CHAPTER- 6

Results

6.0 RESULTS

The results anthropometric body composition and psychological parameters are summarized below.

Table- 9a Results of anthropometric parameters:

Sl. No.	Group	Parameter	Pre	Post	Follow up	Sig. in pre - post	Sig. in pre - follow up
1	yoga	Wt-weight	82.63±10.05	81.51±10.00	80.47±9.59	0.004 **	0.007 **
	control		79.45±8.85	79.22±8.93	78.82±9.16	-	-
2	yoga	MAC left	29.98±2.02	29.42±1.92	28.21±1.59	0.02 **	<0.001 ***
	control		32.53±16.53	28.10±1.70	28.30±1.86	-	-
	yoga	MAC right	30.18±2.04	29.64±2.04	28.24±2.07	0.02 **	<0.001 ***
	control		32.47±16.73	28.10±1.85	28.39±2.04	-	-
4	yoga	HC	103.50±5.71	101.29±4.95	99.46±4.76	< 0.001 ***	<0.001 ***
	control		104.28±6.60	101.38±6.13	100.50±5.79	<0.001 ***	<0.001 ***
5	yoga	WC	99.58±7.37	98.25±7.12	95.09±6.76	0.04 *	<0.001 ***
	control		99.28±6.82	95.79±8.33	96.29±7.20	<0.001 ***	0.002 **
6	yoga	WHR	0.96±0.04	0.97±0.05	0.96±0.04	-	-
	control		0.95±0.06	0.94±0.06	0.96±0.05	-	-
7	yoga	Percentage body fat (from skin fold)	30.78±4.37	29.66±3.30	28.16±3.45	0.051 *	<0.001 ***
	control		27.55±5.17	27.58±5.29	27.64±4.65	-	-
8	yoga	BMI	28.7±2.35	28.33±2.42	27.97±2.21	0.008 **	0.009 **
	control		27.70±2.05	27.61±2.01	27.28±2.55	-	-
9	yoga	SKF - cumulative	93.93±22.56	85.52±13.38	76.45±11.74	0.03 *	<0.001 ***

	control	skin fold	73.65±20.61	72.17±14.55	72.12±13.88	-	-
10	yoga	Biceps-Raf	14.55±7.19	12.70±5.02	11.62±3.14	-	0.02 *
	control		10.72±5.00	11.10±3.69	10.34±3.06	-	-
11	yoga	Triceps-SKF right arm back side- Rab	19.05±7.01	17.87±5.05	15.26.±2.90	-	0.001 ***
	control		13.70±6.57	13.22±4.24	14.77±3.66	-	-
12	yoga	Suprailiac-SKF at stomach front side-Stof	32.45±7.82	28.04±5.45	26.47±6.69	0.002 **	0.001 ***
	control		27.46±9.37	25.57±7.06	24.81±6.10	-	-
13	yoga	Sub scapular-SKF shoulder back side-Shob	27.87±6.97	26.91±5.23	23.10±5.61	-	0.002 **
	control		21.76±7.11	22.28±4.98	22.2±6.42	-	-

Note: *** means p<0.001, ** means p<0.01, * means p<0.05

Table- 9b Results of body composition parameters

Sl. No.	Group	Parameter	Pre	Post	Follow up	Sig in pre post	Sig in pre follow up
1	yoga	Bmr	1582.81±151.60	1574.35±145.84	1584.14±157.38	-	-
	control		1566.83±128.98	1564.37±130.06	1563.40±129.49	-	-
2	yoga	Bm	3.16±0.44	3.08±0.42	3.16±0.44	0.02 *	-
	control		3.11±0.39	3.09±0.39	3.08±0.38	-	0.04 *
3	yoga	Obd	130.52±10.65	128.77±10.98	127.13±10.02	0.005 **	0.007 **
	control		126.11±9.41	125.56±9.27	124.94±10.11	-	-
4	yoga	Smm	31.61±4.18	31.37±4.04	31.65±4.40	-	-
	control		31.14±3.59	31.04±3.60	31.06±3.62	-	-

5	yoga	Fm	26.48±5.42	25.75±6.03	24.25±4.45	-	<0.001 ***
	control		24.04±5.65	23.91±5.63	23.57±5.68	-	-
6	yoga	Pfin	31.94±4.36	31.43±4.84	30.12±3.94	-	<0.001 ***
	control		30.05±5.14	29.98±5.14	29.68±5.08	-	-
7	yoga	Aobd	0.94±0.03	0.94±0.03	0.93±0.03	-	<0.001 ***
	control		0.94±0.03	0.93±0.03	0.93±0.03	-	-
8	yoga	Ralm	3.33±0.49	3.35±0.53	3.34±0.55	-	-
	control		3.23±0.44	3.27±0.46	3.24±0.45	-	-
9	yoga	Lalm	3.28±0.47	3.29±0.52	3.29±0.56	-	-
	control		3.21±0.42	3.25±0.45	3.23±0.43	-	-
10	yoga	Tlm	26.15±2.89	26.12±3.08	26.16±3.26	-	-
	control		25.59±2.58	25.77±2.71	25.72±2.59	-	-
11	yoga	Rllm	8.49±1.27	8.47±1.25	8.42±1.26	-	-
	control		8.33±1.10	8.27±1.08	8.29±1.05	-	-
12	yoga	Lllm	8.54±1.26	8.49±1.18	8.44±1.20	-	-
	control		8.27±1.06	8.24±1.07	8.24±1.05	-	-
13	yoga	Wmra	1.86±0.61	1.81±0.70	1.61±0.46	-	0.001 ***
	control		1.64±0.61	1.62±0.62	1.59±0.59	-	-
14	yoga	Wmla	1.88±0.61	1.84±0.71	1.63±0.47	-	0.001 ***
	control		1.65±0.60	1.62±0.62	1.59±0.59	-	-
15	yoga	Wmt	14.35±2.83	13.97±3.24	13.26±2.45	-	0.001 ***
	control		13.06±3.09	13.05±3.10	12.84±3.13	-	-
16	yoga	Wmrl	3.54±0.74	3.42±0.75	3.24±0.59	-	0.001 ***
	control		3.23±0.71	3.17±0.66	3.15±0.69	-	-
17	yoga	Wmll	3.53±0.73	3.41±0.74	3.23±0.58	-	0.001 ***
	control		3.22±0.71	3.16±0.65	3.13±0.68	-	-
18	yoga	Pfra	34.00±6.95	33.10±7.28	31.13±6.42	-	0.001 ***
	control		31.73±8.26	31.25±8.75	31.01±8.14	-	-
19	yoga	Pfla	34.59±6.99	33.82±7.53	31.67±6.62	-	0.001 ***

	control		31.94±8.04	31.36±8.89	30.94±7.98	-	-
20	yoga	Pft	33.96±4.04	33.34±4037	32.27±2.80	-	0.001 ***
	control		32.22±5.03	32.09±5.19	31.71±5.1	-	-
21	yoga	Pfrl	28.21±3.89	27.59±4.11	26.74±3.61	-	0.001 ***
	control		26.75±4.43	26.53±4.28	26.36±4.27	-	-
22	yoga	Pfll	28.04±3.87	27.49±4.12	26.62±3.64	-	0.001 ***
	control		26.80±4.46	26.56±4.27	26.34±4.23	-	-
23	yoga	Pm	11.09±1.38	11.02±1.35	11.11±1.46	-	-
	control		10.94±1.18	10.90±1.19	10.91±1.20	-	-
24	yoga	Mm	3.77±0.52	3.70±0.50	3.78±0.52	0.046 *	0.806
	control		3.74±0.45	3.71±0.46	3.69±0.46	-	0.006 **
25	yoga	Tbwm	41.14±5.14	40.90±4.95	41.18±5.34	-	-
	control		40.59±4.35	40.54±4.40	40.49±4.36	-	-
26	yoga	Sklm	53.00±6.60	52.68±6.37	53.06±6.90	-	-
	control		52.29±5.62	52.20±5.66	52.16±5.63	-	-
27	yoga	ffm	56.09±7.03	55.71±6.74	56.16±7.28	-	-
	control		55.36±5.97	55.25±6.03	55.19±5.99	-	-

Note: *** means $p<0.001$, ** means $p<0.01$, * means $p<0.05$

Table- 9c Results of psychological parameters

Sl. No.	Group	Parameter	Pre	Post	Followup	Sig. in PRE POST	Sig. in PRE FOLLOW UP
1	yoga	PSS-pss	16.51±6.12	12.59±6.65	12.16±6.90	< 0.001 ***	<0.001 ***
	control		14.29±6.51	13.51±5.95	13.06±6.31	-	-
2	yoga	AAQW-aaqw	81.24±17.35	71.54±14.62	74.76±16.16	<0.001 ***	0.02 *
	control		73.11±14.80	69.71±16.28	66.63±14.20	-	0.008 *
3	yoga	psqi	5.08±2.75	4.16±2.03	4.38±2.67	0.02 *	-
	control		4.91±2.5	4.23±2.45	4.44±2.67	-	-
4	yoga	Ghqs (0011)	1.73±2.78	0.43±1.68	0.54±1.99	0.002 **	0.004 **
	control		1.00±1.51	1.06±2. 47	0.66±1.49	-	-
5	Yoga	Ghml	1.76±2.64	0.81±2.49	0.81±2.03	0.03 *	0.02 *
	control		1.11±1.57	1.06±2.30	0.74±1.52	-	-
6	yoga	Phq	4.72±4.60	3.08±3.36	3.24±3.94	0.02 *	0.03 *
	control		4.06±4.74	3.43±3.48	3.11±3.54	-	-
7	yoga	MAAS	4.28±0.90	4.52±0.79	4.52±0.90	-	-
	control		4.45±0.86	4.52±0.81	4.64±0.93	-	-
8	yoga	Ipqr (IPAQ)	1772.12±2161.29	2127.00±3568.65	1868.81±2209.72	-	-
	control		2459.96±2465.01	2546.14±2434.58	1831.24±2220.50	-	-
9	yoga	Brqf	40.27±21.91	47.49±15.66	44.43±18.61	0.011 *	-
	control		39.89±22.33	38.03±23.36	39.86±22.12	-	-

Note: *** means p<0.001, ** means p<0.01, * means p<0.05

Table- 9d Results of PSQI sleep components are given below:

Sl. No.	Group	Parameter	Pre	Post	Follow up	Sig. in pre post	Sig. in pre follow up
1	yoga	Slpq	0.84±0.69	0.57±0.55	0.68±0.53	0.03 *	-
	control		0.83±0.41	0.63±0.55	0.69±0.53	0.04 *	-
2	yoga	Slpl	0.81±0.70	0.68±0.67	0.70±0.78	-	-
	control		0.77±0.91	0.69±0.83	0.80±0.83	-	-
3	yoga	Slpd	0.68±0.75	0.76±0.55	0.76±0.86	-	-
	control		0.83±0.75	0.69±0.76	0.74±0.78	-	-
4	yoga	Hsle	0.59±0.93	0.27±0.51	0.43±0.77	0.02 *	-
	control		0.46±0.74	0.23±0.49	0.37±0.88	-	-
5	yoga	Sldd	1.30±0.70	1.14±0.54	1.08±0.55	-	-
	control		1.29±0.57	1.26±0.61	1.14±0.55	-	-
6	yoga	Uslm	0.14±0.35	0.08±0.28	0.08±0.49	-	-
	control		0.03±0.17	0.09±0.28	0.06±0.24	-	-
7	yoga	Dtd	0.73±0.69	0.68±0.53	0.81±0.84	-	-
	control		0.66±0.54	0.66±0.68	0.74±0.89	-	-

Note: *** means p<0.001, ** means p<0.01, * means p<0.05

The base line demographic data of both the groups were similar. The distribution of socio economic and working conditions was similar in both the groups. The food habits (vegetarian and non-vegetarian) and family status (married and unmarried) were similar in both the groups. The minimum age in the Yoga group was 26 years and maximum 60 years. In the Control group minimum age was 21 years and maximum was 58 years. The BMI of the Yoga group ranged from 25.33 to 34.84 kg/m^2 with the mean ±SD 28.7±2.35 kg/m^2. The BMI of Control group ranged from 25.01 to 33.64 kg/m^2 with the mean ±SD 27.70±2.05 kg/m^2.

The educational and anthropometric data were similar in both groups. In each group, out of 40 subjects, 20 were with educational qualification between 10^{th} standard to graduate, and 20 were

with postgraduation or above. In each group, the number of subjects with age from 18 to 40 was 20 and age from 41 to 60 years was 20. Even though the inclusion criteria specified for BMI, was from 23 kg/m^2 in each group the enrolled subjects were having BMI above 25 kg/m^2. Further in each group all the subjects were working.

The Yoga group was given yoga intervention for fourteen weeks. The average attendance in percentage was 66, 61, 53 and 49 at the completed weeks of 6, 8, 12 and 14 respectively. The Control group was asked to do routine normal physical activity like walking during that time, in place of yoga intervention. Further they were told that their parameters will be monitored, total 3 times during the period of intervention and respective results will be given after measurements (i.e.at baseline, 14^{th} week and 3 month after 14^{th} week).

The sample food plan, a format for food log and respective individual assessments were given to both the groups. The regular food log and calorie intake was not obtained from either group. The Control group was also asked not to do any form of yoga practice during the 6 months.

After the fourteen weeks the assessments were done for both the groups, using the same instruments which were used for baseline assessments. Further the Yoga group was asked to continue yoga practice at their home and the Control group was asked to continue the physical activity like walking during the period in place of yoga practice. The adherence to the conditions was confirmed by self-declaration during the assessments.

After three months from the second assessment, the third assessment was carried out for both the groups with same instruments.

a) First three months:
i. Anthropometric parameters

After the fourteen weeks of IAYT intervention, the body weight (wt) reduction in Yoga group was significant ($p<0.004$) and reduction in Control group was not significant.

The Mid arm circumference (MAC) of both left and right arm were reduced in both groups. In Yoga group left MAC change was significant ($p<0.02$) and in Control group, it was not significant. Similarly right MAC of Yoga group was reduced and change was significant ($p<0.02$) and change in Control group was not significant.

The WC (waist circumference), Right arm front side SKF (skin fold thickness), WHR (waist hip ratio) and Percentage body fat based on SKF were not normally distributed. The WHR and the Percentage body fat (based on 4 point skin fold thickness) and the bicep SKF were reduced in both the groups but were not significant.

The improvement in WC in both groups were significant (Yoga $p<0.04$ & Control $p<0.001$). The reduction in HC was also significant in both the groups

The BMI was reduced in both groups but reduction was significant in Yoga group ($p<0.01$). There was no significant change in the ABSI.

The change in cumulative skin fold thickness was significant in Yoga group alone ($p<0.03$). Further among the four separate measurements of skin fold thickness, in the Yoga group alone, suprailiac skin fold thickness change (reduction) was significant ($p<0.002$). In both groups all the four skin fold thickness values showed trend of reduction, except that in the Control group biceps and sub scapular skin fold thickness showed increasing trend. Also percentage body fat calculated based on the cumulative skin fold thickness, reduced only in the Yoga group ($p<0.05$) and in the Control group it was increased but not significant.

ii. Body composition

After three months, in both the groups all other body composition parameters showed trend of improvement. But reduction in bone & mineral mass (both $p<0.02$), and Obesity degree ($p<0.01$) were significant in Yoga group alone. In both the groups, both the arm lean masses increased whereas in Control group trunk lean mass also increased.

iii. Psychological Parameters

After fourteen weeks, the PSS score improvement was significant ($p<0.001$) in Yoga group alone. In Yoga group AAQW score improvement was significant ($p<0.001$) and in Control group score was improved but not significant.

All the scores of the seven components of PSQI showed trend of improvement from Pre to Post in Yoga group and improvement of two of them, namely Habitual sleep efficiency (hsle) ($p<0.02$) and Sleep quality (slpq) ($p<0.03$) were significant. In the Control group, Use of Sleep Medication and Day Time Dysfunction were increased (worsened) Sleep duration reduced and all other components were reduced (improved) but not significant. Change (improvement) in sleep quality was found significant ($p<0.04$) in the Control group.

iv. Correlations:

Regarding relative improvements among the variables, body weight was positively correlated with HC ($r =0.234$, $p<0.02$), WC ($r=0.366$, $p<0.01$), SKF suprailiac ($r=0.12$, $p<0.16$) PSS score ($r= 0.18$, $p<0.07$) and AAQW score ($r=0.15$, $p<0.10$). The left MAC was negatively correlated with PSS ($r=-0.28$, $p<0.01$) but there was no significant correlation with AAQW.

Also right MAC was negatively correlated with PSS ($r=-0.29$, $p<0.01$) and there was no correlation with AAQW.

SKF suprailiac and SKF sub scapular had positive correlation ($r=0.46$, $p<0.001$), triceps and sub scapular skin fold had positive correlation ($r=0.28$, $p<0.01$). The BMI and HC had positive correlation ($r=0.23$, $p<0.03$). The PSS was correlated positively with AAQW scores ($r=0.22$, $p<0.04$).

There was positive correlation of BMI with Protein mass ($r=0.308$, $p<0.01$), Mineral mass ($r=0.227$, $p<0.05$) Bone mass ($r=0.233$, $p<0.05$), BMR (basal metabolic rate) (0.237, $p<0.01$), Fat mass (.511, $p<0.01$), FFM (Fat free mass) (0.324, $p<0.01$) Total body water ($r=0.324$, $p<0.01$)

Skeletal muscle mass (r=0.326, p<0.01) and PSQI score (r=0.201, p<0.05). It was also found that FFM is strongly and positively correlated to BMR.

v. Between group analysis:

In the between group analysis, difference in scores in the parameters of body weight, HC, SKF suprailiac, BMI, PSS and AAQW were not significant.

b) Follow up:

i. Anthropometric parameters

The body weight was reduced in both yoga and control groups. However reduction in the Yoga group alone, was found significant (p<0.007). The upper mid arm circumference of right arm (MACR) and upper mid arm circumference of left arm (MACL) were reduced in both Yoga and Control groups. Change in the Yoga group alone was significant (p<0.001). Compared to baseline values, the WHR remained same in the Yoga group, increased in Control group but not significant. In the Yoga group, the percentage body fat PFT based on chart (Durnin & Womersley, 1974) was decreased and was found significant (p<0.001). In the Control group change was not significant.

Further the HC was found reduced and was significant in both the groups (p<0.001). The SKF cumulative (SKFT) was reduced in both the groups but was significant (p<0.001) in the Yoga group alone. The skin fold thickness of triceps (p<0.001) suprailiac (p<0.001) and sub scapular (p<0.002) and biceps (p<0.02) were reduced in yoga group. In control group sub scapular and biceps reduced but were not significant. The skin fold thickness of triceps and suprailiac were increased but changes were not significant. The BMI was reduced in both the groups with significance (p< 0.009) in the Yoga group alone. There was no change in ABSI in both the groups.

ii. Body composition results

The following improvements were significant in yoga groups-The bmi (p<0.009), obesity degree (p<0.007), abdominal obesity degree, fat mass and percentage body fat (all with p<0.001), water

mass at trunk and both limbs (all with $p<0.001$), parentage body fat at trunk and both limbs (all with $p<0.001$). There was improvement in other body composition parameters but were not significant.

iii. Psychological Parameters

The improvement in PSS was significant in Yoga group ($p<0.001$) alone. In both the groups the AAQW improvement was significant (yoga $p<0.02$ and control $p<0.01$). There was improvement in PSQI global (sum of seven components) score but not significant. Except sleep quality (slpq) and day time dysfunction (Dtd), all other five components of PSQI were reduced in the Yoga group and in the Control group all reduced except sleep latency (slpl), use of sleep medication (uslm) and day time dysfunction (Dtd). These Changes were not significant.

iv. Correlations

BMI was positively correlated to WC ($r=0.509$, $p<0.01$), CST ($r=0.443$, $p<0.01$), HC ($r=0.47$, $p<0.01$) and AAQW($r=0.348$, $p<0.01$). The PSS was not much correlated to BMI. The PSS was negatively correlated to MACL ($r=-0.291$, $p<0.01$) and MACR ($r=-0.300$, $p<0.01$).

It was found that there is positive correlation of body weight with Bmr, obesity degree, skeletal muscle mass, fat mass, percentage body fat, protein mass, mineral mass, fat free mass, total body water, skeletal muscle mass (all with $p<0.01$) and there was no much correlation with PSQI.

v. In the between group analysis no significant change in any body composition parameters was observed.

The results of between group analysis carried out at Pre and Post states are given below.

Table- 10 Pre state between group analysis

Variable	Yoga – Pre- Mean ±Std dev	Control Pre-Mean ±Std dev	t	Sig (2 tailed)	Diff. in Mean 95% CI lower/Upper
Age	40.03±8.74	42.20±12.06	-0.88	0.38	-2.17(-7.10-2.76)
Ht	169.45±7.35	169.29±6.37	0.10	0.92	0.16 (-3.08-3.40)
Wt	82.63±10.05	79.45±8.85	1.42	0.16	3.18 (-1.28-7.64)
Macl	29.98±2.02	32.53±16.53	-0.93	0.35	-2.55 (-8.01-2.91)
Macr	30.18±2.04	32.47±16.73	-0.83	0.41	-2.29 (-7.82-3.23)
Wc	99.58±7.37	99.28±6.82	0.18	0.86	0.30 (-3.05-3.64)
Hip	103.50±5.71	104.28±6.60	-0.54	0.59	-0.78 (-3.67-2.12)
Raf	14.55±7.19	10.72±4.98	2.62	0.01	3.83 (0.91-6.76)
Rab	19.05±7.01	13.70±6.57	3.34	0.00	5.35 (2.15-8.55)
Stof	32.45±7.82	27.46±9.37	2.46	0.02	4.99 (0.94-9.03)
Shob	27.87±6.97	21.76±7.11	3.68	0.00	6.11 (2.80-9.42)
Bmi	28.70±2.35	27.70±2.05	1.91	0.06	1.00 (-0.04-2.03)
Whr	0.96±0.04	0.95±0.06	0.75	0.46	0.01 (-0.01-0.03)
Absi	0.08±0.00	0.08±0.00	-2.11	0.04	0.00 (0.00-0.00)
Skft	93.93±22.56	73.65±20.61	3.98	0.00	20.28 (10.10-30.45)
Pfc	30.78±4.37	27.55±5.17	2.87	0.01	3.23 (0.98-5.48)
Ghqs	1.73±2.78	1.00±1.51	1.37	0.17	0.73 (-0.33-1.79)
Ghml	1.76±2.64	1.11±1.57	1.25	0.22	0.64 (-0.39-1.67)
Pss	16.51±6.12	14.29±6.51	1.50	0.14	2.23 (-0.74-5.19)
Phq	4.73±4.60	4.06±4.74	0.61	0.54	0.67 (-1.52-2.87)
Maas	4.28±0.90	4.45±0.86	-0.83	0.41	-0.17 (-0.59-0.24)
Ipqr (ipaq)	1772.12±2161.29	2459.96±2465.01	-1.26	0.21	-687.84 (-1775.96-400.28)
aaqw	81.24±17.35	73.11±14.80	2.13	0.04	8.13 (0.53-15.73)
Brqf	40.27±21.91	39.89±22.33	0.07	0.94	0.38 (-10.02-10.79)
psqi	5.08±2.75	4.86±2.50	0.36	0.72	0.22 (-1.01-1.46)
Bmr	1582.81±151.60	1566.83±128.98	0.48	0.63	15.98 (-50.36-82.32)
Bm	3.16±0.44	3.11±0.39	0.46	0.64	0.05 (-0.15-0.24)
Obd	130.52±10.65	126.11±9.41	1.86	0.07	4.41 (-0.32-9.15)
Smm	31.61±4.18	31.14±3.59	0.51	0.61	0.47 (-1.37-2.31)
Fm	26.48±5.42	24.04±5.65	1.87	0.07	2.44 (-0.16-5.04)
Pfin	31.94±4.36	30.05±5.14	1.68	0.10	1.89 (-0.35-4.12)
Aobd	0.94±0.03	0.94±0.03	0.44	0.66	0.00 (-0.01-0.02)
Ralm	3.33±0.49	3.23±0.44	0.92	0.36	0.10 (-0.12-0.32)
Lalm	3.28±0.47	3.21±0.42	0.64	0.53	0.07 (-0.14-0.28)
Tlm	26.15±2.88	25.59±2.58	0.87	0.39	0.56 (-0.73-1.85)
Rllm	8.49±1.27	8.33±1.10	0.57	0.57	0.16 (-0.40-0.72)

Lllm	8.54±1.26	8.27±1.06	0.97	0.34	0.27 (-0.28-0.82)
Wmra	1.86±0.61	1.64±0.61	1.53	0.13	0.22(-0.07-0.51)
Wmla	1.88±0.61	1.65±0.60	1.61	0.11	0.23(-0.05-0.51)
Wmt	14.35±2.83	13.06±3.09	1.86	0.07	1.30 (-0.09-2.69)
Wmrl	3.54±0.74	3.23±0.71	1.78	0.08	0.30 (-0.04-0.64)
Wmll	3.53±0.73	3.22±0.71	1.81	0.07	0.31 (-0.03-0.65)
Pfra	34.00±6.95	31.73±8.26	1.27	0.21	2.27 (-1.31-5.85)
Pfla	34.59±6.99	31.94±8.04	1.49	0.14	2.65 (-0.89-6.18)
Pft	33.96±4.04	32.22±5.03	1.62	0.11	1.74 (-0.40-3.88)
Pfrl	28.21±3.89	26.75±4.43	1.50	0.14	1.47 (-0.49-3.42)
Pfll	28.04±3.87	26.80±4.46	1.27	0.21	1.25 (-0.72-3.21)
Pm	11.09±1.38	10.94±1.18	0.48	0.63	0.15 (-0.46-0.75)
Sklm	53.00±6.60	52.29±5.62	0.49	0.63	0.71 (-2.18-3.60)
ffm	56.09±7.03	55.36±5.97	0.47	0.64	0.73 (-2.34-3.80)

Table- 11 Post state Between group analysis

Post -Between Group Analysis					
Variable	Yoga - Post-Mean Std dev n=37	Control Post-Mean Std dev n=35	t	Sig(2 tailed)	Diff. in Mean 95% CI lower/Upper
Wt	81.51±10.00	79.22±8.93	1.02	0.31	2.29 (-2.17- 6.76)
Macl	29.42±1.92	28.10±1.70	3.07	0.003	1.32 (0.46-2.17)
Macr	29.64±2.04	28.10±1.85	3.35	0.001	1.54 (0.62- 2.46)
HC	101.29±4.95	101.38±6.13	-0.07	0.945	-0.09 (-2.70 – 2.52)
Triceps -Rab	17.87±5.05	13.22±4.24	4.22	<0.001	4.65 (2.42- 6.85)
Supraili ac-Stof	28.04±5.45	25.57±7.06	1.66	0.101	2.47 (-0.49 -5.42)
Sub scapula r-Shob	26.91±5.23	22.28±4.98	3.85	<0.001	4.63 (2.23 -7.04)
Bmi	28.33±2.42	27.61±2.01	1.37	0.175	0.72 (-0.33 -1.77)
Cumula tive skin fold-Skft	85.52±13.38	72.17±14.55	4.06	<0.001	13.35 (6.79 – 19.91)
Pss	12.59±6.65	13.51±5.95	-0.62	0.539	-0.92 (-3.89 -2.05)
Aaqw	71.54±14.62	69.71±16.28	0.5	0.618	1.83 (-5.44-9.09)
Psqi	4.16±2.03	4.23±2.45	-0.13	0.901	-0.07 (-1/12 – 0.99)
Bmr	1574.35±145. 84	1564.37±130. 06	0.31	0.761	9.98 (-55.11 -75.07)
Bm	3.08±0.42	3.09±0.39	-0.20	0.846	-0.02 (-0.21 -0.17)
Obd	128.77±10.98	125.56±9.27	1.34	0.186	3.21 (-1.58 -8.0)
Smm	31.36±4.04	31.04±3.60	0.36	0.718	0.33 (-1.47 – 2.13)
Fm	25.75±6.03	23.91±5.63	1.34	0.186	1.84 (-0.91 -4.59)
Pfin	31.43±4.84	29.98±5.14	1.23	0.222	1.45 (-0.90 – 3.80)

Aobd	0.94±0.03	0.93±0.03	0.72	0.476	0.01 (-0.01 – 0.02)
Ralm	3.35±0.53	3.27±0.46	0.73	0.466	0.09 (-0.15 -0.32)
Lalm	3.29±0.52	3.25±0.45	0.38	0.707	0.04 (-0.19 -0.27)
Rllm	8.47±1.25	8.27±1.08	0.70	0.487	0.19 (-0.36 – 0.74)
Tlm	26.12±3.08	25.77±2.71	0.51	0.608	0.35 (-1.02- 1.72)
Lllm	8.49±1.18	9.24±1.07	0.96	0.34	0.25 (-0.27- 0.78)
Wmra	1.81±0.70	1.62±0.62	1.21	0.231	0.19 (-0.12 -0.50
Wmla	1.84±0.71	1.62±0.62	1.35	0.182	0.21 (-0.10 -0.53)
Wmt	13.97±3.24	13.05±3.10	1.23	0.225	0.92 (-0.57 – 2.41)
Wmrl	3.42±0.75	3.17±0.66	1.49	0.141	0.25 (-0.08 -0.58)
Wmll	3.41±0.74	3.16±0.65	1.54	0.128	0.25 (-0.07 -0.58)
Pfra	33.10±7.28	31.25±8.75	0.98	0.331	1.85(-1.92 -5.63)
Pfla	33.82±7.53	31.36±8.89	1.28	0.208	2.46(-1.40- 6.32)
Pft	33.34±4.37	32.09±5.19	1.10	0.273	1.25 (-1.0 -3.50)
Pfrl	27.59±4.11	26.53±4.28	1.07	0.287	1.06(-0.91 -3.03)
Pfll	27.49±4.13	26.56±4.27	0.94	0.351	0.93(-1.04 -2.90)
Pm	11.02±1.35	10.90±1.19	0.38	0.707	0.11 (-0.49 -0.71)
Mm	3.7±0.50	3.71±0.46	-0.10	0.921	-0.1 (-0.24 -0.21)
Tbwm	40.90±4.95	40.54±4.40	0.33	0.746	0.36 (-1.85 -2.57)
Sklm	52.68±6.37	52.20±5.66	0.34	0.736	0.48 (-2.36 -3.32)
Ffm	55.71±6.75	55.25±6.03	0.31	0.760	0.46 (-2.55-3.48)

Further, the correlation test carried out, among the difference between Post and Pre values, to find the relative improvements, are given as below.

Table- 12a Correlation test- difference of Pre and Post Anthropometric

Table-5 Correlations among (n=72) variable

	wt	macl	macr	wc	HC	raf	rab	stof	shob	bmi	whr	skft	pfc	pss	aaqw
wt	1.00														
macl	-0.03	1.00													
macr	-0.02	.995**	1.00												
wc	.366**	0.10	0.10	1.00											
hc	.234*	0.08	0.08	.396**	1.00										
raf	0.00	-0.03	-0.04	0.05	-0.02	1.00									
rab	-0.11	-0.07	-0.07	-0.05	-0.05	.691**	1.00								
stof	0.12	-0.01	-0.03	0.08	0.04	.420**	0.18	1.00							
shob	0.07	-0.04	-0.03	0.09	0.02	.352**	.277**	.456**	1.00						
bmi	.993**	-0.03	-0.02	.359**	.231*	-0.01	-0.10	0.11	0.06	1.00					
whr	.201*	0.04	0.05	.770**	-.275**	0.06	-0.03	0.04	0.07	.196*	1.00				
skft	0.04	-0.05	-0.06	0.06	0.00	.813**	.697**	.735**	.708**	0.03	0.05	1.00			
pfc	0.12	-0.04	-0.05	0.11	0.02	.736**	.630**	.727**	.714**	0.11	0.09	.953**	1.00		
pss	0.18	-.279**	-.281**	0.01	0.09	-0.02	-0.08	-0.01	0.05	0.17	-0.05	-0.02	-0.06	1.00	
aaqw	0.15	-0.01	0.01	0.06	-0.02	0.00	0.03	-0.07	0.09	0.15	0.06	0.01	-0.01	.215*	1.00

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Table- 12b Correlation test: difference of Pre and Post body composition

	wt	Bmi	psqi	bmr	Bm	Smm	fm	pfin	pm	mm	ffm	Tbwm	Sklm
Wt	1												
Bmi	0.993**	1											
Psqi	0.196*	0.201*	1										
Bmr	0.322**	0.327**	0.149	1									
Bm	0.243*	0.233*	0.041	0.809**	1								
Smm	0.317**	0.323**	0.160	0.995**	0.776**	1							
Fm	0.522**	0.511**	0.022	-0.639**	-0.528**	-0.640**	1						
Pfin	0.367**	0.356**	-0.009	-0.752**	-0.593**	-0.755**	0.975**	1					
Pm	0.308**	0.317**	0.147	0.988**	0.773**	0.994**	-0.640**	-0.754**	1				
Mm	0.227*	0.218*	0.073	0.852**	0.943**	0.820**	-0.580**	-0.658**	0.814**	1			
Ffm	0.319**	0.324**	0.146	1.000**	0.810**	0.994**	-0.641**	-0.753**	0.988**	0.854**	1		
Tbwm	0.324**	0.330**	0.157	0.998**	0.781**	0.994**	-0.637**	-0.750**	0.988**	0.827**	0.998**	1	
Sklm	0.319**	0.326**	0.161	0.998**	0.782**	0.996**	-0.641**	-0.754**	0.990**	0.828**	0.998**	0.999**	1

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Further, the changes on various parameters during followup, was found using paired sample t test. There was significant improvement in MACR, MACL, WC, Hip circumference and subscapular skin fold thickness ($p<0.001$ for all). Further There was improvement in skin fold thickness of triceps, cumulative skin fold thickness and percentage fat ($p<0.01$ for all) in the Yoga group alone.

Table- 13 Changes during Followup

Parameter	Significant improvements in Yoga group (*** sig. at p<0.001, ** sig. at p<0.01 & * sig. at p<0.05.)	Significant improvements in Control group (*** sig. at p<0.001, ** sig. at p<0.01 & * sig. at p<0.05.)
MACR	***	----
MACL	***	----
WC	***	***
HIP (Hip circumference)	***	----
Rabr	**	***
Shob	***	----
Skft	**	----
WHR	*	----
Pfc	**	----
MM	*	----
BM	*	----
FM	*	----
Pfin	*	----
Aobdr	*	----
Bmr	*	----
Wm in all 5 segments	*	----
Percentage fat- all five segments except left leg. Sig. of change in left leg percentage fat (Pfll) was p=0.06).	*	----

The intervention was conducted during March to September in 2015. All the yoga practices were introduced in a slow and step by step manner. None of the participants reported any adverse events during the intervention period.