Original Article

The efficacy of mindfulness-based intervention on adolescents with attention deficit/hyperactivity symptoms and externalizing problems on reducing mother–adolescent conflict

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Abstract

Introduction: Employing mindfulness-based intervention in diverse areas of children, adolescents and families' mental health is growing increasingly. In this study we examine the efficacy of mindfulness-based intervention for adolescents with attention deficit/hyperactivity symptoms and externalizing problem on reducing mother-adolescent conflict.
Methods: Child behavior checklist (CBCL), Youth self-report (YSR) of Achenbach system of empirically-based assessment (ASEBA) and parent-adolescent conflict questionnaire (PACQ-A) was administered to a sample of 253 adolescent-mother dyads who accepted the project invitation. 24 adolescents who scored borderline in attention problem subscale, high in externalizing problems scale of CBCL and PACQ-A, and their scores had been confirmed in youth self-report, were chosen and randomly assigned to two experimental (n=12) and control (n=12) groups. The adolescents in experimental group received 8 weekly mindfulness-based intervention sessions, each taking 2 hours. The adolescents of the control group did not receive any intervention for the same duration. Quantitative data were analyzed using multivariate analysis of variance (MANOVA).
Results: The experimental group showed a significant reduction in frequency and intensity of conflict, as compared to control group. The multivariate η^2 based on Wilks's Λ was strong, 0.44 .
Conclusion: The results provided additional and promising evidence for the efficacy of the mindfulness-based intervention in reducing the mother-adolescent conflict in the family of adolescents with attention deficit/hyperactivity symptoms and externalizing problems, and may be of practical importance in management the home-conflict in these high stress families.
Declaration of Interest: None.

Key words: Mother–adolescent conflict, Attention deficit/hyperactivity symptoms, Externalizing problems, Mindfulness-based intervention.

Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is a neurobehavioral disorder defined by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity (1). Adolescents with ADHD typically demonstrate impairment across several domains of functioning (academic, peer relations, family conflict, delinquency, etc.), giving this disorder a far-reaching effect (2).

As in full-syndrome ADHD, children/ adolescents with sub-threshold ADHD have higher levels of educational, functional, and interpersonal impairments than children/ adolescents with no ADHD (3-4).
Epidemiologic studies indicate that ADHD occurs in about 5 percent of children and adolescents (5). Prevalence estimates of sub-threshold ADHD varied widely from 0.8 to 23.1 % (3). An estimated 50% of youth with clinical and sub-clinical ADHD symptoms

meet criteria for Oppositional Defiant Disorder (ODD) and/or Conduct Disorder (CD) (6). These are conditions classified as externalizing disorders, problems of behavioral control and impulsivity that are mainly demonstrated in youths' outward behavior (7).

Parent-adolescent conflict, coercive interchanges, and negative communication are more intense and frequent for teenagers with ADHD and their parents than for teenagers without psychiatric problems and their parents. This is a consequence of both the neurobiologically based executive function deficits inherent in ADHD and the common comorbid conditions such as ODD and CD (8-9). The conflict manifests in a range of issues such as family relationships, responsibilities, homework and chores (8) and is most severe for young boys interacting with their mothers (10).

There are empirical data suggesting that parent-adolescent conflict is related to adolescent maladjustment (11-12) and externalizing behavior, influencing each other reciprocally (13). A troubled parent–adolescent relationship has adverse effects on youth development (12), and increases risk for academic problems (11), poor psychological health (14), adolescent drug use (15), and delinquency (16).

Not many studies have been conducted on managing parent–adolescent conflict in adolescents with ADHD symptoms and externalizing problems, and then most of them are change-oriented strategies such as problem-solving/communication training (PS/CT) and parental behavior management training (BMT), with limited success (see 17-19) or barely applicable for general use (see 20). On the other hand, stimulant medication has no effect on parent–adolescent conflict (21). Parent training program strategies typically include some form of aversive or punishment contingencies, which may initiate coercive parent–child interactions in some children/adolescents, especially those with oppositional defiant disorder (22).

Mindfulness-based intervention, which emphasizes self-monitoring, attention training, and repeated practice of metacognitive strategies, improves executive functioning (23), emotion regulation (24), the capacity of empathy (25), and impulsivity problems (7). Therefore it may be an appropriate intervention to reduce parent–adolescent conflict in the family of adolescents with ADHD symptoms and externalizing problems.

This method is an intervention based on eastern meditation techniques that promotes awareness of the present moment, enhances non-judgmental observation, and reduces automatic responding (26). Though mindfulness has often been conceived as an intrapersonal phenomenon, yet it’s applying in relationship contexts to improve interpersonal functioning is growing (27). For example, some studies have shown improvements in the methods employed by partners to approach and resolve their conflicts, following mindfulness-based interventions (28-31).

The literature on the application of mindfulness interventions for improving parent-adolescent relationship and reducing their destructive conflict is limited but promising (7, 22, 32) and more research is needed to investigate and validate the benefits of mindfulness-based intervention for reducing frequency and intensity of conflicts between mother-adolescent dyads particularly in the family of adolescents with ADHD symptoms and externalizing problems. Given its promising potential for reducing conflict, we hypothesized that the mindfulness-based intervention for adolescents with ADHD symptoms and externalizing problems would reduce frequency and intensity of mother–adolescent conflict.

Methods

We used the pretest-posttest control group design and our statistical population includes the adolescent boys (14-18 years) studying in Rasht high schools in 2016-2017 academic year. Subjects were recruited using convenience purposeful sampling. For sample selection, first 4000 research invitation letters was distributed among students and parents in related educational settings (such as high-schools and educational institutions) to inform families about the research project. Then 253 interested adolescent-mother dyads completed

the child behavior checklist (CBCL), Youth self-report (YSR) of Achenbach system of empirically based assessment (ASEBA) and Parent-Adolescent Conflict Questionnaire-Adolescent's form (PACQ-A). Finally, 24 of those adolescents who scored borderline in attention problem subscale and high in externalizing problems scale of CBCL and PACQ-A and their scores had been confirmed in youth self-report were chosen and randomly assigned to two experimental (n=12) and control (n=12) groups. The adolescents in experimental group received 8 mindfulness-based intervention 2 hours sessions each week, but the control group didn't receive any intervention for the same duration. For both groups two regular assessments administrated that consisted pretest in December and posttest in March. One adolescent dropped out after three sessions because of conflicts with schoolwork so he was omitted from the final analysis. All parents signed a written voluntary informed consent form. Instruments were accomplished by two specialized master of clinical psychology in phase of posttest and the interventional sessions accomplished by the first author trained Ph.D. student of clinical psychology in Shahed university, Tehran, Iran under supervision of two advisor and associate professors.

Achenbach system of empirically based assessment (ASEBA). The ASEBA is a collection of questionnaires used to assess adaptive and maladaptive behavior and overall functioning in individuals. The Child Behavior Checklist (CBCL) and the Youth Self–Report (YSR) of ASEBA was used in this research. The CBCL is a parental questionnaire used to measure the parental perception of children and adolescents' behaviors (6 to 18 years). The YSR is administered to adolescents aged 11–18 to obtain self-reports about their problem syndromes. The majority of the items on the YSR are generally equivalent to the CBCL, but are worded in the first person. Responses are recorded on a Likert scale: 0 = Not true, 1 = Somewhat or Sometimes true, 2 = Very true or Often true. The CBCL/YSR yield scores on the following eight syndrome scales: withdrawn, somatic complaints, anxious/ depressed, social problems, thought problems, attention problems, delinquent behavior, and aggressive behavior. The total problem score subsumes the eight syndrome scales. The three syndrome scales withdrawn, somatic complaints and anxious/depressed constitute the broad band internalizing scale. The syndrome scales delinquent behavior and aggressive behavior comprise the broad band externalizing scale. Higher scores indicate greater problems. The ASEBA is used in a variety of settings, including mental health, school, research, and forensic settings and has been translated in one hundred languages (33). The reliability and validity of the Iranian versions of the CBCL and YSR have been demonstrated (34) and these two scales with adequate psychometric characteristics have been widely used in child and adolescent research in Iran.

Parent-Adolescent Conflict Questionnaire-Adolescent's form (PACQ-A). The PACQ-A is a 92-item self-report questionnaire developed in 2011 by Asadi Younesi and colleagues to assess the frequency and intensity of parent-adolescent conflict. The respondents rate the 92 items on a 5-point likert-scale to measure both the frequency and intensity of conflict. In PACQ-A, higher scores indicate greater conflict (frequency and intensity). The PACQ-A has a high internal consistency (with Cronbach's alpha coefficients of 0.96 and 0.98 for the frequency and intensity of conflict, respectively). Test-retest reliability coefficients in a two-week interval are also high. In addition, evidence of construct validity of the parent-adolescent conflict questionnaire came from the fact that distressed families obtained significantly higher average than non-distressed families considering both the frequency and intensity of conflict (35).

The intervention program for adolescents, in this research, was based on zylowska's protocol; "The mindfulness prescription for ADHD" (36), that is a 8-step mindfulness based program aiming to promote attention control and regulating emotion via mindfulness practices. Steps 1 to 3 start with psycho-education and proceed to move out of automatic pilot, train attention control, and focus on this moment. Step 4 to 8 deal with

using these basic mindfulness skills to observe and handle thoughts, feelings, and actions (36). Adolescents' group sessions (each taking 2 hour) were held in 8 weeks and the mindfulness skills were exercised in sessions and at home (as formal and informal practices). An overview of the program is presented in table 1.

Table 1. Summary of the mindfulness intervention program (36)

	Theme	Topics & Exercises
1	Attention and the five senses	The science of attention, Attention and mindfulness. Exercises: mindful eating.
2	Mindful breathing	The importance of the breath, common difficulties. New Exercises: mindful breathing, mindful walking.
3	Mindfulness of sound, breath and body	Movement of attention and awareness, matching attention and intention. New Exercises: mindfulness of breath, body, and sound.
4	Mindfulness of body sensations and movement	Learning to listen to the body, mind-body connections is a two way street. New exercises: Body scan, mindfulness of physical pain.
5	Mindfulness of thoughts	Mind like a sky and thoughts like clouds metaphor, Working with judgmental thoughts. New exercises: Mindfulness of thoughts/mind like a sky.
6	Mindfulness of feelings	Awareness of emotions. New Exercises: Mindfulness of difficult emotions, loving-kindness meditation.
7	Mindful listening and speaking	Communication and relationships, nonviolent communication. New exercises: Mindful presence, mindful listening and speaking.
8	Mindful decisions and actions	Mindfulness of actions, mindful self-coaching, creating good habit, time management, putting it all together.

Results

Table 2 shows the descriptive statistics of pretest and posttest scores on the frequency and intensity of the mother-adolescent conflict in experimental and control group.

Table 2. The summary of the mother-adolescent conflict scores in experimental and control group

Subscales	Group	Pre-test		Post-test	
		Mean	SD	Mean	SD
Conflict Frequency	Experimental group	242.27	30.77	221.36	31.07
	Control group	237.16	28.41	244.41	35.17
Conflict Intensity	Experimental group	185.18	25.38	174.18	27.40
	Control group	181.75	28.48	184.83	28.44

Results of t-test and levene's test for equality of variances, based on pretest scores, revealed no preexisting differences between means and variances of experimental and control groups (Table 3).

Table 3. The summary of results in t-test and Levene's test

	Levene's Test	Sig.	t-test	Sig.
Conflict frequency	0.08	0.768	0.41	0.683
Conflict intensity	0.09	0.767	0.30	0.764

Before using a Multivariate Analysis of Variance (MANOVA) to evaluate differences between two groups, Preliminary analyses were conducted to check the assumptions. Box's Test of Equality of Covariance Matrices (MBox=0.58, F=0.17, P=0.915) and Levene's Tests of Equality of Error Variances related to conflict frequency (F=0.19, P=0.664) and conflict intensity (F=0.29, P=0.596) were non-significant. Therefore, there was no violation

of the assumptions. A one-way MANOVA (using gain scores) was conducted to determine the effect of the intervention on dependent variables.

Significant differences were found among the two groups on the dependent measures, Wilks's Λ=0.55, F(2,20)=7.96, p<0.01. The multivariate η^2 based on Wilks's Λ was strong, 0.44. Analysis of variances (ANOVA) on each dependent variable was conducted as follow-up tests to the MANOVA (table 4).

Table 4. Results of univariate analysis following multivariate analysis

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group membership	Conflict frequency	4550.75	1	4550.75	16.40	0.001	0.43
	Conflict intensity	1138.30	1	1138.30	6.21	0.021	0.22
Error	Conflict frequency	5827.15	21	277.48			
	Conflict intensity	3848.91	21	183.28			

As it can be seen from table 4, the ANOVAs on the conflict frequency scores, F(1,21)=16.40, p<0.01, η^2=0.43 and conflict intensity scores F(1,21)=6.21, p<0.05, η^2=0.22 were significant.

Conclusion

Mindfulness-based intervention decreased mother-adolescent conflict significantly, therefore, the research hypothesis is confirmed and it could be concluded that this intervention is effective on reducing frequency and intensity of mother–adolescent conflict.

Results of the present study are consistent with Bögels et al. (2008), in which the parents reported improvement in relationship difficulties of their adolescents suffered from externalizing behavior problems, after mindfulness-based cognitive therapy and mindful parenting (7). Also, a study of the outcomes of a mindfulness program for parents and children with ADHD (22), concluded an increase in mother-child positive interaction. This is however incompatible to Haydicky et al. (2015) who studied the effectiveness of mindfulness-based cognitive therapy for adolescents with ADHD and mindful parenting, and report no significant reduction in parent-adolescent conflict following the intervention, though the authors themselves attributed the finding to low level of the conflict in baseline of their particular sample (37). In Iran, however, Borjali (2013), supporting the mindfulness effect on improvement and reduction of parent-adolescent conflict, found that mindfulness-based cognitive therapy leads to a significant decrease in the conflict and its consequences (verbal and physical aggressiveness) in adolescents (32).

In spite of the interactive nature of parent-adolescent system and its reciprocal mechanisms of intensifying conflict (8) and difficulty of determining the direction in such reciprocal interaction, some evidence and studies show negativity of these interactions is from child to parent rather than vice versa, although parental behavior is partly influential (13). Similarly, in the current study, decreasing in ADHD symptoms and externalizing behavior (See 36, 7) - and the accompanied deficits including executive function (23) and emotion regulation (24) - led to decreasing in frequency and intensity of the conflict by affecting both side of this interactive system, directly and indirectly.

Mindfulness is a relational nature and promotes connection and closeness (38). Mindfulness practices enhance the social connectedness and skills and perspective taking (39, 40). Besides can provide practical and attitudinal skill for more positive encounter with conflict (41). Also, it appears that mindfulness training could promote structural and functional changes in neural circuits that regulate physiological and emotional responses, and improve the capacity for empathy, which in turn can lead to non-reactional and compassionate responsiveness and a reduction in impulsivity (25). In the present study, it seems, mindfulness as an emotion regulation strategy and promoter of capacity for empathy succeeds to help adolescents resisting against acting out

impulses emerged from emotions, and help them to regulate and demonstrate their behaviors based on consequences.

Mindfulness meditation promotes the relaxation response, resulting in psychophysiological alterations that are the opposite of those of stress-induced hyper-arousal (28). It is probable that the reduction in arousal and increasing in capacity of staying with strong negative emotions without acting accordingly played a part in the present study.

Mindfulness helps in modifying aggression-related ruminations, leading to reduction in aggressive behaviors (42). Practicing the skills of continuous awareness, would develop an insight into patterns in thoughts, feelings, and interactions with others, and result in skillful choosing of helpful responses instead of automatic reactions (43).

Externalizing disorders accompany with more rigid beliefs about parental unfairness, autonomy, and ruination in adolescents (44). Mindfulness exercises could play a part in ameliorating these beliefs and be useful in reducing the intensity and frequency of the conflict, by taking a non-judgmental observation and a compassionate empathetic attitude. Finally, learning and practicing mindful listening and speaking skills in the context of mindfulness-based intervention could have led to an improvement in communicative skills of the adolescents (36), which in turn resulted to better management of the conflict when occurs.

This study had some limitations. First, our small sample size and use of the purposeful convenience sampling limited the generalizability of the results. Another limitation of the study was reliance on adolescent self-report data. Furthermore, this study does not provide information about the mindfulness based intervention efficacy relative to other forms of treatments. Finally, without follow-up, no data provided for longer term effects of the intervention. Studies with a larger sample size, follow-up plan and multi-informant measures have recommended.

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