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Study the Effects of Yoga Practice on Body Composition, Physical Fitness and Cardio-Pulmonary Functions of 10–12 Years Healthy Female Volunteers

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Abstract:
Background*: Back grounds: Yoga practice may increase the physical fitness and improve the cardio-pulmonary functions. The investigation aimed to find out the role impact of yoga practice on body composition, physical fitness and cardio-pulmonary functions of young healthy female volunteers.*
Materials and Methods*: A total of 145 healthy female volunteers (age: 10-12 yrs) voluntary participated (25 excluded) 120 volunteers were randomly grouped into (i) Yoga Practitioners (YP: n = 60) and (ii) Sedentary Control Individual (SCI: n = 60). The YP followed a training schedule of 1 hour/day, 05 days/week for 24 weeks, no yoga training in SCI. Assessment of selected body composition, physical fitness and cardio-pulmonary functions variables were performed at the beginning (0 wk) and after yoga training (12 wks and 24 wks).*
Results*: Signifiant decrease (P≤0.05) in weight, BMI, body fat, WHR, reaction time, SBP, DBP, HRrest, HRmax, HRrec; and an increase (P≤0.05) in grip strength, flexibility, PFI, VO_{2max}, FVC, FEV1 and PEFR were observed among the volunteers of YP after yoga training. In addition, the SCI volunteers had higher (P≤0.05) weight, BMI, BSA, body fat, WHR, MUAC, reaction time, SBP, DBP, HRrest, HRmax, HRrec; and lower (P<0.05) grip strength, flexibility, PFI, VO_{2max}, FVC, FEV1 and PEFR than the volunteers of YP.*
Conclusion: *Regular practice of yoga helps to reduce body fat, SBP, DBP, HRrest, HRmax, HRrec; and increase strength, flexibility, PFI, VO_{2max}, lung functions thus increase the level of physical fitness and cardio-pulmonary functions.*
Keyword*: Yoga, body fat, blood pressure, heart rate, VO_{2max}, pulmonary function.*

I. Introduction

Yoga is that the practice of accessing and integrating all aspects of our true nature. Yoga unit the body with mind and soul, thus yoga unite the individual soul with the Universal soul. With the advancement of technology the screen time also increased for children for working with computer and mobile phone. With the advancement of technologies more and more individual are using computers and smart phones, this on the other hand reduces the physical activity among the people. The lack of physical activity is concerned with health issues such as obesity and cardiovascular disease, mental illness etc (Parkhad, 2015). Lack of physical activities is associated with diseases like obesity, cardio-pulmonary disease, diabetes etc (Parkhad, 2015; Agnihotri et al., 2016). Physical activities have beneficial health effects and lower the chances of disease risk (Parkhad, 2015; Agnihotri et al., 2016). Yoga incorporates asana, pranayama and meditation, is used as therapy to maintain physical and mental wellness (Adams et al., 2022). Regular yoga practice has beneficial effects like, increase physical fitness and co-ordination to brain and muscles (Manna et al., 2004). It also reduces body fat and optimizes lipid profile (Manna, 2017). Yoga practice also reduces oxidative stress and increases the levels of antioxidants, and thus enhances bodies defence mechanism (Manna, 2018). The cardiovascular and pulmonary functions are considered as an indicator of health; these variables reflect the risk of cardio-pulmonary diseases (Agnihotri et al., 2016; Manna, 2017). Studies have shown that yoga practice have beneficial effects on cardiovascular and pulmonary functions (Manna, 2017; Halder et al., 2012).

The work related stress and lack of physical activity may increase the risks of various diseases, and increase the expanses for medical facilities. School children are also exposed to various levels of stress including long hours of school, academic load, and mental pressure due to competition etc. In the present time school children are also spends a large amount of time in the screen in computer/ tab and /or cell phone, which reduces the level of physical activities. The school has a role to identifying children who have low physical fitness. Yoga may be considered as mode of physical exercise in school, which may help to improve the physical and mental status of the children. This investigation was considered to observe the impact of regular

practice of yoga on body composition, physical fitness and cardio-pulmonary functions of 10–12 years healthy female volunteers.

II. Material And Methods

Sample size determination: The sample size was computed by using G*power software (7). To conduct a Two way ANOVA with repetitions, the input option was chosen as: test family- F test, Statistical Test- ANOVA: Repeated measures within between interaction. Effect size-Cohen's f = 0.4 according to Cohen (8), α error probability – 0.05, power – 0.95, Number of groups: 2, Number of Repetitions: 3, Nonsphericity correction ε = 1; the output was the noncentrality parameter λ – 16.00, critical F= 3.0872959, Numerator df – 2.0, Denominator df = 100, total sample size – 52, actual power – 0.95. Therefore, a total of 52 subjects were needed to carry out this study. To avoid mid study withdrawal a total of 145 female volunteers (age: 10–12 years) voluntary participated. Among them 25 volunteers were excluded due to injury and illness. The remaining 120 volunteers completed the study, and were grouped as the (i) control group (CG, n = 60) and (ii) Yoga Practitioners (YP, n = 60). The yoga practitioners were participating for last three years, whereas the control group volunteers were sedentary individuals.

Volunteers and group: One hundred and forty five (*n* = 145) healthy female volunteers (age: 10–12 years) who were not performing yoga for last 01 years were included from Midnapore District, West Bengal, India. Volunteers without history of disease and illness were included. Volunteers were medically examined by the Physicians. Twenty five participants were excluded due to injury and illness prior to the study, the remaining one hundred twenty (n=120) volunteers were randomly grouped into (i) Yoga Practitioners (YP: n = 60) and (ii) Sedentary Control Individual (SCI: n = 60).

Table 1: Training schedule for Yoga

Yogic Training Schedule	Duration of each session (min)
Prarthana	02
Om Uchharan	02
Gayatri Mantra	02
Yogic SukshmVyayam	10
Surya Namaskar	12
Yogasana (i) Mritasana (ii) Supt Pawanmuktasana (iii) Kandrasana (iv) Makarasana (v) Shalabhasana (vi) Bhujangasana (vii) Mandukasana (viii) Usharasana (ix) Gomukhasana	10
Pranayama (i) Kapal Bhati (ii) Mahabandh (iii) Laybadh Shvas Prashwas (iv) Nadi Shodhan (v) Ujjayi & Bhramari Pranaya	15
Meditation	05
(i) Ajpa Jap (ii) Shanti Mantra	02
Total	60

Experimental Design: The Yoga Practitioners (YP) followed a training schedule of 1 hour/day, 05 days/week for 24 weeks following a standard protocol (Chatterjee & Mondal, 2014) (Table 1). In the Sedentary Control Individual (SCI) no such training schedule were followed. Assessment of body composition, physical fitness and cardio-pulmonary variables were performed at 0 week, after 12 weeks and 24 weeks.

Ethical clearance: The volunteers were informed about the protocol and written informed consent was taken from them. They were asked to maintain normal diet and stay away from strenuous exercise while participated in this study. The Institutional Research Committee has given the approval for this study.

Measurement of Body Composition Variables

Measurement of height and body mass: The stature (height) was measured in centimeters by the stadiometer (Seca220, UK) (Jonson & Nelson, 1996). The weight (body mass) of the subject was recorded in kilograms on a standard electronic weighing machine (Seca Alpha 770, UK) (Jonson & Nelson, 1996).

Determination of BMI and BSA: The BMI and BSA were derived from the standard equations using body mass and stature (Jonson & Nelson, 1996).

Determination of Body Fat: The skin fold thickness were measured from the biceps, triceps, sub scapular, and suprailiac site using a skin fold caliper (Cescorf, USA) for determination of body density (Siri, 1956). The value of body density was used for determination of percent body fat (Siri, 1956). The fat mass and lean body mass (LBM) was derived from the standard equation (Jonson & Nelson, 1996).

Determination of Waist hip ratio: The waist hip ratio (WHR) was derived from the standard equation using the waist circumference (WC) and hip circumference (HC) of the subject (Jonson & Nelson, 1996).

Measurement of Mid-upper arm circumference: Using the non-stretchable still tape placed at the maximum extension of the subject's upper arm, the mid-upper arm circumference (MUAC) was measured (Jonson & Nelson, 1996).

Measurement of Physical Fitness Variables

Measurement of Handgrip Strength: The hand grip dynamometer (Baseline, USA) was used for measurement of hand grip strength of right hand grip strength (GSTR) and left hand grip strength (GSTL) following standard protocol (Lee & Gong, 2020).

Measurement of Flexibility: The sit and reach box (Baseline, USA) was used for determination of flexibility by modified sit and reach test (Hui & Yuen, 2000).

Determination of Hand Reaction Time: The subject was asked to stand near a table keeping elbow on the table extending wrist. The ruler was held vertically between outstretched index finger and thumb leveling zero mark on the ruler with the thumb. The ruler was not touch thumb or index finger of subject. After the call 'ready' the ruler was dropped vertically without warning and the subject caught the ruler as quickly as possible using index finger and thumb. The distance from zero mark and the position of thumb where it catches the ruler was recorded (Del et al., 2014). This test was performed 20 times and 5 higher and 5 lower scores were discarded and the middle 10 scores were taken. The average of the 10 scores was computed. The reaction time of left hand (LHRT) and reaction time of right hand (RHRT) were calculated using the standard equation.

Assessment of Fitness Index (PFI): The physical fitness index of the participants was assayed by modified Havard step test following standard protocol (Parmar & Modh, 2013).

Measurement of Cardio-pulmonary Variables

Measurement of heart rate and blood pressure: The heart rate during rest, maximum exercise and recovery was measured from the carotid artery using standard methods (Astrand & Rodhal, 1986). The blood pressure was measured by digital sphygmomanometer (Omron HEM 7120, Japan) in resting position (Astrand & Rodhal, 1986).

Assessment of Maximal Aerobic Capacity (VO_{2max}): The maximal aerobic capacity (VO_{2max}) was measured by Queen's College Step Test method using standard methods (Chatterjee et al., 2004).

Assessment of pulmonary functions: The lung function test including FVC, FEV_1 and PEFR was performed by portable digital spirometer (Spirobank II, MIR, USA) following standard protocol (Mustajbegovic et al., 2001).

Statistical Analysis: All the data collected were analyzed by a standard statistical software package IBM SSPSS 20 (IBM Corp., Armonk, NY: USA). The descriptive statistics including mean and standard deviation was computed. Repeated measures analysis of variance (ANOVA) and multiple comparison tests were applied to find out the difference between the variables (Mishra etal., 2019). The alpha was chosen at $P \leq 0.05$.

III. Results

Impact of Yoga Practice on Body Composition Variables of 10–12 Years Healthy Female Volunteers: A reduction (P≤0.05) in weight (body mass), BMI, body fat, fat mass, waist circumference, and waist-hip ratio was noted after 24 weeks of yoga practice. When compare to sedentary control individual group with yoga practitioner group, it was found that sedentary control group volunteers had significantly higher (P≤0.05) weight, BMI, BSA, percent body fat, fat mass, waist circumference, hip circumference, WHR and MUAC than the yoga practitioner group (Table 2).

Table 2: Impact of yoga practice on Body Composition Variables of 10–12 yrs healthy female volunteers

Parameters	Sedentary Control Individual (n=60)			Yoga Practitioners Group (n=60)		
	0 Wk	12 Wk	24 Wk	0 Wk	12 Wk	24 Wk
Stature (cm)	146.0 ± 4.1	146.1 ^{NS} ± 4.1	146.2 ^{NS} ± 4.2	146.3^{NS} ± 5.1	146.4 ^{NS} ± 5.2	146.5 ^{NS} ± 5.3
Body mass (kg)	43.1 ± 3.2	43.6^{NS} ± 3.4	43.8^{NS} ± 3.3	42.9^{NS} ± 3.3	41.6$^{\$}$ ± 3.8	40.4$^{*\$}$ ± 3.2
BMI (kg/m^2)	21.3 ± 2.2	21.7 ^{NS} ± 2.1	21.9 ^{NS} ± 2.2	20.1$^{\$}$ ± 2.3	19.4$^{\$}$ ± 2.1	18.9$^{*\$}$ ± 2.2
BSA (m^2)	1.4 ± 0.1	1.4^{NS} ± 0.05	1.4 ^{NS} ± 0.04	1.3$^{\$}$ ± 0.1	1.3$^{\$}$ ± 0.1	1.3$^{\$}$ ± 0.1
Body fat (%)	21.6 ± 2.4	22.2^{NS} ± 2.2	23.0* ± 2.3	20.3$^{\$}$ ± 2.7	18.6$^{*\$}$ ± 2.3	17.2$^{*\#\$}$ ± 2.6
Fat mass (kg)	9.8 ± 1.4	10.1^{NS} ± 1.5	10.2^{NS} ± 1.3	9.1$^{\$}$ ± 1.1	7.8$^{*\$}$ ± 1.8	6.7$^{*\#\$}$ ± 1.4
LBM (kg)	35.5 ± 3.1	36.0^{NS} ± 3.4	36.2^{NS} ± 3.5	34.4$^{\$}$ ± 3.8	35.1$^{\$}$ ± 3.5	35.6$^{\$}$ ± 3.6
WC (cm)	71.9 ± 5.1	73.4^{NS} ± 5.3	75.7$^{*\#}$ ± 5.4	68.5$^{\$}$ ± 5.7	67.4$^{\$}$ ± 6.2	64.6$^{*\$}$ ± 5.8
HC (cm)	83.0 ± 5.4	83.0^{NS} ± 5.5	84.3^{NS} ± 5.7	78.9$^{\$}$ ± 5.2	79.7$^{\$}$ ± 5.4	77.3$^{\$}$ ± 5.2
WHR	0.87 ± 0.08	0.89^{NS} ± 0.07	0.90^{NS} ± 0.09	0.86 ^{NS} ± 0.06	0.84$^{\$}$ ± 0.05	0.83$^{*\$}$ ± 0.05
MUAC (cm)	19.8 ± 2.7	19.9^{NS} ± 2.6	20.6^{NS} ± 2.8	21.5$^{\$}$ ± 3.0	22.5$^{\$}$ ± 2.8	22.8$^{\$}$ ± 2.7

[When compared to 0 week- $^{*}p\leq0.05$; when compared to 12 week- $^{\#}p\leq0.05$; when compared to control group- $^{\$}p\leq0.05$; NS= not significant]

Impact Yoga Practice on Physical Fitness Variables of 10–12 Years Healthy Female Volunteers: An increase (P≤0.05) in hand grip strength, flexibility and physical fitness index; and significant (P≤0.05) decrease in reaction time was observed after yoga training. When compare to sedentary control individual group with yoga practitioners group, it was found that sedentary control individual had significantly lower (P<0.05) in grip strength, flexibility and physical fitness index; and higher (P≤0.05) reaction time than the yoga practitioners group (Table 3).

*Impact Yoga Practice on C*ardio-pulmonary variables *of 10–12 Years Healthy Female Volunteers:* A decrease ($p\leq0.05$) in blood pressure, heart rate in rest, exercise and recovery; increase ($p\leq0.05$) in VO_{2max}, FVC, FEV1 and PEFR was observed after yoga training. When compare to sedentary control individual group with yoga practitioners group, it was found that sedentary control individual group volunteers had higher ($p<0.05$) in blood pressure, heart rate in rest, exercise and recovery; lower ($p\leq0.05$) VO_{2max}, FVC, FEV1 and PEFR than the yoga practitioners group (Table 4).

Table 3: Impact of yoga practice on Physical fitness variables of 10–12 yrs healthy female volunteers

Parameters	Sedentary Control Individual (n=60)			Yoga Practitioners Group (n=60)		
	0 Wk	12 Wk	24 Wk	0 Wk	12 Wk	24 Wk
GSTR (kg)	16.7 ± 2.7	16.8^{NS} ± 2.5	17.0^{NS} ± 2.4	17.1^{NS} ± 2.7	18.5$^{*\$}$ ± 2.5	19.7$^{*\$}$ ± 2.7
GSTL (kg)	16.1 ± 2.6	16.5^{NS} ± 2.4	17.5* ± 2.3	16.4 ^{NS} ± 2.7	18.2$^{*\$}$ ± 2.8	19.4$^{*\$}$ ± 2.2
Flexibility (cm)	29.6 ± 4.9	30.9^{NS} ± 4.1	31.7 ^{NS} ± 4.3	31.7 ^{NS} ± 4.5	33.7$^{\$}$ ± 4.5	34.9$^{*\$}$ ± 4.1
LHRT (Sec)	0.23 ± 0.01	0.23* ± 0.01	0.22* ± 0.01	0.22$^{\$}$ ± 0.01	0.21$^{*\$}$ ± 0.01	0.20$^{*\#\$}$ ± 0.01
RHRT (Sec)	0.24 ± 0.01	0.23* ± 0.01	0.23* ± 0.01	0.23$^{\$}$ ± 0.01	0.20$^{*\$}$ ± 0.01	0.19$^{*\$}$ ± 0.01
PFI	48.3 ± 4.1	48.5^{NS} ± 3.9	48.8^{NS} ± 4.6	48.7^{NS} ± 4.7	50.7^{NS} ± 4.8	52.6$^{*\$}$ ± 4.5

[When compared to 0 week- $^{*}p\leq0.05$; when compared to 12 week- $^{\#}p\leq0.05$; when compared to control group- $^{\$}p\leq0.05$; NS= not significant]

Table 4: Impact of yoga practice on cardio-pulmonary variables of 10–12 yrs healthy female volunteers

Parameters	Sedentary Control Individual (n=60)			Yoga Practitioners Group (n=60)		
	0 Wk	12 Wk	24 Wk	0 Wk	12 Wk	24 Wk
RSBP (mm Hg)	116.7 ± 7.2	116.2^{NS} ± 7.4	115.1^{NS} ± 7.8	116.4 ± 6.8	111.1$^{*\$}$ ± 6.7	109.3$^{*\$}$ ± 5.3
RDBP (mm Hg)	76.2 ± 5.2	75.9^{NS} ± 5.3	74.7^{NS} ± 5.6	75.1^{NS} ± 5.7	73.7^{NS} ± 5.0	70.3$^{*\#\$}$ ± 4.7
Rest HR (bpm)	90.0 ± 7.6	89.9^{NS} ± 7.8	89.7^{NS} ± 8.2	89.1 ± 7.3	84.9$^{*\$}$ ± 6.7	81.8$^{*\$}$ ± 6.3
HR_{max} (bpm)	177.7 ± 5.9	176.9^{NS} ± 6.1	177.4^{NS} ± 5.0	180.2^{NS} ± 5.3	178.0^{NS} ± 6.5	176.6* ± 7.2
RecHR1 (bpm)	153.2 ± 6.0	15.0^{NS} ± 5.7	150.4^{NS} ± 6.2	148.0$^{\$}$ ± 5.4	146.9$^{\$}$ ± 5.2	142.0$^{*\#\$}$ ± 5.6
RecHR2 (bpm)	133.2 ± 6.1	132.0^{NS} ± 6.4	131.8^{NS} ± 5.8	131.0^{NS} ± 5.6	128.7$^{\$}$ ± 5.8	121.6$^{*\#\$}$ ± 6.1
RecHR3 (bpm)	118.1 ± 5.9	117.0^{NS} ± 5.6	116.9^{NS} ± 5.0	115.0$^{\$}$ ± 5.7	114.2$^{\$}$ ± 4.8	111.7$^{*\$}$ ± 4.9
$VO_{2\ max}$ (ml/kg/min)	31.8 ± 3.6	32.1^{NS} ± 3.8	32.3^{NS} ± 3.4	33.0^{NS} ± 3.3	34.9$^{*\$}$ ± 3.7	36.8$^{*\$}$ ± 3.7
FEV1 (l)	1.86 ± 0.48	1.88^{NS} ± 0.47	1.91^{NS} ± 0.47	1.92 ± 0.47	2.20$^{*\$}$ ± 0.47	2.60$^{*\#\$}$ ± 0.57
FVC (l)	1.93 ± 0.56	1.95^{NS} ± 0.55	1.98^{NS} ± 0.54	2.00 ± 0.55	2.25$^{*\$}$ ± 0.50	2.64$^{*\#\$}$ ± 0.53
PEFR (l/min)	219.5 ± 11.4	221.0^{NS} ± 10.4	223.2^{NS} ± 10.9	226.1$^{\$}$ ± 10.6	241.4$^{*\$}$ ± 11.1	254.7$^{*\#\$}$ ± 10.7

[When compared to 0 week- $^{*}p\leq0.05$; when compared to 12 week- $^{\#}p\leq0.05$; when compared to control group- $^{\$}p\leq0.05$; NS= not significant, SBP= systolic blood pressure, DBP= diastolic blood pressure, RestHR= resting heart rate, HR_{max} = maximal heart rate, RecHR1= recovery heart rate 1st min, RecHR2= recovery heart rate 2nd min , RecHR3= recovery heart rate 3rd min, VO_{2max} = maximal oxygen capacity, FVC= Forced vital capacity, FEV1 = Forced expiratory volume during the 1st second, PEFR= Peak expiratory flow rate.]

IV. Discussion

Yoga has a beneficial role for keeping health and physical fitness. This investigation showed a decrease in that body mass, BMI, body fat, WHR among the yoga practitioners group. Moreover, the volunteers of the yoga practitioners group had lower body mass, BMI, fat, WHR than the sedentary control individual. The volunteers of yoga practitioners group underwent a high level of yogic exercise over a period of time, which may resulted in lowering of body fat percentage. Yoga asana involves movements of different limbs, change in posters and bending ether in forwards or backwards direction. These may cause increase activities of abdominal muscles, which may be the probable cause of reduction in body mass, BMI, body fat and WHR after yoga practice. Similar findings were noted by many authors where reduction in body weight and body fat was observed following yoga (Manna, 2018; George & Ludvik, 2000; Zorofi et al., 2013; Mehta et al., 2017). On the other hand, no change was observed in height, BSA, LBM, hip circumference and MUAC after yoga training. This may be because of the limited time of yoga practice. Obesity and increase in subcutaneous fat may elevate risk for cardiovascular disease (Manna, 2018; George & Ludvik, 2000; Zorofi et al., 2013; Mehta et al., 2017).

Yoga has been considered as mode of physical exercise. This investigation showed an improvement in strength, flexibility and physical fitness index; and reduction in reaction time among the volunteers of yoga practitioners group following the schedule yoga practice. When compare to sedentary control group with yoga group, it was found that control group volunteers had significantly lower in grip strength, flexibility and physical fitness index; and higher reaction time than the yoga group volunteers. Yoga asana involves movements of different limbs, change in posters and bending ether in forwards or backwards direction. These may cause increase activities of the muscles all over the body, which may the cause increase in grip strength, flexibility and physical fitness index; and reduction in reaction time after yoga training. Similar observations were reported by many authors (Govindaraj et al., 2016; Singh et al., 2017).

Yoga has beneficial health effects. This investigation showed decrease in blood pressure and heart rate in rest, exercise and recovery; and increase in VO_{2max}, FVC, FEV1 and PEFR among the volunteers of yoga practitioners group following the schedule yoga practice. When compare to sedentary control group with yoga group, it was found that these volunteers had higher blood pressure and heart rate in rest, exercise and recovery; and lower VO_{2max}, FVC, FEV1 and PEFR than the yoga practitioners group volunteers. Similar observations

were noted by other investigators (Parkhad, 2015; Manna, 2018; Nivethitha et al., 2016; Selvamurthy et al., 1983). Yoga consists of asana, pranayama and meditation. Yoga asana involves movements of different limbs, change in posters and bending ether in forwards or backwards direction. Pranayama involves deep and slow breathing, uni-nostril breathing, alternate nostril breathing, breathing holding etc. this may cause lowering of cardiovascular parameters like blood pressure and heart rate among the volunteers of yoga practitioners group following the schedule yoga practice (Manna, 2018; Nivethitha et al., 2016; Selvamurthy et al., 1983). Pranayama and meditation may increase the parasympathetic activation which may lower the heart rate and blood pressure following yoga practice (Nivethitha et al., 2016). Regular follow of yoga may improve the parasympathetic activations over and sympathetic activity which is responsible for restoration of cardiovascular functions (Selvamurthy et al., 1983). Meditation also activate parasympathetic nervous system and thus reduce anxiety, stress – and lowers arterial tone and peripheral resistance, which may result in decreased blood pressure and heart rate, and thus improve peripheral circulation and blood flow to the tissues (Selvamurthy et al., 1983; Gopal et al., 1973). Thus regular practice of yoga may reduce the risk of cardiovascular disease risk. Yoga asana involves movements of different limbs, change in posters and bending ether in forwards or backwards direction. Pranayama involves deep and slow breathing, uni-nostril breathing, alternate nostril breathing, breathing holding etc which might be the cause of increase in VO_{2max}, FVC, FEV1 and PEFR after yoga training (Patil, 2012; Doijad et al., 2013; Tyagi & Cohen, 2013). Elevation in pulmonary functions and maximal aerobic capacity enhance the level of fitness and reduce the risk for pulmonary disease. Regular yoga practice may reduce body fat, which is essential for disease free life.

V. Conclusion

Regular practice of yoga helps to maintain normal healthy life style and physical fitness which is indicated by improving body composition, cardiovascular and pulmonary functions. This investigation showed that regular practice of yoga has beneficial effects on body composition, physical fitness cardiovascular and pulmonary functions in healthy individuals. Yoga practice may reduce the chance of CVD and pulmonary diseases. School may adopt the yoga regime as an alternate mode of exercise for school children. As young people are the working force of the country, thus regular yoga practice can improve number of working days, productivity; and reduce expenditure towards medication by maintaining disease free lifestyle.

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