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## The effect of massage therapy on depression, anxiety and stress in adolescent wrestlers

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### Abstract

In this study we examined the effects of massage therapy on depression, anxiety and stress in youth wrestlers. To do this test participated 24 wrestlers that participations' age ranged from 15-18 years old. In doing so, we control the effects of massage therapy on experimental and control groups by DASS Inventory. During 10 sessions of treatment the experimental groups were received 25 minutes sports massage for every session. As shown MANOVA by comparison of Depression, Anxiety, and Stress scores between experimental and control groups and by control the pretest scores, indicated the significant different between scores of Depression ( $P<0.001$ ), Anxiety ( $P<0.001$ ), and Stress ( $P<0.001$ ) in experimental and control groups. The findings of this study indicate that massage therapy tangibly and significantly decreases the level of depression, anxiety and stress of wrestlers that this phenomenon can lead to mental health and thereby improve their performance.

**Keywords:** Sport massage; DASS inventory; youth wrestlers; depression, anxiety and stress

### Introduction

Massage therapy is one of the oldest forms of treatment that nowadays is popularity as part of complementary and drug-free approaches (Moyer and et al. 2004). For thousands of years in all over the world Massage has been used for relaxation and smooth's the mood (Weerapong et al., 2005; Galloway et al., 2004).

Massage has been defined as a systematic forms of touch the soft tissues with palm and fingers for the purpose of promoting health and well-being (Moyer and et al., 2004).

According to Field T and et al (2005), massage makes the increase of artery, vein, and local blood stream and stroke volume. Improve the defecation and inhibit pain mechanism. Increase the serotonin and dopamine and decrease cortisol and heal the awareness.

Massage therapy cause the stimulus of central nerve system and decrease the heartbeat and respiration and therefore reason the calmness feel (Sherman and et al. 2005). In a meta-analysis research (n=17) shows that massage therapy make the decrease of depression signs (Hou and et al., 2010).

Massage therapy promotes psychosocial relaxation and reduce stress. In addition, this therapy has been reported to improve immune function. Massage therapies have been reported to produce beneficial physiological effects such as vasodilation, an increase in skin temperature, body relaxation. (Field, 1998) In addition, massage also has been proposed to promote psychosocial relaxation and reduce stress (Yuka Noto and et al., 2007).

According to Weerapong and et al (2005), investigated a reduction in anxiety and an improvement in mood state also cause relaxation (psychological mechanisms) after massage. The majority of research in the psychological area has reported that massage provided positive effects on anxiety (Weerapong and et al., 2005). And according to Moyer CA et al (2004) major effects of massage therapies were reductions of trait anxiety and

depression. Prolonged stress and associated tension can create anxiety, physical pain, and discomfort. A typical intended outcome of massage is the reduction of stress (Sarah Brownlee and John Dattilo, 2002).

There are many different forms of massage therapy (more than 80 type) with diverse settings that used by different groups in various occupations (Brownlee and Dattilo, 2002). According to Nancy A. Werner (2005) one forms of massage is Sports massage, that now is popular, is based on 12 principle body postures that form all athletic movements. This form of massage can assist to athletes to healing the muscle strains and maintain peak activity in healthy muscles with less risk of injury (Werner, 2005). Sports massage is frequently used in rehabilitation settings and with athletes (Brownlee and Dattilo, 2002).

According to Jurch (2010) sport massage has numerous benefits and every system of the body affected by this. The effects of massage therapy fall into one of three categories: physical, psychological, and emotional (Jurch, 2010). Massage is widely used by the athletic population for a variety of purposes such as injury prevention, recovery from fatigue, relaxation, and to increase performance (Hemmings, 2001). According to Hemming and et al (2000) the effects from sports massage are foremost psychological rather than physiological and may sense of initial recovery after a massage originate from psychological effects through which massage could generate beneficial effects on recovery and subsequent performance levels (Hemmings and et al., 2000).

The science of sports massage is of interest to many population including athletes, athletic trainers, coaches, as well as sports physiologists (Moraska, 2005). Moraska (2005) explored the investigation into the effects of massage on physiological and psychological parameters related to athletic performance has been slow and only small body of literature on massage therapy and physical activity has been published. In conclusion from research published on sports massage is mixed with regard to the effectiveness of treatment on a specific physiological condition.

One of the more intangible aspects of sporting competitions is the psychological component. The psychological effect provided to an athlete by an experience such as massage may be of importance in a non-physiological manner. A brief report that suggests a 40-50 minute massage given to athlete may decrease anxiety (Moraska, 2005).

In previous researches there were two problems that influenced on measurements; first the measurement technology was limited to physiological measures including heart rate, blood pressure and temperature. No control group was another methodological problem. Without a control group, the effects of the massage could be due to 'placebo effects', the effects of simply receiving attention from a therapist, therefore, further studies on the effects of massage on anxiety need to provide more appropriate control groups (Chaitow, 2005; Weerapong and et al., 2005).

Finally, since there is a paucity of research in the effect of massage therapy on depression, anxiety and stress in adolescent athletes in sport massage field especially wrestlers, the purpose of this study was to determine if sport massage has an effect on adolescent wrestlers depression, anxiety and stress according to DASS questionnaire. We hypothesized that sport massage would reduce the level of depression, anxiety and stress of adolescent wrestlers.

## **Materials and Methods**

### **Participation**

In this study, sample population was selected out of 50 male adolescent wrestlers who were wrestling in amateur level (who exercise wrestling at least 3-5 years and participated in provincial competitions). The participations' age ranged from 15-18 years old. In order to homogenize the participant and make sure about their general mental health level, a DASS (Depression, Anxiety and stress scale) Test was administered to the participants. Having analyzed the data, 24 participants who scored lowest score (low score = normal mood) were chosen as the subjects of this study, therefore they were randomly assigned into experimental and control group with 12 in each group. Then subjects parent completed the parental consent form and permitted to their child participate in this study.

### **Instrumentation/Apparatus and Materials**

First, the participants' general mental health was assessed using the Manual for the Depression, Anxiety and stress scales (2<sup>nd</sup> Ed) test to ensure the homogeneity of the groups at the beginning of the course.

Before the intervention, physical measurements were performed such as age, height, weight and body fat percentage in the two groups. The participants' heights were measured by using stadiometer SECA model and weights were measured by using digital scale. Body fat percentage was measured by caliber and Jackson & Polack formula. Both groups daily participated in 65-55 percent of normal wrestling HRmax training sessions. Then the experimental group received sport massage by neutral oil per session for 10 session. Every session was 25 minutes. Massage by the massage experts and researches were carried out in a quiet place with suitable light

and ventilation in a sanitary condition and massage sessions planned for each sample was done in a certain time, while during this period the control group were followed to ensure of their regular training in club.

### **Depression Anxiety and Stress Scale (DASS) questionnaire**

Depression, Anxiety and Stress Scale is containing of 42 questions and tree self-report scale to assess the negative emotional state. Each of the depression, anxiety and stress scales are contains of 14 items. So depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale assesses the levels of chronic non-specific arousal. Gamma coefficients that represent the loading of each scale on the overall factor (total score) are 0.71 for depression, .86 for anxiety, and 0.88 for stress (Lovibond and Lovibond. 1995). Reliability of the three scales is considered adequate and test-retest reliability is likewise considered adequate with 0.71 for depression, 0.79 for anxiety and 0.81 for stress (Brown and et al. 1997). Exploratory and confirmatory factor analyses have sustained the proposition of the three factors ( $p < .05$ ; Brown and et al. 1997).

### **Exercise protocol**

Exercise protocol used in the study were derived from Rashidlamir et al (2009) investigation protocol that was based on wrestling techniques and in a session of wrestling training was contain of 10 minutes warm up followed by a series of dynamic stretches and mobility exercises, 16 minutes cool down, 17 minutes wrestling practice and 17 minutes circle exercise.

### **Massage protocol**

According to Moraska (2005); McGilvery and et al (2010) techniques that are commonly used in sports massage include Effleurage, Petrissage, Tapotement, Friction and Vibration:

Effleurage describes long, soothing, stroking movements using the flat of the hand (or fingers if working on small areas). These are often used to apply oil evenly to the body. You can use one hand on its own or with the other providing support on top of it, both hands simultaneously, or one hand alternating with the other.

Petrissage describes a number of movements which involve various ways of kneading, rolling and picking up the skin and muscles. These firm and strengthen the structures by stimulating the deep layers of tissue, and increasing the supply of blood to the area. They also improve the flow of lymph.

Tapotement, or percussion movements, are fast and stimulating. They include cupping, hacking, pounding (also called pummeling), which all sound like painful practices but when carried out properly should certainly not cause bruising or pain.

Friction, or “connective tissue massage”, is a penetrating circular movement which applies deep direct pressure to one particular site of muscular tension, using the thumb, fingertips or knuckles. It is a valuable technique for concentrating on specific areas of tightness and muscle spasm in the back.

Vibration (Shaking) is a pre-event technique to stimulate the target muscle groups prior to competition. The procedure involves tremulous movement resulting in a shaking of the body region massaged. The purpose of vibration is to facilitate muscle relaxation and increase circulation.

The protocol of this treatment is extracted from Jelve'us (2011) that suggested areas to massage for wrestlers:

1. Ankles and calves. Triceps surae, peroneal, tibialis posterior, and tibialis anterior muscles.
2. Knees and thighs. Quadriceps femoris, adductors, and hamstring muscles.
3. Gluteal and hip area. Gluteus maximus, medius and minimus, TFL, and iliopsoas muscles.
4. Lower back. Quadratus lumborum, erector spinae, and lower latissimus dorsi muscles.
5. Shoulders. Latissimus dorsi, teres major and minor, infraspinatus, subscapularis, deltoid, serratus anterior, and pectoralis major muscles.
6. Neck. Splenius capitis, splenius cervicis, trapezius, levator scapulae, and suboccipital muscle group.
7. Arms. Biceps and triceps brachii muscles.

### **Procedure**

At first, a DASS test was administered to 50 adolescent wrestlers who were wrestling in competitive level. Having analyzed the data, 24 wrestlers who scored normal range of score were chosen for the study. Before the beginning of the experiment it was checked that any one of the participants had not injury. Then, they were randomly assigned into experimental and control group with 12 in each group.

After that, participants in experimental group were asked to participate in a justification session for coordination and set the massage schedule. Then set a daily schedule for each one of them along 10 days. On the other hand, coaches and researches were controlled participate of experimental & control groups in wrestling daily practice. In this trend experimental group were given massage after 60 minutes wrestling practice and the control group only participate in wrestling practice.

During 10 daily sessions of treatment the experimental groups after 60 minute wrestler practice were received 25 minutes sport massage for every session, and the control group only participated in 60 minute wrestler practice. Having finished the treatment (10 days, 10 sessions), participants in both groups participated for the posttest. Before and after 10 sessions of massage therapy, both groups were asked to complete DASS questionnaires and data were recorded to analyze by SPSS statistical software. The researches administered the pretest as posttest to see the effects of the treatment during the study.

**Data analysis**

In this study for homogeneity of normal age, height, weight and Body mass index were used of kolmogorov-smirnov test that indicated both groups had normal deal ( $P>0.05$ ). To Comparison between both groups were used of MANOVA and for pretest & posttest scores were used of dependent MANOVA separately.

**Results**

The table 1 shows the mean, standard deviation and depression, anxiety and stress variables of pretest and posttest in both groups.

**Table 1: Comparison of Depression, Anxiety, and Stress scores**

Group	Variable	pretest		posttest	
		Mean	SD	Mean	SD
Experimental	Depression	17.8	2.06	15.92	1.92
	Anxiety	12.42	1.73	7.83	1.94
	Stress	21.75	1.81	15.75	1.60
Control	Depression	16.67	1.72	16.42	1.67
	Anxiety	12.58	1.67	11.83	2.08
	Stress	22	1.75	21.75	2

The table 2 shows the within-group variation between depression, anxiety and stress. The result show that 10 sessions of massage therapy significantly has reduced wrestlers' levels of depression, anxiety and stress.

**Table 2: Tests of Within-Subjects Contrasts**

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
depress	Linear	6.021	1	6.021	11.077	.003
depress * group	Linear	2.521	1	2.521	4.638	.042
Error(depress)	Linear	11.958	22	.544		
Anxiety	Linear	85.333	1	85.333	113.206	.000
anxiety * group	Linear	44.083	1	44.083	58.482	.000
Error(anxiety)	Linear	16.583	22	.754		
Stress	Linear	117.187	1	117.187	106.865	.000
stress * group	Linear	99.187	1	99.187	90.451	.000
Error(stress)	Linear	24.125	22	1.097		

The table 3 shows the changes between groups. According to the following table, the results show that in depression variable between groups there was no significant difference after 10 sessions of massage and the level of depression significantly a few increased. But there was a significant differences in anxiety and stress variable between control and experimental groups.

**Table 3: Tests of Between-Subjects Effects**

factor		Type III Sum of Squares	df	Mean Square	F	Sig.
depress	Intercept	13101.021	1	13101.021	2.067E3	.000
	group	.021	1	.021	.003	.955
	Error	139.458	22	6.339		
anxiety	Intercept	5985.333	1	5985.333	1.057E3	.000
	group	52.083	1	52.083	9.197	.006
	Error	124.583	22	5.663		
stress	Intercept	19804.687	1	19804.687	3.673E3	.000
	group	117.187	1	117.187	21.733	.000
	Error	118.625	22	5.392		

Overall and according to the results it can be concluded that stress decreased more than anxiety and depression, then anxiety better reduced and less than all depression reduced.

### Discussion and Conclusion

Massage therapy is one of the oldest forms of treatment that nowadays is popularity as part of complementary and drug-free approaches (Moyer and et al. 2004), and massage has been defined as a systematic forms of touch the soft tissues with palm and fingers for the purpose of promoting health and well-being (Moyer and et al. 2004). The main aim of this study was to examine the effect of 10 sessions massage therapy on Depression, Anxiety, and Stress of adolescent wrestlers. This experiment was designed to comparison the level of Depression, Anxiety, and Stress in wrestlers that reserved massage besides wrestling exercises and other group doesn't reserved massage and just participates in wrestling exercises.

The results of this study shown the decrease in means of Depression, Anxiety, and Stress in experimental group in comparison of before the interventions ( $P < 0.05$ ), while in control group this different were not significant. In other words, the experimental group by participate in massage therapy sessions enjoyed of this benefits for decrease of Depression, Anxiety, and Stress signs.

These results were consistent with the findings of Yuka Noto and et al & Moyer and et al. Physical contact has a very important role in reducing anxiety. During the massage there is contact between body of massage client and masseur hands. The basic and prerequisite condition for the effectiveness of this method is that the patient accepts the physical contact. In this study following these tips also had a role in reducing anxiety. These results supported by findings of Field TM (2005), Brownlee S and Dattilo J (2002) & Hou W.H and et al (2010) & Plews-Ogan M and et al (2005) that claimed massage therapy can reduce depression and stress. In addition, other researches like Weerapong and Kolt (2005), Moyer CA et al (2004) & Anderson PG and Cutshall SM (2007) found that massage therapy reduced the level of anxiety. Also massage therapy have many other results like Autism (Escalona A and et al 2001), ADHD (Khilnani S and et al 2003), Bulimia (Field T and et al 1998), Cystic fibrosis (M Hernandez-Reif and et al 1999), Cancer (Kutner JS and et al 2008 & Cynthia D. M and et al 2008 & Billhult A and et al 2007), fibromyalgia (Gordon C and et al 2006), Back pain (Sherman KJ and et al 2006 & Furlan AD and et al 2008 ), back and neck pain (Skillgate E and et al 2007), lymphedema (Bernas M and et al 2005), infant weight gain (Field, T and et al 2011), persistent pain (Munk N and et al 2011), nausea (Billhult A and et al 2007), bronchiectasis (Maa SH and et al 2007), ulcers (Duimel-Peters IG and et al 2006), agitation (Yang MH and et al 2007), Prostate (Bradley R. Hennenfent and et al 2006), orthopaedic (Dryden T and et al 2004), pruritus (Roh YS and et al 2007). Also there are some researches in field of sports like Jurch (2010), that investigated the benefits of sports massage therapy in the sport of tennis and categories the effects of massage therapy to physical, psychological, and emotional. In this trend psychologically effects relaxed the nervous system and reduced anxiety. Hemmings (2001), categorized the effects of massage therapy into physiological, psychological and performance effects that psychological effects was including improve mood

and relaxation and reduced anxiety. Hemmings and et al. (2000), studied the effects of massage on both physiologic and perceived recovery in eight amateur boxers. The investigators designed a testing protocol to examine if massage performed between bouts of simulated boxing matches would help to improve physiologic variables (Heart rates and blood lactate and glucose levels), performance, and the athlete's perception of recovery. These findings provide some support for the psychological benefits of massage, and Moraska (2005) was review sport massage researches and results from published literature supported of massage to benefit athletic recovery and performance but based on Moraska (2005) that explored the investigation into the effects of massage on physiological and psychological parameters related to athletic performance has been slow and only small body of literature on massage therapy and physical activity has been published. We need more researches in field of sports especially wrestling that is a conflict sport and mental mood is an important factor for wrestlers.

Indeed, this study had some limitations that perhaps the most of all was insufficient duration of treatment. Accordingly it was better to anticipate a long term trial period. Maybe next limitations were few subjects, and over or under working of muscles. As well as due to the sensitivity of adolescent age may be selected age requirements also affected the results, therefore, recommended that this test will be repeated in other age groups.

### **Conflict of interest**

The authors declare no conflict of interest

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