

Comparison of long - Term Effects of Internal Imagery and Progressive Muscle Relaxation on Brunel Mood among Malaysian and Iranian Taekwondo athletes

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Abstract. The aim of the present study was to investigate the long term effects of two different techniques, namely internal imagery and progressive muscle relaxation (PMR) on the mood among taekwondo players in Malaysia and Iran. This method was designed by eighty eight taekwondo players (Mean age: 12.79) were randomly assigned into 4 groups, 1) imagery exercise, 2) progressive muscle relaxation, (PMR) 3) combined imagery exercise and progressive muscle relaxation and 4) control group. Mood State Adolescents have been measured after the 8th, 16th, 24th, intervention session and the measurement were repeated after the completion of 24th follow up's sessions (without any intervention). Using 4 (groups) x 5 (trials) repeated measured ANCOVA, the results revealed experimental groups is significantly better than control group in positive and negative of mood in both countries during the post measurement and after completion of 24 follow up sessions. In comparison between the groups, combined and imagery groups is significantly better than relaxation group.

Keywords: progressive muscle relaxation, internal imagery Mood State scale.

1. Introduction

An athlete's mood at any one time is a product of both personality and situation; therefore it is a much more valid measurement of their psychological state during performance. The first reason includes some study that demonstrate elite athletes who frequently have a mood profile that was lower in negative moods (tension/anxiety, depression, anger, fatigue and confusion) and higher in vigor [8]. Secondly mood has regular effect on individuals' daily lives [2]. Several techniques affect mood such as progressive muscle relaxation that is a physical relaxation techniques and imagery that is cognitive practice [6]. These two techniques changed the body temperature which can result in reduced muscle tension, leading to increased feelings of relaxation and stress reduction; increased level of endorphins which some studies have reported lead to improved mood states [7]. Some researcher believed that the effects of various relaxation and imagery techniques may differ on several dimensions and every technique also have specific effects [1]. For instance Wood studied about effects of three different methods, relaxation, visualization, yogic breathing and stretch. The range of age was 21 to 76 years old. Thus, a 30 min programmed of yogic stretch and breathing exercises have significantly increase positive mood, in this study have used been a six sessions of training that may effect on results [12] and Hashim studied about progressive muscle relaxation and autogenic on mood and didn't find any interaction effects on mood. In this study used twelve training sessions [4]. Indeed, it is not clear how many sessions are require before mastery of technique is achieved and effect is produced. Holmes who studied about comparative imagery and self-talk on mood, after three sessions results have been showing imagery condition would showing a greater increase in positive effect and results suggest that positive training can be enhanced through imagery as opposed to verbal processing. The type of methodology effect on results for example some of the study measured variables immediately after

completed the training but some study attention to long term effects [3]. McKinney et al, studied about Guided Imagery and Music sessions on mood and cortisol. Participants divided in to two groups (control conditions and combined group) experimental sections were 13 week and also 6 weeks follow-up. Results demonstrated that after 6 sessions, participants reported significant decreases between pre- and post session depression, fatigue, and total mood disturbance and had significant decreases in cortisol level by follow-up. Pretest to follow-up decrease in cortisol was significantly associated with decrease in mood disturbance, although according the previous study the level of plays and the range of age effects on mood's results [7]. In this regard, there is a need to identify appropriate combination that is important to ensure its effectiveness, identify the effects of extended sessions of both imagery and PMR training and identify the long term effects of extended sessions of both imagery and PMR training. In terms of skills acquisition, although internal imagery and PMR has been suggested to produce the best effects, contradictory findings were still found in the literature review Therefore the aim of this study is investigated in progressive muscle relaxation and imagery on psycho physiological parameters, psychomotor, and physical performance among adolescent Taekwondo athletes.

2. Methodology

2.1. Participants

This study consisted of two phases. The first phase was conducted in Malaysia and second phase was conducted in Iran. Eighty eight taekwondo players (Malaysia taekwondo players=40, Iranian taekwondo players =48) aged 8-17 years were recruited in this study. The subjects reported that they had never received any relaxation and imagery.

2.2. Instrument

Questionnaire: Mood states were measured using Brunel Mood Scale (BRUMS) [10]. Their responses contain 24 simple mood descriptors such as negative and positive. Respondents indicated on a five point scale. Ranging from 0 =not at all to 4 = extremely)

Relaxation and imagery instrumentation: pre-recorded progressive muscle relaxation and internal imagery were used for relaxation and imagery training along with other relaxation and imagery training accessories (e.g., mats, CD players and headphone). The relaxation instructions followed a script proposed by Greenberg [14].

2.3. Procedures

Permission to conduct the study was obtained from the relevant authorities. Furthermore, the study protocol was approved by the Research Ethics' Committee (Human) of the author's institution. Three coaches provided scores of the participants' reverse swing kick technique at the baseline measurement and the groups were matched according this score, age and gender. They were then randomly assigned into 4 groups, 1) imagery exercise, 2) progressive muscle relaxation, (PMR) 3) combined imagery exercise and progressive muscle relaxation and 4) control group. Relaxation, imagery and combined group listened to pre-recorded audio-tape two times per week. Mood questionnaire were measured after 8th, 16th, 24th intervention session. The measurement were repeated (without any intervention) after 3 months (24 sessions) of completion of intervention.

3. Statistic Analysis

Two statistical analyses were used. Descriptive statistics were used for data screening and two way repeated measurements ANCOVA was used to examine between groups differences. Data were analyzed using SPSS (V. 18).

3.1. Study I

4. Results

The data were checked for accuracy, distributional properties, and missing values. No missing values or outliers were present, and the distributional properties were within normal range. Descriptive statistics are presented in Tab: 1.

Table 1. Means and s.d. Values for measured parameters in the four experimental groups across the experimental trial.in malaysia

	Group	Positive Mood		Negative Mood	
		Mean	Std. Deviation	Mean	Std. Deviation
First measurement	Control	7.0000	3.20713	17.4444	12.29950
	Relaxation	5.0000	2.44949	21.6667	12.19631
	Combine Groups	4.8750	3.31393	18.8000	8.01110
	Imagery	4.6667	2.87228	16.0000	8.86942
Second measurement	Control	7.2500	1.98206	17.7778	9.76957
	Relaxation	6.1429	3.33809	19.8889	15.67996
	Combine Groups	8.8750	1.95941	13.3000	8.19282
	Imagery	7.8889	2.08833	15.0000	7.48331
Third measurement	Control	6.6250	2.55999	19.5556	14.10772
	Relaxation	7.7143	4.46148	18.5556	12.29950
	Combine Groups	9.7500	3.01188	11.5000	7.60482
	Imagery	8.6667	3.96863	12.3000	11.36320
Fourth measurement	Control	7.5000	3.66450	19.6667	11.04536
	Relaxation	8.5714	3.35942	17.4444	8.15646
	Combine Groups	10.0000	4.34248	10.6000	4.50185
	Imagery	9.3333	5.80948	10.4000	6.44981
Fifth measurement	Control	8.1250	4.08613	25.1111	12.93681
	Relaxation	11.0000	3.78594	10.5556	6.78438
	Combine Groups	12.7500	3.91882	12.2000	7.18331
	Imagery	14.0000	4.00000	14.4474	8.28385

The differences in the Mood across the independent variables were analysis using two way repeated measurement ANCOVA and for measurement between groups LSD post hoc has been used. Based on Mauchly's test of sphericity, no significant differences in the variances of the differences in all of the subscales were found across the test sessions. Therefore, the assumption of the homogeneity of variance was met. The results revealed in positive mood found significant differences between the groups. In the fourth measurement, control group has significant difference with combined ($p < 0.00$) and in the fifth measurement the control group has significant difference with the combined and imagery group ($p < 0.00$) and no significant differences were not discovered in between experimental groups.

Table 2. Compare Groups In Across Five Measurements of Positive Mood

Times	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^a
First measurement	Control	Relaxation Group	2.000	1.549	0.207
		Combined Group	2.125	1.497	0.167
		Imagery Group	2.333	1.454	0.120
	Relaxation	Combined Group	.125	1.549	0.936
		Imagery Group	.333	1.508	0.827
		Combined Group	-.208	1.454	0.887
Second measurement	Control	Relaxation Groups	1.107	1.222	0.373
		Combined Group	-1.625	1.181	0.180
		Imagery Groups	-.639	1.147	0.582
	Relaxation	Combined Group	-2.732 [*]	1.222	0.034
		Imagery Groups	-1.746	1.190	0.153
		Combined Group	-.986	1.147	0.397
Third measurement	Control	Relaxation Group	-1.089	1.842	0.559
		Combined Group	-3.125	1.780	0.090
		Imagery Group	-2.042	1.730	0.248
	Relaxation	Combined Group	-2.036	1.842	0.279
		Imagery Group	-.952	1.794	0.600
		Combined Group	-1.083	1.730	0.536
Fourth measurement	Control	Relaxation Group	-1.071	2.322	0.648
		Combined Group	-2.500	2.243	0.275
		Imagery Group	-1.833	2.180	0.408
	Relaxation	Combined Group	-1.429	2.322	0.543
		Imagery Group	-.762	2.261	0.739
		Combined Group	-.667	2.180	0.762
Fifth measurement	Control	Relaxation Group	-2.875	2.048	0.171
		Combined Group	-4.625 [*]	1.978	0.027
		Imagery Group	-5.875 [*]	1.923	0.005
	Relaxation	Combined Group	-1.750	2.048	0.400
		Imagery Group	-3.000	1.994	0.144
		Combined Group	1.250	1.923	0.521

The results found significant differences between groups in negative mood. Control group has significant difference with the combined and imagery groups and relaxation group has significant difference with imagery and combined group in the fourth measurement ($p < 0.00$). In the fifth measurement the control group has significant difference with experimental group ($p < 0.00$).

Table 3. Compare Groups in Accroce Five Measurements of Negative Mood

Times	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^a
First measurement	Control	Relaxation Group	-4.222	4.908	0.396
		Combined Group	-1.356	4.784	0.779
		Imagery Group	1.444	4.784	0.765
	Relaxation	Combined Group	2.867	4.784	0.553
		Imagery Group	5.667	4.784	0.244
	Imagery	Combined Group	-2.800	4.656	0.552
Second measurement	Control	Relaxation Groups	-2.111	5.009	0.676
		Combined Group	4.478	4.882	0.365
		Imagery Groups	2.778	4.882	0.573
	Relaxation	Combined Group	6.589	4.882	0.186
		Imagery Groups	4.889	4.882	0.324
	Imagery	Combined Group	1.700	4.752	0.723
Third measurement	Control	Relaxation Group	1.000	5.414	0.855
		Combined Group	8.056	5.277	0.136
		Imagery Group	7.256	5.277	0.178
	Relaxation	Combined Group	7.056	5.277	0.190
		Imagery Group	6.256	5.277	0.244
	Imagery	Combined Group	.800	5.136	0.877
Fourth measurement	Control	Relaxation Group	2.222	3.674	0.549
		Combined Group	9.067*	3.581	0.016
		Imagery Group	9.267*	3.581	0.014
	Relaxation	Combined Group	6.844	3.581	0.064
		Imagery Group	7.044	3.581	0.057
	Imagery	Combined Group	- .200	3.485	0.955
Fifth measurement	Control	Relaxation Group	14.556*	4.270	0.002
		Combined Group	14.511*	4.161	0.001
		Imagery Group	12.911*	4.161	0.004
	Relaxation	Combined Group	-.044	4.161	0.992
		Imagery Group	-1.644	4.161	0.695
	Imagery	Combined Group	1.600	4.050	0.695

3.2. STUDY II

5. RESULTS

The data were checked for accuracy, distributional properties, and missing values. No missing values or outliers were present, and the distributional properties were within normal range. Descriptive statistics are presented in Tab: 3.

Table 4. Means and s.d. Values for measured parameters in the four experimental groups across the experimental trial in iran.

	Group	Positive Mood		Negative Mood	
		Mean	Std. Deviation	Mean	Std. Deviation
First measurement	ontrol	8.0833	2.60971	30.5833	14.51932
	elaxation	9.8333	2.58785	24.2500	11.90206
	ombine Groups	7.6667	3.98482	24.3333	8.88649
	magery	8.8333	3.37998	33.3333	17.10042
Second measurement	ontrol	9.5000	1.67874	34.9167	17.66073
	elaxation	11.5833	2.60971	10.5833	7.27959
	ombine Groups	9.8333	1.80067	17.2500	9.57388
	magery	9.8333	1.99241	24.0000	14.32100
Third measurement	ontrol	9.6667	2.14617	35.3333	15.20965
	elaxation	12.1667	1.74946	9.9167	5.48483
	ombine Groups	12.3333	1.87487	13.5833	6.33114
	magery	11.4167	1.72986	22.5833	11.71990
Fourth measurement	ontrol	9.9167	2.57464	35.5000	9.07043
	elaxation	12.4167	2.19331	10.7500	3.59608
	ombine Groups	12.8333	2.28963	13.2500	3.88763
	magery	12.1667	2.12489	20.9167	5.75971
Fifth measurement	ontrol	8.6667	2.22928	31.1667	5.98230
	elaxation	12.6667	1.43548	10.5833	4.31611
	ombine Groups	12.8333	1.74946	11.7500	3.72034
	magery	12.1667	2.08167	15.6667	4.29235

The differences in the mood scores across the independent variables were analysis using two way repeated measurement ANCOVA and for measurement between groups LSD post hoc has been used. Based on Mauchly's test of sphericity, no significant differences in the variances of the differences in all of the subscales were found across the test sessions. Therefore, the assumption of the homogeneity of variance was met. The results revealed significant differences between groups in positive moods. In second, third, fourth and fifth measurement, control group has significant difference with the experimental groups ($p < 0.00$)

Table 5. Compare Groups In Across Five Measurements Of Positive Mood

Times	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^a
First measurement	Control	Relaxation Group	-1.750	1.304	0.186
		Combined Group	.417	1.304	0.751
		Imagery Group	-.750	1.304	0.568
	Relaxation	Combined Group	2.167	1.304	0.104
		Imagery Group	1.000	1.304	0.447
		Combined Group	1.167	1.304	0.376
Second measurement	Control	Relaxation Groups	-2.083*	.838	0.017
		Combined Group	-.333	.838	0.693
		Imagery Groups	-.333	.838	0.693
	Relaxation	Combined Group	1.750*	.838	0.043
		Imagery Groups	1.750*	.838	0.043
		Combined Group	.000	.838	1.000
Third measurement	Control	Relaxation Group	-2.500*	.769	0.002
		Combined Group	-2.667*	.769	0.001
		Imagery Group	-1.750*	.769	0.028
	Relaxation	Combined Group	-.167	.769	0.829
		Imagery Group	.750	.769	0.334
		Combined Group	-.917	.769	0.239
Fourth measurement	Control	Relaxation Group	-2.500*	.940	0.011
		Combined Group	-2.917*	.940	0.003
		Imagery Group	-2.250*	.940	0.021
	Relaxation	Combined Group	-.417	.940	0.660
		Imagery Group	.250	.940	0.791
		Combined Group	-.667	.940	0.482
Fifth measurement	Control	Relaxation Group	-4.000*	.775	0.000
		Combined Group	-4.167*	.775	0.000
		Imagery Group	-3.500*	.775	0.000
	Relaxation	Combined Group	-.167	.775	0.831
		Imagery Group	.500	.775	0.522
		Combined Group	-.667	.775	0.394

Negative mood results showed the control group has significant difference with the experimental groups and the relaxation group has significantly difference with the imagery and combined groups in second, third, fourth and fifth measurement ($p < 0.00$).

Table 5. Compare Groups In Across Five Measurements of Negative Mood

Times	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig. ^a
First measurement	Control	Relaxation Group	6.333	5.492	0.255
		Combined Group	6.250	5.492	0.261
		Imagery Group	-2.750	5.492	0.619
	Relaxation	Combined Group	-.083	5.492	0.988
		Imagery Group	-9.083	5.492	0.105
		Combined Group	9.000	5.492	0.108
Second measurement	Control	Relaxation Groups	24.333*	5.251	0.000
		Combined Group	17.667	5.251	0.002
		Imagery Groups	10.917	5.251	0.043
	Relaxation	Combined Group	-6.667	5.251	0.211
		Imagery Groups	-13.417*	5.251	0.014
		Combined Group	6.750	5.251	0.205
third measurement	Control	Relaxation Group	25.417*	4.276	0.000
		Combined Group	21.750*	4.276	0.000
		Imagery Group	12.750*	4.276	0.005
	Relaxation	Combined Group	-3.667	4.276	0.396
		Imagery Group	-12.667*	4.276	0.005
		Combined Group	9.000*	4.276	0.041
fourth measurement	Control	Relaxation Group	24.750*	2.445	0.000
		Combined Group	22.250*	2.445	0.000
		Imagery Group	14.583*	2.445	0.000
	Relaxation	Combined Group	-2.500	2.445	0.312
		Imagery Group	-10.167*	2.445	0.000
		Combined Group	7.667*	2.445	0.003
Fifth measurement	Control	Relaxation Group	20.583*	1.900	0.000
		Combined Group	19.417*	1.900	0.000
		Imagery Group	15.500*	1.900	0.000
	Relaxation	Combined Group	-1.167	1.900	0.542
		Imagery Group	-5.083*	1.900	0.010
		Combined Group	3.917*	1.900	0.045

6. Discuses

The main objectives of the present study were to investigate the effects of progressive muscle relaxation and internal imagery and to compare the relative effectiveness of these two techniques on mood but Wood utilized 6 sessions and didn't find any significant difference for imagery and relaxation [11]. The present results indicated that 24 sessions of relaxation training induced long-term effects on mood. We consider that the period in which the measurement were taken would have influenced the results. Variables in the present study were measurement of the 24 sessions after the completion of the relaxation training, and in resting condition and they had international competition after the third measurement this competition may affected the results. Our objective was to study the effect of progressive muscle relaxation and internal imagery on positive mood in Malaysia and Iran. In these results, we found all experimental groups have significantly shown increase compared with control group in Iran but in Malaysia combined and imagery have

significantly improve compared with control group, although relaxation group has improved. In recently results we thought the number of sample size has effects on results although, Holmes found imagery have significant better than verbal training group in positive mood [3]. results show experimental groups have significantly lower negative mood compared to control group in both countrybut combined and imagery groups have significantly decrees compare with relaxation group. Naoi, studied about cognitive and relaxation, he found cognitive intervention (one week) have affected on mood score compare them with relaxation group [12]. Our results raised another question. Specifically, how many sessions are required for an individual to really master the technique in order to produce the long-term effects? However, it is difficult to determine the number of sessions required for the trainee to have sufficient experience with the technique but we believed 24 sessions of training might be supported for stability effect of training. McKinney et al found significant improvement in 88 subjects that undertaking imagery after 13 weeks of training and also after 6 weeks follow up [7].In summary, our findings revealed experimental groups have significant is improve in the mood's aspects in post measurements and after completion of 24 follow-up's sessions in both countries.

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