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Original Article

Investigating the Effectiveness of Modifying the Parent-Child Interaction Pattern Based on Filial Play Therapy on Internet Addiction, Sleep Quality, and Self-efficacy in 9-12-Year-Old Children

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Abstract

Background: Despite all the positive features of the internet, the risk of addiction threatens users. Sleep disorders and the negative effects on self-efficacy are important risks of this technology. Accordingly, the present study aimed to investigate the effectiveness of modifying the parent-child interaction pattern based on play therapy (filial therapy) on internet addiction, sleep quality, and self-efficacy in 9-12-year-old children.

Methods: This quasi-experimental study was conducted using a pre-test-post-test design with a control group. The statistical population of the study consisted of all 3617 boys and girls aged 9-12 years studying in selected schools in Kerman, Iran (12 elementary schools) in the academic year 2020-2021. A total of 72 students were randomly selected from among the children who met the benchmark score of internet addiction and were not under medical and psychological treatment. The participants were divided into two experimental and control groups (36 students each). A demographic information questionnaire, the Internet Addiction Scale (YIAS), the Self-Efficacy Questionnaire for Children (SEQ-C), and the Pittsburgh Sleep Quality Index (PSQI) were used to collect data. Data were analyzed using SPSS software.

Findings: The mean scores of internet addiction in the pre-test and post-test were 86.67 and 86.23 in the control group and 88.14 and 75.14 in the experimental group, respectively, which showed a decrease in internet addiction. The scores of sleep quality in the pre-test and post-test were 1.81 and 1.78 in the control group and 1.75 and 0.5 in the experimental group, respectively. Moreover, the overall scores of self-efficacy in the pre-test and post-test were 63.64 and 63.94 in the control group and 62.08 and 81.75 in the experimental group, respectively. The results indicated an improvement in the overall quality of sleep and self-efficacy.

Conclusion: The results showed that the severity of internet addiction in children decreased after the treatment based on modifying the parent-child interaction, and this treatment was also effective on self-efficacy and sleep disorders.

Keywords: Filial therapy, Addiction, Internet, Sleep, Self-efficacy

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Introduction

The current age is considered the era of technology and information explosion for human society and the access to this huge amount of information and interpersonal communication has been made possible through the Internet. Indeed, the important and central role of the Internet in human life is increasing day by day.[1,2]

Despite all the positive features of the Internet, there are serious concerns about its increasing and long-term use leading to internet dependence which affects the human body, soul, and mind and increases the possibility of internet addiction. Like other types of behavioral addictions, internet addiction has many negative consequences.[3]

Since the 1990s, addictive behavior in some internet users has attracted the attention of experts, and a number of studies have been conducted in this field. The studies on internet addiction have reported several negative consequences for young people and teenagers who are addicted to the Internet, including decreased academic performance,[1] poor eating habits,[2] violent social behavior,[3] conflictual family relationships,[4] increased risk of suicidal ideation,[5] physical problems,[6] increased negative emotions such as anxiety,[7] depression,[8] and loneliness,[9] more procrastination,[10] psychiatric disorders and emergencies,[11] low self-efficacy,[12] and sleep disorders.[13]

In a study on teenagers with internet addiction, Trumello et al showed that the effective and positive

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communication of teenagers with their parents leads to their emotional accessibility and has a negative correlation with internet addiction. Emotional accessibility refers to the support, responsiveness, and sensitivity of the parents resulting in a stronger emotional bond and secure attachment.[14]

The results of the study by Allaei indicated that adolescents who have a weak support network are more prone to the addictive use of the Internet. Besides, compared to family support, the adolescents' weak support network with friends has more predictive power.[15]

Another common problem with the increase in the use of the internet is sleep disorders. Low quality of sleep has been reported in various studies. For example, the prevalence of sleep disorders is 54.7% among Taiwanese students, 71.4% among Brazilian students, and 55% among Peruvian students.[16] There is a direct relationship between excessive use of the Internet (gaming, chatting, etc.) and sleep disorders as reported by Lemola et al,[17] Fossum et al,[18] and Demirci et al.[19]

Self-efficacy is also threatened by internet addiction. Previous studies have shown that self-efficacy is related to better health, higher success rate, and social integration. Self-efficacy is one of the concepts proposed in Bandura's social cognitive theory.[20] According to this theory, self-efficacy is a person's belief in his abilities which leads to more control over challenges and enhances an individual's performance. It also affects the recognition of emotions and behaviors and helps to manage stressful events.[21] Self-efficacy is a basic concept in understanding human behavior that has been used in various fields such as academic progress, emotional disorders, and physical and mental health.[22] Self-efficacy is directly related to healthy behaviors and affects the amount of perseverance, commitment, and effort to achieve a goal.[23]

Several studies have investigated the role of attachment with peers and parents in youth internet addiction and have reported that good and effective communication with parents and peers creates a healthy and safe environment for the physical and emotional development of teenagers.[12] Children with weak parent-child attachment are at a higher risk for addictive online behaviors, while negative prediction is associated with a lower likelihood of internet addiction. Moreover, good father-child relationship has a negative correlation with internet addiction, and the feeling of alienation between the child and the mother directly predicts the child's behavioral problems.[24] Aslani et al also showed that in families where parental supervision and participation in children's activities are less common and the dynamics of relationships are absent or very limited, instead of interacting with the family, the child resorts to the virtual space.[25] Therefore, this section discusses the parent-child relationships and types of attachment.

Lin et al reported in a study on Taiwanese students that low self-efficacy is one of the risk factors for and predictors of internet addiction.[12] Based on numerous studies, pharmacotherapy and psychotherapy methods such as cognitive therapy, behavior therapy, acceptance and commitment therapy, mindfulness, etc. have been proposed and implemented for the treatment of internet addiction. Child parent relationship therapy (CPRT) is one of the effective methods for improving the relationship between parents and children and reducing children's behavioral and psychological problems. This intervention approach is proposed for children with emotional and behavioral disorders and emphasizes improving the quality of the parent-child relationship and changing the interaction patterns between the two. By changing and rebuilding the interaction between the parent and the child, this treatment reduces problematic behaviors. Furthermore, parents are encouraged to give more positive attention to the behaviors they want as well as to specific disciplinary methods to respond to undesirable behaviors. They learn special skills and use them while playing with the child.[10,12] Indeed, the aim is to match negative behaviors with positive behavioral patterns and emphasize the development of high levels of self-esteem in children.[24] As a result, the change in the quality of the parent-child relationship can be regarded as an effective factor in reducing disruptive behaviors of children.[25] The child-parent therapeutic relationship is a game-based communication skills training for parents. By enhancing the child-parent relationship, this method can improve the child's emotional and behavioral problems and guarantee his mental health. It also affects the child's behavioral disorders and executive performance.[26] On the other hand, internet addiction is considered a type of behavioral addiction, and therapy based on improving the child-parent relationship is one of the newest methods to enhance children's behavior. In this regard, play is an effective means for strengthening family relationships, creating understanding and respect between children and parents, and solving the problems of children and their families. The effectiveness of play in reducing behavioral problems has been confirmed in various studies, Therefore, the current study aimed to investigate the effectiveness of modifying the parent-child interaction pattern based on play therapy (filial therapy) on reducing internet addiction and increasing sleep quality and self-efficacy in 9-12-year-old children.

Methods

This quantitative quasi-experimental study was conducted using a pre-test-post-test design with a control group. The independent variable was treatment based on parent-child interaction, and the dependent variables included the severity of internet addiction symptoms, self-efficacy, sleep quality, and communication with parents and peers. The current study was practical and outcome-oriented.

The statistical population consisted of all 3617 male and female students aged 9 to 12 years old studying in selected schools of Kerman, Iran (12 elementary schools) in the academic year 2020-2021.

The participants were selected using multi-stage sampling method. Accordingly, the elementary schools of Kerman were divided into two districts, and then three girls' and three boys' schools were randomly selected from each district. In the next step, the researcher prepared text and audio messages explaining the objectives of the study and research methods and presented them to the parents through teachers and the Shad application. Then, Young's Internet Addiction Scale (YIAS) was made available to all students (3617 people) electronically and in person. A total of 2628 questionnaires were completed and returned. In the next step, 72 students were randomly selected from among the children who met the benchmark score of internet addiction (92 students) and were not under medical and psychological treatment. After the parents signed the informed consent form, the students were assigned to two experimental and control groups (36 members each). The experimental group underwent intervention based on the modification of the parent-child relationship (play therapy model by Landreth), while the control group did not receive any intervention. The age of the participants varied from 9 to 12 years and their level of education varied from the 4th to 6th grade.

Due to the spread of the coronavirus disease, the treatment program based on improving parent-child interaction was provided in ten 90-minute weekly sessions for the mothers of the students in the experimental group through in-person and face-to-face training as well as educational movies and pamphlets while observing health protocols and social distancing in Nourieh hospital using the following two methods:

1. Mother-child method: In some sessions, mothers participated together with their children suffering from internet addiction.

2. Mother-alone method: In this method, only mothers were present in the sessions.

In addition to face-to-face training and film screening, educational brochures were presented and tasks were assigned to the mothers. Mothers also followed the program every day for 30 minutes playing with the child based on the educational content.

The inclusion criteria for children were meeting the benchmark score on Young's Internet Addiction Scale, having access to the Internet, not having mental, behavioral, and mental disorders or hearing, vision, and speech problems, and not receiving drugs or psychological treatment. The inclusion criterion for parents was having the ability to read and write. The exclusion criteria were having a particular disease and receiving any other treatment at the time of the study.

Data were collected through the Internet Addiction Scale (IAS), the Self-Efficacy Questionnaire for Children (SEQ-C), the Pittsburgh Sleep Quality Index (PSQI), and a demographic information questionnaire including age, gender, education level, place of residence, etc.

Internet Addiction Scale

This questionnaire was designed by Young (1996) and has 20 items scored on a Likert scale.[25] Based on the scores obtained on this scale, the individuals were classified into three groups including normal internet users, users with significant problems due to internet use, and users with internet addiction.

Self-Efficacy Questionnaire for Children

This questionnaire was developed by Muris in 2001 to assess self-efficacy in children and adolescents with three subscales: social self-efficacy, academic self-efficacy, and emotional self-efficacy.[9] This questionnaire has 23 items scored on a five-point Likert scale from "very much" to "very little". The social self-efficacy subscale (8 items) measures the ability to establish relationships with peers, assertiveness, and achieve social standards. The academic self-efficacy subscale (8 items) measures the capability to manage learning behaviors, master academic subjects, and fulfill academic expectations. The emotional self-efficacy subscale (7 items) measures one's ability to deal with and control negative emotions.

Pittsburgh Sleep Quality Index

This tool was developed in 1989 by Boyce et al to measure sleep quality.[9] The original questionnaire has 9 items (item 5 with 10 sub-items leading to a total of 19 items) which are scored on a 4-point Likert scale from 0 to 3. It has 7 subscales including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime drowsiness.[18,20,23]

Data were analyzed using descriptive and inferential statistics as well as parametric sign tests. The descriptive statistics included mean, standard deviation, frequency tables, frequency percentages, and graphs. Internet addiction, sleep quality, and self-efficacy variables and their components were described in the two control and experimental groups in the pre-test and post-test. For the inferential statistics, the normality of data distribution was assessed using the Kolmogorov-Smirnov test. As the research variables did not have a normal distribution, non-parametric tests were used. Then, using the sign test, internet addiction, sleep quality, and self-efficacy were compared in the control and experimental groups in the pre-test and post-test. Data analysis was performed using SPSS software.

Results

Based on the sum of the scores obtained from the

questions on internet addiction, a total score from 0 to 100 was calculated for each participant in the control and experimental groups in the pre-test and post-test. As shown in Table 1 and Figure 1, the mean scores of internet addiction in the pre-test and post-test stages were 86.67 and 86.23 in the control group and 88.14 and 75.14 in the experimental group, respectively. The results showed internet addiction decreased in the experimental group. Moreover, based on the results of the sign test at the significance level of 0.05, the p-value was less than 0.001 (Table 2). Therefore, the null hypothesis was rejected indicating that there was a significant difference in the severity of internet addiction in 9-12-year-old children before and after CPRT training for parents.

Based on the sum of the scores obtained from the questions on sleep quality, a total score from 0 to 21 was calculated for each participant in the control and experimental groups in the pre-test and post-test. The descriptive statistics for sleep quality in both control and experimental groups in the pre-test and post-test are presented in Table 3 and Figure 2. According to the PSQI, a total score higher than 5 is a sign of poor sleep quality. As shown in Table 2 and Figure 2, the participants in the control and experimental groups did not have poor sleep quality. The mean scores of sleep quality in the pre-test and post-test stages were 1.81 and 1.78 in the control group and 1.75 and 0.5 in the experimental group, respectively. The results indicated an improvement in the overall quality of sleep in the experimental group after the intervention. The *P* value was 0.001 (Table 4); thus, the null hypothesis was rejected showing there was a significant difference in the sleep quality of 9-12-year-old children with internet addiction before and after CPRT training for parents.

Based on the sum of the scores obtained from the questions on self-efficacy, a total score from 24 to 120 was calculated for each participant in the control and experimental groups in the pre-test and post-test. The descriptive statistics for self-efficacy in control and experimental groups in the pre-test and post-test are shown in Table 3 and Figure 3. As shown in Table 5, the mean scores of self-efficacy in the pre-test and post-test stages were 64.25 and 63.94 in the control group and 62.08 and 81.75 in the experimental group, respectively. The scores indicated an increase in self-efficacy in the experimental group after the intervention. Furthermore, the p-value was less than 0.001; hence, the null hypothesis was rejected (Table 6) showing there was a significant difference in self-efficacy in 9-12-year-old children with internet addiction before and after CPRT training for parents.

Discussion

The results of the sign test showed that the severity of internet addiction in 9-12-year-old children with internet addiction decreased after the treatment based on modifying the parent-child interaction. In line with these findings, the study by Soltani and Farhadi[26] on 30 mothers of preschool children with computer game addiction who received CPRT treatment in ten two-hour sessions (two sessions per week) showed the positive effect of this treatment on reducing the symptoms of computer game addiction. However, no other study was found on the effectiveness of CPRT on internet addiction. The findings of the present study are in line with a study which investigated the effectiveness of this treatment on all kinds of children's behavioral problems and confirmed its positive effect on reducing behavioral problems.[12] Since internet addiction is considered one

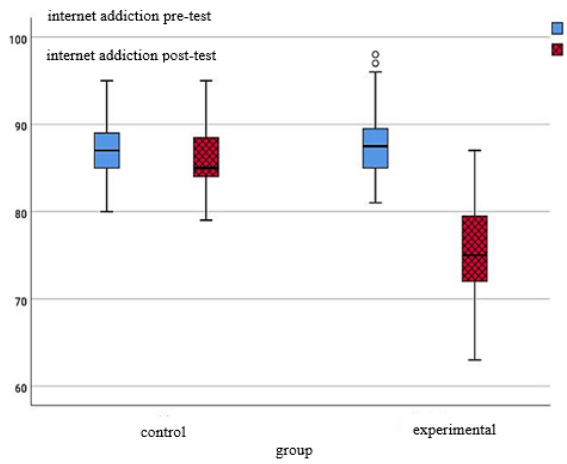

Figure 1. Box-and-whisker plot for internet addiction in control and experimental groups in pre-test and post-test

Table 2. Sign test for internet addiction in the experimental group in pre-test and post-test

Test statistic	-5.245
***P* value**	<0.001 *

*Level of significance at 0.05.

Table 1. Descriptive statistics for internet addiction

Internet addiction		Kurtosis	Skewness	Maximum	Minimum	Variation range	Standard deviation	Variance	Mode	Median	Mean
Control group	Pre-test	0.492	0.497	95	80	15	3.28	10.8	85	8.56	86.67
	Post-test	0.610	0.643	95	79	16	3.45	11.94	85	85	86.23
Experimental group	Pre-test	0.216	0.777	98	81	17	4.04	16.35	89	87.5	88.14
	post-test	-0.105	0.005	87	63	24	5.44	29.6	70	75	75.14

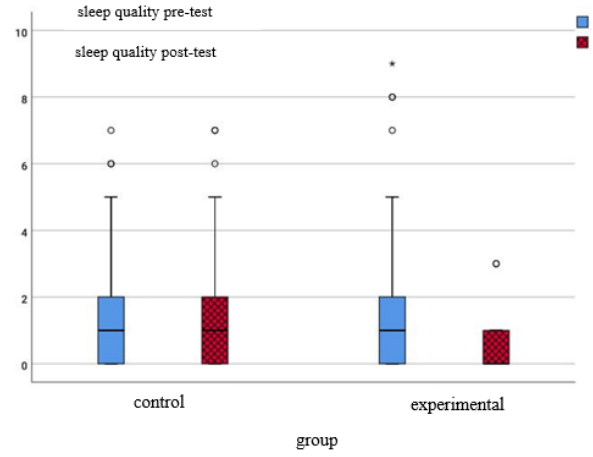

Figure 2. Box-and-whisker plot for sleep quality in control and experimental groups in pre-test and post-test

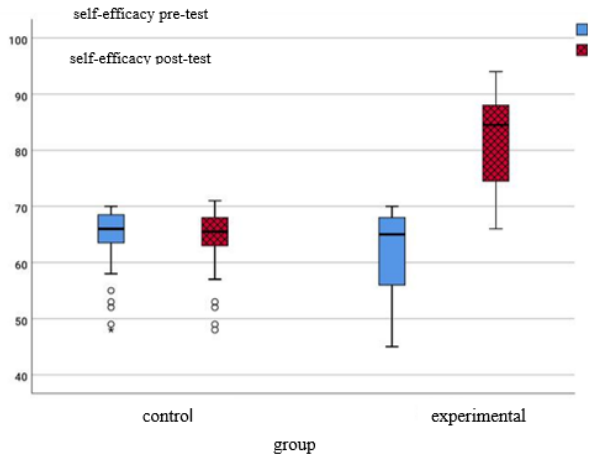

Figure 3. Box-and-whisker plot for self-efficacy in control and experimental groups in pre-test and post-test

Table 3. Descriptive statistics for sleep quality

Sleep quality		Kurtosis	Skewness	Maximum	Minimum	Variation range	Standard deviation	Variance	Mode	Median	Mean
Control group	Pre-test	0.619	1.215	7	0	7	1.969	3.875	0	1	1.81
	Post-test	1.167	1.365	7	0	7	2	4	0	1	1.78
Experimental group	Pre-test	1.727	1.678	9	0	9	2.623	6.879	0	1	1.75
	Post-test	4.286	1.953	3	0	3	0.77	0.6	0	0	0.5

Table 4. Sign test for sleep quality in the experimental group in the pre-test and post-test

Test statistic	3.174
***P* value**	0.001*

*Level of significance at 0.05

type of behavioral addiction and a subset of children's behavioral problems, it can be stated that the results of this study are indirectly consistent with the findings of the studies by Bagheryan et al,[27] Monahan et al,[28] Rothenberg et al,[29] Sohrabi et al,[30] Amanelahi et al,[31] Bahmani et al,[32] Mostafavi et al,[33] and Hashemi et al.[34] These findings can be explained by relying on the results of a study that showed the quality of the parent-child relationship as a mediating factor plays a significant role in the use of virtual spaces and internet addiction.[35] The results of the sign test showed that the treatment based on modifying the parent-child interaction was effective in improving the self-efficacy of the participants in the experimental group in the post-test phase. Although no study was found on the effectiveness of CPRT in increasing children's self-efficacy, the results of the study by Karimi Ivanaki[36] showed a significant increase in parenting self-efficacy in mothers of 3-5-year-old children who received training on the methods of improving the relationship between the parents of the child. According to Bandura's theory, self-efficacy refers to a person's belief in his abilities which influences life events,[37] plays an important role in dealing with challenging life situations,[38] and helps people behave logically in the face of these challenges.[39] Undoubtedly, the role of parents in the development of children's self-efficacy and sense of competence is undeniable[40] and the positive reaction of parents to children's performance leads to high self-efficacy, while neglecting children's performance, blaming, and making fun of them decrease their self-efficacy.[41] The family communication pattern or schema is defined based on the relationship of family members with each other.[42] The quality of relationships within the family and parenting styles play a decisive role in the formation of one's personality and social functioning as well as the cognitive and mental health of the child in the future.[43] CPRT treatment is based on the theory of attachment and social learning. Through child-oriented and parent-oriented activities, it tries to create safe attachment and regulate emotional behavior. It also relies on different techniques (reward, description, reflection, issuing good commands, providing notes) and the principles of behavior change to achieve the following aims:

1. Increasing the child's self-esteem and solving behavioral problems
2. Increasing the quality of positive interaction between parents and children
3. Establishing effective and consistent behavior management strategies
4. Giving parents a better sense of competence and self-efficacy

Therefore, treatment based on improving the parent-

Table 5. Descriptive statistics for self-efficacy

Self-efficacy		Kurtosis	Skewness	Maximum	Minimum	Variation range	Standard deviation	Variance	Mode	Median	Mean
Control group	Pre-test	1.534	-1.544	70	48	22	5.95	3.455	69	66	64.25
	Post-test	1.592	-1.488	71	48	23	5.78	33.48	64	6.55	63.94
Experimental group	Pre-test	-0.544	-0.913	70	45	25	7.51	56.53	69	65	62.05
	Post-test	-1.051	-0.539	94	66	28	8.24	68.02	87	84.5	81.75

Table 6. Sign test for self-efficacy in the experimental group in pre-test and post-test

Test statistic	5.833
P value	0.001 *

*Level of significance at 0.05.

child interaction can increase the child's self-efficacy.[44] Since a person establishes communication based on the self-esteem and self-confidence he receives in the family, he uses development mechanisms and shows higher self-efficacy.[45] The results of the sign test indicated that the quality of sleep in the experimental group improved after CPRT treatment. Although there was no similar study on the effect of the treatment based on improving the parent-child interaction on the quality of sleep, the study by Mortazavi and Farhadi,[46] investigating the relationship between computer games addiction and sleep disorders in preschool children with the moderating role of communication with parents, showed a direct relationship between the occurrence of sleep disorders and their adverse effects and the destructive role of computer game addiction. In this study, the type of communication with parents and its components (acceptance of the child, rejection of the child, protective insight, negligence) were introduced as a moderating factor between sleep disorder and addiction to computer games. Moreover, according to the study by Ghanbari et al,[47] computer games reduce the intimacy of parents and disturb their sleep. Other studies have also shown a direct relationship between sleep disorders and addiction to different forms of internet use.[35,48-51] The current study also revealed a correlation between internet addiction and sleep disorders. In this regard, the theory of Koplan, based on Bamrind's conceptualization, considered parenting styles to be effective in sleep quality and suggested that having a supportive view reduces sleep disturbance while the rejection of the child leads to its increase.[16,25]

The participants of this study were in the age range of 9-12 years old; thus, generalization of the findings to other age groups should be done cautiously. Besides, this study was conducted at the time of the COVID-19 pandemic, the closure of schools and online education. Although online class attendance has been considered equivalent to attendance at school, it can indirectly impact the outcomes. As students were not physically present at school, the six-month follow-up for treatment was not conducted.

Suggestions for further research

This study should also be conducted on preschoolers and first-grade students.

The present study should be conducted at the right time, without the restrictions of the corona virus and the reopening of schools and face-to-face education, so that results can be generalized to the statistical population.

The effectiveness of the treatment should be re-evaluated after a six-month follow-up, so that the effects of the treatment can be investigated at longer intervals.

Practical suggestions

Since the findings showed the effectiveness of CPRT treatment on reducing internet addiction, increasing self-efficacy, improving sleep quality, and enhancing parent-child and peer-child interactions, CPRT can be adopted as a game-based child-centered therapeutic approach for primary school children.

Conclusion

The use of various aspects of the Internet and virtual space has become an integral part of human life; as a result, internet addiction, as a behavioral addiction and a newly emerging disorder, is increasing in different societies. Considering the importance of childhood and adolescence and the formation of one's personality and identity at this age as well as the significance of physical and mental health, gaining self-confidence and self-esteem, and learning life skills, self-efficacy and social interaction training and coping effectively with tensions and problems in this period of life are of paramount importance. Timely diagnosis and proper treatment of internet addiction highlight the necessity to conduct studies in this field. The results of this study showed that the treatment based on improving the parent-child interaction is effective in reducing the severity of internet addiction and improving sleep quality and self-efficacy in 9-12-year-old children with internet addiction.

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Authors' Contribution

Conceptualization: Fereshteh Danesh, Masoud Mohammadi.
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Investigation: Masoud Mohammadi.
Methodology: Fereshteh Danesh, Masoud Mohammadi.
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Supervision: Fereshteh Danesh, Masoud Mohammadi.
Validation: Masoud Mohammadi.
Visualization: Fereshteh Danesh, Ghasem Naziri.
Writing–original draft: Najmeh Fath.
Writing–review & editing: Fereshteh Danesh, Ghasem Naziri.

Competing Interests
The authors declare no conflict of interest.

Ethical Approval
This study was approved by the Islamic Azad University of Shiraz with the code of ethics (IR.IAU.SHIRZ.REC.1400.035).

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