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IMPACT OF MENTAL RELAXATION TRAINING ON SELECTED NEURO-PSYCHO-PHYSIOLOGICAL VARIABLES OF BOXERS

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ABSTRACT

The study was conducted to find out the Impact of Mental Relaxation Training on selected neuro-psycho-physiological variables of boxers. For this study 60 male boxers', aged of 16 to 22 years were selected randomly as subjects from KD's Boxing Academy of Mumbai. The selected 60 boxers were divided into two equal groups viz: experimental group and control group consisting of thirty subjects in each group. The experimental group was given Mental Relaxation Training for 32 weeks, three days in a week for a duration of one hour in the evening. The control group was treated as sedentary. The data were collected by conducting the pre and post-test of both the groups on the selected neuro-psycho-physiological variables i.e. Hand reaction time, Foot reaction time, Static balance, Stress, Anxiety, concentration, Pulse rate and Blood pressure of the Boxers. The collected data were analysed by using the 'ANCOVA' test for significance difference. While concluding, it may be stated that mental relaxation training exercises significantly showed reduction in the Hand reaction time, Foot reaction time, Anxiety, Stress, and improvement in Concentration, Static balance as well as significantly helped to maintain Pulse rate and Blood pressure of the Boxers.

Key Words:- Mental Relaxation training, reaction time, balance, stress, anxiety, concentration, Pulse Rate, BP

INTRODUCTION

Researchers have reported that 50 percent of consultations among athletes at Olympic games or sports events were were related to stress or anxiety problems (Murphy, 1988).

Coaches as well as Sports psychologists have strong believed that negative psychological pressure such as Anxiety and stress lead neuro-muscular as well as physiological bad impact during competitions are harmful, worsening performance and even leading to dropouts (Hanin, 2000). Anxiety, as a negative emotional, affect perceptions in sport competitions, where a large majority of athletes consider anxiety to be debilitative towards performance, which may result in decreases in performance (Weinberg & Gould, 2011; Raglin & Hanin, 2000). Contradictory, the somatic is the physiological element, which related to autonomic arousals, negative symptoms such as feelings of nervous, high blood pressure, dry throat, muscular tension, rapid heart rate, sweaty palms and butterflies in your stomach (Jarvis, 2002; Jones, 2000; Martens, Vealey & Burton, 1990). The application of mental Relaxation skills in sports is linked with the development and maintenance of expert performance in sport (Durand-Bush and Salmela, 2002; Orlick, 2000). Research identifies a number of psychological variables that are linked with enhanced performance in combat sports. These variables comprise of psychological skills including: concentration (Williams and Elliott, 1999). A significance amount of research has been conducted on competitive anxiety on sports (Martens, Vealey & Burton, 1990) and the relaxation techniques (Humara, 2001; Martens, Vealey & Burton, 1990; Richards, 2004). Many researches indicated that relaxation techniques benefits athletes by enhancing self-confidence, concentration, performance, reducing anxiety and stress, blood pressure besides muscle tense (Pragman, 1998; Vincent & Yahaya, 2012; Weinberg & Gould, 2011). Research has indicated that most successful athletes used relaxation techniques compared to less successful athletes (Gould, Eklund & Jackson, 1993; Orlick &Partington, 1988).

Boxing is one of the most popular combat sports. It's a combination of strength, power, agility, stamina and endurance. In this competitive world everyone wants to become a champion. Players do regular training for that but they concentrate more on their physical abilities. Players tend to give less importance to psychological abilities. This aspect is equally important. As a result boxers suffer from problems like Anxiety, Stress, Fatigue and multiple nerve-related difficulties as well as lack confidence related to their performance in the boxing ring. Doubts regarding their performance in the ring, level of preparation and fitness bring about fluctuations in Blood Pressure, Pulse rate, and Breathing which ultimately effect on their performance. Therefore proper study of these vital variables of Boxers is very important and finding proper solutions is "the need of the hour". Mental relaxation techniques may improve the mental strength of the Boxers and ultimately their performance.

It was hypothesized that the mental relaxation training may help to reduce Hand reaction time, Foot reaction time, static balance, Anxiety, Stress, Concentration Blood pressure (Diastolic and Systolic), and normal Pulse rate of boxers.

2. METHODOLOGY

2.1 Sample

Sixty male Boxers from KD's Boxing Academy, Mumbai between the ages of 16 to 22 years were selected randomly as subjects for this study to find out the Impact of Mental Relaxation Training on selected neuro-psycho-physiological variables of boxers.

2.2. Selection of Variables

The following were the selected dependent variables (neuro-psycho-physiological) of the study

Neurological Variables	Psychological Variables	Physiological Variables
1. Hand reaction time 2. Foot reaction time 3. Static balance	4. Anxiety 5. Stress 6. Concentration	7. Pulse rate 8. Systolic Blood pressure 9. Diastolic blood pressure

2.3 Selection of Tools:

The following tools were use in this study

No.	Dependent Variables	Test	Equipment	Unit of Measure
Neuro-Muscular Variable				
1	Hand reaction time	Nelson Hand Reaction Time	Scale, paper, pen and Table	Centimetre
2	Foot reaction time	Nelson Foot Reaction Time	Scale, paper, pen, Table and wall	Centimetre
3	Static Balance	Stork stand test	Stopwatch, paper, pen	Second
Psychological Variable				
4	Anxiety	Sport competition anxiety test	Questionnaire, paper and pen	Number
5	Stress	Comprehensive Stress questionnaire		Number
6	Concentration	Concentration questionnaire		Number
Physiological Variable				
7	Pulse rate	Dr. Morepen BP monitor	Dr. Morepen BP monitor, paper and pen	Beat per min
8	Diastolic and systolic Blood pressure			mm Hg

2.4 Research Design

Parallel group experimental design was formulated for this experimental study.The subjects were divided into two equal groups viz: experimental group and control group consisting of 30 subjects in each group. The experimental group was given Mental Relaxation Training for 32 weeks, three days in a week for duration of one hour in the evening. The control group has not received Mental Relaxation Training. The pre post tests were conducted on the selected neuro-psycho-physiological variables administering standardized tests.

2.5 Data Collection

The data were collected by conducting the pre and post-test of both the groups on the Anxiety, Stress, concentration, pulse rate and blood pressure variables administering standardised test of the Boxers.

2.6 Statistical Techniques

The data was analysed by using 'ANCOVA' test.

3. FINDINGS OF STUDY

The data collected on pre and post-test on neuro-psycho-physiological variables analysed and the data were arranged systematically in tabular forms associated with graphical representations and were interpreted logically considering the scientific values.

TABLE 1

LEVENE'S TEST OF EQUALITY OF ERROR VARIANCE IN REACTION TIME, STATIC BALANCE, ANXIETY, STRESS, CONCENTRATION, PULSE RATE AND BLOOD PRESSURE AMONG EXPERIMENTAL AND CONTROL GROUP

No.	Variables	F	Df1	df2	Sig.
1	Hand reaction time	.435	1	58	.512
2	Foot reaction time	1.205	1	58	.277
3	Static Balance	1.294	1	58	.260
4	Anxiety	5.924	1	58	.018
5	Stress	5.847	1	58	.019
6	Concentration	3.984	1	58	.051
7	Pulse rate	1.930	1	58	.170
8	Diastolic BP	.230	1	58	.633
9	Systolic BP	1.590	1	58	.212

* The obtained significance value was greater than 0.05.

It was concluded from table 1 that there is equal error variance among groups and performing of ANCOVA is optimally valid.

TABLE 2

ANALYSIS OF COVARIANCE OF AMONG REACTION TIME, STATIC BALANCE, ANXIETY, STRESS, CONCENTRATION, PULSE RATE AND BLOOD PRESSURE OF GROUPS

Variables	Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Hand reaction time	Pre_HRT	87.082	1	87.082	32.767	.000
	Groups	522.437	1	522.437	196.581	.000
	Error	151.484	57	2.658		
	Corrected Total	714.583	59			
Foot reaction time	Pre_FRT	259.439	1	259.439	72.139	.000
	Groups	639.399	1	639.399	177.789	.000
	Error	204.994	57	3.596		
	Corrected Total	1034.850	59			
Static Balance	Pre_SB	74.459	1	74.459	28.779	.000
	Groups	622.066	1	622.066	240.434	.000
	Error	147.474	57	2.587		
	Corrected Total	836.333	59			
Anxiety	Pre-Anxiety	29.445	1	29.445	17.449	.000
	Groups	305.810	1	305.810	181.220	.000
	Error	96.188	57	1.688		
	Corrected Total	402.983	59			

Variables	Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Stress	Pre-Stress	244.271	1	244.271	20.367	.000
	Groups	4327.999	1	4327.999	360.862	.000
	Error	683.629	57	11.993		
	Corrected Total	5011.650	59			
Concentration	Pre_ Concentration	39.168	1	39.168	25.496	.000
	Groups	300.581	1	300.581	195.661	.000
	Error	87.565	57	1.536		
	Corrected Total	391.333	59			
Pulse Rate	Pre-Pulse	468.627	1	468.627	63.247	.000
	Groups	502.564	1	502.564	67.827	.000
	Error	422.340	57	7.409		
	Corrected Total	1366.983	59			
Diastolic blood pressure	Pre_ diastolic	.756	1	.756	.075	.785
	Groups	303.753	1	303.753	30.237	.000
	Error	572.610	57	10.046		
	Corrected Total	886.183	59			
Systolic pressure	Pre_ systolic	.796	1	.796	.059	.809
	Groups	522.939	1	522.939	38.729	.000
	Error	769.637	57	13.502		
	Corrected Total	1292.583	59			

It is evident from table 2 that after 32 weeks of mental relaxation training was significant as the obtained p-value is less than 0.05.

TABLE 3

ADJUSTED MEAN AND STANDARD ERROR OF HAND REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	16.533	9.940	.299	9.341	10.539
Control Group	15.667	15.893	.299	15.295	16.492

Table 3 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 16.533 - post mean score is 9.940 and control group per mean score is 15.667 – post mean score is 15.89. It was hypothesized that Mental Relaxation training Program has significant demotion in Hand Reaction time of Boxers" is accepted.

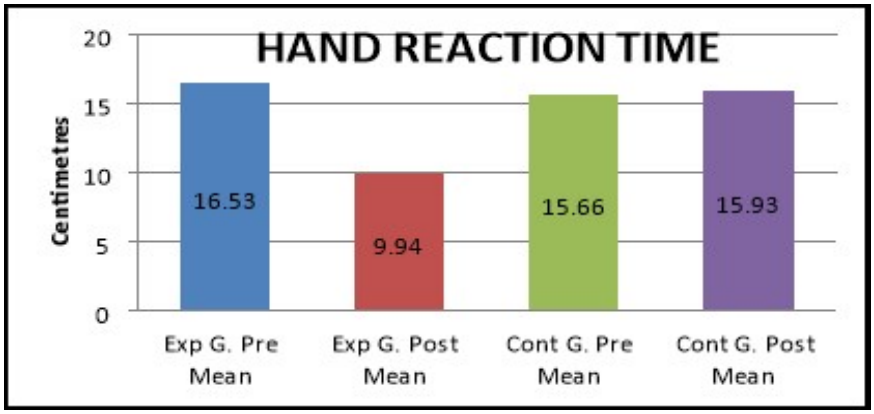

FIGURE-1: MEAN PLOT OF ADJUSTED MEANS OF HAND REACTION TIME OF EXPERIMENTAL AND CONTROL GROUP

TABLE 4

ADJUSTED MEAN AND STANDARD ERROR OF FOOT REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	19.433	12.771	.347	12.076	13.466
Control Group	18.866	19.329	.347	18.634	20.024

Table 4 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 19.433 – post mean score is 12.771 and control group is pre mean score is 18.866 – post mean score is 19.329. It was also hypothesized that Mental Relaxation training Program has significant demotion in Foot Reaction time of Boxers" is accepted.

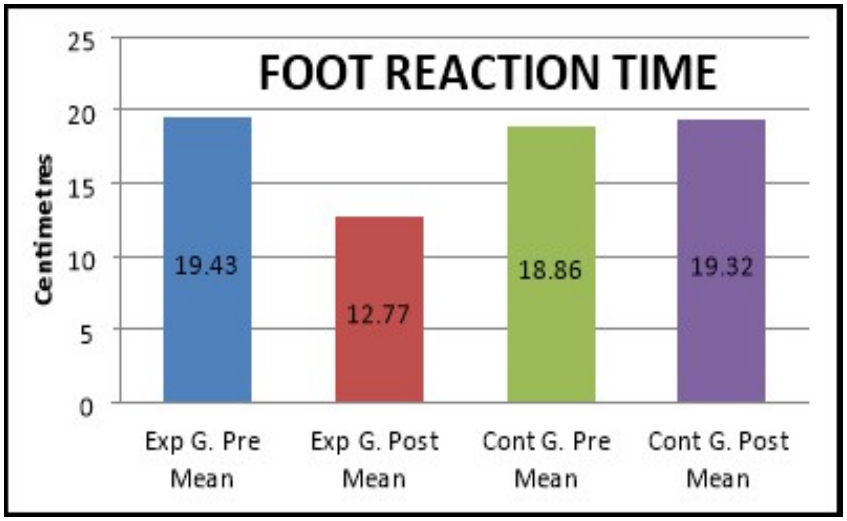

FIGURE:2_MEAN PLOT OF ADJUSTED MEANS OF FOOT REACTION TIME OF EXPERIMENTAL AND CONTROL GROUP

TABLE 5
ADJUSTED MEAN AND STANDARD ERROR OF STATIC BALANCE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	6.966	13.387	.294	12.799	13.975
Control Group	7.033	6.946	.294	6.358	7.534

Table 5 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 6.966 – post mean score is13.387 and control group is pre mean score is 7.033 - post mean score is 6.946. It was also hypothesized that Mental Relaxation training Program has significant improvement in Static Balance of Boxers" is accepted.

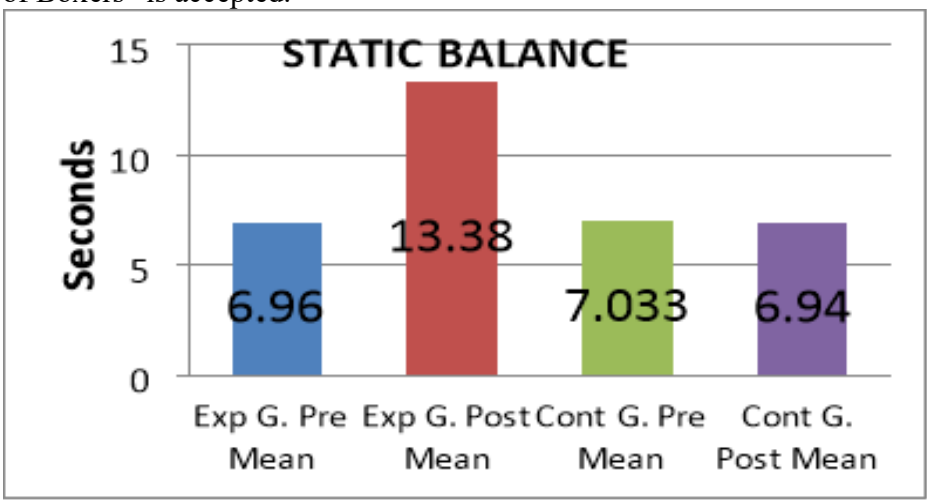

FIGURE 3-MEAN PLOT OF ADJUSTED MEANS OF STATIC BALANCE TIME (SST) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 6
ADJUSTED MEAN AND STANDARD ERROR OF ANXIETY OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	23.933	18.348	.241	17.865	18.831
Control Group	22.966	23.018	.241	22.535	23.502

Table 6 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 23.933 – post mean score is 18.348 and control group pre mean score is 22.966 - post mean score is 23.018. It was also hypothesized that Mental Relaxation training Program has significant demotion in Anxiety of Boxers" is accepted.

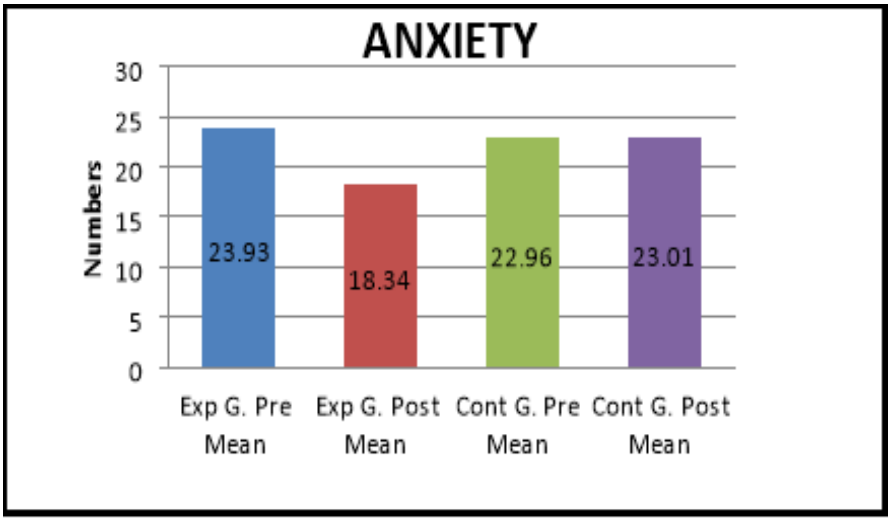

FIGURE: 4-MEAN PLOT OF ADJUSTED MEANS OF ANXIETY (SCAT) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 7

ADJUSTED MEAN AND STANDARD ERROR OF STRESS OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	67.833	48.602	.642	47.316	49.887
Control Group	65.466	66.098	.642	64.813	67.384

Table 7 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 67.833 – post mean score is 48.602 and control group pre mean score is 65.466 – post mean score is 66.098. It was also hypothesized that Mental Relaxation training Program has significant demotion in stress of Boxers, is accepted.

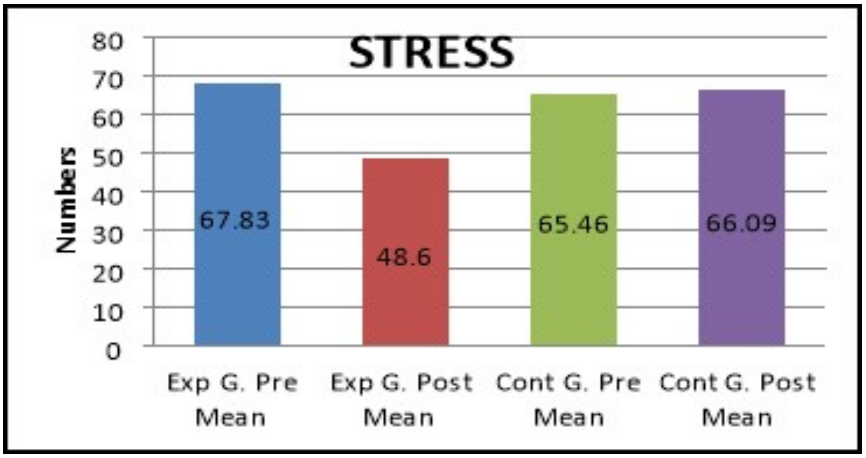

FIGURE:5-MEAN PLOT OF ADJUSTED MEANS OF STRESS (CSQ) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 8
ADJUSTED MEAN AND STANDARD ERROR OF CONCENTRATION OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean	Post Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Experimental Group	14.6	9.348	.230	8.886	9.809
Control Group	13.666	13.986	.230	13.524	14.447

Table 8 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is 14.6 – post mean score 9.348 and control group pre mean score is 13.666 – post mean score is 13.986. It was also hypothesized that Mental Relaxation training Program has significant improvement in concentration of Boxers, is accepted.

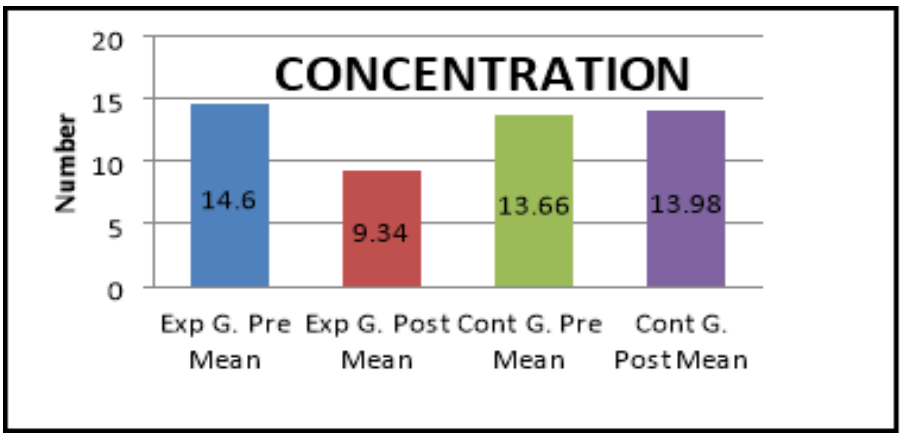

FIGURE: 7-MEAN PLOT OF ADJUSTED MEANS OF CONCENTRATION (CQ) OF EXPERIMENTAL AND CONTROL GROUP

TABLE 9
ADJUSTED MEAN AND STANDARD ERROR IN PULSE RATE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
	BTON	ATON	BTON	ATON		Lower Bound	Upper Bound
Experimental Group	72.57	79.3	71.4	73.421	.497	72.426	74.417
Control Group	73.03	78.93	73.2	79.212	.497	78.217	80.207

Table 9 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 72.57 / ATON 79.3 - post mean score is BTON 71.4 / ATON 73.421 and control group pre mean score is BTON 73.03 / ATON 78.93 – post mean score is BTON 73.2 / ATON 79.212. It was also hypothesized that Mental Relaxation training Program has significant to maintain normal pulse rate of Boxers, is accepted.

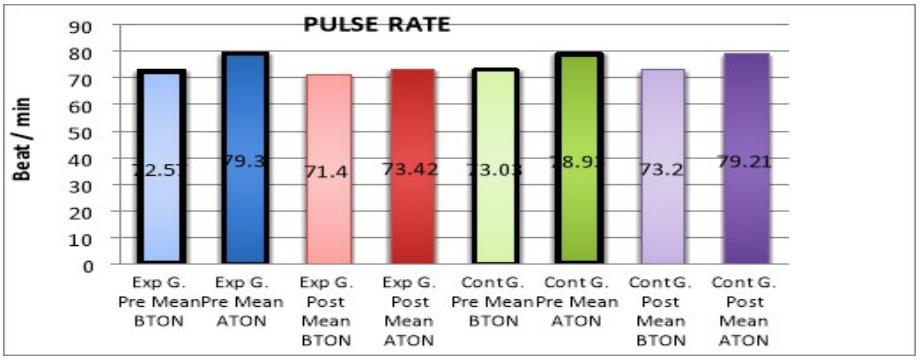

FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF PULSE RATE OF EXPERIMENTAL AND CONTROL GROUP

TABLE 10

ADJUSTED MEAN AND STANDARD ERROR OF DIASTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
						Lower Bound	Upper Bound
	BTON	ATON	BTON	ATON			
Experimental Group	78.3	67.3	78	74.052	.581	72.889	75.216
Control Group	78.8	69.77	77.8	69.515	.581	68.351	70.678

Table 10 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 78.3 / ATON 67.3 – post mean score is BTON 78 / ATON 74.052 and control group pre mean score is BTON 78.8 / ATON 69.77 – post mean score is BTON 77.8 / ATON 69.515. It was also hypothesized that Mental Relaxation training Program will have significant to maintain normal Diastolic B.P (Blood pressure) of Boxers, is accepted.

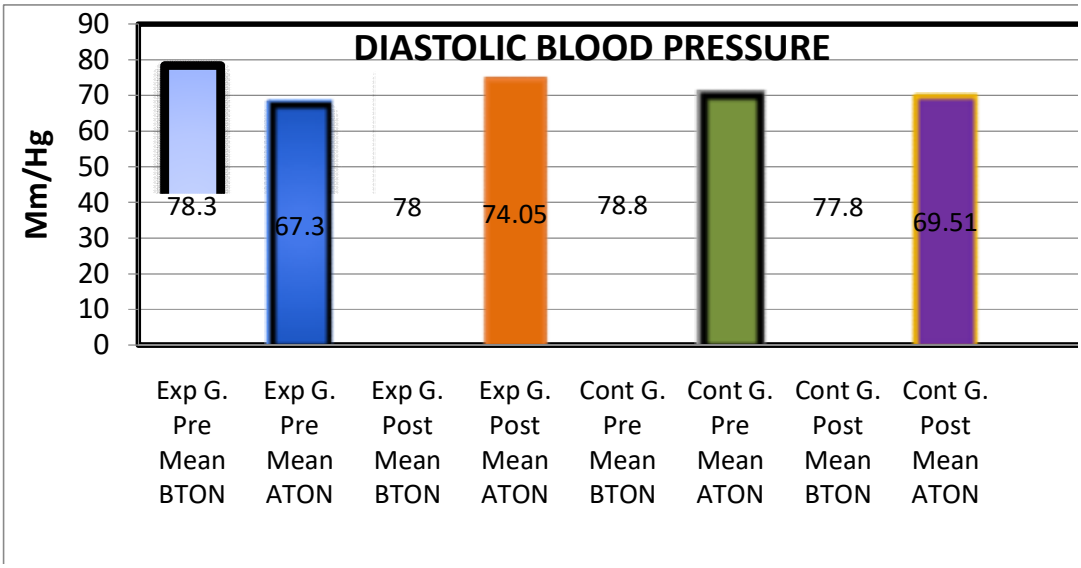

FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF DIASTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUP

TABLE 11
ADJUSTED MEAN AND STANDARD ERROR OF SYSTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUPS

Groups	Pre Mean		Post Mean		Std. Error	95% Confidence Interval	
	BTON	ATON	BTON	ATON		Lower Bound	Upper Bound
Experimental Group	126.26	133.5	126	127.129	.671	125.785	128.473
Control Group	127.6	133	128	133.037	.671	131.694	134.381

Table. 11 depicts the adjusted mean values after nullifying the effect of initial difference among the treatment groups. The value of pre mean score of experimental group is BTON 126.26 / ATON 133.5 – post mean score is BTON 126 / ATON 127.129 and control group pre mean score is BTON 127.6 / ATON 133 – post mean score is BTON 128 / ATON 133.037. It was also hypothesized that Mental Relaxation training Program will have significant to maintain normal Systolic B.P (Blood pressure) of Boxers., is accepted.

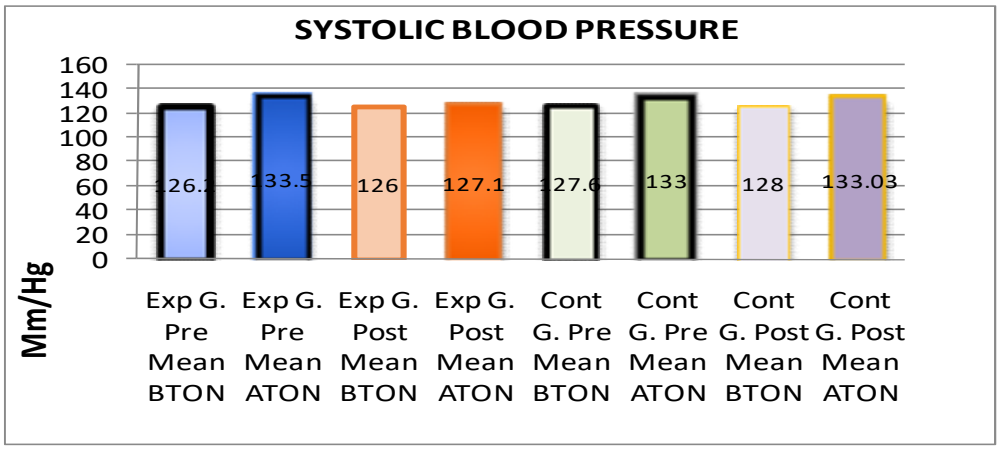

FIGURE 8-MEAN PLOT OF ADJUSTED MEANS OF SYSTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUP

4. DISCUSSIONS

From the above findings of the present study, selected mental relaxation training exercises contributed positively towards the improvement of selected neuro-psycho and physiological variables of the Boxers.

5. CONCLUSIONS

1. Mental Relaxation training Program has showed significant demotion in Hand Reaction, Foot Reaction time, Anxiety and Stress
2. Mental Relaxation training Program has showed significant improvement in Static balance and Concentration of Boxers.
3. Mental Relaxation training Program has showed significant to maintain normal pulse rate and Blood pressure of Boxers.

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