, 304 participants were randomized to the following 4 groups for 22 weeks: aerobic training (n = 75), resistance training (n = 78), combined aerobic and resistance training (n = 75), or non exercising control (n = 76). All participants received dietary counseling, with a daily energy deficit of 250 kcal. The primary outcome was percentage body fat measured by magnetic resonance imaging at baseline and 6 months. We hypothesized that aerobic training and resistance training would each yield greater decreases than the control and that combined training would cause greater decreases than aerobic or resistance training alone. Decreases in percentage body fat were -0.3 (95% CI, -0.9 to 0.3) in the control group, -1.1 (95% CI, -1.7 to -0.5) in the aerobic training group (P = .06 vs controls), and -1.6 (95% CI, -2.2 to -1.0) in the resistance training group (P = .002 vs controls). The -1.4 (95% CI, -2.0 to -0.8) decrease in the combined training group did not differ significantly from that in the aerobic or resistance training group. Waist circumference changes were -0.2 (95% CI, -1.7 to 1.2) cm in the control group, -3.0 (95% CI, -4.4 to -1.6) cm in the aerobic group (P = .006 vs controls), -2.2 (95% CI -3.7 to -0.8) cm in the resistance training group (P = .048 vs controls), and -4.1 (95%

CI, -5.5 to -2.7) cm in the combined training group. In per-protocol analyses (≥ 70% adherence), the combined training group had greater changes in percentage body fat (-2.4, 95% CI, -3.2 to -1.6) vs the aerobic group (-1.2; 95% CI, -2.0 to -0.5; P = .04 vs the combined group) but not the resistance group (-1.6; 95% CI, -2.5 to -0.8). Aerobic, resistance, and combined training reduced total body fat and waist circumference in obese adolescents. In more adherent participants, combined training may cause greater decreases than aerobic or resistance training alone.

Perez-Gomez et al., (2013) investigated the effect of 10-weeks of endurance training or resistance training on regional and abdominal fat, and in the lipid profile, examining the associations among the changes in body composition, weight, waist circumference and lipid profile. Body composition, waist circumference and lipid profile were analyzed in 26 volunteers healthy young men (age 22.5 ± 1.9 yr), randomly assigned to: endurance group (EG), resistance group (RG) or control group (CG). The EG significantly decreased after training the body weight, body mass index, total body fat and percentage of fat, fat and percentage of fat at the trunk and at the abdominal region and High-Density Lipoprotein. The RG significantly increased total lean mass and decreased total cholesterol, High-Density and Low- Density Lipoprotein. We concluded that 10-week of endurance training decreased abdominal and body fat in young men, while 10-week of resistance training increased total lean mass. These types of training had also effects on lipid profile that seem to be to some extent associated to changes in body composition; however it requires additional investigation.

Sanal et al., (2013) investigated gender difference in the effects of combined aerobic resistance exercise (ARE) versus aerobic exercise (AE) alone on body composition in overweight and obese adults. They were randomized into one of two intervention groups; AE group (N.=33) performed leg cycle exercises with increasing duration and frequency; ARE group (N.=32) performed additionally progressive weight-resistance exercises for the upper and lower parts of body. Both groups were asked not to change their diet. Body composition including percentage of fat (PF), fat mass (FM) and fat free mass (FFM) in regional and whole body was determined by dual-energy X-ray absorptiometry (DXA) at baseline and week 12. ARE leads to more gains on regional and whole body FFM than AE. ARE was more effective in increasing the FFM of arms, trunk and whole body and decreasing PF of trunk in men and superior on reducing FM of legs in women when comparing with AE. In order to reduce the trunk fat in men and leg fat in women, resistance exercise can be added into an aerobic training program.

Brandon Sawyer et al., (2012) conducted a study on aerobic exercise training in women typically results in minimal fat loss, with a significant percentage of women actually gaining body fat. It was hypothesized that heterogeneity in body fat changes after training would be independent of initial % body fat. Seventy-three non-vigorously active women (age: 30.5 ± 7.9 yrs; ht: 164.7 ± 7.5 cm; wt: 67.2 ± 14.4 kg; %fat: 37.5 ± 8.7) underwent Dual X-ray Absorptiometry (DXA) before and after a 12-wk exercise training programme of treadmill walking 3 days/wk for 30 min at 70% of VO_2max. For all women combined, % body fat was reduced modestly after training (−0.53%; $P = 0.02$). Women with the lowest baseline body fat (LF: n=37; %fat = 30.2 ± 5.2%) and highest baseline body fat (HF: n=36; %fat = 44.5 ± 4.8%) did not differ with regard to changes in %fat (LF = −0.28 ± 1.6%; HF = − 0.78 ± 2.1%; $P = 0.27$) or total fat mass (LF = −0.04 ± 1.3 kg; HF = −0.76 ± 2.5 kg; $P = 0.14$). Leg fat was reduced by more in HF (HF = −0.93 ± 2.9 kg; LF = +0.21 ± 1.8 kg; $P < 0.05$), indicating greater reduction in gynoid fat pattern in HF (HF = −1.88 ± 2.0%; LF = −

0.04 ± 2.0%; $P< 0.01$). Both groups had marked heterogeneity in fat changes, with 50% of LF and 39% of HF gaining total body fat after training. Our results suggest that regardless of initial body fat, aerobic exercise training in women is characterized by “losers” and “gainers” in total body fat. Women with high initial body fat may be more likely to lose lower body fat and have a reduced gynoid fat pattern.

Siroos Hosseini et al., (2012) found out the effects of aerobic exercise on some pulmonary indexes, body composition, body fat distribution and VO_2 max in normal and fat men of personal and members of faculty of Azad university Bebahan branch. There are several reports on the association between body mass index (BMI) and pulmonary indexes. Body fat distribution and overweight may have negative impacts on the pulmonary system that's because those with overweight are generally inactive and are with decreased working potential for them, the amount of energy they need for daily activities is consumed by energizing the respiratory organs due to the depression in the pulmonary operation and weakness of respiratory organs.The method of this study was semi – experimental. Study's approach was of pre-tested and post-tested with the control group. Statistical sample of this research, includes 200 of male masters and personnel of Behbahan Azad University with average between 35 to 45 ages. In this study, the examinees were categorized by simple random selection into experimental groups of less than -25,and more than 25 BMI .Before the exercises aerobics we took pre-test and post-tested of pulmonary indices(FEV1,FVC),body mass index, body fat distribution and VO_2 max from each group, and obtained data are analyzed by variance analysis, in the meantime the level of significance in this research is $\alpha \leq 0/05$, and analyzing of data is done by spss software. The result of this study has shown that aerobic exercise has affected on pulmonary indices, BMI, VO_2 max and body fat distribution in fat and normal groups and there were significant differences between these groups and control groups $P \leq 0/05$. We can see a positive significant associated between VO_2 max and pulmonary indices and a negative significant associated between pulmonary indices and BMI, body fat distribution with increase in once caused decrease in another.

Park et al., (2003) investigated the changes of maximal oxygen consumption, left ventricular function and serum lipids after 36 weeks of aerobic exercise in elderly women without the influence of drugs. Eight elderly women were studied by M-mode and Doppler echocardiography to assess left ventricular size, mass and function. Maximal oxygen consumption VO_2 max was determined for each subject by administering a treadmill exercise test. The training intensity was decided by heart rate reserve. Subjects performed exercise for 40 minutes a day, 3 days a week at 50-60% of the heart rate reserve during the 36 weeks. Exercise capacity was assessed byVO_2 max with a graded exercise test of the treadmill. Weight and % body fat decreased after training. Cardiorespiratory function improved because of the increase in VO_2 max and VO_2 max normalized for body weight after training. Systolic blood pressure significantly decreased. There are no significant difference in all left ventricular's parameters (end-diastolic dimension, end-systolic dimension, end-diastolic volume, end-systolic volume, stroke volume, cardiac output, ejection fraction, fractional shortening) after 36 weeks. Exercise training did not induce left ventricular (LV) enlargement as evidence of an absence of increase in left ventricular end-diastolic volume. The total cholesterol level and triglyceride level decreased after training. High density lipoprotein-cholesterol significantly increased and low density lipoprotein-cholesterol significantly decreased, atherogenic index (AI) significantly decreased and apolipoprotein A-I increased and apolipoprotein B decreased after training. In conclusion, although there was no significant change in left ventricular function, aerobic training showed a positive influence on body composition, maximal oxygen consumption and serum lipids.

William et al., (2002) evaluated the effect of inspiratory and expiratory muscle training on pulmonary function and maximal exercise performance in competitive triathletes and marathon runners. The participants in this study (N=12) had a mean weekly aerobic training time of 7.5 hours per week of swimming, cycling, or running. Eight subjects were assigned to a pulmonary resistance treatment group and four control subjects were given a sham device that allowed no greater than 15% resistance on inspiration or expiration. The subjects performed 30 maximal inhalation/exhalation maneuvers on their respective devices two times per day for four weeks. The subjects were tested for forced vital capacity (FVC), forced expiratory volume in one second (FEV1), FEV1/FVC ratio, forced inspiratory vital capacity (FIVC), peak inspiratory flow rate (PIFR), and peak expiratory flow rate (PEFR). Each subject was also tested for peak exhalation force (PEF) as well as a maximal oxygen consumption (VO_2max), carbon dioxide production (VCO2), tidal volume (VT), ventilation (VE), ventilatory threshold (VT), and respiration rate (RR). The data revealed that training using the pulmonary resistance device produced significant increases in maximal VE and maximal VT while decreasing RR (although not statistically significant) at maximum exercise. However, no significant changes were seen in VO_2 or any pulmonary function variables measured.

2.3 REVIEWS RELATED TO YOGIC TRAINING

Ashutosh Chauhan et al., (2017) conducted a study to evaluate the effect of 1-month yoga practice on body mass index (BMI), and blood pressure (BP). The present study was conducted to determine the effect of yoga practice on 64 participants (age 53.6 ± 13.1 years) (experimental group) whereas the results were compared with 26 healthy volunteers (control group). We examined the effects of yoga on physiological parameters in a 1-month pilot study. Most of the participants were learner and practiced yoga for 1 h daily in the morning for 1 month. BMI and BP (systolic and diastolic) were studied before and after 1 month of yoga practice. Yoga practice causes decreased BMI (26.4 ± 2.5–25.22 ± 2.4), systolic BP (136.9 ± 22.18 mmHg to 133 ± 21.38 mmHg), and diastolic BP (84.7 ± 6.5 mmHg to 82.34 ± 7.6 mmHg). On the other hand, no significant changes were observed in BMI and BP of control group. This study concludes that yoga practice has potential to control BMI and BP without taking any medication.

Juliana Costa Shiraishi et al., (2017) conducted a study to evaluate the effects of a 12-week systema-tized yoga intervention on health-related physical fitness components assessed by body mass, body mass index (BMI), waist circumference (WC), relative body fat, abdominal endurance, upper body endurance, hamstring flexibility, and cardio respiratory fitness. The study was performed at University of Bra-sília, Faculty of Physical Education, Distrito Federal, Brazil. Twenty-five young healthy yoga novices (22.36 ± 2.40 years), both gender, volunteered to partic-ipate in this study. The intervention was based on 50 minutes yoga class, twice a week for 12 weeks, involving physical poses, meditation, and relaxation. Measurements were performed one week prior to and one week after the yoga intervention. Collecting data included age, gender, height, body mass, body fat estimates and physical fitness tests. Body fat percentage was determinated by the measure of skinfolds at seven sites. The results showed 1.3 (1.0-4.0) cm decrease in WC and 0.7 (0.9- 1.5) decrease in body fat percentage, and 7.8(2.0- 5.0) cm increase in hamstring flexibility and 3.0(1 .0 - 4.0) in abdominal endurance, after the yoga intervention ($p < 0.01$). In conclusion, the present study found that a 12 -week yoga programme improved physical fitness in young healthy subjects.

Chanavirut et al., (2016) tested the hypothesis that short-term yoga exercise increased chest wall expansion and lung volumes in young healthy Thais Fifty-eight healthy young volunteers (20.1±0.6 years of age) were randomly allocated into Yoga training (n=29) and control (n=29). Five positions of Hatha Yoga (UttitaKummersana, Ardha Matsyendrasana, Vrikshasana, Yoga Mudra, and Ushtrasana) were assigned because of their dominant effects on chest wall function. The Yoga practice was 20 min/session and 3sessions/week for 6 weeks. The matching control subjects were designed and stayed free without Yoga exercise in a similar period. Before and after training lung expansion was measured by a standard tape at three levels: upper (sternal angle), middle (rib 5), and lower (rib 8). Lung volumes (tidal volume, FEV1, FEV25-75% and FVC) were measured by a standard spirometer. Compared to pre-training, Yoga exercise significantly increased ($p<0.05$) chest wall expansion in all levels (upper 3.2±0.1 versus 4.4±0.1 cm, middle 5.0±0.1 versus 5.9±0.1 cm, lower 5.9±0.2 versus 6.8±0.1 cm), FEV1 (2.5±0.1 versus 2.8±0.1 L), FEV25-75% (4.1±0.2 versus 4.8±0.2 L/sec), and FVC (2.5±0.1 versus 2.8±0.1 L). The upper chest wall expansion improved better than the other two levels. Resting tidal volume was not altered by Yoga (0.53±0.03 versus 0.55±0.03 L). In contrast, the control subjects did not show any change in all measured parameters through the study. The present data suggest that short-term Yoga exercise improves respiratory breathing capacity by increasing chest wall expansion and forced expiratory lung volumes.

Puli Sreehari and L Rajeshwar Reddy (2016) conducted a study on exercise is one of the methods used by physiologists to understand the functioning of various systems of the body. This study was conducted in KMC Warangal on healthy female medical students. VO_2 max was measured by using Bruce Treadmill Test which is an indirect to estimate VO_2 max. For female VO_2 max = 4.38 x T - 3.9 T = Total time on the treadmill measured in fraction of a minute. Changes were recorded prior to and after training in yoga in a group of 60 female Healthy medical students. The Average VO_2 max in control group was 31.90 ml/Kg/min and study group it was 32.16 ml/Kg/min. After the study group undergo continuous yoga training for 90 days under trained yoga teacher the VO_2 max in the control group showed negligible change whereas the Average VO_2 max in the Study group increased to 38.46 ml/Kg/min which was significant. The study demonstrates that yoga training improves the maximal oxygen consumption of the body. There is beneficial effect of yoga on respiratory system in females.

Kaushik Halder et al., (2015) conducted to appraise the effect of a specific Hatha yoga package on anthropometric characteristics, flexibility and muscular strength of healthy individuals of different age groups from similar occupational trade. A total of 71 participants (Group All) from Indian Air Force ground personnel volunteered and age wise divided into 3 groups - (i) Group I (Gr. - I) (n_1 = 27, 20-29 years), (ii) Group II (Gr. - II) (n_2 = 21, 30-39 years) and (iii) Group III (Gr. - III) (n_3 = 23, 40-49 years). All the participants undergone selected Hatha yoga training for 1 h daily for a period of 12 weeks. Parameters were recorded before and after the training. Pre and post training differences were assessed by Student's t-test. Body weight (All, Gr. - II and Gr. - III [all $P< 0.05$]), body mass index (Gr. - II and Gr. - III [both $P< 0.01$]) and fat% (Gr. - II and III [both $P< 0.05$]) were decreased significantly. Neck circumference was increased significantly in Gr. - I ($P< 0.05$) but decreased significantly in Gr. - III ($P< 0.05$). Chest circumference (All ($P< 0.001$), in Gr. - I and II [both $P< 0.05$]), grip strength (All [left: $P< 0.01$ and right: $P< 0.05$], in Gr. - I [left:

P< 0.05 and right: *P*< 0.01], in Gr. - II [right: *P*< 0.05] and in Gr. - III [left: *P*< 0.05 and right: *P*< 0.01]), back leg strength (group wise *P*< 0.001, *P*< 0.05, *P*< 0.01 and *P*< 0.05 respectively) and flexibility (all *P*< 0.001) were increased significantly. Hatha yoga can improve anthropometric characteristics, muscular strength and flexibility among volunteers of different age group and can also be helpful in preventing and attenuating age related deterioration of these parameters.

Dinesh et al., (2015) compared the effect of 12 weeks of slow and fast pranayama training on pulmonary function in young, healthy volunteers. Ninety one healthy volunteers were randomized into slow pranayama group (SPG), n =29, fast pranayama group (FPG), n = 32 and control groups (CG) (n = 30). Supervised pranayama training (SPG: Nadisodhana, Pranav pranayama and Savitri pranayama; FPG: Kapalabhati, Bhastrika and Kukkriya pranayama) was given for 30 min/day, thrice/week for 12 weeks by certified yoga instructors. Pulmonary function parameters (PFT) such as forced vital capacity (FVC), forced expiratory volume in first second (FEV1), ratio between FEV1 and FVC (FEV1 /FVC), peak expiratory flow rate (PEFR), maximum voluntary ventilation (MVV), and forced expiratory flow25-75 (FEF25-75), were recorded at baseline and after 12 weeks of pranayama training using the computerized spirometer (Micro laboratory V1.32, England).In SPG, PEFR, and FEF25-75 improved significantly (P < 0.05) while other parameters (FVC, FEV1, FEV1 /FVC, and MVV) showed only marginal improvements. In FPG, FEV1 /FVC, PEFR, and FEF25-75 parameters improved significantly (P < 0.05), while FVC, FEV1, and MVV did not show significant (P > 0.05) change. No significant change was observed in CG. Twelve weeks of pranayama training in young subjects showed improvement in the commonly measured PFT. This indicates that pranayama training improved pulmonary function and that this was more pronounced in the FPG.

Rajeshwar Reddy et al., (2015) conducted a study on yogic exercises when practiced regularly have shown to improve health and well being. Healthy male individuals n=50 were selected and divided into two groups randomly (Group I- after 9 weeks of regular yogic training, Group II (Control)- normal individuals. Pulmonary function tests such as Forced Vital Capacity (FVC), Peak Expiratory Flow Rate (PEFR), Forced Expiratory Flow (FEF 25-75%) and Maximum Voulntary Ventilation (MVV) were recorded with Medspiror. FVC, PEFR and MVV were 74.04%, 78.8%, 78.6% respectively in control group while the values in study group were 81.21%, 97.1%, 97.42% respectively. 'P' values were significant for PEFR and MVV. Pranayama training helps in improvement of Respiratory function after regular training. This may be due to beneficial effect of Pranayama on respiratory system. Yoga has beneficial effects on respiratory and cardiovascular systems when practiced regularly.

Volga Hovsepian et al., (2013) conducted a study on the effect of yoga and aerobic trainings on pulmonary and physical fitness factors of healthy female university students. This quasi-experimental study included 60 healthy female students who were randomly assigned into two groups; exercising yoga and aerobics twice a week for three months. Respiratory rate (RR) along with Pulmonary Function Tests such as pulmonary capacities (PEF, PIF, FEV1, FVC), and physical fitness factors including flexibility, balance, and maximal aerobic capacity (VO_2max), were measured at baseline and after applying trainings. The data were analyzed using student (T – test) at P <0.05 significance level. Participants had a mean ±SD age of 19.02±2.19 years, height of 160.48±5.34 cm and weight of 56.7±10.7kg with no significant differences between the two groups. After training, in the yoga group; RR decreased, pulmonary and all physical fitness parameters except VO_2 max increased significantly ($P < 0 .05$).In the aerobic group; PEF and PIF increased significantly. There were no changes in RR, FEV1, FVC, however all physical fitness parameters improved significantly ($P < 0.05$).Our findings suggest that yoga training can lead to significant improvement in most variables except VO_2 max. Therefore regular practice of yoga seems to improve health related aspects of physical fitness and may enhance wellness.

Vinayak et al., (2013) conducted a study on yoga is considered to be a very good exercise for maintaining proper health. To find the effect of short term Yoga practice on aerobic capacity (VO_2max.) To measure aerobic capacity (VO_2max.) Before and after Yoga practice. The present study was conducted on 60 M.B.B.S. students (40 males and 20 females) within the age group of 18-20years. VO_2 max was measured using bicycle Ergometer in our 'Exercise and Sports Physiology' laboratory. It was recorded at start of study (baseline) and then after 12 weeks of yoga therapy. For both the genders VO_2 max was found to be increased after yoga therapy for 12 weeks. The present study concludes that yoga practice can be used to perk up cardiorespiratory fitness.

Saha et al., (2010) conducted a study to compare the effect of 3 months yogic practice on aerobic and anaerobic capacity. Healthy young male volunteers of age 21–33 years, height 174.8} 3.52 cm and weight 69.6} 7.17 kg (mean} SD) were participated in this study (64 volunteers for anaerobic (n1=64) and 21 volunteers for aerobic (n2=21)). The yoga training imparted by certified yoga teacher included the practice of yogasanas, pranayamas, meditation, mudra and bandh for 2 h in the morning and 1. h in the evening during the weekdays. Wingate Anaerobic Test protocol was applied for the prediction of peak and average anaerobic power. The device consisted of a mechanically braked bicycle ergometer and software controlling the test. Aerobic performance was assessed by submaximal exercise for 5 min on a bicycle ergometer with a fi xed load of 150 w and cycle speed 50 rpm. Heart rate was recorded at rest, 5 min of exercise. Body mass index (BMI) was calculated as the ratio of weight to height squared. After 3 months body weight and BMI decreased significantly ($p< 0.05$). After training, heart rate decreased non-significant by 5.10%, at 5 min of exercise as compared to that before training. Peak and average anaerobic power (Wingate Test) improved significantly ($p < 0.05$). The study revealed that 3 months continuous yogic exercise resulted improvement in anaerobic capacity of individuals, as compared to aerobic capacity.

Ahmed et al., (2010) investigated how far the short term practice of yoga (30 and 60 days) for an hour daily can improve the respiratory function. Male subjects (n=50, age 30-50 years) were randomly selected. Respiratory parameters (FVC, FEV1, PEFR, FEF (25-75%) and MVV) were determined by using a multifunctional computerized spirometer. Yoga (posture and pranayamas) practice for a month produced no significant improvement in pulmonary parameters. Nevertheless, when the subjects continued it for next 30 days, i.e., after 60 days significant changes were noted in FVC ($p<0.001$), FEV, ($p<0.01$) and PEFR ($p<0.05$). The result also revealed that amongst them 30 days yoga training resulted in a significant increase in FVC in elder group of people (age 41-50 yrs) where as in younger group (age 30-40 yrs) the changes were not so prominent. Result indicated that short term (30 days) yoga practice quickly improves respiratory functions in relatively elder people (age 41-50 yrs), when many of them in our tropical country suffer from primary level of respiratory problem. Regular practice of Yoga (posture and pranayamas) can prevent it by increasing the efficacy of respiratory muscles.

Arnulfo Ramos Jimenez et al., (2009) evaluated the effect of an intensive HY intervention (IHY) on cardiovascular risk factors in middle-aged and older women from Northern Mexico. In this prospective quasi experimental design, four middle-aged and nine older CHY practicing females(yoginis) were enrolled into an 11-week IHY programme consisting of 5 sessions/week for 90 min (55 sessions). The programme adherence, asana performance, and work intensity were assessed along the intervention. Anthropometric [body mass index (BMI), % body fat and Σ skin folds], cardiovascular fitness [maximal expired air volume (VE max), maximal O2 consumption (VO_2max), maximal heart rate (HR max), systolic (BPs) and diastolic blood pressure (BPd)], biochemical [glucose, triacylglycerols (TAG), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C)], and dietary parameters were evaluated before and after IHY. Daily caloric intake (~1,916 kcal/day),programme adherence (~85%), and exercising skills (asana performance) were similar in both middle-aged and older women. The IHY programme did not modify any anthropometric measurements. However, it increased VO_2 max and VE max and HDL-C while TAG and LDL-C remained stable in both middle-aged and older groups ($P < 0.01$). The proposed IHY programme improves different cardiovascular risk factors (namely VO_2 max and HDL-C) in middle-aged and older women.

Upadhyay Dhungel et al., (2003) conducted a study on Pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. The responses of Alternate Nostril Breathing (ANB) the Nadisudhi Pranayama on some cardio-respiratory functions were investigated in healthy young adults. The subjects performed ANB exercise (15 minutes every day in the morning) for four weeks. Cardio-respiratory parameters were recorded before and after 4-weeks training period. A significant increment in Peak expiratory flow rate (PEFR L/min) and Pulse pressure (PP) was noted. Although Systolic blood pressure (SBP) was decreased insignificantly, the decrease in pulse rate (PR), respiratory rate (RR), diastolic blood pressure (DBP) were significant. Results indicate that regular practice of ANB (Nadisudhi) increases parasympathetic activity.

Mandanmohan et al., (2003) conducted a study on the effect of yoga training on pulmonary functions; Hence the present work was planned to study the effect of yoga training on hand grip strength (HGS), hand grip endurance (HGE), maximum expiratory pressure (MEP), maximum inspiratory pressure (MIP), forced expiratory volume (FEV), forced expiratory volume in first second (FEV1) and peak expiratory flow rate (PEFR). 20 school children in the age group of 12 to 15 years were given yoga training (asans and pranayams) for 6 months. 20 age and gender-matched students formed the control group. Yoga training produced statistically significant ($P < 0.05$) increase in HGS and HGE. MEP, MIP, FEV, FEV1 and PEFR also increased significantly ($P < 0.001$) after the yoga training. Our study shows that yoga training for 6 months improves lung function, strength of inspiratory and expiratory muscles as well as skeletal muscle strength and endurance. It is suggested that yoga be introduced at school level in order to improve physiological functions, overall health and performance of students.

Ray et al., (2001) conducted a study on the effect of training in Hatha yogic exercises on aerobic capacity and PE after maximal exercise was observed. Forty men from the Indian army (aged 19-23 yr) were administered maximal exercise on a bicycle ergometer in a graded work load protocol. The oxygen consumption, carbon dioxide output, pulmonary ventilation, respiratory rate, heart rate (HR) etc., at maximal exercise and PE score immediately thereafter were recorded. The subjects were divided into two equal groups. Twelve subjects dropped out during the course of study. One group (yoga, n = 17) practiced Hatha yogic exercises for 1 h every morning (6 days in a week) for six months. The other group (PT, n = 11) underwent conventional physical exercise training during the same period. Both groups participated daily in different games for 1 h in the afternoon. In the 7th month, tests for maximal oxygen consumption (VO_2 Max) and PE were repeated on both groups of subjects. Absolute value of VO_2 Max increased significantly ($P < 0.05$) in the yoga group after 6 months of training. The PE scores after maximal exercise decreased significantly ($P < 0.001$) in the yoga group after 6 months but the PT group showed no change. The practice of Hatha yogic exercises along with games helps to improve aerobic capacity like the practice of conventional exercises (PT) along with games. The yoga group performed better than the PT group in terms of lower PE after exhaustive exercise.

Yadav and Das (2001) assessed the effects of yogic practice on some pulmonary functions. Sixty healthy young female subjects (age group 17-28 yrs.) were selected. They had to do the yogic practices daily for about one hour. The observations were recorded by MEDSPIROR, in the form of FVC, FEV-1 and PEFR on day-1, after 6 weeks and 12 weeks of their yogic practice. There was significant increase in FVC, FEV-1 and PEFR at the end of 12 weeks.

Bowman et al., (1997) found out the effects of asana and core training on breath holding time, VO_2 max and resting pulse rate level of middle aged working women. The sample consisting of sixty middle aged women ranging between 35-50 years. They were divided into two groups, consisting control group and experimental group. The control group was not given any treatment and the experimental group was given asana and core training programme was given five days per week for a period of 8 weeks. All the subjects were subjected for pre and post test. Physiological variables of breath holding time, VO_2 max and resting pulse rate level. The data collected from the subjects were statistically analyzed with't' ratio to find out significant difference among experimental group and control group and physiological variables if any. The result indicates that eight weeks of asana and core training programme produced significant improvement in breath holding time, VO_2 max and resting heart rate level. Asana, core training, breath holding time, VO_2 max and resting pulse rate.

2.4 SUMMARY

Researcher selected three types of training programmes namely resistance, aerobic and yogic training on the selected body composition and physiological variables of college men. The researcher has presented the reviews under three major heads viz literatures related to resistance training, aerobic training and yogic training on the selected dependent variables 9 literatures related to resistance training 15 literatures related to aerobic training and 17 literatures related to yogic training which were significantly improved body composition and physiological variables.