

Original Article

The effectiveness of self-compassion on the sleep quality and life quality of mothers with children with attention-deficit/hyperactivity disorder

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Abstract

Background: This study aimed to investigate how self-compassion affected the quality of sleep and overall well-being of moms whose children had been diagnosed with ADHD (Attention Deficit Hyperactivity Disorder).

Methods: This was a quasi-experimental study. Thirty mothers were randomly divided into an experimental group (15 participants) receiving self-compassion training and a control group (15 participants) receiving no intervention. Data collection tools included the Pittsburgh Sleep Quality Index, the WHO Quality of Life questionnaire, quantitative electroencephalography, and a self-compassion protocol. Data analysis was performed using SPSS-24, with descriptive statistics and multivariate analysis of covariance (MANCOVA).

Results: Results showed no substantial differences between groups in the pre-test phase. However, post-test results revealed significant improvements in the experimental group. Self-compassion interventions significantly enhanced sleep quality ($F=45.64$, $P<0.01$), life quality ($F=275.12$, $P<0.01$), and alpha wave activity ($F=176.64$, $P<0.01$). These improvements highlight the effectiveness of self-compassion training in reducing stress and anxiety, leading to increased satisfaction and calmness.

Conclusion: Self-compassion-based programs can serve as a beneficial approach to enhancing sleep quality and overall life quality in mothers of children with ADHD. This research underscores the potential of self-compassion interventions in promoting mental well-being and improving physiological and psychological outcomes.

Keywords: Empathy; Sleep Quality, Quality of Life.

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Introduction

One of the most common psychological conditions identified in children is ADHD (attention deficit hyperactivity disorder), which can have a serious negative impact on kids and their families. (1). This disorder, which affects approximately 4-6% of children, is typically associated with difficulties in attention, concentration, and hyperactive

behaviors (2). Self-compassion training has gained attention recently as a successful treatment strategy for enhancing the quality of sleep and life in general, especially for moms of children with ADHD (3). This approach can serve as a tool for reducing stress and anxiety in mothers, as well as improving their sleep quality. Research has shown that self-compassion training can

have a remarkable positive impact on mothers' sleep quality (4). Furthermore, this approach contributes to enhancing mothers' quality of life, especially in psychological and social aspects (5). Research has shown that self-compassion training can greatly enhance a mother's quality of life in many areas, such as her physical and mental health, social connections, and environmental well-being (6).

According to other research, mothers of preschool-aged children with learning difficulties who received self-compassion training saw a discernible improvement in the quality of their sleep. These results suggest that when mothers experience positive emotions and self-compassion, they can create a calmer environment for their children, which ultimately affects their sleep quality (7).

Self-compassion, which includes components such as self-kindness, mindfulness, and a sense of shared humanity, is increasingly recognized as an important psychological skill. It can improve psychological flexibility and well-being, and positively impact sleep quality and overall life quality by reducing self-criticism. This concept is acknowledged as a method for enhancing mental health and improving the physical and emotional well-being of individuals.

Based on previous studies, it is hypothesized that self-compassion training can have a remarkable impact on improving sleep quality and life quality in mothers of children with ADHD. Thus, this research is designed to address the following questions: Can self-compassion improve sleep quality in mothers of children with ADHD? Does self-compassion training significantly impact the life quality of these mothers? What is the association between sleep quality and life quality in this group of mothers? Do demographic variables (such as education level, age, and economic status) influence the effectiveness of self-compassion?

Answering these questions could provide valuable insights for designing effective psychological interventions aimed at improving the life quality of mothers of children with ADHD. The primary goal of this research is to investigate the self-compassion training effectiveness on the sleep quality and quality of life of mothers with children diagnosed with ADHD, to assess the positive effects of this therapeutic approach on their mental and physical well-being, and to improve their sleep and life conditions.

Methods

Study population: This study was a quasi-experimental research designed to evaluate the effectiveness of self-compassion training on the quality of sleep and quality of life in mothers of children with ADHD. The study employed a pre-test/post-test design with a control group and random assignment, allowing for a comparison between the experimental group (which received the intervention) and the control group (which did not), both before and after the intervention. This design ensures the reliability and validity of the findings.

The target population of the study consisted of mothers of children diagnosed with ADHD, aged 7 to 12 years, living in Tabriz in 2023. The children's diagnoses were confirmed through medical centers.

A sample of 30 mothers was selected through convenience sampling after visiting local healthcare centers. These participants were then randomly assigned to either the experimental group, which received the self-compassion training, or the control group, which did not receive any intervention. Random assignment ensures that the two groups are comparable at the start of the study, minimizing potential confounding factors.

A pre-test was conducted to assess the quality of sleep and quality of life of all participants using standardized questionnaires. After the intervention (self-compassion training), a post-test was

administered to evaluate changes in these variables. The data was then analyzed to determine whether the self-compassion training had a significant impact on the mothers' sleep quality and quality of life.

The research sample was selected among the eligible people in a targeted manner in the number of 30 people and randomly replaced in an experimental group and a control group. In this way, a group of 15 people received self-compassion and no intervention was done for 15 people in the control group. It should be noted that first all mothers responded to the quality of life and sleep quality questionnaire, and quantitative electroencephalography was also recorded, then 30 people who were in an unfavorable condition according to the cut-off point were selected, and after the intervention, a post-test was conducted.

Data Collection Tools:

a) PSQI (Pittsburgh Sleep Quality Index): Daniel J. B.C. created the PSQI to gauge the quality of sleep and help people who have difficulty falling asleep. This seven-question survey evaluates people's opinions about the quality of their sleep. Each question is scored from 0-3, with scores of 0, 1, 2, and 3 representing normal sleep, mild, moderate, and severe problems, respectively. The seven subscales are used to compute the overall score, which spans from 0-21. Poor quality of sleep is shown by a total score of 6 or higher (8). According to test-retest investigations, the questionnaire reliability ranged from 93% to 98%, and its validity was evaluated with a Cronbach's alpha of 0.80. Additionally, the questionnaire has been utilized in numerous countries and has a reliability of 0.89 and a validity of 0.73 (9).

b) Quality of Life Questionnaire: This survey investigates four facets of health: social relationships, mental health, environmental health, and physical health. It has 24 questions (8 questions about environmental health, 6 questions about mental health, 7 questions about physical

health, and 3 questions about social connections). Each area's general health and life quality are assessed by the first two questions. There are a total of 26 questions on the questionnaire. Physical health is reported in questions 18, 17, 16, 15, 10, 4, and 3; mental health is evaluated in questions 26, 19, 11, 7, 6, and 5; social relationships are evaluated in questions 22, 21, and 20; and environmental health is evaluated in questions 25, 24, 23, 14, 13, 12, 9, and 8 (11). Reliability scores were 0.77 for mental health, 0.77 for physical health, 0.84 for environmental health, and 0.75 for social interactions. Cronbach's alpha indicated that the internal consistency for environmental health was 0.84, social relationships were 0.55, mental health was 0.73, and physical health was 0.70.

c) Quantitative Electroencephalography (QEEG): Brain activity was recorded using a 21-channel electroencephalograph (EEG) device with a Nihon Kohden amplifier system. Reference electrodes A1 and A2 were attached to the ears. Electrodes were placed on the scalp using a special cap based on the international 10/20 system. Brain waves were recorded with a sampling rate of approximately 250 Hz, covering a frequency range of 0.1 to 40 Hz. The brain activity of each participant was recorded for 20 minutes in a sitting, relaxed position, with both eyes open and closed. After the waves were recorded, the data were processed using the Neuroguid software and converted into quantitative data for analysis using the Fast Fourier Transform (FFT). Any artifacts in the recorded waves were visually inspected and removed as much as possible, and a 120-second segment of artifact-free waves was selected for analysis (Table 1).

Statistical analysis method

To analyze the study data, descriptive statistics like mean \pm standard deviation as well as inferential statistics like multivariate covariance analysis were utilized. Software called SPSS-24 was used for this.

Table 1. Compassion-based treatment protocol

Session	Purpose and content
The first session	The process began with a pre-test to assess participants' initial status. Group members were introduced, communication was established, the session structure was explained, and the principles of parent-based compassion therapy were outlined. The distinction between self-compassion and self-pity was also clarified.
The second session	Training in mindfulness, along with breathing and physical exercises, was provided. Participants were introduced to brain systems related to compassion, and the rationale for household chores was explained to boost motivation.
The third session	Familiarizing with the specifications of compassionate individuals and how to show compassion toward others, nurturing feelings of kindness and warmth toward oneself, and understanding that everyone has flaws and difficulties (cultivating a shared humanity sense) in contrast to self-destructive feelings, along with assigning tasks to practice these concepts.
The fourth session	Parents reviewed the previous session, reflecting on whether they are "compassionate" or "non-compassionate." The first part of self-compassion exercises (value of compassion, empathy for oneself and the adolescent, physiotherapist metaphor) was introduced, along with kindness assignments.
The fifth session	Reviewing the previous session exercise, familiarization and application of the second part of the training of the compassionate mind (acceptance away from judgment, forgiveness, teaching the influenza metaphor, and teaching tolerance), and meditating on love and giving homework.
The sixth session	Reviewing the previous session exercise, the practical exercise of creating a compassionate self-image, teaching the methods and styles of expressing compassion (practical compassion, verbal compassion, continuous compassion, and temporary compassion), and using these techniques in daily life about students and teachers, friends, parents, and acquaintances, providing homework.
The seventh session	participants reviewed the previous exercises and were taught compassionate letter writing, along with daily journaling for themselves and their students. They learned how to apply compassion in real-life situations and assess their behavior in those contexts. The eighth session focuses on providing and summarizing strategies for maintaining and applying compassion-based therapy in daily interactions with others, along with conducting assessments.
The eighth session	Summarizing and presenting solutions for maintaining and applying compassion-based therapy in daily life about the people around and performing the post-test.

Results

The study involved 30 mothers, randomly categorized into 2 groups: 15 received self-compassion therapy, and 15 were in the

control group. Data were gathered using the use of sleep quality and life quality questionnaires, along with quantitative electroencephalography (Table 2).

Table 2. The demographic specifications of the participants

Demographic Characteristic	Description
Sample Size	30 mothers
Study Location	Tabriz, 1402 (2023)
Selection Method	Random division into two groups
Experimental Group Size	15 mothers who received self-compassion therapy
Control Group Size	15 mothers who did not receive any intervention
Age of Children	Children diagnosed with ADHD, ages 7-12 years.
Data Collection Tools	PSQI, WHO Quality of Life Questionnaire, Quantitative Electroencephalography, Self-Compassion Protocol
Intervention	Self-compassion therapy
Analysis Methods	Descriptive statistics (mean ± standard deviation), MANCOVA (Multivariate Covariance Analysis) using SPSS-24
Target Population	Mothers of children with ADHD in Tabriz

The investigated groups did not have significant differences with each other in most of the studied variables in the pre-test stage. But in the post-test stage, these quantities faced more variance so the mean \pm standard deviation of the groups have changed significantly Table 3.

Table 3. Central and distribution index of life quality and sleep quality in the pre-test and post-test stages

Variables	-	Experiment Group		Control Group	
		Mean	SD	Mean	SD
		Quality of Life	pre-test	39.14	3.98
	post-test	47.37	5.24	39.64	4.52
Sleep Quality	pre-test	21.87	3.64	21.12	3.75
	post-test	32.25	4.78	21.01	3.13
Alpha wave	pre-test	17.53	2.78	17.64	2.64
	post-test	24.24	3.53	16.19	2.27

All of the tests were significant, according to the findings of the multivariate covariance analysis on the experimental and control groups' quality of life levels. Table 4.

An F-value of 45.64 and a p-value of 0.001 suggest a statistically remarkable difference in sleep quality between the experimental and control groups, according to a multivariate analysis of covariance (MANCOVA) comparing the two groups' sleep quality. This suggests that the self-compassion intervention had a strong positive impact on the experimental group's sleep quality. The low p-value (< 0.05) confirms that the finding is unlikely due to chance. Therefore, the intervention

significantly improved the sleep quality of mothers in the experimental group.

Findings proved that compassion has a considerable influence on the quality of life, which is substantial at the level of $P < 0.01$ and $F = 275.12$. This research suggests that compassion has a beneficial effect on raising people's life quality. According to the findings of the multivariate covariance analysis, the differences in life quality metrics between the control and experimental groups are significantly influenced by compassion. This means that increasing compassion can effectively enhance the level of life quality. The findings of the current study shed light on the importance of focusing on the education and strengthening of compassion in programs aimed at improving individuals' quality of life. The results indicate that compassion significantly affects the alpha wave, as shown by the F-value of 176.64, which is statistically significant ($P\text{-value} = 0.001$). This suggests that the experimental group, which likely received compassion-related intervention, exhibited a noticeable change in alpha wave activity than the control group. The significant F-value supports the hypothesis that compassion has a substantial effect on the alpha wave. With a P-value below the 0.01 threshold.

Discussion

In this literature, it was proven that in the pre-test stage, most variables showed no discernible variations between the groups under study. The variables displayed more volatility in the post-test phase, though, as the groups' means and standard deviations changed noticeably.

Table 4. Multivariate covariance analysis of control and experimental groups in the post-test stage

Row	effect	df	Error of df	F	p.value
Pillai effect	0.483	8	23	28.19	0.001
Wilkes Lambda	0.029	8	23	28.19	0.001
Hotelling's work	7.34	8	23	28.19	0.001
The biggest root of Ray	7.34	8	23	28.19	0.001

Multivariate covariance analysis results showed that the experimental group experienced substantial effects on the alpha wave, sleep quality, and life quality in comparison to the control group.

The finding of this literature proves that self-compassion increases the quality of sleep, which is in agreement with the results of Mohammadi Sangachin Doost et al. (11), Mohammadi Sangachin Doost et al. (12), Kafi et al. (13), Rezaei-Oshyani et al. (14), Narimani et al. (15), Brown & Ryan (16), Breslin et al. (17), Richards & Martin (18), Marotta et al. (19), Tarsia et al. (20) are consistent. In addition, Shurab et al. (21), found that patients with breast and prostate cancer who participated in a mindfulness-based stress reduction program experienced notable increases in their quality of life, stress symptoms, and sleep quality. In any event, present-tense nonjudgmental consciousness has some evolutionary adaptive value. The physiological justification of this therapeutic method to increase the quality of sleep is that it has been determined that meditation creates a state of alertness and awareness, which can be measured objectively and through an electroencephalogram. In people who are in a meditative state, features such as alpha wave activity along with a decrease in metabolic rate, theta waves such as low arousal states in connection with sleep, and even some delta wave activities that are similar in heavy sleep and coma (unconsciousness) is seen. Although experimental psychologists have defined meditation as a modified state of consciousness, Zen meditation teachers still consider it an experience of "increasing consciousness" rather than an experience of "correcting consciousness" (22).

Another way to interpret these results is that ongoing, nonjudgmental, and non-evasive

care of anxiety-related sensations can lessen the emotional responses that are typically brought on by anxiety symptoms. The visceral exposure strategy is comparable to this method. To alleviate symptoms associated with involuntary thoughts, these therapists instructed insomniacs to practice deep breathing and cardiovascular activity, as well as to develop tolerance to these sensations. The remarkable and potent aspect of mindfulness is that it teaches the patient about the origins of the disorder and how it works in the brain, keeps him from feeling anxious, concentrates on his thoughts and desires while he is in a consciousness state, and enables him to avoid repeating behaviors or thoughts and dwelling on them in an attempt to lessen anxiety and consider the biological causes of the disorder. Even though advancements in technology, human development, and progress have made it possible to treat many illnesses without the need for physical movement and to save time, it must be recognized that many illnesses and mental disorders remain untreated and that they can be resolved with a short-term therapist's training (23).

The current study's findings demonstrated that compassion training improves people's quality of life, which is in agreement with the results of Koyu et al. (24), Sharifian et al. (25), Zhao et al. (26), Noursina & Kiani (27), Didehban et al. (28), Nielsen et al. (29), Ghaljeh et al. (30) are consistent.

Compassion training influences the information processing and cognitive system by raising people's present awareness through methods like focusing on the body and breathing and bringing attention to the present. This helps to explain these findings. Ruminating in individuals (31). In principle, in theory, self-compassion can increase the preventive effect of treatment. This point is

confirmed by the present results regarding the impact of mindfulness therapy on reducing dysfunctional attitudes and thoughts. That being said, self-compassion does indeed seem to be effective through attentional control training. It is assumed that vulnerability to the recurrence and return of problems is caused by frequent links between depressed mood negative self-problematic patterns and dysfunctional attitudes, which in turn lead to changes in cognitive and neurological levels. Therefore, compassion can increase the preventive aspect by changing faulty thinking patterns and training attention control skills and ultimately improve life quality (17).

In general, it can be said that the approach of compassion with the integration of elements such as the dialectical philosophy of mindfulness, acceptance, communication, etc., along with the use of meditation as a central area in this approach, as well as paying more attention to control Attention confirms the eastern view of the interaction of mind and body along with their effectiveness in the field of health and mental health and increases the life quality (18).

In general, teaching self-compassion can be an effective tool for improving the mental health of mothers. According to the available evidence, this approach can not only reduce stress and anxiety but also improve the life quality and mental health of mothers.

Conclusion

The conclusion of this research indicates that self-compassion-based interventions have had significant positive effects on quality of life, sleep quality, and alpha wave activity in the experimental group. In the pre-test stage, the groups did not differ significantly in most of the studied variables, indicating initial similarities between the groups. However, in the post-test stage, significant changes in the means and standard deviations of the groups were

observed, indicating the positive effects of self-compassion interventions in the experimental group.

Overall, this study shows that self-compassion interventions can be an effective tool in improving mental health, sleep quality, and quality of life. Therefore, incorporating such interventions into health and psychological programs could contribute to the improvement of public health.

It is expected that self-compassion training will not just improve the quality of mothers' sleep but also improve their life quality. This approach can be an effective tool to deal with the daily challenges of mothers and ultimately lead to the creation of a more positive environment for children with ADHD. According to the available evidence, Therefore, it may be said that self-compassion improves mothers' general quality of life in addition to their sleep quality. This approach can be introduced as an effective tool in educational programs for parents to help them better cope with the challenges of raising children and improving their life quality.

Recommendation

In examining the outcomes of self-compassion training in healthcare, especially in maternal health, it has been shown that integrating such training can have positive effects on improving both the mental and physical health of mothers. Given the multiple physical and psychological pressures during pregnancy and postpartum, self-compassion training can be an effective solution for reducing stress, anxiety, and depression, while also enhancing self-esteem and coping abilities. Therefore, it is recommended that healthcare policymakers seriously consider integrating self-compassion education into routine maternal health programs. This action can not only improve the quality of life for mothers but also create a supportive environment for their mental health development during pregnancy and

postpartum. Ultimately, such policies can lead to a reduction in the psychological burden and healthcare costs associated with postpartum mental disorders, contributing to the overall health improvement of the community.

Suggestions

Longitudinal Studies: Long-term studies are essential to examine the sustained effects of self-compassion education on mothers' mental and physical health postpartum. These studies can help analyze the long-term impact of such training on reducing anxiety and depression and improving the life quality for mothers.

Cultural Group Studies: Given the cultural and social differences in pregnancy and motherhood experiences, future studies could explore the effects of self-compassion training across different cultures and communities. This can help develop educational programs tailored to the specific needs of each society.

Research on Integrating into Healthcare Systems: Future research can examine how self-compassion education can be effectively integrated into existing healthcare programs such as prenatal and postnatal care. These studies could focus on implementation strategies, barriers, and opportunities for incorporating this training into healthcare systems.

Impact on Other Family Members: Considering the effect of self-compassion education on other family members, such as spouses and children, could help create a more supportive environment for mothers. Research could explore whether self-compassion training for mothers positively impacts family relationships and the quality of life for other family members.

Comparison with Other Psychological Interventions: Future studies could compare self-compassion education with other psychological interventions, such as cognitive-behavioral therapy or supportive therapy, to determine which approach has

the greatest impact on improving mothers' mental health.

Authors' contribution

Sevda Mohammadi and Roghayeh Kiyani developed the study concept and design. Sevda Mohammadi and Roghayeh Kiyani acquired the data. Sevda Mohammadi and Roghayeh Kiyani analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

Informed consent

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study.

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Conflict of interest

The authors declare that they have no conflict of interests.

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