CHAPTER 6

RESULTS

6.0 RESULTS

We, in this section, discussed in depth the results of the study to investigate the effect of *Ānāpānasati* Meditation on anxiety, verbal aggression, and depression. The demographic details of the participants are available in Table 2.

Table 2: Demographic details of the participants

Group	N	Age
Experimental		
All	59	43.37 ± 8.56
Men	16	42.69 ± 12.15
Women	43	43.63 ± 6.95
Control		
All	60	36.83 ± 9.72
Men	44	38.70 ± 9.27
Women	16	31.69 ± 9.34

A CONSORT flow diagram **(Fig 1) below** explains various phases of Randomized Controlled Trials.

As shown in the CONSORT flow diagram, of the 140 participants enrolled, 130 were considered for randomization, as 10 participants were not interested in the study. Hence, there were 130 participants for the randomization. At the end of the randomization, 65 participants each were allotted to both experimental and control groups. In the follow-up, we lost 6 participants from the experimental group and 5 participants from the control group, and a total of 119 participants have completed the six-month intervention successfully consisting of 59

participants in the experimental group and 60 participants in the control group. At the end of the six-month intervention, we analyzed the final BDI, STAI, and VAS scores of all 119 participants from both groups.

We analyzed the pre and post data of both the experimental and the control groups using repeated-measures ANOVA. As data were collected before and after intervention across the experimental and the control groups, the independent variable time is one of the factors and group (E0C1) is another factor, where E0C1 equals 0 denotes the experimental group and E0C1 equals 1 denotes the control group.

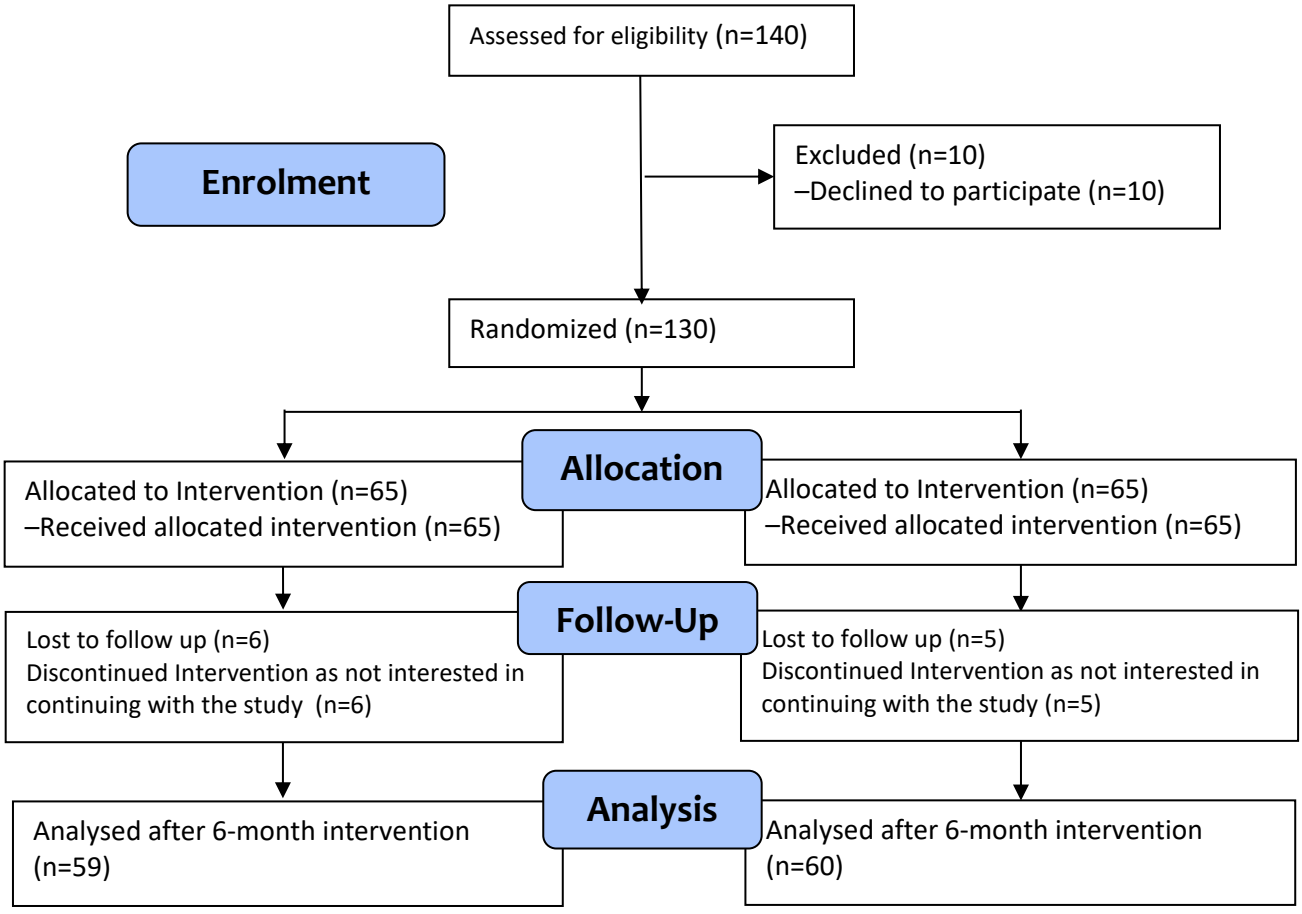

Fig 1: CONSORT Flow diagram of the phases of the randomized controlled trial (enrolment, allocation, follow-up and analysis)

We analyzed the pre and post STAI scores of the experimental and the control groups using repeated-measures ANOVA. We observed that there is a significant interaction between the time and groups $F(1, 117) = 16.45$, $p < 0.05$. As there is a significant interaction between the

two factors, we did a post hoc pairwise comparison using Bonferroni corrections to understand the effect of an intervention in both the groups.

6.1.1 STAI Scores – Pre and Post comparison between experimental and control groups

The pre and post STAI scores across experimental and control groups are figuring in Table 3 and plotted in Figure 2. A post hoc pairwise comparison has shown a significant decrease in anxiety score ($p < 0.05$) in the experimental group (47.61 ± 7.41 to 44.58 ± 5.08) whereas there is an increase in anxiety score (50.55 ± 4.25 to 52.02 ± 4.41) in the control group.

The mean difference of STAI between the pre and post-intervention in the experimental group is 3.03 ± 0.79 and the mean difference of STAI between the pre and post in the control group is 1.47 ± 0.78. The confidence interval (CI) of the mean difference between pre and post STAI scores of experimental groups stood at (1.47, 4.59). The confidence interval (CI) of the mean difference between the pre and post STAI scores of the control group stood at (-3.01, 0.08). The effect size of within-subjects is observed to be at 0.12 with a confidence interval as (0.03, 0.24), and the effect size of between subjects is observed as 0.25 with a confidence interval as (0.13, 0.37).

Table 3: Comparison of STAI pre and post scores across Experiment and Control Groups

Group	N	STAI (Pre)	STAI (Post)	P Value	CI
Experiment	59	47.61 ± 7.41	44.58 ± 5.08	0.00^{*}	(1.47, 4.59)
Control	60	50.55 ± 4.25	52.02 ± 4.41	0.06	(-3.01, 0.08)

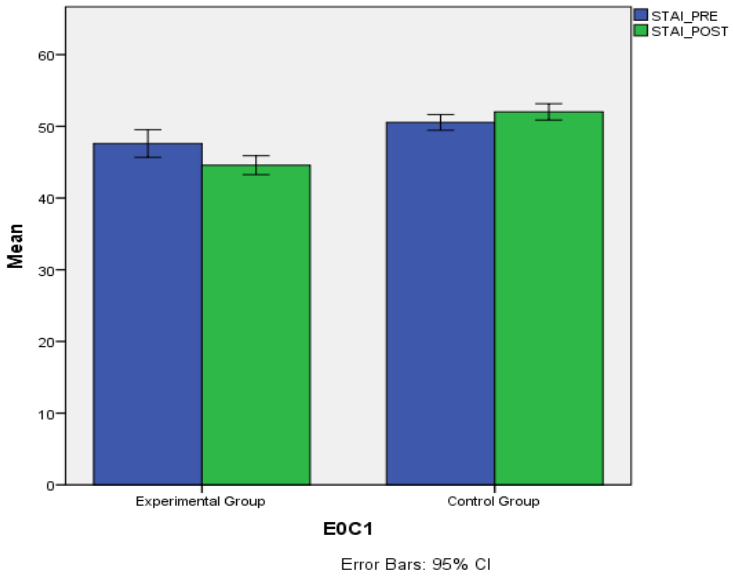

Figure 2: Comparison of STAI pre and post scores in Experiment and Control Groups (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.1.2 STAI Scores – Pre and Post comparison across experimental and control groups

We did along similar lines, post hoc pairwise comparison between the pre scores of STAI across the experimental and the control groups and the post scores across both the groups. The results are figuring in Table 4. There is a significant difference ($p < 0.05$) in the baseline scores of experimental and control groups and after the intervention, the STAI score has decreased in the experimental group whereas it has increased in the control group.

Table 4: Comparison of STAI Scores across Experiment and Control Groups

Pre/Post	Experiment (N = 59	Control (N = 60)	P Value
STA Pre	47.61 ± 7.41	50.83 ± 4.51	0.029
STAI Post	44.58 ± 5.08	52.02 ± 4.41	0.000

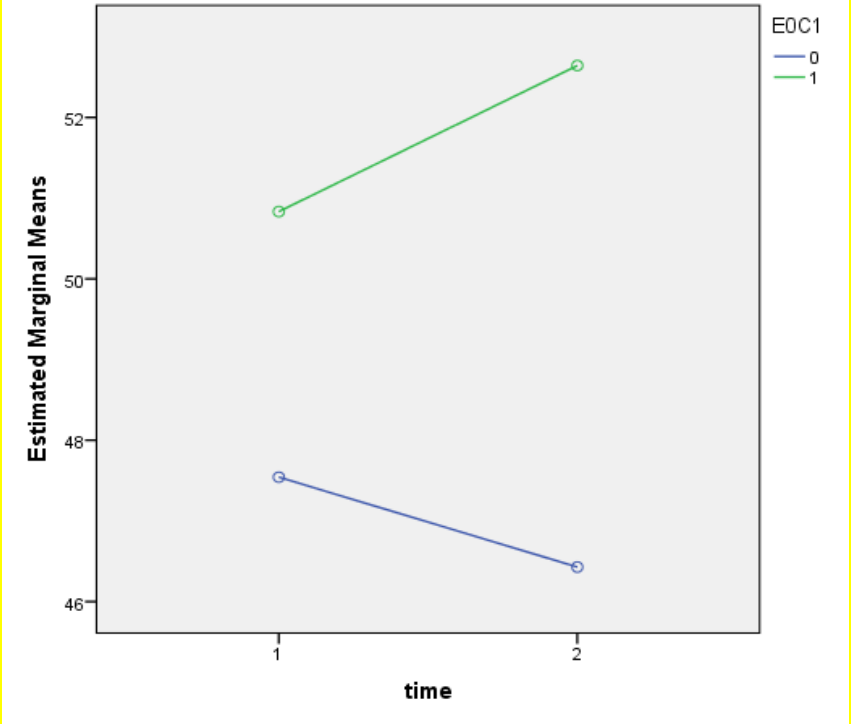

Figure: 3: Interaction between time and group
(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

Figure 3 shows the interactions between time and group wherein time have two levels 1 (pre-intervention) and 2 (post-intervention) and groups are represented with the variable E0C1. It shows that the difference in STAI scores of both the experimental and the control groups has pointed out a statistically significant increase after the intervention.

6.1.3 STAI Scores – Pre and Post comparisons between males and females in experimental and control groups

The pre-post comparison of STAI scores across males and females in both experimental and control groups is done and the results are tabulated in Table 5. We analyzed the scores across males and females to understand if gender has any influence on the anxiety scores. The STAI scores of both males and females have reduced in the experimental group, whereas it has increased in the control group. We observed that there is no significant influence of gender on anxiety scores.

It also showed that the STAI score in the experimental group has a non-significant decrease in males (47.27 ± 5.73 to 45.00 ± 4.78) and a significant decrease in females (45.63 ± 7.55 to

43.25 ± 5.56) whereas in the control group it has increased in males (50.64 ± 4.26 to 51.82 ± 4.70) and in females also (50.31 ± 4.35 to 52.56 ± 3.56).

Table 5: Comparison of STAI Score Pre and Post across Males and Females

Group	Gender	N	STAI (Pre)	STAI (Post)	P-Value
Experimental	Male	16	45.63 ± 7.55	43.25 ± 5.56	0.26
	Female	43	48.35 ± 7.30	45.07 ± 4.87	0.01*
Control	Male	44	50.64 ± 4.26	51.82 ± 4.70	0.08
	Female	16	50.31 ± 4.35	52.56 ± 3.56	0.07

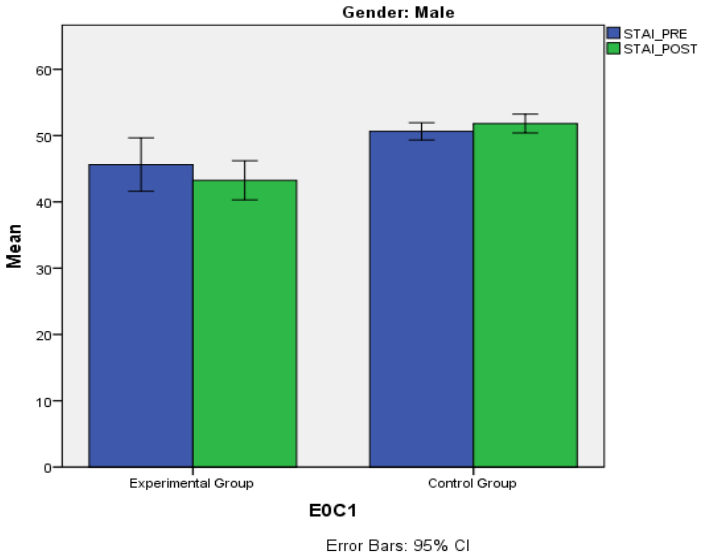

Figure: 4: Comparison of STAI scores in males

(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

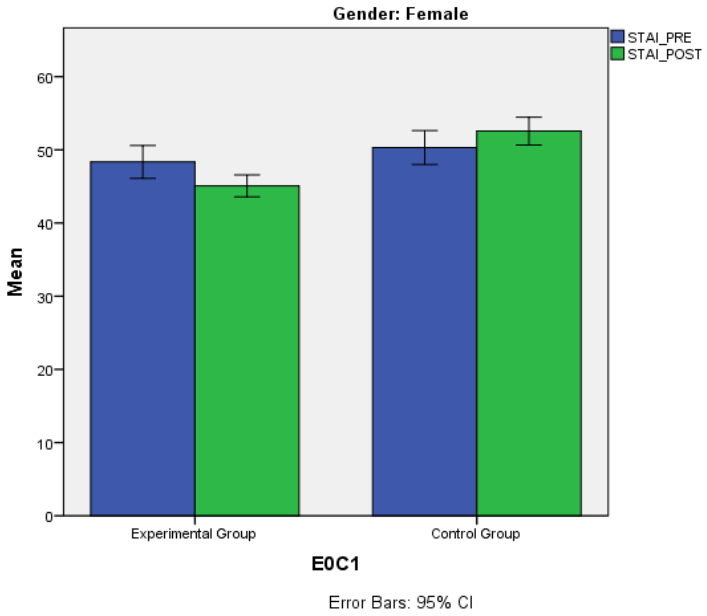

Figure: 5: Comparison of STAI scores in females

(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.1.4 STAI Scores – Pre and Post comparison between age groups of participants in experimental and control groups

The STAI scores, in the analysis across two age groups (< 45 years and ≥ 45 years), show the influence of age on anxiety scores. A comparison of the pre-post scores across two age groups gave the results tabulated in Table 6. The pre-post comparison of STAI scores across age groups in both experimental and control groups showed the results tabulated in Table 4. We observed that the STAI score has increased in the age group < 45 years, whereas it has decreased in the age group for ≥ 45 years. In the control group, it has increased in the participants of both groups. We observed that there is no significant influence of age on the scores.

Table 6: STAI versus Age in Experiment and Control Groups

Group	Age	STAI Pre	STAI Post
Experiment	< 45 yrs	47.50 ± 9.137	44.00 ± 5.57
	≥45yrs	47.74 ± 4.78	45.26 ± 4.45
Control	<45 yrs	50.50 ± 4.24	51.67 ± 4.24
	≥45 yrs	50.71 ± 4.45	53.14 ± 4.93

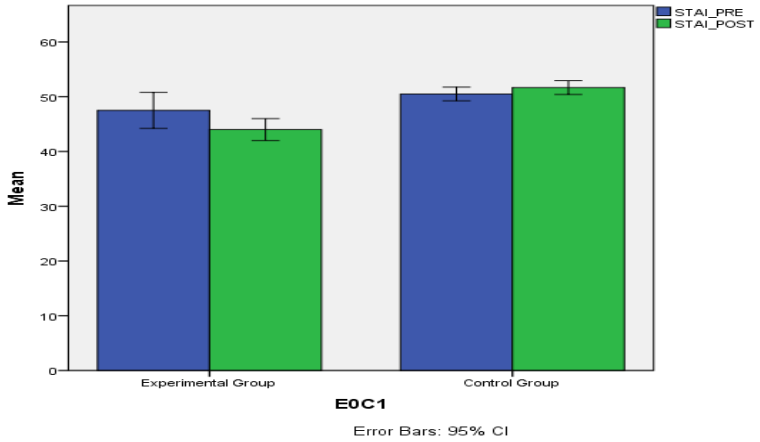

Figure: 6: Comparison of STAI scores in the age of below 45 (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

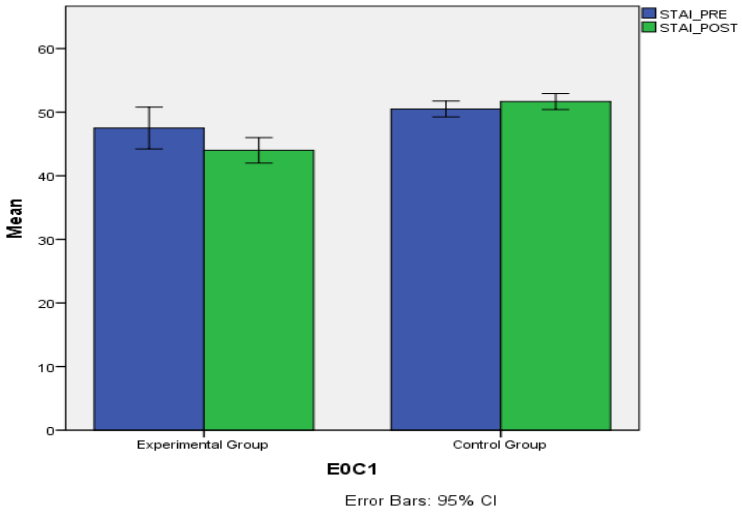

Figure: 7: Comparison of STAI scores in the age group of 45 and above (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.2 VERBAL AGGRESSION

The pre and post-VAS scores of experimental and control groups, when analyzed using repeated-measures ANOVA, showed that there is a significant interaction between the time and groups ($F(1,117) = 84.26$, $P < 0.05$). As there is a significant interaction between the two factors, we did post hoc pairwise comparisons using Bonferroni corrections to investigate the effect of the intervention in both the groups.

6.2.1 VAS Score comparison between experimental and control groups.

We looked at the pre and post data in both experimental and control groups and found the results tabulated in Table 7 and plotted in Figure 8. A Post hoc pairwise comparison has shown a statistically significant decrease in VAS score in the experimental group (66.53 ± 6.93 to 46.97 ± 6.79) whereas the decrease in VAS score (66.73 ± 12.15 to 64.97 ± 13.16) in the control group is not significant. The mean difference of VAS score between pre and post-intervention in the experimental group is 19.56 ± 1.38 and the mean difference of VAS score between pre and post in the control group is 1.77 ± 1.37. The confidence interval (CI) of the mean difference between pre and post VAS scores of experimental groups stood at 16.83, 22.29. The

confidence interval (CI) of the mean difference between pre and post VAS scores of the control group stood at -0.94, 4.47.

The effect size of within-subjects is observed to be 0.42 with a confidence interval as 0.29, 0.52 and the effect size of between subjects is observed to be 0.22 with a confidence interval as 0.09, 0.34.

Table 7. Comparison of VAS scores before and after the intervention for experimental and control groups

Group	N	VAS Pre	VAS Post	P-Value	CI
Experimental	59	66.53 ± 6.93	46.97 ± 6.79	0.00	16.83, 22.29
Control	60	66.73 ± 12.15	64.97 ± 13.16	0.19	-0.94 , 4.47

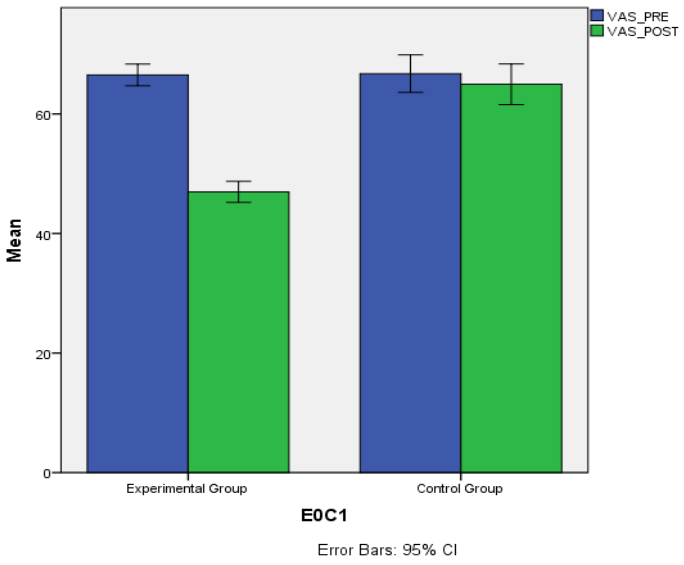

Figure 8: Comparison of VAS pre and post scores in Experiment and Control Groups (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

Pairwise comparison is done between the pre scores of VAS ($p < 0.05$) across the experimental and the control groups and the post scores of VAS ($p < 0.05$) across both the groups gave the results tabulated in Table 8. The mean difference in the baseline scores of VAS is 6.80 ± 1.32

whereas the mean difference in the scores of VAS after the intervention is 23.16 ± 2.14. The mean difference in the VAS scores has significantly reduced after the intervention.

Table 8: Comparison of VAS Scores across Experiment and Control Groups

Pre-Post	Experiment (N = 59)	Control (N = 60)	P-Value
VAS Pre	66.53 ± 6.93	66.73 ± 12.15	0.000
VAS Post	46.97 ± 6.79	64.97 ± 13.16	0.000

6.2.2 VAS Score comparison between pre and post scores of experimental and control groups in males and females.

The pre and post VAS scores were analyzed across males and females to find out if gender has any influence on the effect of the intervention on VAS scores showed the results tabulated in Table 9 and plotted in Figures 9 and 10. The VAS scores of both males and females in the experimental group have reduced significantly after the intervention when compared to the control group. It further shows that VAS score in the experimental group has decreased significantly in males (67.25 ± 5.60 to 47.50 ± 6.19) and also in females (66.26 ± 7.40 to 46.77 ± 7.05) whereas in the control group it has decreased insignificantly in males (68.50 ± 12.09 to 66.25 ± 13.40) and females (61.88 ± 11.26 to 61.44 ± 12.16).

The pre VAS scores of males and females are almost the same and post-VAS scores have reduced significantly in both males and females. We observed that there is no significant influence of gender on VAS scores.

Table 9. Comparison of VAS scores before and after the intervention in the experimental and the control groups in males & females.

Group	Gender	N	VAS Pre	VAS Post	P-Value
Experimental	Males	16	67.25 ± 5.6	47.50 ± 6.19	0.00
	Females	43	66.26 ± 7.40	46.77 ± 7.05	0.00
Control	Males	44	68.50 ± 12.09	66.25 ± 13.40	0.19
	Females	16	61.88 ± 11.26	61.44 ± 12.16	0.08

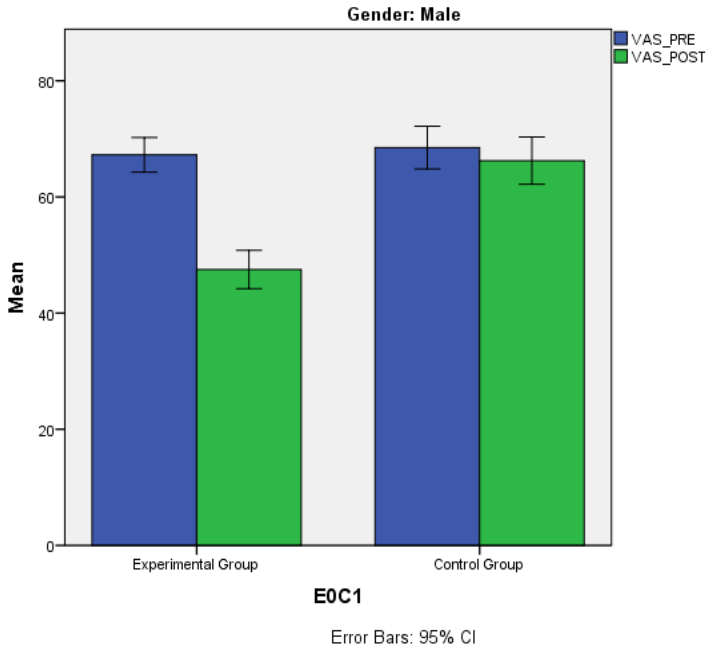

Figure 9: Comparison of VAS scores in males
(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

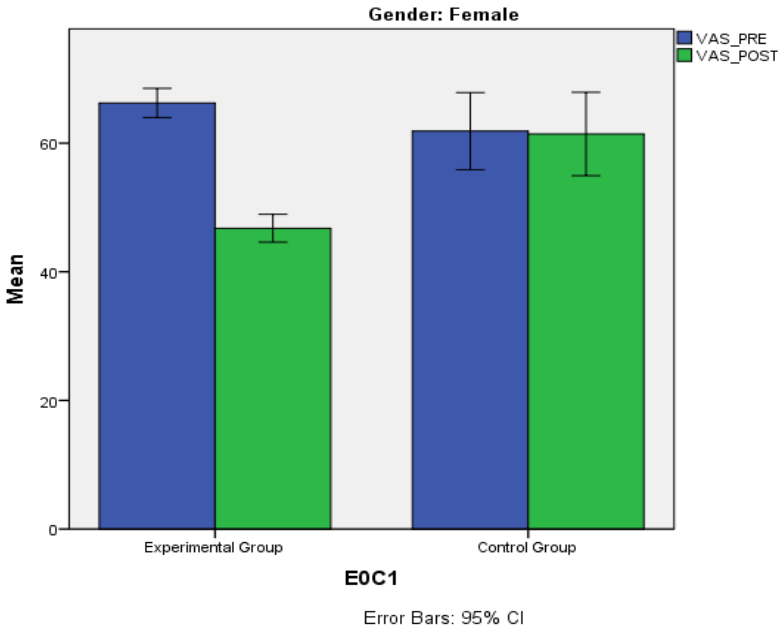

Figure 10: Comparison of STAI scores in females
(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.2.3 VAS Score comparison between pre and post scores of in the experimental and control groups for the age groups

The scores of VAS analyzed across two age groups (< 45 years and ≥ 45 years) to find out if there is any influence of age on the VAS scores and the pre and post scores of VAS of both experimental and control groups compared across two age groups have shown the results tabulated in Table 10 and plotted in Figures 11 and 12.

We found that in both experimental and control groups there was a decrease in VAS scores after six months of intervention. We observed that there is no significant influence of age on VAS score.

Table 10: Comparison of VAS scores before and after the intervention in the experimental and control groups for the age groups greater than and less than 45 years.

Group	Age Group	VAS (Pre)	VAS (Post)
Experimental	<45yrs	65.88 ± 6.59	47.91 ± 6.70
	≥45yrs	67.30 ± 7.36	45.85 ± 6.84
Control	<45yrs	68.52 ± 7.36	65.98 ± 13.66
	≥45yrs	61.86 ± 4.22	60.64 ± 2.99

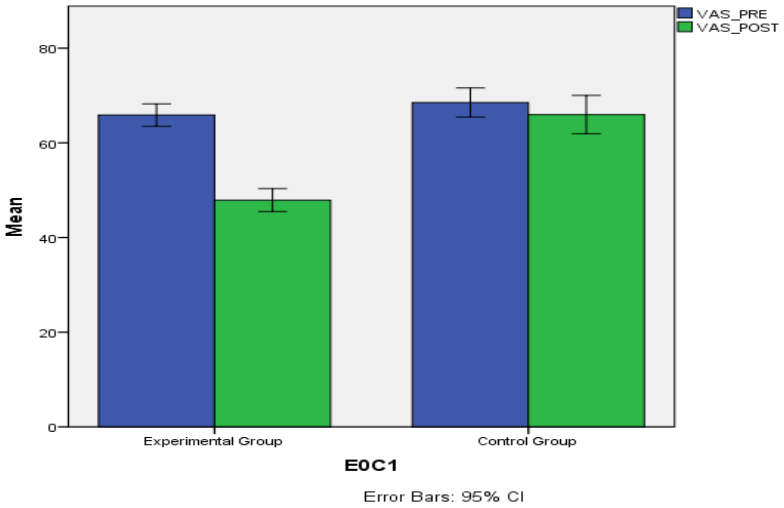

Figure 11: Comparison of VAS scores in the age of below 45 (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

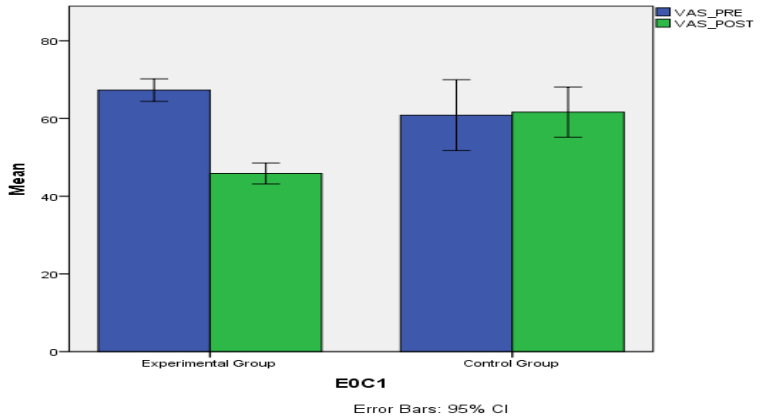

Figure 12: Comparison of VAS scores in the age group of 45 and above (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

The interactions between time and group are plotted in Figure 13, wherein time has two levels 1 (pre-intervention) and 2 (post-intervention), and groups are represented with the variable E0C1 and E0C1 equals to 0 which corresponds to the experimental group and E0C1 equals 1 corresponds to the control group. It is observed that the difference in VAS scores of both the experimental and the control groups has shown a statistically significant increase after the intervention.

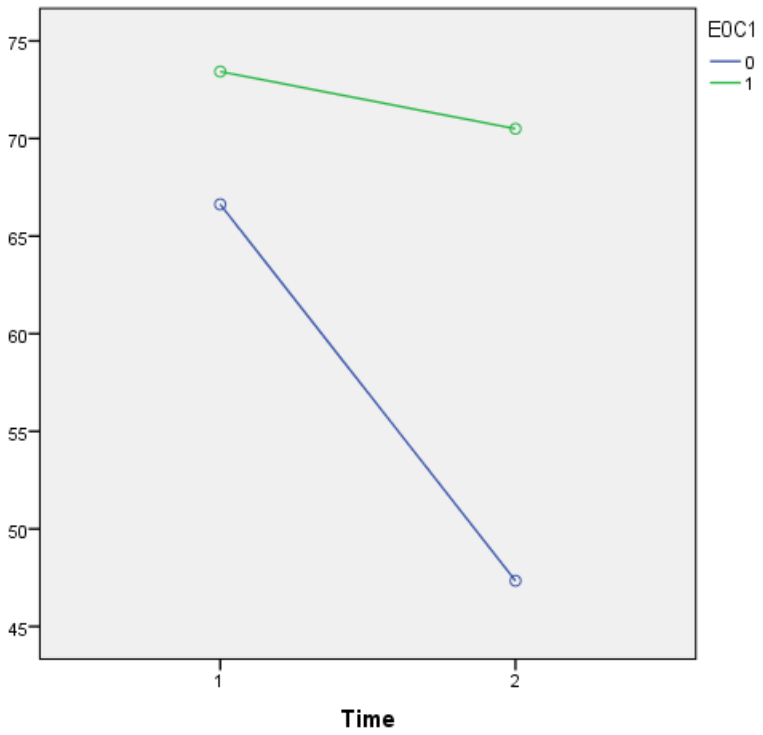

Figure 13: Interaction between time and group (Experimental and Control)
(E0C1 = 0 for Experiment Group and E0C1 = 1 for Control Group)

6.3 DEPRESSION

The BDI scores before and after the *Ānāpānasati* Meditation in the analysis for both the experimental and control groups using repeated-measures ANOVA and the pre-post comparison of BDI scores across the experimental and the control groups reflected the results tabulated in Table 11 and plotted in Figure 14.

6.3.1 BDI-II Score comparison between experimental and control groups.

We found that there is a significant interaction between the time and groups ($F(1,117) = 210.56$, $p < 0.05$). As there is significant interaction between the two factors, post hoc pairwise comparisons were done using Bonferroni corrections to understand the effect of the intervention in both the groups.

The comparison of the pre and post-data done across the experimental and the control groups showed the results tabulated in Table 11 and plotted in Figure 14. A post hoc pairwise comparison has shown a statistically significant decrease in BDI score in the experimental group (25.78 ± 9.32 to 4.02 ± 5.33) whereas the BDI score (15.33 ± 11.43 to 16.60 ± 12.77) has increased in the control group. The mean difference of BDI score between the pre and post-intervention in the experimental group is 21.76 ± 1.31 and the mean difference of BDI score between pre and post in the control group is 1.27 ± 1.12. The confidence interval (CI) of the mean difference between pre and post BDI scores of the experimental group is observed as 19.53, 23.99. The confidence interval (CI) of the mean difference between pre and post BDI scores of the control group remained at -3.48, 0.95.

The effect size of within-subjects is 0.64 with a confidence interval of 0.54, 0.71 and the effect size of between subjects is 0.004 with a confidence interval of 0, 0.05.

Table 11: Comparison of BDI Score Pre and Post for Experiment and Control Groups

Group	N	BDI Score Pre	BDI Score Post	P-Value	CI	
Experiment	59	25.78 ± 9.32	4.02 ± 5.33	0.00	19.53	23.99
Control	60	15.33 ± 11.43	16.60 ± 12.77	0.26	-3.48	0.946

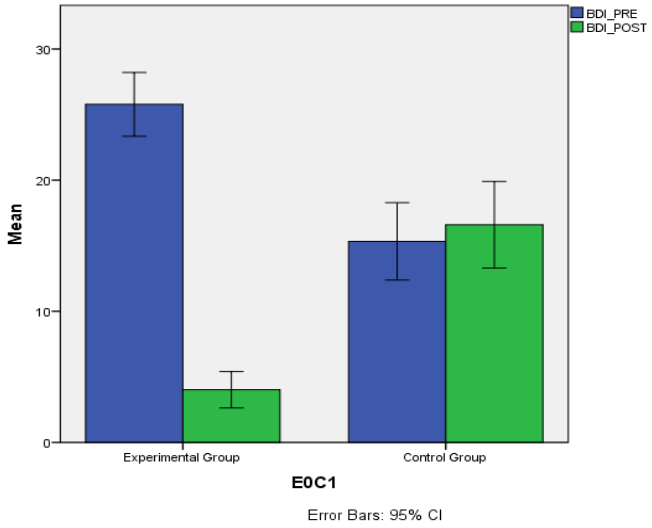

Figure 14: Comparison of BDI pre and post scores in Experiment and Control Groups (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.3.2 BDI-II Score comparison between males and females in experimental and control groups.

The pre and post-BDI scores in the analysis across males and females to find out if gender has any influence on the effect of the intervention on BDI score and in the pre-post-comparison of BDI scores across males and females in both the experimental and the control groups have shown the results tabulated in Table 12 and plotted in Figures 15 and 16. The BDI scores of females were higher and after the intervention, the scores of both males and females have reduced significantly. It also explained that BDI score in the experimental group has significantly decreased in males (24.63 ± 10.91 to 5.44+_6.84) and also in females (26.21 ±

8.76 to 3.49 ± 4.63) whereas in the control group it has increased insignificantly in males (14.27 ± 11.47 to 14.73 ± 12.54) and decreased insignificantly in females (18.25 ± 11.17 to 17.75 ± 12.33).

The pre BDI scores of males and females are nearly the same in the experimental group and post BDI scores have reduced significantly in both males and females. We observed that there is no significant influence of gender on the BDI scores.

Table 12: Comparison of BDI Score Pre and Post across Males and Females

Group	Gender	N	BDI Score Pre	BDI Score Post	P-Value
Experiment	Male	16	24.63 ± 10.91	5.44+_6.84	0.00
	Female	43	26.21 ± 8.76	3.49 ± 4.63	0.00*
Control	Male	44	14.27 ± 11.47	14.73 ± 12.54	0.19
	Female	16	18.25 ± 11.17	21.75 ± 12.33	0.20

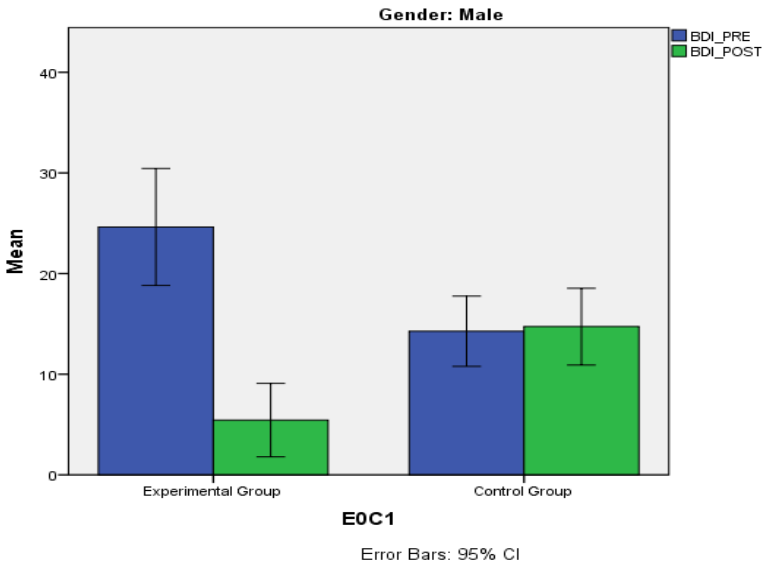

Figure 15: Comparison of BDI scores in Males

(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

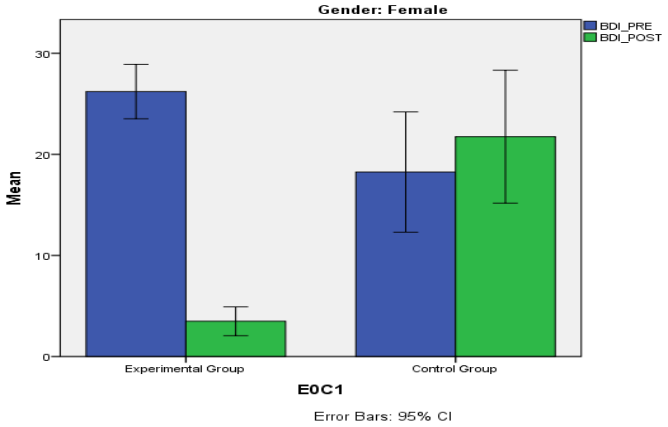

Figure 16: Comparison of BDI scores in Females

(E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

6.3.3 BDI-II Score comparison between age groups of participants in experimental and control groups.

The scores of BDI analyzed across age groups to find out if there is any influence of age on BDI score and the pre and post-BDI scores compared across two age groups have shown the results tabulated in Table 13 and plotted in Figures 17 and 18. The scores have significantly reduced in both age groups.

It also further showed that the BDI score in the experimental group has decreased in the participants of both the age group, whereas in the control group, BDI scores have increased slightly in both groups. We observed that there is no significant influence of age on depression.

Table 13: BDI Score Vs Age in Experiment and Control Groups

Group	Age Group	BDI Pre	BDI Post
Experiment	<45	28.25 ± 9.56	4.75 ± 5.65
	≥45	19.15 ± 8.28	3.15 ± 4.89
Control	<45	14.72 ± 11.97	16.00 ± 12.99

≥45	17.36 ± 9.56	18.57 ± 12.27

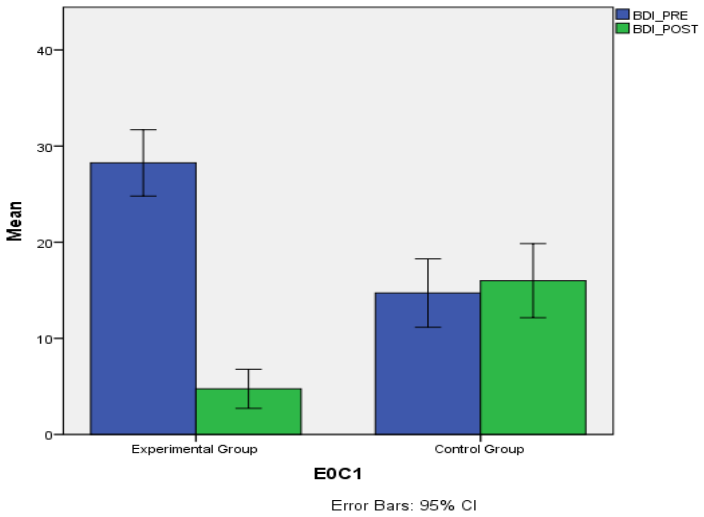

Figure 17: Comparison of BDI scores in the age of below 45 (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

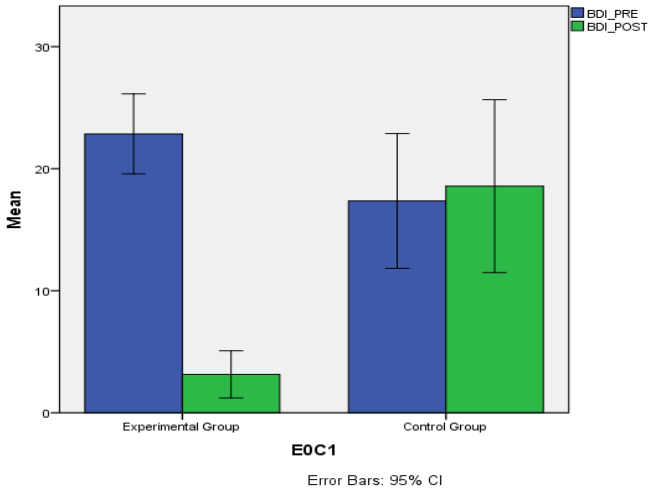

Figure 18: Comparison of BDI scores in the age group of 45 and above (E0C1 = 0 for Experimental Group and E0C1 = 1 for Control Group)

There was a significant interaction ($p < 0.05$) between time and group as shown in Figure 19 and the graph reveals that post-intervention BDI scores have reduced significantly in the experimental group compared to the control group.

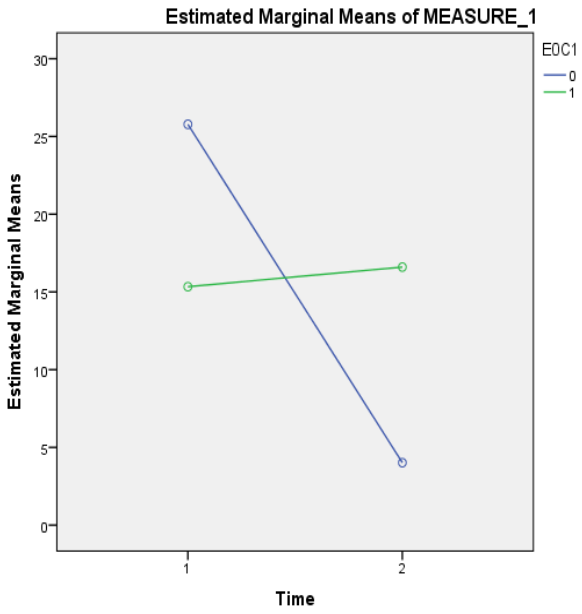

Figure 19: Interaction between time and group (experimental and control) (E0C1 = 0 for Experiment Group and E0C1 = 1 for Control Group)

6.3.4 Comparison of the values without higher score values.

We observed that the BDI scores of 24 participants from the experimental group and 18 participants from the control group are clinically significant (29 – 63) and out of them one of the STAI scores was 71 which comes under severe anxiety level (70 – 80). We have taken the scores of 77 participants by considering 35 participants from the experimental group and 42 participants from the control group who were not having clinically significant BDI scores and analyzed them using repeated-measures ANOVA to assess the influence of clinically significant BDI and STAI scores on the final results.

The pre and post-STAI scores have shown significant interactions (FP < 0.05) between time and groups (E0C1). The post hoc pairwise comparisons have shown a significant decrease ($p < 0.05$) in STAI score (47.49 ± 5.26 to 45.31 ± 4.11), whereas in the control group there was an increase in the STAI score (50.83 ± 4.51 to 52.64 ± 4.79)

In the experimental group, there was a significant ($p < 0.05$) decrease in BDI score (19.20 ± 4.78 to 3.74 ± 5.38) whereas in the control group the decrease in BDI score (12.29 ± 8.04 to

12.14 ± 7.74) was not significant (p = 0.67). We observed that high BDI scores have not shown a significant impact on the final results. The pre-post results of STAI, VAS, and BDI scores of the experimental and the control groups are summarized in Table 14.

Table 14: Pre and Post scores of STAI, VAS, BDI in experimental and control groups

Pre/Post	**Experimental**	**Control**
All Participants	**(N = 59)**	**(N = 60)**
STA Pre	47.61 ± 7.41	50.55 ± 4.25
STAI Post	44.58 ± 5.08	52.02 ± 4.41
VAS Pre	66.53 ± 6.93	66.73 ± 12.15
VAS Post	46.97 ± 6.79	64.97 ± 13.16
BDI Pre	25.78 ± 9.32	15.33 ± 11.43
BDI Post	4.02 ± 5.33	12.67 ± 12.77
Participants without high scores	**(N = 35)**	**(N = 42)**
STA Pre	47.49 ± 5.26	50.83 ± 4.51
STAI Post	45.31 ± 4.11	52.64 ± 4.79
VAS Pre	67.34 ± 6.95	73.43 ± 5.11
VAS Post	46.54 ± 6.95	70.50 ± 11.13
BDI Pre	19.20 ± 4.78	12.29 ± 8.04
BDI Post	3.74 ± 5.38	12.14 ± 7.74