

## The Effectiveness of Mindful Parenting, Social Thinking and Exercise on Quality of Life in ADHD Children

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### Abstract

#### Background

Quality of life (QOL), is the most important goal of treatment. The aim of this study was to compare the effectiveness of mindful parenting, social thinking and exercise on quality of life in ADHD children.

#### Materials and Methods

An experimental design was used. Samples consist of 60 students 8-12 years with the DSM-5 classification ADHD that were engaging in education in 2015-2016 in Abadan, Iran. 60 children according to criteria inclusion were randomly placed in 4 groups: mindful parenting (17 mothers of ADHD children), social thinking (n=15), exercise (n=13), and control group (n=15). Measure tools consist of Conner's Parent Rating Scale (CPRS) and Pediatric quality of life (pedQOL) questionnaire. Interventions were: mindful parenting (9-session), social thinking (8 sessions) and exercise (8 sessions).

#### Results

The results showed significant change in QOL of experimental group compared with the control group ( $P<0.05$ ). Post-hoc pairwise comparison indicated that there were significant change in QOL scores between mindful parenting group and social thinking group ( $P<0.05$ ) and mindful parenting had more effect. Difference between social thinking group and exercise group was significant ( $P<0.05$ ).

#### Conclusion

Considering the effective role of mindful parenting and exercise in improving QOL, can be told mindful parenting intervention and exercise can be applied in clinical field, particularly for improving ADHD children's QOL.

**Key Words:** ADHD, Children, Mindful Parenting, Social thinking, Quality Of Life.

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## 1- INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a highly prevalent disorder in children. Its prevalence was estimated about 5-10% in world (1, 2), and 12.5% in Iran (3), and is two to three times more prevalent in boys than girls (4). ADHD is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, has symptoms presenting in two or more settings, and negatively impacts directly on social, academic or occupational functioning (5). ADHD children have difficulties in relationship with others and are socially immature. They lack the adequate interpersonal sensitivity skills for age and have low awareness of emotions, behaviors and intentions of others (6). Therefore they emotionally impaired and their ability of enjoying is low. Quality of life (QOL) of ADHD children is affected by social, emotional, psychological and physical problems that accompany with this disorder.

QOL is an individual's subjective perception of the impact of health status on physical, psychological and social functioning (7). QOL depends on a person's perception and reflects his satisfaction or dissatisfaction of main dimensions of life. Several researches reveal these children have lower QOL than their peers (8-11). The QOL of parents ADHD children, also is affected by ADHD (12). Even some believe that low QOL is an essential problem in individual with ADHD (13); it can be the main goal of therapy. This low QOL in ADHD children can predict adverse psychosocial outcomes in later life (14). So, it is extremely important that effective interventions perform for improving in QOL.

Two kinds of psychological interventions for these children are: parent-focused interventions and child-focused interventions. One meta-analysis showed that parenting interventions are effective

and let to a moderate reduction in ADHD symptoms (15). On the other hand, research showed that parenting interventions has no benefit for some parents (16). In the shadow of theoretical and empirical advances of third-wave of behavioral cognitive therapies, this hypothesis emerged and examined that mindful parenting can be an effective intervention, so these contradictory results can come nearer together. Mindful parenting focuses on stress and psychopathology of parents rather than behavioral problems of child and therefore can result in improving function of family (17-19).

Beyond parent-focused interventions, child-focused interventions as more pivotal interventions have more various. Some types of interventions for ADHD children are based on social cognition; because they have impaired social cognition (20) and deficits for recognition of emotional expressions (21). They need to social skills training (22). Although, training interventions of social skills traditionally were based on behavioral approach, their focus is altered to social cognition training by recent advancements on neurocognitive science. Social cognition training has a positive effect on hot executive functional and QOL in ADHD children (20, 23). Winner coined the term social thinking based on social cognition (23). It is a shift from traditional social skills intervention to social thinking theory.

Beside psychological interventions, exercise is a suitable intervention for ADHD children. Old and recent studies have provided considerable support for its efficacy. Exercise may promote calmness (24), improve executive functional (25, 26), and ADHD symptoms such as inhibitory response (27) in ADHD children. Its effect is the same stimulant medications (28). Considering the various and recent interventions for ADHD children such as mindful parenting and

social thinking on one hand and importance of QOL of the other hand to bring forth an intervention challenge. With regard to charge, duration, practicableness, effectiveness and outcome of each intervention, the primary goal of present study was to determine the effectiveness of mindful parenting, social thinking and exercise on QOL for ADHD children.

## 2- MATERIALS AND METHODS

### 2-1. Study design and Population

An experimental design (pretest-posttest with a control group) was used. Samples consist of 60 students 8-12 years with the DSM-5 classification ADHD that were engaging in education in 2015-2016 in Abadan, South West of Iran. First, four school randomly selected. Then parents of students completed Conner's Parent Rating Scale (CPRS). Among them, 60 children who according to their parents were prepared to participation in the study and met the inclusion criteria were selected. Inclusion criteria were: (1) engagement with education, (2) 8-12 years old, (3) obtain a score of 1.5 or more in ADHD index of CPRS, (4) never used any stimulant when starting study, (5) diagnosis of ADHD from psychologist based on DSM5.

Exclusion criteria included of child having a serious medical condition, absence over two sessions, unwillingness to participate in the study, using stimulant during the research. Selected subject were randomly placed in 4 groups: *group1*: mindful parenting (17 mothers of ADHD children), *group2*: social thinking (n=17), *group3*: exercise (n=17), and *group 4*: control group (n=15). Finally, 2 children of group 2 because of absenting above two sessions, 4 children of group 3 because of living abroad, using stimulant and abstention were excluded. Before intervention all participants assessed for pretest. Then interventions were implemented on

participants and after the end, received posttest.

## 2-2. Interventions

### 2-2-1. Mindful parenting

Mindful parenting is an adaption for parents of Mindfulness-based Cognitive Therapy (MBCT) and Mindfulness Based Stress Reduction (MBSR), consisted of 8 weekly sessions (29), that summarized below. Bogels and Restifo designed and published manual of mindful parenting (17).

- Session 1: becoming aware of parenting on automatic pilot.
- Session 2: beginner's mind parenting and self-compassion.
- Session 3: reconnecting with our body as a parent.
- Session 4: responding rather than reacting to parenting stress.
- Session 5: parenting patterns and schemas.
- Session 6: conflict and parenting.
- Session 7: love and limits.
- Session 8: a mindful path through parenting.

Follow-up session: each time, beginning Anew.

### 2-2-2. Social thinking program

60 min sessions that were based on addressing social cognitive deficits through a series of lessons designed to promote social thinking (23). This program consist of step-by-step methods for teaching social-cognitive and -communicative skills to students who have challenges that affect their school and home life (30). Themes sessions summarized below.

- Session 1: being part of a group and recognizing exceptions.
- Session 2: listening with eyes and whole body.

- Session 3: self-awareness and self-monitoring our behavior in a group.
- Session 4: starting the detective agency.
- Session 5: the super detective agency.
- Session 6: adjusting our participation and language based on what other are thinking, imaging or wondering.
- Session 7: our language makes others have different thoughts and feelings.
- Session 8: the four steps of communication.

### 2-2-3. Exercise sessions

Participants in each session completed four stations. Stations consist of activities that required participant to employ a variety of motor skills (moving objects, various forms of locomotion, skipping, running, hopping, and crab walking).

### 2-3. Mesuring tools

#### 2-3-1. Conner's Parent Rating Scale (CPRS)

CPRS is used for initial screening ADHD children. This scale has 48 items and a subscale for diagnosing ADHD that Mean 1.5 or more of it indicates ADHD. It is popularly used in Iran (31). Factor validity was confirmed (32) and its reliability has reported 0.93 (33).

#### 2-3-2. Pediatric quality of life questionnaire (pedsQL)

QOL was measured by using the Pediatric Quality of Life Inventory™ (PedsQL). The 23-item PedsQL is appropriate for children 8-12 years and include child-report and parent-report. We used Parent-report form. The psychometric properties of pedsQL appear adequate (34, 35).

### 2-4. Data analyses

Data were analyzed using SPSS software version 21.0. Descriptive statistic (mean, standard deviation) were used to summarize quantitative variables (age and QOL) and analysis of covariance (ANCOVA) for testing the main and interaction effects of categorical variables on a posttest scores of QOL, controlling for the effects of pretest score. Each pair of means compared with the Least Significant Difference (LSD).

### 3-RESULTS

Finally, 60 students participated in this study. The mean of age of the subjects was  $9.43 \pm 1.14$  years (**Table.1**). **Table.1** presents the mean and standard deviation (SD) of age for each group. The QOL improved in mindful parenting group and exercise group at post-test, but didn't change in social thinking group and control group. **Table.2** shows the mean and standard deviation values for pre-post QOL in experimentals and control group. The assumption of homogeneity of regression slopes checked to see whether any interactions with the covariate might be significant. Results showed that the regression lines were parallel among groups and assumption is being met (**Table.3**).

The one-way ANCOVA was used to determine whether there are any significant differences between four groups on QOL. As shown in **Table.4**, there was a significant difference between interventions after adjusting the effect of pre-test score ( $P < 0.05$ ). Therefore, the effect of interventions on children's QOL was statistically significant. An effect size of .34 was recorded (**Table.4**), that is 34% of variance of QOL explained by interventions. Post-hoc was used as a test for a significant difference between groups that has been revealed by the analysis of variance. Post-hoc pairwise comparison (**Table.5**), indicated that there were significant change in QOL scores between

parenting mindful group and control group ( $P < 0.05$ ); that means mindful parenting had positive effect on QOL. Difference between social thinking group and exercise group was significant ( $P < 0.05$ ), indicating exercise has more effect. Exercise, also improved QOL compare to control group.

Finally, difference between social thinking group and control group was not statistically significant ( $P = 0.56$ ), therefore social thinking didn't improve QOL in experimental group comparing to control group.

**Table-1:** Descriptive Statistics for the age of Sample

Variables	Number	Mean	SD
Group 1	17	9.58	1.27
Group 2	15	9.33	1.17
Group 3	13	9.46	1.05
control Group	15	9.33	1.11
Total	60	9.43	1.14

SD: Standard deviation.

**Table-2:** The mean (SD) of QOL in experimental and control group based on pretest-posttest

Variables	Mean	Pretest	Mean	Post-test
		SD		SD
Group 1	31.35	13.19	19.52	18.84
Group 2	32.13	11.62	27.33	12.59
Group3	29.23	17.37	19.69	13.97
Control Group	30.73	16.59	29.93	14.83

**Table-3:** results of homogeneity of regression slopes

Post-test QOL	Sum of Squares	Df	Mean Square	F	P-value
Group QOL interaction	253.87	3	84.62	1.98	0.12

Df: degrees of freedom.

**Table-4:** The results of analysis covariance (ancova) for the comparison of posttest of scores of QOL in the control and experimental groups

Source	Sum of Squares	Df	Mean Square	F	P-value	Partial Eta Squared
Pre-test	5782.41	1	5782.41	128.77**	.000	.70
Group	1293.28	3	431.09	9.60**	.000	.34
Error	2469.77	55	44.90			

Df: degrees of freedom; \*\*  $P < 0.01$ .

**Table-5:** The least significant difference (LSD) comparison for groups

Comparisons	Mean quality of life Difference	Std. Error	P-value	95% CI	
				Lower Bound	Upper Bound
Group 1. Group2	-7.80	4.30	.13	-20.19	4.59
Group 1. Group 3	1.37	4.47	.76	-11.51	14.26
Group 1. Control	-10.40**	4.30	.01	-22.79	1.99
Group 2. Group 3	9.17*	4.59	.05	-4.07	22.43
Group 2. Control	-2.60	4.43	.56	-15.37	10.17
Control. Group 3	-11.77**	4.59	.01	-1.47	25.03

\*  $P < 0.05$ ; \*\*  $P < 0.01$ .

#### 4- DISCUSSION

The objective of this research was to compare effectiveness three interventions on QOL of ADHD children. Based on the result, participants in mindful parenting and exercise groups showed marked improvement on Pediatric Quality of Life Inventory. The magnitude of the improvements in the interventions group showed up clearly in the comparison analyses (Analysis of covariance), with the control group. This research adds to the small body literature examining the effects of psychological and non-psychological interventions on QOL changes. We believe, this is the second study investigating the effect of intervention on QOL in ADHD children. First research has shown the positive impact of Atomoxetine on QOL in these children (36).

For more detailed discussion, we must note that both mindful parenting and exercise have influence on QOL of ADHD children. Our result is consistent with the other research results were conducted on efficacy of mindful parenting interventions in decreasing the children's problem behaviors (29). Because, ADHD impacts not only on the child, but also on parents, this finding could attributed to fact that parent-focused interventions have parallel effect on child and parents, therefore increasing QOL of ADHD children by improving in child-parent relation. Our result showed that social thinking didn't improve QOL of ADHD children. This finding is not consistent with Ciallis et al. (2014), and Crooke and et al. (2008), that showed social thinking is effective intervention for improving social skills (20, 23). Social thinking training program aims to help children enhance and improve their social skills, giving them the ability to interact with people around them effectively, as well as increasing their self-confidence and quality of life. But, finding of our study didn't show any improvement in QOL after social thinking intervention.

We can attribute this result to comorbidity oppositional defiant disorder (ODD), with ADHD. Roughly half the ADHD children have ODD that result among them don't benefit of training social thinking. On the other hand, we can tell ADHD children don't have enough attention for doing activities of program. Finally, the size of group has important role. Small groups are better for training social thinking to these children. Exercise is also one of the most effective ways to improve QOL. Exercise in this study, similar to the result of other study (24, 37), showed a significant effect on the QOL of ADHD children. According to results of Archer and kostrzewa's study (2012) (37), brain-derived neurotropic, an essential element in normal brain development that promotes quality of life, is increased markedly by the intervention of the regular physical exercise. The benefits of exercise were also evident for many secondary outcomes. Hence, exercise is an intervention that may address the broad range of QOL issues following diagnosis ADHD disorder.

##### 4-1. Limitations of the study

Our sample is consisted of boys. Future studies may profitably conduct with samples of both sexes. Also, more research is needed to investigating and comparing to pharmacological intervention

#### 5- CONCLUSION

The primary goal of present study was comparing the effectiveness of mindful parenting, social thinking and exercise on QOL of ADHD children. This study showed that mindful parenting and exercise improved QOL of ADHD children. Mindful parenting, which integrates parenting skills with MBCT and MBSR, represents one candidate specialist parenting intervention. Our results support the effectiveness of exercise for ADHD children, but didn't enough support for effectiveness of social thinking.

We concluded that though social thinking training appears important for children with ADHD, but more study is needed, especially on the effects of this type of training. These findings are notable that exercise as well as psychological interventions such as mindful parenting or better of social thinking can improve QOL of ADHD children. Considering the effective role of mindful parenting and exercise in improving QOL, can be told mindful parenting intervention and exercise can be applied in clinical field, particularly for improving ADHD children's QOL.

**6- CONFLICT OF INTEREST:** None.

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