

**EFFECTIVENESS OF MASSAGE THERAPY IN REDUCING THE SYMPTOMS OF ATTENTION DEFICIT
- HYPERACTIVITY DISORDER AND ITS EFFECT ON ATTACHMENT STYLES OF MASSAGER
PARENT**

***Sahar Habibzadeh¹, Hassan Boland²**

1. Department of Clinical Psychology, Rasht Branch, Islamic Azad University, Rasht, Iran.

2. Department of Counseling, Faculty of Literature and Human Sciences, University of Guilan, Rasht, Iran

*Corresponding Author: guilan.sad@gmail.com

ABSTRACT

This study aimed to investigate the effectiveness of massage therapy in reducing the symptoms of attention deficit hyperactivity disorder (ADHD) and changing the attachment style of the massager parent. To this end, 30 children with ADHD that were visited by a psychiatrist and had taken the Ritalin were selected and randomly divided into two treatment and control groups using the available sampling method. Then, parents completed the Connors' questionnaire on attachment scale before and after the massage therapy intervention. Afterwards, the children in the treatment group were massaged by a massager for three weeks, two sessions of 45 minutes per week. Children in control group did not receive any treatment during the study and remained on the waiting list. After the end of the third week, a massage training package was offered to the parents in the treatment group to execute continuous massage exercises every night for 10 minutes before sleeping for a week. Finally, the collected data were analyzed for statistical analysis using SPSS software version 20 using the Multivariate Analysis of Covariance (MANCOVA). The results show that massage therapy reduces the symptoms of ADHA ($P < 0.01$). The children in the treatment group showed less symptoms of ADHD compared with the children in the control group in the posttest. Moreover, the attachment between parent and child with ADHD was not significant in executing the massage on the child by the parents that this shows that the mean of dependent variables was not different in the treatment and control groups

KEYWORDS: Massage Therapy, Hyperactivity, Attachment Style, Massager Parent

INTRODUCTION

One of the most common childhood disorders that have attracted the psychiatrists and psychologists' attention is the attention deficit hyperactivity disorder (ADHA) (Boosing *et al.*, 2010). This disorder was originally identified by the German doctor called Hufmann in 1845. ADHA is a neurodevelopment disorder that is described with three main features, namely, attention deficit, hyperactivity, and impulsivity. ADHA is one of the most common neuro-behavioral disorders in the childhood that affects a large part of the world population (America Psychiatric Association, 2000). Children with ADHD may not have the ability to pay close attention to the details or they may mistake in doing their home works or other activities. There are irregularities in doing activities and the tasks were carried out with no precision or enough thinking. Concentrating on playing and doing home works is often difficult for them (Ebica *et al.*, 2009).

Although a significant percentage of children and adolescents are affected by ADHA, etymological efforts have failed during the past three decades in finding the optimal strategies of control and therapeutic interventions. Since no single factor is known as a cause of attention deficit and hyperactivity disorder, it is thought that this disorder results from the complex interaction between genetic, environmental, and biological factors (Keeling *et al.*, 2008 quoted Abedi *et al.*, 2012). In fact, it seems that genetic and environmental factors cause the neurobiological differences and consequently, the symptoms of ADHA. However, rare cases of ADHA can occur without genetic background. Although, it does not seem that psychosocial factors are the single reason for ADHD, they still play a potential role in the expression of the symptoms (Barkley, 2006). In this regard, explanatory efforts on ADHD have focused on the reasons such as traumatic brain injury, neurodegenerative diseases, allergic reactions to the food and additives, bio-chemical imbalance of the brain, environmental variables such as lead, constraints, and environmental stresses (Lotfi Kashani and Vaziri, 2004).

Due to a variety of the problems associated with ADHD, it is certainly impossible that one treatment can cover all the treatment requirements for this disorder. For this reason, specialists often adopt several combined treatment strategies to consider the different aspects of psychosocial problems of children. None of the treatment interventions should be

considered as the ADHD healer; in fact, they just reduce the disorder symptoms as well as emotional and behavioral problems associated with it. When there is no treatment, most symptoms of disorder can be traced back to the pretreatment level, so the key for the effectiveness of any intervention is using it for a long time. With regard to the symptoms and the various complications such as a variety of the child abuses and denial of the children that ultimately lead to the loss of sense of self-respect and self-confidence, this kind of children and adolescents should be treated. One of the common treatments is using the stimulant drugs. One of the best drugs in Iran for this disorder is Ritalin that approximately 75% of the children show the positive response. Initially, this drug is tested for two weeks and then, it is prescribed for a long time if the children, parents, and teachers report the positive effects. Due to the short half-life of the drug, it is prescribed two or three times a day. Since these drugs have side effects, drug holidays are defined as the lack of consumption on holidays (Fridays), national holiday and sometimes eids and summers (Espur, 2008).

Massage therapy is a non-pharmacological intervention with the reinforcement of touch system and it has been recently considered for the children with ADHD. In many studies, massage therapy and reinforcement of touch system have been used with other treatment methods for ADHD therapy. Moreover, all of these studies report positive results such as: having better emotional feeling, reducing the restlessness and hyperactivity, happiness, reducing stress, improving the behavior and increasing the social interaction, reducing the daydreaming and inattention, increasing the mood, increasing the awareness, and improving the cognitive functions such as the ability to do the mathematical computations (Conner and Jet, 2007).

The word 'massage' is derived from Arabic word 'Mas' which means gentle pressure (Ghasemi, 2012). Massage can be defined as the maneuver of therapist' hands on the patients skin and subcutaneous tissues that may be stationary or motional and the pressure rate is variable. A professional massager can affect all of the body surfaces. It causes relaxation, muscle tension, and vein blood flow. From the mental aspect, massage not only reduces the anxiety and stress, but also helps the body to be more alert (Ghasemi, 2012). There are different kinds of massage that differs in terms of usage, purpose, location, and type. Each of them includes different techniques, for example, Shiatsu, Swedish, or classic massage, Thailand massage etc. Of course, almost all of them follow the general rules. Swedish massage is used for children because of its relaxing nature, its easy acceptance by children, ease of learning and easy training for the parents and its diversity for solving the different problems in the children massaging (Sinclair, 2005). There are simple variables that help us to use from a kind of Swedish massage for the children and achieve the specific objectives. These variables are massage order of different parts of body, for example, which layer of the body tissue should be massaged, how much pressure and time should be considered for each part of the body, how much the touching speed should be, and how we change the different pulse from one state to another (Ostrom, 2000). Swedish massage includes passive touch techniques, effleurage or Caresses massage, Petrissage or friction massage, friction or pressure, taputment or kneading.

One of the most important indicative factors of personality in adulthood is the relationship between the child and his/her mother or caregiver. The quality and nature of this relationship has been taken into account by many psychologists such as Freud, Mellani Cline, Sallivan, Ericsson, and Bubbly. Bubbly, among others, considered this relationship as attachment. Attachment is a psychoanalytical concept that is derived from the works of Ethnologists (Dadsetan, 2013). Attachment styles are among the variables related to mental health in adulthood (Sayadi *et al.*, 2014). Attachment styles are formed as the result of the relationship between the child and the primary caregivers (Asgari *et al.*, 2015). Family Health can play a crucial role in shaping the children's healthy attachment (Etemadi and Saadat, 2015). Psychological well-being is one of the factors associated with the secure attachment style (Asgari *et al.*, 2014). Attachment types based on the Bowlby's theory include: 1) secure attachment 2) avoidance insecure attachment 3) ambivalent insecure attachment 4) disorganized-disoriented attachment (Mansour and Dadsetan, 2012). Bowlby (1980) believes that emotions are strongly associated with the attachment and state that many of the emotional stresses play a significant role in the forming, maintaining, breaking up, and restructuring the attachment (Bowlby, 2007). PoshtMashhadi *et al.* (2009) carried out a study entitled the Effectiveness of the combined intervention of attachment therapy and parenting training in insecure attached mothers on symptoms of the children with ADHD on six mothers who had children with ADHD with insecure attachment styles. Their depression score was less than 21 in Beck's Depression Inventory. The results showed that the intervention was effective in reducing the symptoms of children with ADHD in insecure attached mothers but rate of symptoms reduction was different in various subjects.

Khylnany *et al.* (2003) showed that two massages of 20 minutes per week for 1 month improve the mood and impulsive behaviors of students in the school and increase their attention in the class. Madygan *et al.* (2003) in a study entitle the effect of massage therapy and physical therapy on the children with ADHD that was conducted on three groups of children with ADHD. The first group received massage therapy and the second group received physical therapy. However, the third or control group did not receive any treatment. Results showed that the both techniques were useful in reducing the symptoms of ADHA.

Many psychologists, who have studied the attachment, believe that a sense of attachment can be formed if the parents spend the time with their children and play or do other physical activities with them.

This study aims to answer the two questions related to the massage therapy:

- 1- Is massage therapy reduces ADHD symptoms?
- 2- If the participation of parent of the child with ADHD in the massage therapy causes a change in his/her attachment style or not?

RESEARCH METHODOLOGY

This study is a quasi-treatment design with unequal control group that used the available sampling method. Since the research method is quasi-treatment and the most important problem is controlling the variables and the internal validity, the external validity is less important and because we need the satisfaction and cooperation of parents of ADHD children, we used the available sampling.

In this study, 30 children with ADHD that were visited by a psychiatrist and had taken the Ritalin were selected and randomly divided into two treatment and control groups, each of 15 using the available sampling method. Then Connors' questionnaire (parent form) and attachment scale questionnaire were administered to all of the children's parents. Then, the children in the treatment group were massaged by a massager for three weeks, two sessions of 45 minutes per week. Children in control group did not receive any treatment during the study and remained on the waiting list. After the end of the third week, a massage training package (including brochures, photos and CDs and photos that parents had taken from the massage sessions) was offered to the parents in the treatment group to execute the continuous massage exercises every night for 10 minutes before sleeping for a week. After the end of the forth session, parents of both groups completed the Conner's questionnaire and attachment questionnaire and results were analyzed.

Treatment plan of this study is as follows:

Treatment plan of the treatment group:

Massage therapy protocol used in this study:

Session 1: Pre-test; completing the Connors' and attachment forms by the parents; therapy communication with the child; preparing the child for the massage; 10 minutes initial gentle massage (passive touch technique); and then executing the main massage that includes effleurage, ryking, kneading and tamp stroking, respectively. At the end, effleurage technique is considered for approximately 5 minutes on the back, arms, and legs.

Session 2 to 6: Executing massage on the child similar to the previous session.

Session 7: Providing the training package for the parents and answering their questions (the parents were trained for 10 minutes and then, they executed this massage on their children every night for a week before sleeping).

After this stage, in order to control the massage process by the parents and know how properly it would be executed, we contacted every 2 days with parents to ask the questions and answer their questions if there is any and analyze the reasons for the ignoring the exercises.

Final session: Implementation of the post-test and re-completing the questionnaire by the parents

1- Connors' questionnaire of the children with ADHD

In this study, we have used parents' form of Connors' questionnaire with 40 items to evaluate the symptoms of ADHA in the children.

This questionnaire was used as the most common screening tool and diagnosis of the ADHA in the most parts of the world. It is based on the Likert four-point scale (0=Never, 1=Low, 2=High, 3= too high) (Bakhshi, 2011). The lowest score is zero and the highest score is 144 in this questionnaire. In the study by Khushabi *et al.* (2002) on the 2667 girls and boys between ages 7-12, correlation of each question was evaluated with whole of the test and reliability of the test ($\alpha = 0.93$) using the Pearson coefficient and Cronbach's alpha. Therefore high validity of questionnaire shows that this tool measures the ADHA features with high precision.

2- Hazan and Shaver's Adult Attachment Scale

Hazan and Shaver's adults' attachment scale with 15 questions that has been translated to the Persian by the professors of Isfahan University was used to obtain a score of parental attachment. This questionnaire measures the attachment style of secure, insecure, and ambivalent attachment styles. It is based on Likert 5 point scale (0=Never, 1=accidentally, 2= Sometimes, 3= Most of the Time, 4 nearly). Five items in the questionnaire are related to the anxiety / avoidance secure attachment style, five items are related to the secure attachment style, and five items are related to the insecure anxiety, ambivalent attachment style. After completing the questionnaire and scoring, the subscale for which the subject achieved the higher score is considered as the attachment style of the individual. The highest score is 20 and the lowest score is zero in any sub-scale. Hazan and Shaver obtained the retest reliability of the questionnaire and Cronbach's alpha reliability as 81% and 78%, respectively. Rahimiyan reported the Cronbach's alpha as 75% in his study. He reported the Cronbach's alpha as 77% for secure attachment style, 77% for avoidance insecure attachment style, and 83% for ambivalent insecure attachment style (Etemadi and Saadat, 2015).

RESULTS

Covariance analysis was used for data analysis. The effect of the independent variable on dependent variable is evaluated using this statistical test. The percentage of the male and female participants in this study was 83.3 and 16.7%, respectively. Levene test was used for analysis of homogeneity of variances. According to the results of the Levene test, insignificant statistical value of *f* Levene, the variances homogeneity of the dependent variables was observed and MANCOVA test could be implemented.

Table 1- Levene test for homogeneity of variance

Variable	f	df1	df2	Sig
Symptoms of ADHD	2.46	1	28	0.13
Attachment Style Parenting	0.92	1	28	0.13

As Table 2 shows after adjusting the scores in the treatment group and the control group in the post-test, symptoms of ADHD and parental attachment style are different. MANCOVA analysis was performed with "Bonferroni" correction method in order to analyze the statistical significance of this difference and show the training nature of this difference.

Table 2- Statistical indicators of the dependent variables in the experimental and control groups

Variable	Group	M	SD
Symptoms of ADHD	experimental	41.80	13.29
	control	49.27	13.32
Attachment Style Parenting	experimental	23.67	6.22
	control	24.87	5.62

H1: Is massage therapy reduces the symptoms of ADHD?

According to the results of table 3, the effect of massage therapy process on reducing the symptoms of ADHD is effective with $F(1, 26) = 43.11$ ($P < 0.01$), Share square - shows the severity of this effect (0.62). Significance of massage therapy effect on reducing the symptoms of ADHD show that the mean of the dependent variables is different in these groups (treatment and control), and children in the treatment group showed less symptoms of ADHD than the children in the control group in the post-test.

Table 3- The results Massage therapy on the symptoms of ADHD

Sources of changes	SS	df	MS	F	P	η^2
ADHD	533.49	1	533.49	43.11	0.01	0.62
Error	321.76	26	12.38			

H2: Is massage therapy effective in changing the attachment style (avoidant, secure, ambivalent) of massager parent?

This hypothesis is tested using the following sub-hypotheses:

- a- Is the massage therapy is effective in changing the avoidant attachment style of the the massager parent?

Table 4- The results Massage therapy on avoidant attachment parent

Sources of changes	SS	df	MS	F	P
avoidant attachment	0.138	1	0.138	0.030	0.86
Error	117.511	26	4.520		

According to the results of table 4, the effect of massage therapy process on changing the avoidant attachment style is not effective with $F(1, 26) = 0.030$ ($P \geq 0.86$). Insignificance of the effect of the massage therapy on changing the avoidant attachment style of the massager parent shows that the mean of the dependent variables is not different in these groups (treatment and control), therefore, the massage therapy is not effective in changing the attachment style of the avoidant massager parent.

Table 5- The results Massage therapy on secure attachment parent

Sources of changes	SS	df	MS	F	P
avoidant attachment	144.758	1	144.758	2.255	1.145
Error	63.327	26	2.436		

- b- Is massage therapy effective in changing the secure attachment style (avoidant, secure, ambivalent) of the massager parent?

According to the results of table 5, the effect of massage therapy process on changing the secure attachment style is not effective with $F(1, 26) = 2.255$ ($P \geq 0.145$). Insignificance of the effect of the massage therapy on changing the secure attachment style of the massager parent shows that the mean of the dependent variables is not different in these groups (treatment and control); therefore, the massage therapy is not effective in changing the attachment style of the secure massager parent.

- c- Is massage therapy effective in changing the ambivalent attachment style of the massager parent?

According to the results of table 6, the effect of massage therapy process on changing the ambivalent attachment style is not effective with $F(1, 26) = 1.097$ ($P \geq 0.305$). Insignificance of the effect of the massage therapy on changing the ambivalent attachment style of the massager parent shows that the mean of the dependent variables is not different in these groups (treatment and control), therefore, the massage therapy is not effective in changing the attachment style of the ambivalent massager parent.

Table 6- The results Massage therapy on anxiety attachment parent

Sources of changes	SS	df	MS	F	P
anxiety attachment	3.410	1	3.410	1.097	0.305
Error	80.820	26	3.108		

DISCUSSION AND CONCLUSION

Based on the results of the parent form in Connors' questionnaire, the effect of the massage therapy on the symptoms of ADHD is significant. Therefore, the mean of the dependent variables in these groups is different and the children in the treatment group showed less ADHA symptoms compared with the children in control group in the posttest. It seems that massage therapy can reduce the symptoms of ADHA that this is the case in researches conducted by Khylnany (2003), Madygan (2003), Hernadz (2001), Field (1998), Ghamari Kiwi (2013). This can be attributed to the use of the Swedish massage technique in this kind of the studies and executing the massage by a professional massager for at least six sessions of 20 minutes that is similar to the interventions of this study in terms of the type and form.

Additionally, using the Connors' questionnaire as a measuring and sampling tool for the middle class of the society and selecting the highest number of the male subjects can be considered as another reason for this kind of similarity. However, it was not consistent with the results of the study by Noorian (2010) executing the massage twice a week for one month can be the main reason for effectiveness. Moreover, the negligible issues in massage process such as the warmth of the massager 's hands, the lack of environmental noise even a relaxing music, the ambient temperature

degree, open or closed eyes of the children with their tendency, pressure rate that is used, the amount of time for each part of the body, touching speed, the amount of time for massage therapy, and the way we change the different pulses from one state to another were considered in this study that can affect directly the results of this kind of the studies.

In addition, using the Swedish technique in this study instead of the touching technique is one of the reasons for the inconsistent results with the Noorian's study. Because using the Swedish massage due to its relaxing nature is more accepted by the children and therefore, is a proper method. In Noorian's study, only the back part of the body was massaged while all parts of the body were massaged in this study and this is one of the main reasons for effectiveness of the different massages. In Noorian's study, only the female subjects were considered that this is one of the reasons for insignificance reasons of his hypothesis. In addition, he only considered three days with three time of the massage per day that is inconsistent with the recommendations of many scholars about the executing the massage for a long time, because passing the time can be effective in obtaining the useful results of the massage therapy. Based on the obtained results based on the questionnaire of the attachment styles and insignificant effect of the massage therapy in changing the massager parent's attachment style, it can be concluded that the mean of the dependent variables is not different in control and treatment groups. It seems that massaging the children by the parents cannot change their attachment style. This finding is not consistent with the results of the studies conducted by Fatehia (2015), Ksykn (2009), and Poshtmashhadi (2009).

This finding shows that any attachment intervention and parenting training that is directly related to the attachment styles of the parents and was used in Poshtmashhadi's study can be the reason for the inconsistency. Besides, the direct effect of the symptoms incidence rate of hyperactivity and insecure attachment are another reasons for this inconsistency, because in this study children were not categorized based on their symptoms and this variable has been considered in Fatehia (2015) and Ksykn (2009). Studying a special style of different kinds of the parent attachment, for example, insecure attachment can lead to the inconsistency. However, this study considered all three attachment styles. Another reason for inconsistent results is using a different sampling method that in Poshtmashhadi's study (2009) one-subject study was considered. Using the different tool for measuring the attachment style is another reason for this kind of inconsistency. Also, using the control variables such as educational level of the parents, the lack of depressed parents or parents with neurological diseases, and couple satisfaction in other studies were considered as other reasons for the inconsistent results. Because the amount of the time for massage by the parents was only one week they may need more time in order to change their attachment style.

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