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Application of Hypnosis in Ophthalmology: An Update

Ali Azizi

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Letter to Editor

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Hypnosis was widely used as a sedation technique for a variety of surgical procedures in the 19th century. However, it was later abandoned due to the introduction of anesthetic drugs (such as nitrous oxide in 1844, ether in 1846, and chloroform in 1847) and the strong focus of contemporary scientists on the physical body as the primary therapeutic paradigm. This marginalization of the mind-body connection persisted until the mid-20th century. The advancements in neurology, phenomenology, psychology, and anesthesia in recent decades have revived interest in the application of hypnosis (Brugnoli, 2014; Facco, Bacci, & Zanette, 2021). So far, limited studies have been conducted on its use in ophthalmology. Available literature has mostly investigated the sedative effects of hypnosis on patient compatibility during ocular procedures until the 1980s (Bucalossi, 1975; Lewenstein, Iwamoto, & Schwartz, 1981). Interestingly, this line of research was largely discontinued in the ophthalmic field until recent years. To be precise, a 2018 study conducted in China shed light again on the effects of hypnosis for pain management in cataract surgery (Chen et al., 2018). Additionally, a case report from the United Kingdom (UK) described the use of a combination therapy including hypnosis to promote the management of a long-term functional vision disorder (FVD) (Yeo, Carson, & Stone, 2019). Subsequently, in two recent review articles, the use of hypnosis was suggested for intraocular pressure (IOP) reduction in patients with glaucoma (Bertelmann & Strempel, 2021), and for the management of persistent FVD (Phansalkar, Lockman, Bansal, & Moss, 2022). This mentioned gap in the clinical application of hypnosis in ophthalmology may indicate that while significant advancements have occurred in ophthalmic surgeries, there may have been limited changes in the management of anesthesia and patient comfort (Palte & Masters, 2023). On the other hand, it could represent a recurring neglect of the psychosomatic aspects of eye diseases. The Cartesian biomedical model, which objectively focuses on the physical body as a machine-like entity, may have historically placed less emphasis on the subjective descriptions of physical phenomena, as is well stated by Hippocrates: "It is more important to know what sort of person has a disease than to know what sort of

disease a person has" (Facco et al., 2021). This indicates that patients may appreciate having options beyond solely pharmacological solutions to address their pain, anxiety, vulnerability, and depression (Brugnoli, 2014). Noteworthy, it has been demonstrated that adopting a holistic mindset toward health issues and embracing integrative approaches can facilitate an individual's healing journey (Bahreini, Azizi, & Roohafza, 2024; Goli, 2023). Accordingly, the author has identified interesting applications of hypnosis in various ophthalmic subspecialties and has conducted a review of the literature, including the controversies demonstrated in such studies (Azizi, article under submission, 2024). At this time, the author proposes revisiting the use of hypnosis in ocular fields, as it could serve as a safe adjunct to conventional procedures. The future horizon for "hypno-ophthalmology" (the application of hypnosis in ophthalmology) could be broadened along this threefold map: touched areas, teleophthalmology, and untouched areas.

Touched areas: To expand upon the familiar results that hypnosis may have introduced so far. Hypnosis could reduce patients' mental and emotional distress, pain, medication consumption, allergic reactions, and procedure-related side effects, while enhancing their sleep quality and recovery through its psychoneurological mechanisms (Brugnoli, 2014; Facco, 2021; Holler, Koranyi, Strauss, & Rosendahl, 2021). Accordingly, hypnosis could be widely applied in minor ophthalmic surgeries (such as reconstruction surgeries and blepharoplasty) and cataract surgeries. In these contexts, hypnosis could be used as the sole sedative or in conjunction with local or general anesthesia (Fathi, Saber Moghaddam Ranjbar, Azaraein, Joudi, Gharavifard, & Moghaddam, 2021).

Teleophthalmology: The intersection of information technology and medical practice used to provide healthcare services to remote or underserved individuals. Regarding the growing focus on teleophthalmology, the investigation and application of self-guided hypnosis through mobile phone applications could become a promising platform for expanded ophthalmic care delivery. This concept may be particularly beneficial for the treatment and follow-up of conditions such as dry eye disease (DED), allergic conjunctivitis, ocular hypertension (OHT), and post-corneal graft patients, where suggestions regarding expedited healing and proper eye drop compliance could be valuable. By leveraging teleophthalmology, it could help extend the reach of other specialized ophthalmic care to patients, thereby improving access and outcomes (Bhagat, Mansuri, & Sonarkar, 2023).

Untouched areas: To expand upon the unfamiliar horizons that hypnosis may be applied to in the future. There could be additional ophthalmic procedures or disease states that would potentially benefit from the wide-ranging applications of hypnosis, but have not yet been investigated. Some suggestions include using hypnosis as a sedative for refractive surgery [such as laser-assisted in-situ keratomileusis (LASIK), photorefractive keratectomy (PRK), and small incision lenticule extraction (SMILE)] or microinvasive glaucoma surgery (MIGS) where the calming and pain-relieving effects of hypnosis could enhance the patient experience and outcomes. These are just a few examples where the integration of hypnosis into ocular practice may yield promising results. Further research and clinical exploration in these and other unexplored domains could uncover new ways to leverage the potential of hypnosis-based interventions in ophthalmology.

All in all, the author encourages interdisciplinary collaborations between mind-body scientists, ophthalmologists, anesthesiologists, and hypnosis practitioners to explore the potential of hypnosis in providing a positive experience for patients during pre-, intra-, and post-operative care or dealing with their ocular diseases.

Conflict of Interests

Authors have no conflict of interests.

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Comparison of Cognitive Fusion, Risk-taking, and Fathers' Communication Style between Adolescents with and without Self-harm

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Qualitative Study

Abstract

Background: Self-harm is a conscious behavior in which a person damages his/her body tissues, but this behavior is not done with the intention of suicide. The present study compared cognitive fusion, risk-taking, and fathers' communication style between adolescents with and without self-harm.

Methods: The population of this study included all adolescents with a history of self-harm who were referred to treatment centers in Shiraz, Iran, from April to September 2023. The research sample included 200 subjects (100 healthy people and 100 adolescents with a history of self-harm) who were selected using the convenience and purposeful sampling method. The participants completed the Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014), Iranian Adolescents Risk-taking Scale (IARS; Zadeh Mohammadi, Ahmadabadi, & Heidari, 2011), and Parent-Child Relationship Scale (PCRS; Fine, Moreland, & Schwebel, 1983). The collected data were analyzed using SPSS software with a two-tailed 5% level of significance.

Results: The results showed a significant difference between adolescents with and without self-harm in terms of cognitive fusion ($F = 41.38$; $P < 0.050$), cognitive defusion ($F = 45.09$; $P < 0.050$), cognitive fusion ($F = 29.37$; $P < 0.050$), risk-taking ($F = 47.72$; $P < 0.050$), and communication style with their father ($F = 31.86$; $P < 0.001$). Moreover, the group of adolescents with self-harm scored higher in cognitive fusion, risk-taking, and communication style with the father.

Conclusion: According to the results, adolescents with self-harm have higher cognitive fusion and risk-taking and an unfavorable communication style with their father compared to adolescents without self-harm, so these variables are crucial in clinical interventions for treatment.

Keywords: Cognitive; Risk-taking; Communication; Self-harm; Adolescents

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Introduction

Adolescence is a complex period in life, which is a time of questioning, curiosity, and risk-taking (Sourani Yancheshmeh, 2018). In every society, children and adolescents' health has been of great importance, and providing them with mental health services helps them to be mentally and physically healthy and play their social roles better (Karimi, Farahbakhsh, Salimi Bajestani, & Moatamedi, 2020). This phenomenon of risk-taking behaviors and self-harm behaviors are closely related to the level of impulsivity in adolescents(Jia Yun L, Motevalli S, Abu Talib M, Gholampour Garmjani M, 2023). The findings show that the prevalence of self-harm without suicide has increased in the last decade (Jantzer, Haffner, Parzer, Resch, & Kaess, 2015). Self-harm refers to a group of intentional behaviors by a person without the intention of suicide to cause direct damage to body tissues, which can be in different forms, such as burning, cutting, and scratching (Doyle, Sheridan, & Treacy, 2017). The frequency of self-harm behaviors in the period of adolescence is more than in other periods of life. In previous studies, it was found that self-harming behaviors without suicide increased from 4% in 2002 to about 16% in 2017 (Doyle et al., 2017; Tørmoen, Myhre, Walby, Grøholt, & Rossow, 2020). According to reports, over the past few years, self-harm and stabbing hands, feet, thighs, and even the head have become routine among girls aged 11 to 13 years. Such behavior can be seen in most schools in Iran. Demographic findings about various types of self-harming behaviors indicate an increase in the incidence of these behaviors in recent years, which has caused concern for the public health of adolescents (Taheri, Taremian, Dolatshahee, & Sepehrnia, 2021). Meta-analysis studies have reported a 2.9–69.6% lifetime prevalence of self-harm in children and adolescents, varying with samples and methods of evaluation. They have estimated the overall lifetime prevalence at 22.1%. Self-harm behavior is highly correlated with various psychiatric symptoms. For example, symptoms of depression and anxiety disorders were more associated with self-harm (Lim et al., 2019).

In pathological psychology, self-harm behaviors have been used since ancient times as a symptom of some mental disorders such as borderline personality disorder (Soltani, Izadi, Sharifi, & Poursadeghfard, 2022), impulse control, and behavior disorders (Roghani, Jadidi & Peymani, 2022). People with high cognitive fusion are more prone to mental disorders (Mozafari, Bagherian, Zadeh Mohammadi, & Heidari, 2021). Cognitive fusion is a verbal process by which people get caught up in their thinking, evaluation, judgments, and memories, and behave based on functions derived from these private experiences. Individual experiences govern behavior and prevent the influence of diverse control sources (Xu et al., 2021). Cognitive fusion pertains to thoughts that affect how a person behaves and perceives things, making them more important than other types of behavioral control and is considered internal (Xu et al., 2021). Lockwood, Daley, Townsend, and Sayal suggested that while 10 impulsive behaviors can predict harmful behaviors, numerous cognitive and emotional factors influence and sustain such behaviors. The cause of most human psychological problems is psychological inflexibility, which is caused by cognitive fusion and experiential avoidance (Lockwood et al., 2017).

Risky behaviors increase harmful and destructive physical, psychological, and social results for the individual, result in great financial and time costs for the family and society, and are considered a social problem (Guo et al., 2023). Passing from childhood to adolescence has been associated with environmental pressures and psychological changes. Most adolescents navigate this phase with no issues; however, certain individuals may resort to self-injurious actions to cope with situational and psychological stressors. The onset of self-injurious behaviors in adolescence accompanied by puberty is because of the interaction of genetics, psychiatry, social psychology, and culture (Karimi et al., 2020).

The family serves as the cornerstone of society and a crucial exemplar of societal conduct. The quality of relationships within a family, particularly between parents and children, undoubtedly plays a crucial role in shaping a child's development and personality across various domains, including social, emotional, and intellectual dimensions. According to Doran and Waldron, there is an increasing tendency for children's behavioral issues in families with problematic familial relationships (Doran & Waldron, 2017). Peng, Hu, Yu, Xiao, and Luo (2021) showed that self-esteem and mental inflexibility play a chain intervening role in the relationship between child-rearing fashion and adolescent mental well-being. Particularly, enthusiastic parental warmth emphatically influenced adolescent mental well-being through the chain-interceding impacts of self-esteem and mental resoluteness. Parental rejection and over-protection adversely affected adolescent mental well-being by weakening self-esteem and expanding psychological inflexibility (Peng et al., 2021). The authors indicated that 21% of young people were neglected by parents who exhibited self-harming behaviors during their own childhood (Baharlou F, Mahdian H, Bakhshipour A. (2023). Although research on fathers has experienced significant growth over the past 20 years (Ahnert & Schoppe-Sullivan, 2020) and there are now a variety of studies examining the role of fathers in different contexts (Ahnert & Schoppe-Sullivan, 2020; Cowan, Cowan, Pruett, & Pruett, 2019), it is still important to note that fathers are underrepresented in longitudinal psychological research compared to mothers (Ahnert & Schoppe-Sullivan, 2020). There has been little research on the difference between cognitive fusion and risk-taking and the style of interaction with the father in adolescents with and without self-harm, to find a solution to these problems in adolescents with self-harm. Thus, this research sought to answer whether there is a difference between adolescents with and without self-harm regarding cognitive fusion and risk-taking and the style of interaction with their fathers.

Methods

The present study was a causal-comparative, descriptive research. The population of this study included all adolescents with a history of self-harm who were referred to treatment centers in Shiraz, Iran, from April to September 2023. The research sample included 200 subjects (100 healthy people and 100 adolescents with a history of self-harm) who were selected using the convenience and purposeful sampling methods, respectively. Considering the G-power tool, alpha = 0.05, and power = 80%, the sample size of 186 subjects was determined for the study (93 subjects in each group). Yet, considering the probability of loss, the sample size was increased to 200. Subjects were enrolled into the study if they passed the following inclusion criteria: verified age of less than 18 years; a history of self-harm; no history of neurological disorders or psychiatric disorders with psychotic features; passing common exclusion criteria; committed to meeting the requirement of refraining from using illicit drugs throughout the study; and providing written informed consent to participate in this study. The mean and standard deviation of the age of the group without self-harm behaviors, the group with self-harm behaviors, and the whole sample was 18.10 ± 2.12, 17.45 ± 1.84 and 17.75 ± 2.01 years, respectively.

All procedures performed in studies involving human participants followed the ethical standards of the institutional and/or national Research Committee with the code 199814. The researchers adhered to ethical principles and ensured that participants' rights were not compromised. Participants were informed that any personal information collected would be kept confidential. After obtaining oral consent and consent, the relevant questionnaires were distributed and collected after completion.

The tools used in the present study included the Cognitive Fusion Questionnaire (CFQ), Iranian Adolescents Risk-taking Scale (IARS), and Parent-Child Relationship Scale (PCRS).

Cognitive Fusion Questionnaire: The CFQ was developed in 2014 by Gillanders et al. (2014), and has 12 questions with 2 factors of fusion (questions 3, 4, 5, 6, 7, 8, 10, 11, and 12) and fault (questions 1, 2, and 9). The questions are scored on a 7-point Likert scale ranging from 7 (always) to 1 (never). The total scores on the CFQ range between 7 and 49, and higher scores indicate more cognitive fusion. The validity of this questionnaire has been confirmed by its creators in research and clinical work. They also reported the Cronbach's alpha coefficient of the questionnaire as 0.93 and its test-retest reliability coefficient as 0.80 with a 4-week interval (Gillanders et al., 2014). Moreover, in the study by Soltani et al. (2022), Cronbach's alpha coefficient of the questionnaire was calculated as 0.80. In the present study, the Cronbach's alpha coefficient of the whole instrument was 0.79.

Iranian Adolescents Risk-taking Scale: The IARS was designed and validated by Zadeh Mohammadi, Ahmadabadi, and Heidari (2011). This scale comprised 38 questions, which assesses 7 subscales of high risk behaviors, including dangerous driving, violence, cigarette smoking, substance abuse, alcohol consumption, sexual behavior, and relationship with the opposite sex. The result of the Kaiser-Meyer-Olkin (KMO) test was acceptable (0.952) and Bartlett's test of sphericity was statistically significant (χ^2 = 21.26191; df = 703; P = 0.001). In addition, the IARS and its subscales have acceptable reliability. The Cronbach's α of the subscales of substance abuse 8 questions), alcohol consumption (6 questions), and cigarette use (5 questions) were 0.90, 0.90, and 0.93, respectively.

Parent-Child Relationship Scale: The PCRS was developed by Fine, Moreland, and Schwebel (1983) to assess the quality of the parent-child relationship. The scale contains 24 items that are scored on scale ranging from 1 to 7. This 24-item tool measures young people's perceptions of their relationship with their parents. It measures positive affection, irritation/role confusion, identification, and communication. The survey is divided into 2 subscales, one assessing the"relationship with mother" and the other measuring the "relationship with father". Both scales are the same, except that the words "mother" and "father" are exchanged. However, different factor loads have been reported for the 2 scales. The subscales of the Father-Child Relationship Scale had an α coefficient value of 0.89-0.94, and the subscales of the Mother-Child Relationship Scale had an α coefficient value of 0.61-0.94. The coefficient for the whole instrument was equal to 0.96, showing its excellent internal consistency. The items in the PCRS can be easily scored. Negatively worded items (9, 13, and 14) are scored reversely. Then, the sum of the scores of individual items is calculated and divided by the number of items for each factor to obtain the mean score of the subscale. The total score of the survey is the sum of the mean scores of the subscales (Fine et al., 1983). The content validity of the Persian version of the scale was assessed and confirmed for use in Iran, and its reliability was assessed using the Cronbach's α coefficient (α = 0.91) (Ghanizadeh & Shams, 2007).

The statistical tests used to check the hypotheses of this research are parametric tests. Considering that one of the presuppositions of this category of statistical tests is the normality of the data distribution, the normality of the distribution of the data obtained from the measurement of the research variables was investigated using the Kolmogorov-Smirnov statistical test. One of the assumptions for this type of statistical test is that the data distribution is normal. To determine if the data collected from measuring the research variables follows a normal distribution, the Kolmogorov-Smirnov statistical test was used and the results were reported. A multivariate analysis of variance test (MANOVA) and an ANOVA test were performed to analyze the data using SPSS software (version 25; IBM Corp., Armonk, NY, USA) with a two-tailed 5% level of significance.

Table 1. Distribution of the frequency and percentage of the sample group according to the state of self-harm and demographic characteristics

	Self-harming (n = 100)			No self-harm (n = 100)			Total (n = 200)	
	F	Percentage of the group	Percentage of total	F	Percentage of the group	Percentage of total	F	Percentage
Gender								
Girl	63	63	32	57	57	29	120	60
Boy	37	37	18	43	43	21	80	40
Age (year)								
12-14	48	48	24	44	44	22	92	46
15-17	52	52	26	56	56	28	108	54
Grade								
First year of high school	45	45	23	47	47	24	92	46
Second year of high school	55	55	27	53	53	26	108	54

There was a significant difference in the values of cognitive defusion, cognitive fusion, risk-taking, and communication style with father, all of which had a score of 0.5 (Table 2). The analysis was done using MANOVA. Box's M test showed that the assumption of the equality of the matrix was not established (P > 0.001; F = 53.394; Wilks' Lambda = 0.201).

As you can see in table 3, to test the research hypotheses, first MANOVA was performed, then, the research hypotheses were tested. The results of MANOVA of the significance levels of all tests allow the use of MANOVA. This indicates that there is a significant difference between the groups of adolescents with and without self-harm at least in terms of one of the dependent variables**.**

As can be seen in table 4, there is a significant difference between adolescents with and without self-harm in terms of cognitive fusion (F = 41.38; P < 0.050), cognitive defusion (F = 45.09; P < 0.050), cognitive fusion (F = 29.37; P < 0.050), risk-taking (F = 47.72; P < 0.050), and communication style with their father (F = 31.86; P < 0.001). There is a significant difference between adolescents with and without self-harm in terms of the mentioned variables, in other words, self-injuring adolescents have less fusion, more cognitive impairment, higher risk-taking, and a less favorable communication style with their father than adolescents without self-harm.

Discussion

This research compared cognitive fusion, risk-taking, and communication style with fathers between adolescents with and without self-harm.

Table 2. Descriptive variables

Groups	Variables	Mean ± SD	Min	Max
Adolescents with self-harm	Cognitive fusion	24.44 ± 2.86	12	59
	Cognitive defusion	23.47 ± 1.79	6	30
	Cognitive fusion	14.30 ± 1.08	6	30
	Risk taking	139.54 ± 11.33	38	190
	Communication style with father	61.28 ± 6.71	24	168
Adolescents without self-harm	Cognitive fusion	48.52 ± 6.29	12	58
	Cognitive defusion	14.51 ± 2.19	6	30
	Cognitive fusion	24.83 ± 2.89	6	29
	Risk taking	89.32 ± 7.46	38	184
	Communication style with father	126.56 ± 9.90	24	168

SD: Standard deviation

Table 3. The results of multivariate analysis of variance on the scores of variables in both groups

Test Statistic	Value	F	P-value
Pillai's Trace	799.0	394.313	0.001
Wilks' Lambda	201.0	394.313	0.001
Hotelling's test	984.3	394.313	0.001
Roy's Largest Root	984.3	394.313	0.001

The results showed that there was a significant difference between the 2 groups regarding cognitive fusion and risk-taking and interaction style with the father and the score of the self-harm group was high compared to the non-harm group. These results are in line with the findings of Lappalainen et al. (2021), Lim et al. (2019), and Tsitsimpikou et al. (2018).

In explaining the difference in cognitive fusion between adolescents with and without self-harm, it can be said that cognitive fusion can lead to the inability of a person to distinguish between his/her thoughts and real-life experiences. This result is in line with that of previous studies (Koolaee, Lor, Soleimani, & Rahmatizadeh, 2014). Accordingly, the more cognitive fusion in people, the more likely they are to be infected. The higher the level of fusion in people, the more control and mastery they have over their living environment, and the automatic feeling of self-confidence and psychological well-being are lower. Cognitive fusion makes a person unable to strategize. He uses appropriate coping methods, and as a result, all the events that can have a normal aspect for him turn into stressful events (Koolaee et al., 2014)

In explaining the difference in risk-taking between adolescents with and without self-harm, it can be said that adolescents adolescents who engaged in risky behaviors like alcohol use and sexual activities are more likely to transition to higher risk levels compared to those who do not engage in such behaviors when it comes to self-harm. These results are in line with the findings of Ruiz, Suárez-Falcón, Riano-Hernández, and Gillanders (2017), Lim et al. (2019), and Tsitsimpikou et al. (2018).

Such findings are consistent with the theory of "adolescence-limited" antisocial behavior, which suggests that many adolescents may experiment with risky behaviors and eventually stop engaging in these behaviors as they age (Guo et al., 2023). One type of self-harm is impulsive self-harm, in which a person injures himself at a high speed and without prior preparation, which is more common in boys (Victor, Muehlenkamp, Hayes, Lengel, Styer, & Washburn, 2018). Therefore, it can be said that self-injurious adolescents perform self-harm behaviors without fear of self-harm because they have a high-risk tolerance and adolescents without self-harm behaviors have a lower risk tolerance for impulsive and self-injurious behaviors, and thus, they avoid them.

In explaining the difference in the communication style with the father between adolescents with and without self-harm, it can be stated that the experience of childhood abuse is difficult in creating a stable and secure sense of self and distinguishing oneself from the interpersonal environment.

Table 4. The results of the one-variable analysis of variance in the text of multivariate analysis of variance on the scores of the variables in two groups

Dependent variables	SS	MS	F	P-value
Cognitive fusion	654.6208	654.6208	41.38	0.001
Cognitive Defusion	267.7888	267.7888	45.09	0.001
Cognitive fusion	604.3431	604.3431	29.37	0.001
Risk-taking	438.8964	438.8964	47.72	0.001
Communication style with father	296.3708	296.3708	31.86	0.001

SS: Sum of squres; MS: Mean square

These results are in line with the findings of Victor et al. (2018) and Karimi et al. (2020). According to Crouch and Wright's interpersonal and systematic theories, self-injury might be rooted in a destructive family dynamic where some individuals are inadvertently encouraged or supported for their self-harmful actions within their family (Bleiberg, 2013). Bleiberg (2013) believes that the family of the self-harming adolescent is stuck in a conversation as though occurring among deaf people. In anyone who feels unheard or misunderstood and has no hope that anyone else can appreciate his/her point of view, adaptation is much less and it does not take his/her needs and feelings into account (Bleiberg, 2013). It can be said that the way of communicating with the father is often lacking in families with children who engage in self-harming behavior due to difficulties in mentalizing (Bleiberg, 2013). Additionally, research indicates that there are distinct roles that fathers and mothers play in communicating with their children. Fathers typically spend less time engaging with their children, preferring to participate in physical and outdoor activities. On the other hand, mothers dedicate their time to more nurturing and domestic interactions (Hardcastle, Maxwell-Smith, Kamarova, Lamb, Millar, & Cohen, 2018). Hence, there is a likelihood that the connection between parents and their children, both father-child and mother-child, could influence self-harm actions in adolescents attending middle school, albeit through distinct factors. According to Hardcastle et al. (2018), a positive relationship between fathers and their children is associated with a decrease in behavioral problems in children (Oliveri, Ortiz, & Levin, 2018; Heydari, Yousefi & Mahdad, 2023).

One limitation of this study is the lack of information about the mental health status and history of mental disorders of the participants who had self-injurious behaviors, which can affect the amount and intensity of self-injurious behaviors of adolescents, and must be taken into account in future researches. It is suggested that random sampling methods be used to control intervening variables and other methods such as structured interviews be used to collect data in future studies. The inception of this research originated when one of the authors of this paper conversed with adolescent girls who resorted to self-injury because of the lack of a healthy bond with their fathers; nevertheless, this examination did not segregate females and males. In Iran, economic pressures are a major concern for parents who must strive to provide for their families, thereby compromising the level of attention they can devote to parenting. Future investigations should consider evaluating the psychological resilience of both groups alongside the factors examined in this study. It is recommended that cross-cultural research be carried out regarding the factors examined in this study. According to this research, it appears that parents, specifically fathers, have a closer bond with their kids, resulting in greater mental adaptability and a tendency to utilize more effective coping mechanisms when faced with difficult circumstances.

Conclusion

The results of this research support the comparison of symptoms between individuals who self-harm and those who do not. Additionally, the study indicated that adolescents who engaged in self-harm exhibited higher levels of cognitive fusion, risk-taking behavior, and a specific communication style with their fathers .

Conflict of Interests

Authors have no conflict of interests.

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Exploring the Predictive Role of Body Image and Rumination on Somatic Symptom Severity: A Quantitative Analysis

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Quantitative Stud

Abstract

Background: This study aimed to quantitatively assess the impact of body image dissatisfaction and rumination on the burden of somatic symptoms among adults.
Methods: A cross-sectional study design was employed with a sample of 330 participants who completed standardized measures assessing somatic symptoms, body image dissatisfaction, and rumination. Data were analyzed using linear regression in SPSS to explore the predictive value of body image and rumination on somatic symptom severity.
Results: The regression model accounted for 40% of the variance in somatic symptom severity, indicating that both body image dissatisfaction and rumination are significant predictors of somatic symptom burden.Specifically, rumination showed a positive correlation, while body image dissatisfaction had a negative correlation with somatic symptom severity
Conclusion: The findings suggest that psychological factors, particularly body image dissatisfaction and rumination, play a significant role in the manifestation and severity of somatic symptoms. Addressing these psychological aspects could be crucial in the management and treatment of somatic symptom disorders.
Keywords: Somatic symptoms; Body image dissatisfaction; Rumination; Predictive analysis; Psychological factors

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Introduction

The burden of somatic symptoms is influenced by various factors such as body image and rumination. Patients with medically unexplained symptoms (MUS) often exhibit precise priors about a normal body condition and have lower tolerance for uncertainty, leading to increased prediction errors and symptom manifestation (Alikhah, Akbari, & Abolghasemi, 2023; Babakhanlou & Babakhanlou, 2024; Bergh et al., 2017). Psychological distress has been identified as a predictor of higher somatic symptom burden in cancer patients (Kroenke, Johns, Theobald, Wu, & Tu, 2012). Moreover, during the COVID-19 pandemic, risk factors such as baseline somatic symptom burden, anxiety levels, occupation, age, psychological symptom burden, efficiency, and fatigability have been found to predict worsening somatic symptom burden (Engelmann et al., 2022).

Individuals with Generalized Anxiety Disorder (GAD) and Major Depressive Disorder (MDD) tend to respond to emotional and somatic experiences with repetitive cognitive processes like worry and rumination, which can exacerbate symptom burden (Fresco et al., 2017). Additionally, factors like PTSD, anxiety, depression, and somatization have been linked to poorer mental and physical health in refugees (Nesterko, Jackle, Friedrich, Holzapfel, & Glaesmer, 2020). Furthermore, cognitive-migraine-fatigue and somatic factors have been shown to predict symptom burden following concussion (Cohen et al., 2020).

Body composition and symptom burden have been studied in advanced cancer patients, where the MD Anderson Symptom Assessment Inventory was used to analyze symptom burden (Parsons, Baracos, Dhillon, Hong, & Kurzrocket, 2012). High somatic symptom burden is associated with higher interoceptive accuracy, as seen in somatic symptom disorder and related conditions (Wolters, Gerlach, & Pohl, 2022). Social comparisons have been found to predict subsequent increases in rumination, exacerbating body image anxiety and dissatisfaction (Dondzilo et al., 2021).

In patients with head and neck cancer, body image concerns post-treatment are predicted by baseline body image, physical symptom burden, and neuroticism (Henry et al., 2022). Moreover, psychosomatic symptom burden has been linked to higher odds and magnitude of COVID-related symptom impairment (Milde, Glombiewski, Wilhelm, & Schemer, 2023). Cyberchondria and fear of COVID-19 have been associated with increased somatic burden, highlighting the interplay between psychological factors and symptom manifestation (Zolotareva, 2022).

Persistent somatic symptoms are prevalent across medical conditions and significantly impact patients' lives (Löwe et al., 2022). Psychological factors like rumination and cognitive mechanisms have been found to reciprocally predict depressive and somatic symptoms (Harding, Murphy, & Mezulis, 2015). Caregiver burden, perceived health, and somatic symptoms play a crucial role in quality of life among caregivers of individuals with traumatic brain injury (Saban et al., 2016).

Therefore, the interplay between body image, rumination, and psychological distress significantly influences somatic symptom burden across various medical conditions. Understanding these relationships can aid in developing targeted interventions to alleviate symptom burden and improve patients' quality of life. This study aimed to quantitatively assess the impact of body image dissatisfaction and rumination on the burden of somatic symptoms among adults.

Methods

Study Design and Participants: This study adopted a cross-sectional design to explore

the predictive relationship between somatic symptom burden and psychological variables, namely body image and rumination. We recruited a diverse sample of 330 participants through online platforms and university bulletin boards. The inclusion criteria required participants to be at least 18 years of age and fluent in English. Participants represented a broad demographic background in terms of age, gender, and socioeconomic status, ensuring the study's findings could be generalized to a wider population. After obtaining informed consent, participants completed a series of standardized questionnaires administered through a secure online survey platform.

Tools

Somatic Symptom Burden: To assess the somatic symptom burden, the Patient Health Questionnaire-15 (PHQ-15) is employed. This tool does not have formal subscales but rather focuses on 15 somatic symptoms to capture a wide range of physical complaints. The PHQ-15 features 15 items, with each item scored from 0 (not bothered at all) to 2 (bothered a lot), leading to a total score range from 0 to 30. A higher score indicates a greater severity of somatic symptoms. The validity and reliability of the PHQ-15 have been extensively confirmed through various studies, making it a reliable instrument for assessing somatic symptom severity across different populations and settings (Benjet et al., 2023).

Body Image: The Body Image Questionnaire (BIQ), specifically through the Body Shape Questionnaire (BSQ) variant, is utilized to evaluate concerns related to body image. The BSQ focuses on concerns about body shape and weight, dissatisfaction with one's body shape, and the fear of gaining weight. It typically consists of 34 items, though shorter versions are available. Scoring is based on a 1 (never) to 6 (always) scale, with total scores reflecting the level of concern with body shape and weight. High scores indicate greater dissatisfaction with body image. The BSQ has been validated in numerous studies and is renowned for its reliability in measuring the psychological aspects of eating disorders and body dissatisfaction (Amirkhanloo, Doosti, & Donyavi, 2022; Mehdi Abadi, 2023).

Rumination: For measuring rumination, the Ruminative Responses Scale (RRS) of the Response Styles Questionnaire (RSQ) is utilized. The RRS includes two primary subscales: Brooding, which is a passive comparison of one's current situation with some unachieved standard, and Reflection, which involves a purposeful inward focus to engage in cognitive problem-solving. With 22 items in total, the RRS employs a scoring system from 1 (almost never) to 4 (almost always). The sum of these scores provides a total rumination score, with separate subscale scores for Brooding and Reflection. The RRS's validity and reliability for measuring rumination, particularly in relation to depression and anxiety, have been well established through numerous studies, demonstrating its strong psychometric properties (Askari Masuleh & Taheri, 2023; Azizi, FarokhSiri, Kazemi Bahmanabad, & Zamani, 2023).

Data analysis: Data analysis was conducted using SPSS software (version 26, IBM Corporation, Armonk, NY, USA). Preliminary analyses included descriptive statistics to characterize the sample and assess the distribution of key variables. The primary analytical approach was linear regression, where somatic symptom burden served as the dependent variable, and body image and rumination scores were entered as independent variables. This approach allowed us to ascertain the extent to which variations in body image and rumination could predict the burden of somatic symptoms among participants. Assumptions of linear regression, including linearity, independence of errors, homoscedasticity, and normality of error terms, were examined and met. The significance level was set at $P < 0.05$ for all statistical tests.

Results

The study sample included a total of 330 participants, representing a diverse array of demographic backgrounds. Among these participants, 183 (55.5%) identified as female, and 147 (44.5%) as male, showing a slight predominance of female participants. The age distribution ranged from 18 to 65 years, with a median age of 32 years. Specifically, the sample's educational attainment varied: 117 participants (35.5%) had completed high school, 153 (46.4%) held undergraduate degrees, and 60 (18.1%) had obtained postgraduate qualifications. Employment status among the participants was as follows: 208 (63%) were in full-time employment, 82 (24.8%) were part-time employed, and the remaining 40 (12.1%) were not currently employed.

Table 1 presents descriptive statistics for the study variables. The somatic symptom burden had a mean score of 16.71 (SD = 3.73) across the 330 participants, indicating a moderate level of symptom reporting. Rumination, with a mean score of 50.91 (SD = 5.52), suggested a relatively high tendency among participants to engage in ruminative thought processes. Body image concerns were also prevalent, with a mean score of 91.93 (SD = 10.83), reflecting significant dissatisfaction among the study's participants.

To ensure the integrity of our linear regression analysis, we meticulously checked and confirmed the key assumptions. The linearity assumption was verified through visual inspection of scatterplots between independent variables (body image and rumination) and the dependent variable (somatic symptom burden), confirming a linear relationship. The independence of errors, assessed via Durbin-Watson statistics, yielded a value of 1.98, indicating no significant autocorrelation in the residuals. Homoscedasticity was examined through scatterplots of standardized residuals against predicted values, showing a uniform spread across all levels of the independent variables, thus meeting the assumption of equal variance (homoscedasticity). Lastly, the assumption of normality of residuals was confirmed through the Shapiro-Wilk test (P = 0.055), and visual inspection of Q-Q plots revealed that the residuals closely followed the line of normality. These analyses affirm that the data met the necessary assumptions for linear regression, ensuring the validity of the findings derived from this statistical approach.

Table 2 Table 2 summarizes the regression model analysis, showing that the model explains 40% (R2 = 0.40, adjusted R2 = 0.37) of the variance in somatic symptom burden, with rumination and body image together significantly predicting the outcome ($F(2, 327) = 7.99$, $P < 0.01$). The model's predictive capacity is evidenced by an R value of 0.63, indicating a strong relationship between the predictors and somatic symptom burden.

Table 3 details the regression coefficients, revealing that rumination significantly predicts somatic symptom burden ($B = 1.24$, $SE = 0.52$, $\beta = 0.29$, $P < 0.01$), as does body image, though in a negative direction ($B = -1.42$, $SE = 0.58$, $\beta = -0.33$, $P < 0.01$). These results highlight the complex interplay between cognitive processes and perceptions of body image in the experience of somatic symptoms.

Table 1. Descriptive statistics findings

Variable	n	Mean ± SD
Somatic Symptom Burdon	330	16.71 ± 3.73
Rumination	330	50.91 ± 5.52
Body Image	330	91.93 ± 10.83

SD: Standard deviation

Table 2. Summary of regression model analysis

Model	SS	df	MS	R	R^2	R^2 adj	F	P
Regression	8993.34	2	4496.67	0.63	0.40	0.37	7.99	< 0.01
Residual	3943.81	327	12.07					
Total	12937.15	329						

SS: Sum of Squares; df: Degrees of Freedom; MS: Mean Squares

Discussion

The primary aim of this study was to explore the predictive relationship between somatic symptom burden and two significant psychological factors: body image and rumination. Our findings indicate that both body image dissatisfaction and rumination significantly predict the burden of somatic symptoms, suggesting that these psychological factors play a crucial role in the manifestation and severity of somatic complaints.

The intricate relationship between somatic symptom burden and psychological factors such as body image and rumination is underscored by a growing body of research that highlights the multifaceted nature of somatic symptom manifestation. Our findings align with previous research suggesting that the burden of somatic symptoms is not solely a product of physical health conditions but is significantly influenced by cognitive and emotional processes. This discussion integrates our results with existing literature to provide a comprehensive understanding of the factors contributing to somatic symptom burden.

Van den et al. (2017) discuss how patients with MUS often hold precise expectations about a normal body condition, coupled with a lower tolerance for uncertainty. This combination can lead to increased prediction errors and the manifestation of somatic symptoms, a finding that resonates with our observation of the impact of body image dissatisfaction on somatic symptom burden. Similarly, psychological distress, as Kroenke et al. (2012) identify, acts as a precursor to increased somatic symptomatology in cancer patients, mirroring our results where body image and rumination serve as predictors for somatic symptom burden (Kroenke et al., 2012).

The global crisis brought on by the COVID-19 pandemic further exemplifies the complex interplay between psychological distress and somatic symptoms. Engelmann et al. (2022) identified several risk factors, including baseline somatic symptom burden and psychological symptom burden, as predictors for worsening somatic symptoms during the pandemic (Engelmann et al., 2022). This highlights the vulnerability of individuals with pre-existing psychological distress to increased somatic symptomatology under stress, supporting our findings on the role of rumination in exacerbating somatic symptom burden.

The repetitive cognitive processes characteristic of Generalized Anxiety Disorder (GAD) and Major Depressive Disorder (MDD), such as worry and rumination, have been shown to exacerbate symptom burden (Fresco et al., 2017). This is in line with our results, suggesting a significant predictive relationship between rumination and somatic symptom burden.

Table 3. Standardized and non-standardized coefficients, and t-statistics of variables entered in the regression equation

Predictor variable	Unstandardized coefficients (B)	Standard error	Standardized coefficients (Beta)	T-value	P
Constant	2.33	0.62	-	-	-
Rumination	1.24	0.52	0.29	3.93	< 0.01
Body Image	-1.42	0.58	-0.33	-4.05	< 0.01

Additionally, the association between psychological factors like PTSD, anxiety, depression, and poorer health outcomes in refugees (Nesterko et al., 2020) further corroborates the link between psychological distress and somatic symptom burden.

In the context of body image, research by Dondzilo et al. (2021) on social comparisons and rumination underscores how these cognitive processes can fuel body image dissatisfaction and, consequently, somatic symptom burden (Dondzilo et al., 2021). Our findings contribute to this dialogue by illustrating how body image concerns, amplified by rumination, significantly predict somatic symptomatology.

Moreover, the relationship between body image concerns and somatic symptom burden is not confined to specific diseases or conditions. For instance, Henry et al. (2022) found that in patients with head and neck cancer, body image concerns post-treatment could be predicted by baseline body image and physical symptom burden (Henry et al., 2022). This parallels our results, suggesting a broader applicability of the relationship between body image dissatisfaction and somatic symptoms across different health conditions.

Furthermore, the role of caregiver burden and perceived health in the quality of life among caregivers (Saban et al., 2016) highlights the broader implications of somatic symptoms beyond the individual, affecting those in caregiving roles. This reflects the extensive impact of somatic symptom burden on both individuals and their support networks, emphasizing the need for holistic approaches to treatment that consider psychological factors.

The evidence presented in our study and supported by the literature underscores the complex and bidirectional relationship between psychological factors and somatic symptom burden. It highlights the importance of addressing psychological wellbeing, including body image and rumination, in the management of somatic symptoms. Future research should continue to explore these relationships to develop more effective interventions that address both the psychological and physical aspects of somatic symptom burden, ultimately improving patient outcomes and quality of life.

Despite the insightful findings, this study is not without its limitations. First, the cross-sectional design restricts our ability to infer causality between the psychological variables and somatic symptom burden. Secondly, the reliance on self-reported measures, while practical, may introduce bias and does not capture the complexity of somatic symptoms or the nuances of body image and rumination. Finally, the study's demographic profile, though diverse, may limit the generalizability of the findings across different cultural and socioeconomic backgrounds, where perceptions of body image and tendencies towards rumination might differ.

Future research should address these limitations by adopting longitudinal designs to elucidate the causal relationships between body image, rumination, and somatic symptom burden. Additionally, incorporating objective measures of somatic symptoms, alongside self-reported psychological assessments, could provide a more comprehensive understanding of these relationships. Exploring these variables across a wider array of cultural and socioeconomic contexts would also enhance the generalizability of the findings. Investigating the mediating and moderating roles of other psychological factors, such as resilience, coping strategies, and social support, could further enrich our understanding of how somatic symptom burdens develop and persist.

Conclusion

The findings of this study have several implications for clinical practice. Healthcare

providers should consider the psychological dimensions of somatic symptoms, particularly the roles of body image and rumination, in their assessment and treatment plans. Interventions aimed at improving body image and reducing rumination, such as cognitive-behavioral therapy (CBT), mindfulness-based stress reduction (MBSR), and acceptance and commitment therapy (ACT), could be beneficial for patients presenting with high somatic symptom burdens. Additionally, educating patients about the interplay between psychological factors and physical health might empower them to engage more actively in their treatment and self-care strategies, potentially mitigating the impact of these symptoms on their quality of life.

Conflict of Interests

Authors have no conflict of interests.

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The Effectiveness of Schema Therapy on Self-Compassion, Body Shame, and Uncertainty Intolerance in Women Applying for Cosmetic Surgery

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Quantitative Stud

Abstract

Background: In the past, cosmetic surgery was performed to return the function and normal shape of a body part. But today, cosmetic surgery has lost its main function. The present research aimed to investigate the effectiveness of schema therapy on self-compassion, body shame, and intolerance of uncertainty in women applying for cosmetic surgery.

Methods: The current research was applied and semi-experimental with a pretest-posttest design with a control group. The statistical population of this research was all women who were referred to cosmetic clinics for cosmetic surgery in Tehran City, Iran, in ***2023***, and 30 people were selected by the convenience sampling method and randomly divided into an intervention group and a control group. Data were collected using the Self-Compassion Scale (SCS), Objectified Body Consciousness Scale (OBC), and Intolerance of Uncertainty Scale (IUS). Schema therapy intervention was performed during 8 sessions of 120 minutes once a week for the experimental group and the data were analyzed by multivariate analysis of covariance (MANCOVA) in SPSS software.

Results: A statistically significant increase in self-compassion ($F = 239.454$) and reductions in body shame ($F = 555.477$) and uncertainty intolerance ($F = 301.050$) were observed in the experimental group after schema therapy ($P < 0.001$).

Conclusion: It can be concluded that schema therapy increases self-compassion and reduces body shame and intolerance of uncertainty in women applying for cosmetic surgery.

Keywords: Body shame; Intolerance of uncertainty; Schema therapy; Self-compassion

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Introduction

A person's appearance is an important part of his self-perception and can affect social interactions with others (Yilmaz, Gottfredson, Zerwas, Bulik, & Micali, 2019). The most important motivation for cosmetic surgery is the hope of achieving a satisfying appearance and enhancing social status (Di Gesto, Nerini, Policardo, & Matera, 2022). Beauty is often perceived as a feminine characteristic, while the preoccupation with the mind is one of the elements of female stereotypes in many cultural contexts (Khabbaz Sabet, Poladi Rishehri, Keykhosrovani, & Bahrani, 2023). In the past, the purpose of cosmetic surgery was to restore the natural form and function of a body part (Sarwer, 2019). However, in recent decades, cosmetic surgery has become one of the most common surgical procedures worldwide, with its prevalence steadily increasing (Wang, Qiao, Yang, Geng, & Fu, 2023).

Today, due to the excessive emphasis on beauty, women's attention to the point where the general culture equates beauty with feeling likable and attention-worthy has become so prevalent that it is not specific to particular social classes, educational levels, or demographics (Morgan, 1991, Morgan, 2020). To illustrate, the American Society of Plastic Surgeons estimated that the number of cosmetic surgeries, especially in women, reached 1.12 million in 2022, significantly higher than that in previous years (Oveisi, Monirpour, & Zargham Hajebi, 2023). About 25000 to 30000 cosmetic surgeries are performed in Iran every year, with a higher prevalence among women than men (Darajati & Rezaee, 2023). Studies show that many cosmetic surgeries are caused by psychological factors in individuals, and improving these factors could reduce unnecessary cosmetic surgeries (Eftekhar, Hajibabaei, Deldar, Rahnama, & Montazeri, 2019). Self-compassion is one of the most effective psychological factors in cosmetic surgery. Self-compassion is defined as having a sense of love and kindness towards oneself (Aghasi & Tizdast, 2021).

Self-compassion involves three components: kindness to oneself versus judgment, human commonality versus isolation, and mindfulness versus extreme assimilation. These three components together form an individual's self-compassion profile (Jones, Brown, Houston, & Bryant, 2021). The impact of self-compassion enhances individuals' ability to appreciate their bodies, fostering body acceptance and respect without focusing on perceived flaws (Yakin, Gencoz, Steenbergen, & Arntz, 2019). Studies have shown that self-compassion can improve individuals' levels of hope, self-esteem, mental health, and positive emotions and reduce their negative emotions (Pullmer, Chung, Samson, Balanji, & Zaitsoff, 2019; Rabeei, Mashayekh, Hatami, Zam, & Shabani, 2023).

Women applying for cosmetic surgery often feel ashamed and embarrassed due to a negative attitude towards their body image, which increases their desire to undergo cosmetic surgery (Hashemian, Aflakseir, Goudarzi, & Rahimi, 2021). Body shame involves various forms of criticism, such as appearance, weight, or body shape, leading to feelings of shame and guilt, low self-esteem, and negative effects on mental health (Walker, Krumhuber, Dayan, & Furnham, 2021). Ghadampour et al. (2022) have shown that schema therapy effectively reduces body image evaluation and concerns about acceptance in women applying for cosmetic surgery.

Another variable related to the demand for cosmetic surgery is the fear of intolerance of uncertainty (Coffman, Dean, & Zwiebel, 2023). Intolerance of uncertainty is closely related to anxiety and has four characteristics distinguishing individuals with anxiety disorders: low tolerance for ambiguous situations, positive beliefs about worry, cognitive avoidance, and a negative orientation towards problems (Wu, Alleva,

Broers, & Mulkens, 2022). People with intolerance of uncertainty believe that uncertainty is disturbing and existence of doubts about the future is unbearable, which causes unexpected negative events and their avoidance (Lowe-Calverley & Grieve, 2021).

Given the limited knowledge about the psychological aspects of cosmetic surgery and the lack of research, the increasing number of individuals seeking these procedures may have significant psychological consequences. Therefore, conducting further studies on the psychological problems of individuals seeking cosmetic surgery and the recurrence of these procedures can help improve the mental and psychological well-being of these individuals in this context. Consequently, the present research aimed to investigate the effectiveness of schema therapy on self-compassion, body shame, and intolerance of uncertainty in women applying for cosmetic surgery.

Methods

The current study was an applied and semi-experimental research with a pretest-posttest design and a control group**.** The statistical population of the study consisted of women visiting a beauty clinic in Tehran City, Iran, in the year 2023. Through preliminary interviews with volunteer women eligible for cosmetic surgery, 30 participants were selected using a convenience sampling method with random assignment to the experimental and control groups (15 participants in each group). It should be noted that a written consent form was obtained from the participating women, ensuring the confidentiality of the information gathered.

Inclusion criteria for participants in the research were willingness to undergo cosmetic surgery, having a minimum diploma education, falling within the age range of 20 to 30 years, and having a history of at least one cosmetic surgery. Exclusion criteria included having psychological disorders, absence of participants during the intervention period, and receiving any type of medication or psychotherapy during the intervention period.

Tools

Self-Compassion Scale (SCS): The SCS is a 26-item scale that was created and validated by Neff et al. (2003). This scale has 6 subscales of self-kindness, self-judgment, common human feelings, isolation, mindfulness, and magnification in 5-point Likert scales (scores 1 to 5). The range of scores on the questionnaire is between 26 (the least self-compassion) and 130 (the most self-compassion). The results of the research conducted by Neff et al. (2003) have shown high reliability and validity for it. The internal consistency of the scale was obtained through Cronbach's alpha of 0.92 for the whole scale and 0.78, 0.77, 0.80, 0.79, 0.75, and 0.81 for each of the subscales, respectively. It has been standardized in Iran by Khosravi et al., 2013, validity and reliability were confirmed by professors and experts using the exploratory factor analysis (EFA) method of the six-factor structure of the questionnaire, and the validity of the total scale was obtained using the Cronbach's alpha method of 0.86. In this study, the Cronbach's alpha value was 0.81.

Objectified Body Consciousness Scale (OBC): To measure body shame, the body shame subscale of the OBC scale of McKinley and Hyde (1996) was used. The 8-item body shame subscale evaluates how people feel about their bodies ($\alpha = 0.670$). The body shame subscale of items 9 to 11 measures the degree of internalization of body cultural standards about oneself and the experience of shame in response to not meeting these externalized norms. The subscales are graded on a 7-point Likert

spectrum from strongly disagree to strongly agree. After the reverse scoring of the related items, the average scores are calculated. The range of scores on the questionnaire is between 7 and 21. A person who gets a high score believes that if he cannot fulfill the cultural expectations about his body, he will be guilty and blameworthy. In Iran, Salimi et al. (2014) reported that the internal consistency of the body shame subscale was 0.75 using Cronbach's alpha method. Nowrozi et al.'s research (2017) used Cronbach's alpha to measure reliability, and the value of this coefficient for body image dimensions, i.e., body shame, was 0.90. In this study, the Cronbach's alpha value was 0.78.

Intolerance of Uncertainty Scale (IUS): This questionnaire has 27 items and was developed by Freeston et al. (1994) to evaluate the emotional, cognitive, and behavioral reactions of people to uncertain situations. This scale is scored on a 5-point Likert scale from completely true (5) to completely false (1). The range of scores of the questionnaire is between 27 and 54 (lowest intolerance of uncertainty) and above 81 is the highest tolerance of uncertainty. The reliability of this test was reported as satisfactory by Freeston et al. (1994). Bohr and Dagas (2002) reported the Cronbach's alpha coefficient obtained for this scale to be 0.94 (Bohr et al., 2002). Its English version has been adapted by Christian et al. (2006). The correlation coefficient of this scale with the worry questionnaire ($r = 0.60$), depression scale one ($r = 0.59$), and anxiety scale one ($r = 0.55$) has been obtained at a significant level (Birel et al., 2011). In Iran, the construct validity of convergent and diagnostic (differential) IUS was calculated through the simultaneous implementation of the Beck Anxiety Inventory (BAI) (Beck et al., 1993), the Penn State Worry Questionnaire (PSWQ) (Meiber et al., 1990), the Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988), and Mental Health Inventory (MHI-28) by Basharat (2008)**.** Pearson's correlation results showed that between the participants' scores on the IUS with anxiety, negative emotions, and psychological helplessness, there was a significant positive correlation from 0.43 to 0.62 ($P < 0.001$) and a significant negative correlation between positive emotions and psychological well-being from -0.41 to 0.57. ($P > 0.001$). These results confirm the convergent and diagnostic validity of the IUS. Preliminary results of confirmatory factor analysis Moreover, the two factors of acceptance and avoidance of uncertainty confirmed action-inhibiting uncertainty for the IUS (cited by Besharat et al., 2014). In addition, Besharat (2018) Cronbach's alpha coefficient for the similarity between acceptance and avoidance of uncertainty was 0.87, for He reported 0.87 inhibitory uncertainty from action and -0.89 for the total flexibility tolerance of uncertainty (cited by Besharat et al., 2014). In this study, the Cronbach's alpha value was 0.79.

Schema therapy sessions

The therapeutic approach in this research was schema therapy based on the book "Schema Therapy" by Young et al. (2003). The therapy consisted of eight sessions, each lasting 120 minutes (Table 1).

Schema therapy intervention was performed during 8 sessions of 120 minutes once a week for the experimental group and the data were analyzed by multivariate analysis of covariance (MANCOVA) in SPSS software (version 26, IBM Corporation, Armonk, NY, USA).

Table 1. Schema therapy sessions

Session	Description
First session	Stating the goals of the treatment, encouraging the participants to continue attending the meetings and familiarizing them with schema therapy, focusing on the life history, pre-test
Second session	Familiarizing with primary maladaptive schemas, their types and characteristics, explaining coping styles, and communicating between current life problems and schemas
Third session	Presenting the logic of cognitive techniques and the metaphor of war, examining members' assignments, using the therapeutic style of empathic exposure, a new definition of schema-confirming evidence
Fourth session	Using cognitive techniques, evaluating the advantages and disadvantages of coping styles and responses, having a dialogue between the student's point of view and a healthy point of view, using role-playing, teaching how to compile training cards
Fifth session	Presenting the logic of experimental techniques and their goals, mental imagery, relating the mental image of the past to the present, and an imaginary conversation with parents
Sixth session	Providing the logic of behavioral techniques, stating the purpose of behavioral techniques, preparing a comprehensive list of specific behaviors as the subject of change, providing ways to prepare a list of behaviors, prioritizing to break the pattern and identify the most problematic behavior, increasing motivation to change behavior
Seventh session	Practicing healthy behaviors through mental imagery and role-playing, overcoming obstacles to changing behavior, making important changes in life
Eighth session	Summary and conclusion with the help of members, post-test

Results

The demographic data of the research participants indicated that the mean and standard deviation (SD) of age in the experimental group was 26.33 ± 2.19. In the control group, the corresponding value was 26.80 ± 5.79.

According to table 2, the average scores of individuals in the experimental group in the variable of self-compassion in the post-test have shown a greater increase compared to the control group. However, in the control group, there is not much difference. Additionally, the body shame score in the experimental group decreased in the post-test, while there was not much difference in the control group. Moreover, the scores of intolerance of uncertainty have also decreased in the post-test in the experimental group, but there is not much difference in the control group. To determine effectiveness, first, the underlying assumptions of the covariance test were examined. The Shapiro-Wilk test was used to check the normality of score distribution. The results indicated that the assumption of normality of score distribution was satisfied ($P > 0.05$).

Table 2. Mean and standard deviation (SD) of scores of self-compassion, body shame, and uncertainty intolerance in the pretest and posttest in the two groups

Source of variance	Group	Pre-test	Post-test
		Mean ± SD	Mean ± SD
Self-compassion	Experimental	45.41 ± 4.17	96.93 ± 6.28
	Control	79.46 ± 5.82	79.33 ± 6.10
Body shame	Experimental	34.80 ± 1.82	13.13 ± 1.59
	Control	29.80 ± 7.44	31.53 ± 4.99
Uncertainty intolerance	Experimental	108.33 ± 8.28	46.06 ± 6.28
	Control	88.93 ± 9.29	88.53 ± 8.95

SD: Standard deviation

Table 3. The results of multivariate research tests

Effect	Value	F	Hypothesis df	Error df	P-value	Partial eta squared
Pillai's trace	0.750	23.034	3	23	0.001	0.750
Wilks' lambda	0.250	23.034	3	23	0.001	0.750
Hotelling's trace	3.004	23.034	3	23	0.001	0.750
Roy's largest root	3.004	23.034	3	23	0.001	0.750

df: Degree of freedom

The results of Levene's test for checking the homogeneity of variance-covariance were not statistically significant, indicating the establishment of the assumption of homogeneity of the covariance matrix (P = 0.058, F = 2.546, Box's M = 17.306). Besides, the Brown-Forsythe test was used, and the results showed that the scores of research groups in the post-test of dependent variables had homogeneous variances (P > 0.05). Furthermore, the level of significant interaction between group and pre-test self-compassion, body shame, and intolerance of uncertainty was not significant (P > 0.05), indicating that the assumption of homogeneity of regression slopes has been met, and the necessary conditions for analyzing the covariance test were satisfied.

The results of the four-variable MANCOVA showed that, with controlling for the effects of pre-test scores, there was at least a significant difference between the experimental and control groups in one of the variables (P < 0.05) (Table 3).

To analyze the data, a univariate analysis of covariance (ANCOVA) was employed. The results of the ANCOVA revealed that, with controlling for the pre-test scores, there was a significant difference between the control and experimental groups in terms of self-compassion (P < 0.001, F = 239.454), body shame (P < 0.001, F = 555.477), and intolerance of uncertainty (P < 0.001, F = 301.050). In other words, the therapeutic schema was effective in enhancing self-compassion, reducing body shame, and mitigating intolerance of uncertainty in cosmetic surgery applicants. Considering the eta-squared index in both control and experimental groups, it can be inferred that 53% of the variance in the difference between the control and experimental groups in the SCS, 63% of the variance in the difference between the control and experimental groups in the body shame scale, and 62% of the variance in the difference between the control and experimental groups in the IUS is attributed to the mutual effect of the independent variable, namely the therapeutic schema (Table 4).

Table 4. Summary of analysis of covariance (ANCOVA) to assess the effect of schema therapy on self-compassion, body shame, and uncertainty intolerance

Variable	Source of variations	SS	df	MS	F	P-value	Eta
Self-compassion	Pretest	148.030	1	148.030	6.996	< 0.001	0.191
	Group	5066.690	1	5066.690	239.454	< 0.001	0.528
	Error	571.303	27	21.159			
Body shame	Pretest	254.891	1	254.891	52.706	< 0.001	0.598
	Group	2686.359	1	2686.359	555.477	< 0.001	0.628
	Error	130.576	27	4.836			
Uncertainty intolerance	Pretest	811.633	1	811.633	25.392	< 0.001	0.441
	Group	9622.836	1	9622.836	301.050	< 0.001	0.614
	Error	863.340	27	31.964			

SS: Sum of squares; df: Degree of freedom; MS: Mean squares

Discussion

The present research aimed to investigate the effectiveness of schema therapy on self-compassion, body shame, and intolerance of uncertainty in women seeking cosmetic surgery. The results of the data analysis indicated a significant positive relationship between schema therapy and self-compassion. These findings were consistent with the studies of Erwin et al. (2019), Hosseini & Momen (2022), and Ansari et al. (2020).

In explaining these findings, it can be said that schema therapy focuses on combating maladaptive schemas and replacing them with skilled and authentic cognitive processes and responses on a broad scale. Consequently, this approach contributes to the enhancement of psychological well-being (Ansari, Asgari, Makvandi, Heidari, & Seraj Khorrami, 2020). According to a study by Yang and colleagues, the goal of schema therapy is to understand emotional states, and during the therapeutic process, these emotional needs are somewhat fulfilled, serving as a foundation for strengthening schemas (Irvine et al., 2019).

Maladaptive schemas primarily result from unmet emotional needs, and by changing these schemas, individuals' mindset, including concerns about negative body evaluation, decreases. Schema therapy for self-compassion can play a significant role in influencing behavior and cognition. Self-compassion can reduce these negative experiences and increase self-esteem, leading to improved satisfaction with body image. Self-compassion allows individuals to accept their body's flaws and imperfections, preventing self-blame for not achieving unattainable cultural beauty ideals, ultimately leading to a desirable perception of body image (Hosseini & Momen, 2022).

Considering the obtained results, it is evident that schema therapy has a significant negative relationship with body shame. The current research results align with the studies of Ansari et al. (2020), Taheri et al. (2022), and Walker et al. (2021). In explaining this finding, it can be stated that schema therapy helps individuals seeking cosmetic surgery to have a better understanding of themselves instead of feeling ashamed, allowing them to modify their cognitive, emotional, and behavioral processes. This leads to a more compassionate self-perception and improvement in distress levels in these individuals (Taheri, Marashi, Hamid, & Beshlideh, 2022).

The present research demonstrates that schema therapy has a significant negative relationship with intolerance of uncertainty in individuals seeking cosmetic surgery. The search results indicate that there is no direct research on the impact of schema therapy on intolerance of uncertainty in women seeking cosmetic surgery. However, studies by Rezaeifard et al. (2022), Inman et al. (2023), and Nedaei et al. (2023) showed that schema therapy was effective in regulating intolerance of uncertainty in individuals with anxiety and depression. Moreover, the difficulty in tolerating uncertainty may be related to the tendency to believe that uncertainty itself is distressing and undesirable and that one should avoid it. In social situations where individuals are evaluated, the characteristic of these situations is often ambiguous and unpredictable. Therefore, when individuals find themselves in unclear, ambiguous, and unpredictable situations, they experience stress, and they may likely interrupt the task they intended to perform in such conditions. However, this feature cannot be observed in individuals seeking cosmetic surgery because these individuals feel uncomfortable due to shame about their physical condition. Therefore, with schema therapy and changing the individual's schemas, it is possible to address anxiety and intolerance of uncertainty effectively.

In conclusion, schema therapy appears to be a promising intervention for women seeking cosmetic surgery, as it positively influences self-compassion, reduces body shame, and decreases intolerance of uncertainty. The findings of this study contribute to the growing body of literature supporting the effectiveness of schema therapy in enhancing psychological well-being and addressing specific challenges in individuals seeking cosmetic surgery.

Conclusion

The results indicated the effectiveness of schema therapy on self-compassion, body shame, and intolerance of uncertainty in women seeking cosmetic surgery. The limitations of the present study included the restricted sample population, consisting only of women, which diminishes the generalizability of the research findings. Additionally, non-cooperation of some women participating in the study was another constraint.

It is recommended that to enhance the generalizability of future research, studies should include both women and men simultaneously to allow for findings that apply to both genders. Furthermore, to prevent unnecessary cosmetic surgeries, standard psychological assessments should be implemented without relying on any external physical indicators. This approach effectively reduces the number of unnecessary cosmetic procedures.

In conclusion, the study suggests that implementing psychological assessments as a standard practice can be effective in minimizing unnecessary cosmetic surgeries. Additionally, incorporating both genders in future research will contribute to the broader generalizability of findings.

Conflict of Interests

Authors have no conflict of interests.

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Reducing Sensation Seeking and Enhancing Inhibition: The Impact of Emotion-Focused Schema Therapy on Children with Attention Deficits

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Qualitative Study

Abstract

Background: The relationship and connection between sensation seeking, attention deficits, and their underlying psychological frameworks has been a subject of extensive research within the field of psychology. The primary objective of this study was to investigate the effectiveness of Emotion-Focused Schema Therapy (EFST) on reducing sensation seeking behaviors and enhancing the behavioral inhibition system (BIS) among children diagnosed with attention deficits.

Methods: A randomized controlled trial (RCT) design was employed, involving 30 participants aged between 8 and 12 years diagnosed with attention deficit, randomly assigned to either the intervention or control group. The intervention group received 10 sessions of EFST. Data were collected at baseline, immediately post-intervention, and at a three-month follow-up, utilizing standard psychometric tools to measure sensation seeking and behavioral inhibition. The data were analyzed using analysis of variance (ANOVA) with repeated measurements, followed by Bonferroni post-hoc tests, utilizing SPSS software.

Results: The ANOVA revealed significant group × time interaction effects for both sensation seeking [$F_{(2,56)} = 17.33$, $P < 0.001$, $\eta^2 = 0.38$] and behavioral inhibition [$F_{(2,56)} = 15.88$, $P < 0.001$, $\eta^2 = 0.35$], indicating significant improvements in the intervention group over time compared to the control group. Bonferroni post-hoc testing supported these findings, showing marked improvements in sensation seeking and behavioral inhibition in the intervention group from baseline to post-intervention and follow-up, with mean differences of 5.93 and -5.06, respectively (both P-values < 0.001)..

Conclusion: EFST effectively reduced sensation seeking behaviors and enhanced the BIS in children with attention deficits. These findings underscore the potential of EFST as a therapeutic approach for managing attention deficit-related behaviors, suggesting promising implications for clinical practices.

Keywords: Emotion-focused schema therapy; Sensation seeking; Behavioral inhibition system; Attention deficits

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Introduction

The relationship and connection between sensation seeking, attention deficits, and their underlying psychological frameworks has been a subject of extensive research within the field of psychology. Sensation seeking, defined as the pursuit of varied, novel, intense, and complex sensations and experiences (Caqueo-Urízar, Atencio-Quevedo, Morales, Flores, & Irarrázaval, 2022; Farzad & Mardani, 2024), has been closely linked to various mental health outcomes and risk behaviors. Concurrently, attention deficit hyperactivity disorder (ADHD) has garnered significant attention due to its impact on cognitive functioning and behavior across the lifespan. The intersection of these constructs – namely, how sensation seeking behaviors may manifest and be managed in individuals with attention deficits – presents a compelling area for investigation (Banaschewski, Brandeis, Heinrich, Albrecht, Brunner, & Rothenberger, 2003).

In exploring the characteristics and implications of sensation seeking, Babad et al. (2019) highlighted its association with survivors of adverse childhood experiences, suggesting a nuanced pathway by which early trauma may predispose individuals to higher risk-taking propensities (Babad et al., 2019). This lends credence to the idea that sensation seeking, while temperamentally based, can be accentuated by environmental factors. Furthermore, Caqueo-Urízar et al. (2022) identified a mediating role of sensation seeking in the complex relationship between substance use and mental health among adolescents, underscoring its relevance in youth psychopathology and intervention strategies (Caqueo-Urízar et al., 2022).

The linkage between sensation seeking and ADHD is particularly intriguing. Banaschewski et al. (2003) provided neurophysiological evidence supporting the existence of a distinct ADHD subtype characterized by elevated conduct disorder symptoms, which may overlap with heightened sensation-seeking traits (Banaschewski et al., 2003). This suggests a biological underpinning to the behavioral manifestations observed in certain cohorts of the ADHD population. In the realm of risky behaviors, Li et al. (2022) demonstrated that sensation seeking significantly predicted risky driving behavior through the mediation of emotion regulation difficulties, a finding that echoes the challenges faced by individuals with attention deficits in managing impulsivity and regulating emotions (Li, Zhou, Ge, & Qu, 2022).

The therapeutic interventions aimed at addressing these intertwined constructs have evolved over time. Emotion-Focused Schema Therapy (EFST), a variant of schema therapy, has shown promise in modifying maladaptive schemas and enhancing emotional regulation (Keyvanlo, Nariman, & Basharpoor, 2022; Louis et al., 2021; Nasirnia Samakoush & Yousefi, 2023; Sobhani, Hosseini, Honarparvaran, Khazraei, Amini, & Hedayati, 2023). This approach appears particularly germane to tackling the challenges of sensation seeking and impulsivity in children and adults alike. Sij et al. (2018) and Videler et al. (2020) have both advocated for schema therapy's efficacy in fostering emotional self-awareness and introducing positive schemas as a counterbalance to maladaptive cognitive patterns, highlighting its adaptability and potential in diverse clinical contexts (Sij, Manshaee, Hasanabadi, & Nadi, 2018; Videler, Royen, Legra, & Ouwens, 2020).

Moreover, the confluence of ADHD, sensation seeking, and their management through innovative psychological treatments is gaining empirical support. Kahler et al. (2009) identified sensation seeking as a predictor of treatment compliance and outcomes in substance use interventions, underscoring the importance of tailoring therapeutic approaches to individual traits and tendencies. Similarly, Shi (2023) shed

light on the role of early maladaptive schemas in predisposing individuals to self-injurious behaviors, a notion that resonates with the conceptual framework of EFST in addressing deep-seated cognitive and emotional patterns (Kahler, Spillane, Metrik, Leventhal, & Monti, 2009; Shi, 2023).

Given these findings, the present study aims to investigate the effectiveness of EFST in moderating sensation seeking behaviors and the functionality of the behavioral inhibition system (BIS) in children with attention deficits. Drawing from the extensive research indicating a complex interplay between sensation seeking, ADHD, and the potential for schema-focused interventions (Newman, Curtin, Bertsch, & Baskin-Sommers, 2010; Raffaele, Khosravi, Parker, Godovich, Rich, & Adleman, 2021), this study seeks to examine the hypothesis that EFST can offer significant benefits in managing sensation seeking and impulsivity, thereby fostering better emotional regulation and adaptive behaviors.

Methods

Study design and participants: This study adopted a randomized controlled trial (RCT) design to evaluate the effectiveness of EFST in modifying sensation seeking behaviors and enhancing the functionality of the BIS in children diagnosed with attention deficit. A total of 30 participants were enrolled in the study, all of whom were diagnosed with attention deficit as per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. The participants, aged between 8 and 12 years, were randomly assigned to either the intervention group (n = 15), which received EFST, or the control group (n = 15), which did not receive any additional intervention outside of their standard care.

The intervention comprised 10 therapy sessions, each lasting 75 minutes, conducted over a period of approximately 10 weeks. Both groups were assessed at baseline, immediately post-intervention, and at a three-month follow-up to evaluate the persistence of any observed effects.

Measures

Sensation seeking: The Sensation Seeking Scale-Version V (SSS-V), developed by Zuckerman in 1994, is a widely recognized measure designed to assess individual differences in the need for varied, novel, and complex sensations and experiences. Consisting of 40 items, this self-report questionnaire is divided into four subscales: thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (Dis), and boredom susceptibility (BS). Respondents answer each item on a forced-choice scale (a binary choice between two options). The scoring of the SSS-V yields both a total sensation seeking score and separate scores for each of the subscales (Zuckerman, 2014). The validity and reliability of the SSS-V have been confirmed through various studies, making it a standard tool for measuring sensation seeking behaviors (Barati, Safarzadeh Sirzar, Pakroyan, & Salehi, 2023; Shadanloo, Yousefi, Parsakia, Hejazi, & Davari Dolatabadi, 2023).

BIS: Originated by Carver and White in 1994, the Behavioral Inhibition System/Behavioral Activation System (BIS/BAS) Scales are adept at evaluating individual propensities towards sensitivity to punishment and reward, which theoretically relate to the activation of the BIS and behavioral activation system (BAS). This tool encompasses 24 items, but for the purpose of our study, we focused solely on the BIS subscale, which is specifically designed to measure the BIS. The BIS subscale consists of 7 items. These items are answered on a 4-point Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree), providing a measure of an

individual's sensitivity to potentially punishing events (Carver & White, 1994). The efficacy of the BIS/BAS Scales in accurately measuring these constructs has been corroborated through extensive research, underscoring their reliability and validity as measures, particularly the BIS subscale for our focused study area on behavioral inhibition (Ghasemzadeh, Mahmoudalilou, Bakhshipour Roudsari, & Bayrami, 2023; Shabtari, Hajializadeh, & Hajmohammadi, 2023).

Intervention

EFST: The intervention detailed in this study employs EFST tailored for children with attention deficit, highlighting a structured approach across 10 sessions, each lasting 75 minutes. The primary aim is to modulate sensation seeking behaviors and enhance the functionality of the BIS, leveraging emotionally driven schema therapy techniques to foster behavioral change and emotional regulation.

Session 1: Introduction to EFST

The first session is devoted to building rapport with the child, introducing the basic concepts of EFST, and setting therapeutic goals. The therapist explains how attention deficit can influence sensation seeking and behavioral inhibition, using child-friendly language to ensure comprehension. This session lays the groundwork for trust and establishes a safe environment for emotional exploration.

Session 2: Identifying personal schemas

Session two focuses on identifying the participant's personal schemas related to sensation seeking and impulsivity. Through interactive activities and discussions, the child begins to recognize patterns of behavior and thought that lead to challenges in attention and inhibition. The therapist introduces simple schema-mapping exercises to help make these concepts tangible for the child.

Session 3: Sensation seeking and safety

This session delves into the concept of sensation seeking, discussing its positives and negatives. The therapist and child work together to identify situations where sensation seeking has led to both safe and unsafe outcomes. The aim is to develop an understanding of risk assessment and impulse control, using role-play to reinforce these skills.

Session 4: Introduction to emotional regulation

The therapist introduces strategies for emotional regulation, teaching the child how to recognize emotional triggers and their effects on behavior. Techniques such as deep breathing, mindfulness, and positive self-talk are practiced, with a focus on situations that commonly trigger impulsive behavior.

Session 5: Strengthening the BIS

During the fifth session, the focus is on strengthening the BIS through exercises designed to improve self-control and patience. The therapist incorporates games and tasks that require waiting and delaying gratification, reinforcing these skills through positive feedback and reinforcement.

Session 6: Overcoming impulsivity with cognitive strategies

This session concentrates on cognitive strategies to manage impulsivity. The child learns how to pause and think before acting, using problem-solving skills to consider the consequences of different actions. Scenario-based discussions are employed to practice these strategies in a controlled environment.

Session 7: Enhancing emotional awareness

In session seven, the aim is to enhance the child's emotional awareness. The therapist and child explore a range of emotions, discussing how they can influence thoughts and behaviors. Activities focus on identifying emotions in oneself and

others, increasing empathy and emotional intelligence.

Session 8: Positive sensation seeking

This session is designed to identify and promote positive forms of sensation seeking. The child and therapist work together to discover activities that fulfill the child's need for excitement and novelty in a safe and constructive manner. Planning for real-life application of these activities is a key outcome of this session.

Session 9: Integration and application

In the penultimate session, the child integrates the skills and strategies learned throughout the therapy. Role-play and scenario-based activities are used to practice handling real-life situations involving sensation seeking and impulse control, ensuring the child feels prepared to apply these skills outside the therapy setting.

Session 10: Review and future planning

The final session serves as a review of the progress made throughout the therapy, discussing successes and areas for ongoing attention. The therapist and child set future goals and establish a plan for maintaining gains, including strategies for dealing with potential setbacks. This session celebrates the child's achievements, encouraging continued growth and self-awareness.

Data analysis: Data collected from the study were statistically analyzed using the SPSS software (version 27, IBM Corporation, Armonk, NY, USA). The primary analyses involved the use of analysis of variance (ANOVA) with repeated measurements to compare the baseline, post-intervention, and follow-up scores of sensation seeking and BIS functionalities between the intervention and control groups. The ANOVA allowed for the examination of intra-group as well as inter-group variations over the three testing periods.

To address any significant findings from the ANOVA, Bonferroni post-hoc tests were conducted to pinpoint the exact nature and timing of differences observed between and within groups. This conservative statistical approach helped control the type I error rate due to multiple comparisons, ensuring the reliability of the differences observed. The level of significance for all statistical tests was set at $P < 0.05$. Additionally, effect size (η^2) calculations were incorporated to ascertain the practical significance of the treatment compared to the control condition across time points. Given the longitudinal nature of the study, including a three-month follow-up assessment was critical to evaluating the sustainability of therapeutic gains achieved through EFST. The analysis focused not only on the immediate effects of the intervention but also its long-term impact on the participants' sensation seeking behaviors and their ability to regulate these behaviors through an enhanced BIS.

Ethics: The current study was designed and conducted with full consent of the authorities of the hospitals where the patients recruited for the study purposes. Consent forms were distributed among the participants and the aim of the study was explained to them to follow the procedures of the research. The patients gave their consent in writing and took part in the study willingly.

Results

The study included a total of 30 participants, with an equal distribution across the intervention and control groups (15 participants in each group). Among the participants, 53.3% (n = 16) were boys and 46.7% (n = 14) were girls. The age of participants ranged from 8 to 12 years, with a mean age of 10.3 years.

Upon analyzing the data, descriptive statistics in revealed meaningful insights into the behavior of participants throughout the study.

Table 1. Distribution of the frequency and percentage of the sample group according to the state of self-harm and demographic characteristics

Variable	Group	Stage	Mean ± SD
Sensation seeking	Experimental	Pre-test	45.38 ± 5.67
		Post-test	39.45 ± 4.92
		Follow-up	40.21 ± 5.03
	Control	Pre-test	44.92 ± 5.81
		Post-test	44.87 ± 5.76
		Follow-up	44.90 ± 5.79
Behavioral inhibition	Experimental	Pre-test	30.56 ± 3.45
		Post-test	35.62 ± 3.67
		Follow-up	34.88 ± 3.49
	Control	Pre-test	31.03 ± 3.50
		Post-test	31.00 ± 3.53
		Follow-up	31.05 ± 3.58

SD: Standard deviation

For the sensation seeking variable, the intervention group showed a baseline mean of 45.38 with a standard deviation (SD) of 5.67. Post-intervention, this group exhibited a notable decrease in mean scores to 39.45 (SD = 4.92), with a follow-up mean score of 40.21 (SD = 5.03), indicating a sustained effect. The control group's mean scores remained relatively stable (baseline: 44.92 **±** 5.81, post-intervention: 44.87 **±** 5.76, and follow-up: 44.90 **±** 5.79). For the behavioral inhibition variable, the intervention group's baseline scores (30.56 **±** 3.45) increased post-intervention (35.62 ± 3.67) and was maintained at follow-up (34.88 ± 3.49). The control group showed minimal change (baseline: 31.03 ± 3.50, post-intervention: 31.00 ± 3.53, and follow-up: 31.05 ± 3.58). These statistics suggest a significant improvement in the intervention group for both measured variables, with effects persisting over time.

Prior to conducting the main analysis, assumptions for ANOVA were tested. The assumption of normality was confirmed via Shapiro-Wilk tests, which yielded P-values greater than 0.05 for both variables at all stages of measurement, suggesting that the data were normally distributed (e.g., sensation seeking: baseline, P = 0.08). The assumption of homogeneity of variances was verified through Levene's test, which indicated no significant deviation from homogeneity (e.g., sensation seeking: baseline, $F_{(1,28)} = 2.45$, P = 0.13). These checks ensured that the data met the necessary prerequisites for the subsequent ANOVA.

The results of ANOVA in **Error! Reference source not found.** showed significant findings for both sensation seeking and behavioral inhibition. For sensation seeking, the between-group F-test was significant [$F_{(1,28)} = 18.49$, $P < 0.001$), with an η^2 of 0.39, indicating a substantial group difference. The time effect also revealed significant changes [$F_{(2,56)} = 21.58$, $P < 0.001$, $\eta^2 = 0.44$), as did the interaction effect (Group × Time) [$F_{(2,56)} = 17.33$, $P < 0.001$, $\eta^2 = 0.38$).

Table 2. The results of analysis of variance (ANOVA) with repeated measurements

Variable	Source	SS	df	MS	F	P-value	Effect size (η^2)
Sensation seeking	Group	102.45	1	102.45	18.49	< 0.001	0.39
	Time	243.98	2	121.99	21.58	< 0.001	0.44
	Group × Time	198.34	2	99.17	17.33	< 0.001	0.38
	Error	314.56	54	5.82			
Behavioral inhibition	Group	88.76	1	88.76	16.02	< 0.001	0.36
	Time	211.43	2	105.71	19.76	< 0.001	0.41
	Group × Time	180.29	2	90.14	15.88	< 0.001	0.35
	Error	298.05	54	5.52			

SS: Sum of squares; df: Degree of freedom; MS: Mean squares

For behavioral inhibition, similar patterns emerged, showing significant between-group differences [$F_{(1,28)}$ = 16.02, P < 0.001, η^2 = 0.36), time-related changes [$F_{(2,56)}$ = 19.76, P < 0.001, η^2 = 0.41), and interaction effects (Group × Time) [$F_{(2,56)}$ = 15.88, P < 0.001, η^2 = 0.35). These results indicate that the intervention effectively modified sensation seeking behaviors and enhanced behavioral inhibition, with consistent effects over time.

According to **Error! Reference source not found.**, the Bonferroni post-hoc analysis further delineated the specific nature of the changes observed. For sensation seeking, significant mean differences between pre-intervention and post-intervention (ΔM = 5.93, P < 0.001), and between pre-intervention and follow-up (ΔM = 5.17, P = 0.002) were reported in the intervention group. The control group showed no significant changes over time. In terms of behavioral inhibition, notable improvements were found from pre-intervention to post-intervention (ΔM = -5.06, P < 0.001) and from pre-intervention to follow-up (ΔM = -4.32, P = 0.001) within the intervention group. Again, the control group's scores remained unchanged. These post-hoc findings underscore the effectiveness of the intervention in achieving and sustaining behavioral changes among children with attention deficits.

Discussion

The primary aim of this study was to evaluate the effectiveness of EFST in moderating sensation seeking behaviors and enhancing the functionality of the BIS in children diagnosed with attention deficits. The findings indicated significant improvements in both target variables for participants in the intervention group compared to the control group, with effects persisting at a three-month follow-up.

Our results align with previous research by Babad et al. (2019) and Li et al. (2022), which highlighted the intricate links between sensation seeking and its behavioral manifestations, suggesting that comprehensive therapeutic interventions can lead to significant behavioral modifications (Babad et al., 2019; Li et al., 2022). The efficacy of EFST observed in this study corroborates the findings of Louis et al. (2021) and Sobhani et al. (2023), emphasizing the potential of schema therapy to target emotional regulation and maladaptive behavioral patterns effectively (Li et al., 2022; Louis et al., 2021; Sobhani et al., 2023).

The marked reduction in sensation seeking and enhanced behavioral inhibition observed in our study participants suggests that EFST can address some underlying schemas that propel high-risk behaviors in children with attention deficits. This notion is supported by research of Sij et al. (2018) and Videler et al. (2020), who found schema therapy to be beneficial in improving emotional self-awareness and reducing vulnerability to psychological distress, thus underscoring the adaptability and effectiveness of EFST (Sij et al., 2018; Videler et al., 2020).

Table 3. The results of Bonferroni post-hoc test

Comparison	Variable	Mean difference (I-J)	SE	P-value
Intervention-pre vs. post	Sensation seeking	5.93	1.12	< 0.001
Intervention-pre vs. follow-up	Sensation seeking	5.17	1.16	0.002
Control-pre vs. post	Sensation seeking	0.05	1.18	> 0.999
Control-pre vs. follow-up	Sensation seeking	0.02	1.20	> 0.999
Intervention-pre vs. post	Behavioral inhibition	-5.06	0.97	< 0.001
Intervention-pre vs. follow-up	Behavioral inhibition	-4.32	1.01	0.001
Control-pre vs. post	Behavioral inhibition	0.03	1.00	> 0.999
Control-pre vs. follow-up	Behavioral inhibition	-0.02	1.02	> 0.999

SE: Standard error

Moreover, the association between ADHD and sensation seeking behaviors, as discussed by Banaschewski et al. (2003), highlights the importance of targeted interventions in managing the unique challenges faced by this population (Banaschewski et al., 2003). The positive outcomes of EFST in our study suggest that addressing the nuanced needs of children with attention deficits through schema-centered approaches can lead to meaningful improvements in behavioral regulation and decision-making.

Conclusion

In conclusion, this study contributes to the growing body of evidence supporting the effectiveness of EFST in managing sensation seeking and impulsivity among children with attention deficits. By harnessing the principles of schema therapy to address the emotional and cognitive underpinnings of sensation seeking, EFST demonstrates significant potential in fostering more adaptive behavior patterns and emotional regulation in this demographic population. The sustained improvements observed in the follow-up assessment further highlight the enduring impact of EFST, advocating for its consideration in therapeutic interventions targeting similar psychological profiles.

Despite its strengths, this study is not without limitations. The sample size was relatively small, potentially affecting the generalizability of the findings. Additionally, the study relied on self-reported measures for assessing sensation seeking and behavioral inhibition, which might introduce bias or inaccuracies in reporting. The absence of a more diverse demographic profile also limits the extent to which these results can be generalized across different populations.

Future research could address these limitations by employing larger and more diverse samples to enhance the generalizability of the findings. Longitudinal studies spanning longer follow-up periods could provide deeper insights into the long-term efficacy of EFST in managing sensation seeking and impulsivity. Moreover, integrating objective assessment tools and multi-informant reports could enrich the depth and accuracy of the data collected, offering a more holistic view of the intervention's impact.

The implications of this study are twofold. Clinically, it underscores the value of EFST as a viable intervention for children with attention deficits characterized by high sensation seeking and impulsivity. EFST's emphasis on emotional regulation and cognitive restructuring offers a promising avenue for addressing the complex interplay between attention deficits and sensation seeking behaviors. On a broader scale, the findings advocate for the integration of schema-focused interventions in psychological practices and educational settings, potentially benefiting practitioners and policymakers seeking effective strategies for managing related behavioral and emotional challenges in children with ADHD. In synthesizing our findings with the broader literature, this study bolsters the argument for a schema-based approach in therapeutic interventions targeting sensation seeking and behavioral inhibition in children with attention deficits. As we move forward, embracing these insights could significantly enhance our ability to provide targeted, effective support for this population, paving the way for more adaptive functioning and improved psychological well-being.

Conflict of Interests

Authors have no conflict of interests.

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The Effectiveness of Acceptance and Commitment Therapy on Ego Strength and Defense Mechanisms among Adolescent Girls with Psychosomatic Complaints in a Non-Clinical Setting

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Quantitative Stud

Abstract

Background: During adolescence, people undergo physical, cognitive, social-emotional, and environmental changes. Considering that the health of any society has a close relationship with the health of its adolescents, this study aimed to examine the effectiveness of acceptance and commitment therapy (ACT) in improving the ego strength and defense mechanisms of adolescents with psychosomatic complaints.

Methods: This study employed a semi-experimental design with a control group involved in pre-test and post-test. The statistical population was all the students of a girls' school in one district of Qazvin City (550), Iran, in 2022. The statistical sample consisted of 30 adolescent girls who were chosen on purpose for entering the research and were randomly assigned to the ACT (15 people) and the control (15 people) groups. Data were collected through Takata and Sakata scale of psychosomatic complaints, Markstrom et al.'s Ego Strength Questionnaire, and Andrews et al.'s Defense Style Questionnaire (DSQ). ACT was provided to the experimental group for 8 sessions, while the control group remained on the waiting list. Data were analyzed using analysis of covariance (ANCOVA) at a significance level of 0.05 in SPSS software.

Results: The ACT was not effective on the developed defense mechanism ($P > 0.05$), but it was effective on the undeveloped defense mechanism, the neurotic defense mechanism, and ego strength in the post-test stage ($P < 0.01$).

Conclusion: It is suggested that clinical psychologists use ACT to reduce the immature defense mechanisms (primary) and improve ego ability in teenagers.

Keywords: Acceptance and commitment therapy; Ego; Defense mechanisms; Adolescent; Female

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Introduction

Adolescence is the beginning of physical, psychological, and social changes that affect a person's performance in adulthood and may be accompanied by problems such as worry about the future of education and work, sexual problems, discomfort, depression, alcohol and drug use, thoughts of suicide, creating problems at school, and conflict with parents and peers (Asadi, Ghasemzadeh, Nazarifar & Niroumand Sarvandani, 2020). It is estimated that 60 to 70 percent of disability and impairment of life years occur between the ages of 12 and 24 in adolescents worldwide (Patel et al., 2007). These problems are especially difficult when combined with other traumatic factors such as membership in an inappropriate peer group, insecure attachment, unclear gender identity, substance abuse, running away from school, and laws. The natural process of passing through this period is faced with serious challenges (De Micheli et al., 2015; Skinner et al., 2016; Duell & Steinberg, 2019; Greene & Patton, 2020; McNeal, 2020; Sarvandani et al., 2021).

Considering that the health of any society has a close relationship with the health of teenagers in that society in general and the health of female teenagers in that society in particular, we will examine the factors affecting the health of adolescents.

One of the factors affecting mental health from the perspective of a psychodynamic approach is ego strength. For the mind to function psychologically, the ego is essential. There is a direct correlation between health and illness and the ego's ability to deal with the pressure of desires triggered by instincts. This is done in such a way that it does not come into sharp conflict with the constraints of the real world and the superego. This capacity of the ego to manage the conflicting demands of the id, the superego, and external reality is called ego strength (Arasu, 2022). In addition, to the extent that the ego cannot create a functional balance, the personality will engage in dysfunctional functioning. Psychopathology can also be understood in terms of the conflicts that arise, as well as the ego's inability to achieve a balance between the various personality levels and how an individual manages the conflicts (i.e., the ego's defense mechanisms) (Yeates, 2014; McNeal, 2020).

Another significant component of adolescent health is defense mechanisms. By changing the way we perceive reality, defense mechanisms are unconscious reactions of "I" as a part of our personality. "I" is attempting to reduce anxiety caused by the conflict between "institution" and "order" through these processes (Cramer, 2015). According to Freud, defenses are necessary for the functioning of a healthy personality. Therefore, with sufficient insight into the defense mechanisms and awareness of the morbid feelings of people, they can easily and more clearly understand the behavior that they did not find rational until that moment and gain more information about the complaints of the disease and their attitude. Achieving such knowledge reduces painful psychiatric complaints in people and causes healthy behavioral changes in their lives (Cramer, 2006).

Regarding the formation of psychosomatic symptoms, it can be mentioned that physical, emotional, and social factors, in varying proportions, play a role in every illness confirms the importance of early experiences for the physical and emotional health of a person and suppression of emotional experience and the related initial avoidance of conflicts has a transient relief function, but in the long term, it promotes anxiety, depression, and unclear physical complaints, including chronic pain (Fritzsche et al., 2020). The psychosomatic problem represents the original nucleus at the inception of the psychoanalytic movement. Freud proposed a model that integrates the somatic, psychic, and social components, and it represents in a

convincing way physical diseases that occur as a result of psychological events (Degni, 2020).

Acceptance and commitment therapy (ACT) has therapeutic effects and has been used to treat and manage a variety of conditions, such as body image and body awareness (Givehki et al., 2018), psychosomatic symptoms and mindfulness (Sayyar Khesmakhi et al., 2019), chronic diseases (Hayes et al., 1996; Wang, 2017), malignancies (Vowles & McCracken, 2008; Zhao et al., 2017), pregnancy and childbirth (Serfaty et al., 2019; Howard et al., 2022), psychiatric-psychological disorders (Lu & Fan, 2017; Waters et al., 2020), pain, depression, mixed anxiety, obsessive-compulsive disorder (OCD), psychosis, and so on (ACBS, 2022). This suggests that the ACT has important clinical significance, and the authors call for further evaluation of the ACT's development and efficacy in future studies. Recent studies have provided ACT literature reviews based on empirical evidence.

Mohammadi et al. (2018) showed in research that therapy based on acceptance and commitment was effective on all secure, avoidant, and ambivalent attachment styles and the developed, underdeveloped, and psychotic defense mechanisms of female heads of households in Tehran, Iran.

The impact of acceptance and commitment-based group therapy on the ego strength and defensive mechanisms of adolescent girls with psychosomatic complaints has not been studied in a non-clinical setting, and there is a research void in this field. The current research seeks to answer the following question: Does it work based on acceptance, commitment, ego strength, and defense mechanisms in a non-clinical setting for adolescent girls with psychosomatic complaints?

Methods

Society and sample: This was a semi-experimental study with a pre-test and post-test design with a control group. In 2022, the statistical population comprised all 550 girl pupils attending a school in one district of the city of Qazvin, Iran. The statistical sample consisted of 30 adolescent girls who were purposefully selected and replaced by a random technique (lottery) in the treatment (15 individuals) and control (15 individuals) groups. Consortium diagram of the present study is presented in Figure 1.

Inclusion criteria: Girls in the age range of 14 to 17, with a psychosomatic questionnaire score of 60 to 90 (the criterion for participation in ACT group training and the need for intervention in the current study was a score of 60 or above in the questionnaire of psychosomatic complaints, which indicates a severe score in the complaints), self and legal guardian satisfaction in conducting the research, interest in participating in the research, no psychological or medical disorder, and not taking psychiatric medication were included in the study.

Exclusion criteria: Exclusion criteria were being absent for more than three sessions, being more than three sessions late for more than 30 minutes, not performing exercises and treatment techniques, and defects in completing the questionnaires (if 20% of the questions in the research questionnaires have not been answered).

Tools

Psychosomatic complaints scale: Takata and Sakata (2004) developed and validated the psychosomatic complaints scale for teenagers in Japan. It consists of 30 questions and has a single-factor structure that is used to measure psychosomatic complaints. The questionnaire is scored on a 4-point Likert scale, with 0, 1, 2, and 3 points assigned to the responses "never", "rarely", "sometimes", and "often", respectively. The scores 0-30 indicate mild problems, 31-60 indicate moderate complaints, and 61-90 indicate a severe and acute condition.

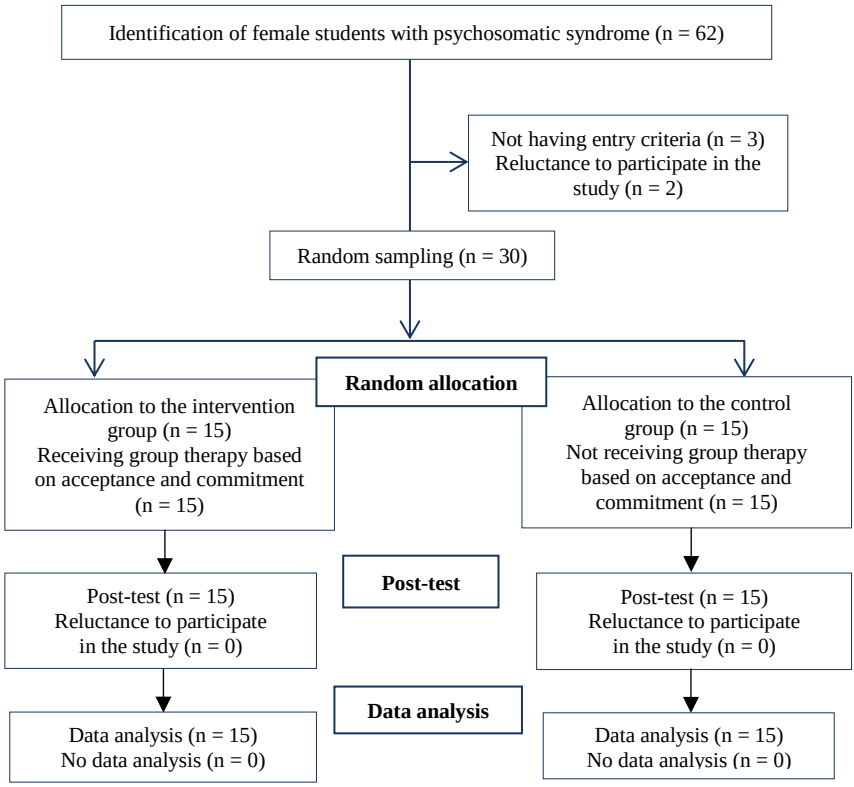

Figure 1. Consortium diagram of the present study

The test-retest reliability of the scale of psychosomatic complaints was confirmed one month apart and on two occasions on a sample of 30 students (r = 0.83). Cronbach's alpha coefficient obtained on the original sample was equal to 0.85, which indicates high internal consistency for the parts of this scale (Hajlo, 2011).

Ego Strength Questionnaire: The Ego Strength Questionnaire was created by Markstrom et al. (1997). The final version of this questionnaire contains 64 items evaluated on a five-point. It also includes a 32-item abbreviated version, which was utilized in this study. Markstrom and Marshall (2007) supported the internal consistency (Cronbach's alpha = 0.94) of the scale.. Several investigations proved its internal consistency, and its concurrent validity was demonstrated by investigating its association with self-esteem, life goal orientation, self-control, and sexual roles (r = 0.70). In addition, the negative association (r = -0.73) between ego strength and despair, identity disorder, and helplessness revealed its divergent validity.

Defense Style Questionnaire (DSQ-40): This questionnaire was developed based on the hierarchical model of defenses by Andrews et al. (1993), which includes 40 questions and 50 defenses at three levels: Immature defense style (denial, isolation, devaluation, and externalization), mature (sublimation, irony, suppression, and anticipatory), and disturbed neurotic (refutation, altruism, idealization, and reverse reaction). The questions are set on a 9-point Likert scale (from completely agree to completely disagree), and a score higher than 10 in each defense is a sign of the

individual's use of that defense (Andrews, Singh and Bond, 1993).

Treatment protocol: The treatment sessions were given to the subjects of the experimental group in 8 sessions (one session each week for 90 minutes) according to the program that was made before the sessions and using the principles of treatment based on acceptance and commitment by the researcher in Qazvin City, and the control group did not receive any training. ACT protocol is based on the theoretical foundations of this approach and based on the ACT manual (Turrell & Bell, 2016).

Data analysis was done using SPSS software (version 26, IBM Corporation, Armonk, NY, USA). To compare the difference between the two experimental and control groups in the variables of defense mechanisms and ego strength, analysis of covariance (ANCOVA), multivariate ANCOVA (MANCOVA), and parametric tests were used. The description of the data was also reported based on the mean ± standard deviation (SD), and $P < 0.05$ was considered a significance level in the analysis.

Results

The experimental group's average age was 15.47 ±1.26 years, while the control group's average age was 15.40 ± 1.18. In the experimental group, 26.6% of parents of teenagers were employees, 46.68% were workers, and 26.6% were freelancers. In the control group, 20% of teenagers' parents were employees, 40% were workers, and 40% were freelancers. In the experimental group, 46.68% of the teenagers' fathers had a bachelor's degree, 33.34% had a diploma, and 20% had a university education. 20% of mothers of teenagers had below-diploma education (46.68% had diplomas and 33.34% had university education). In the control group, 20% of the teenagers' fathers had a bachelor's degree, 60% had a diploma, and 40% had a university education. 20% of mothers of teenagers had education below the diploma level, 53.34% had a diploma, and 26.66% had a university degree.

The results indicated that the treatment based on ACT was not effective on the developed defense mechanism ($P > 0.05$), but it was effective on the undeveloped defense mechanism, the neurotic defense mechanism, and ego strength in the post-test stage ($P < 0.05$). The results of partial eta squared (η^2) showed that the effect of therapy based on acceptance and commitment on the ego's ability was greater than that of the undeveloped defense mechanism and the neurotic defense mechanism (Table 1).

Discussion

A study was undertaken in a non-clinical setting to assess the efficacy of acceptance and commitment-based group therapy on adolescent girls with psychosomatic complaints. The present study revealed that the treatment based on acceptance and commitment was ineffective on the developed defense mechanism but effective on the undeveloped defense mechanism, the neurotic defense mechanism, and ego strength during the post-test phase. This finding agrees with the findings of Lu and Fan (2017), Waters et al. (2020), and Mohammadi et al. (2018). To explain the effectiveness of ACT on the ego capacity and defense mechanisms of adolescents, it can be stated that ACT is a behavioral therapy that increases psychological flexibility by utilizing the skills of mindfulness, acceptance, and cognitive impairment.

Table 1. Means and standard deviations (SDs) of the variables of the groups in the pre-test and post-test stages

Variable	Group	Pre-test	P-value	Post-test	F	P-value	η^2
		Mean ± SD		Mean ± SD			
Mature defense mechanism	ACT	25.73 ± 7.19	0.55	37.06 ± 4.54	0.87	0.3600	0.035
	Control	24.13 ± 7.19		34.26 ± 5.58			
Immature defense mechanism	ACT	116.13 ± 18.45	0.54	67.46 ± 9.93	26.97	0.0001	0.520
	Control	112.46 ± 13.18		99.60 ± 18.08			
Neurotic defense mechanism	ACT	36.13 ± 7.35	0.42	22.86 ± 4.10	17.44	0.0001	0.420
	Control	34.33 ± 4.36		33.13 ± 6.81			
The power of the ego	ACT	78.66 ± 11.56	0.11	103.20 ± 10.75	58.20	0.0001	0.710
	Control	85.26 ± 10.58		82.53 ± 8.99			

ACT: Acceptance and commitment therapy; SD: Standard deviation

Bodily awareness/mindfulness plays a role in shifting from automatic and destructive thoughts to feelings of the body which help to release tension and be more flexible in trauma and distress so that the healing expectation is facilitated, and placebo mechanisms become active also when we experience our whole body as an integral and non-judgmental state of mind and a more secure emotional state, which may facilitate more positive feeling about our future body (Goli, 2022).

In the present study, according to the treatment protocol based on commitment and acceptance, cognitive flexibility is the increase in the client's ability to connect with their experience in the present and, based on what is possible for them at that moment, to want to act in different ways which are consistent with their chosen values. The central processes of therapy based on commitment and acceptance teach people how to let go of the idea of inhibiting thought and get rid of disturbing thoughts; instead of the conceptualized self, strengthen the observed self, accept internal events instead of controlling them, clarify their values, and address them (Hayes & Strosahl, 2005). Moreover, acceptance of feelings and observation of thought can change the mind-body meaning system and sequentially the symptom formation pathways (Goli, 2016).

Treatment based on acceptance and commitment is the only psychological and experimental intervention in which acceptance and mindfulness strategies are used together with commitment and behavior change strategies to increase psychological flexibility (ability to change or maintain stability, along with functional behaviors that are the way those goals are realized) and also prepare a person to face the situation without the need to control or overcome it, while reducing avoidance strategies and increasing the level of activity and control of emotions (Hayes et al., 2013). These cases were also included in the treatment sessions of the present study. In addition to that, in the present research, according to the treatment protocol based on commitment and acceptance, teenagers were taught to accept their feelings rather than distance themselves from them and to address their thoughts and thought processes through mindfulness and turn them into activities. The link is goal-oriented. They were taught to experience their thoughts and feelings instead of trying to stop them, people are asked to work towards their goals and values and to experience their thoughts and feelings. According to the explanations and exercises the teenagers did during the treatment sessions, the treatment based on commitment and acceptance of the ego's capabilities and defense mechanisms was effective.

Conclusion

It is suggested that clinical psychologists use ACT to reduce immature defense mechanisms (primary) and improve ego ability in teenagers.

Conflict of Interests

Authors have no conflict of interests.

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This article is based on a post-doctoral research project at Mashhad University of Medical Sciences, Mashhad, Iran, and follows the Mashhad University of Medical Sciences Code of Ethics IR.MUMS.MEDICAL.REC.1401.289. When making this research and putting it together, ethical principles were taken into account. Participants were informed of the goal of the study, and their information was kept strictly confidential and utilized for research purposes only.

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A Comparative Study of the Applicable Laws araelating to Educational Support of Exeptional Children and Adolescents of Iran and UNICEF International Organization

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Quantitative Study

Abstract

Background: The main goal of planning governments is to provide physical, mental, and social support to people by providing them with relevant facilities. The purpose of this study was to compare the implementation of the laws related to the educational support of exceptional children and adolescents in Iran and the United Nations International Children's Emergency Fund (UNICEF) international organization.

Methods: The research method was qualitative and adaptive. The sample included the documents and annual reports available in the Organization for Education of Exceptional Children and the Welfare Organization of Iran that were selected through available and targeted sampling from 2011 to 2020, and an international dimension, UNICEF annual reports on educational support for exceptional children and adolescents from 2011 to 2020. Some quantitative data were analyzed using descriptive methods, and content analysis was done in the documentation adaptation section. According to the findings, the number of exceptional children and adolescents covered by well-being has increased in recent years.

Results: The Phi correlation coefficient between families of exceptional children and adolescents and welfare authorities on the quantity and quality of educational support showed that the views of families and authorities were in harmony. According to a UNICEF study in 51 developing countries, 42% of female and 51% of male exceptional and disabled children (an average of about 47%) managed to attend primary school, while in Iran, the average was 62.5%.

Conclusion: It can be concluded that educational support in Iran is better than UNICEF reports from developing countries.

Keywords: Adolescent; Child; Iran; United Nations; Exceptional

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Introduction

Cancer is the name given to a set of diseases resulting from the uncontrolled proliferation of cells. Cancer cells are separated from the usual mechanisms of cell division and growth. The exact cause of this phenomenon remains unclear, but genetic factors or factors that disrupt cell function may play a role in cancer formation (Hopstaken et al., 2022). Prostate cancer (PC) is one of the men's most common cancers and is considered as one of the most important causes of mortality in adult men. In the United States (US), it is reported to be the second leading cause of death after lung cancer (among cancers). PC is the most common cancer in men, affecting about one in six men (Plym et al., 2022; Schmanke, Okut, & Ablah, 2021). The highest prevalence of PC is in Africa and the lowest in the Asian population. Several studies have shown familial accumulation of PC. The main reason for this accumulation is to inherit the genes involved (Dorff et al., 2022).

The prostate is one of the most important glands of the male reproductive system, located below the bladder and in front of the large intestine, and plays an essential role in reproduction. The gland is usually small in size, but over fifty, it gradually enlarges and sometimes causes problems for men. In general, the most common prostate diseases are inflammation of the prostate (prostatitis), enlarged prostate (benign prostatic hyperplasia) due to aging, and PC. The most worrying prostate disease is PC, which means forming cancer cells in the prostate tissue. Because this prostate cell deformity occurs slowly, it may not show symptoms for several years before severe malignancy. Late diagnosis can lead to malignancy as well as the spread of cancer cells to other tissues, including the bladder and colon (Alghamidi, Hussain, Alghamdi, & El-Sheemy, 2014; Orrason, Westerberg, Garmo, Lissbrant, Robinson, & Stattin, 2020). Studies show that cancer has several negative consequences in these patients, including decreased general health, reduced quality of life, and despair, among which anxiety, depression, and despair are more common. Cancer generally causes profound emotional problems in patients and their families, ranging from depression, anxiety, and maladaptation to emotional disorders and fear of relapse and death. The prevalence of psychological disorders in patients with cancer is high, and there is a high risk of depression and anxiety in these patients (Bastani et al., 2010; Choi, Rhee, & Flannery, 2022). Thus, if special measures are not considered to solve these problems, they will have destructive effects and adverse physical and psychological consequences.

The phenomenon of anxiety is one of the issues that human beings have always been involved with over time. This phenomenon is pervasive and universal, and it exists in all human beings, and even the most instrumental people have experienced it. Feeling anxiety occurs when a person perceives a danger beyond his ability to deal with it (Henriksson et al., 2022; Mayer, Craske, & Naliboff, 2001). Over the past decade, several psychological methods have been developed to improve the psychological status of people with cancer, like reality therapy and neurofeedback.

Reality therapy is a counseling and psychotherapy method founded by Glasser (2000). Reality therapy helps people explore wants, needs, behavioral values, and ways which help meet their needs. It is based on common sense and emotional conflicts, emphasizing reality, accepting responsibility, and recognizing right and wrong and their relationship to daily life. Glasser's approach is a unique blend of philosophy and existential and behavioral methods similar to the self-regulatory methods of therapists' behavior (Asadzadeh, Samad-Soltani, Salahzadeh, & Rezaei-

Hachesu, 2021; Glasser, 2000). Non-denial of reality, responsibility, and, accordingly, planning to achieve goals is one of the primary human needs in the process of life, which has been given importance in this therapeutic approach. This approach helps people control their behavior, take responsibility for their actions, and make better choices in their lives, emphasizing that access to a successful identity is achieved through successful work and the power to choose the agent. It is vital for his mental health (Chow, Hon, Chua, & Chuan, 2021). Researchers have examined and validated the effect of reality therapy on a wide range of psychological symptoms. Bhargava (2013) showed that reality therapy effectively reduced depression in deaf people. Lowe (2000) also found that reality therapy effectively reduced stress and anxiety in pregnant women.

The neurofeedback process involves training or learning to self-regulate brain activity. The brain controls blood flow through the dilation or contraction of blood vessels, and the blood flow in the brain is directed to specific areas. Neurofeedback works so that it has far fewer side effects than the drug. It is also a non-invasive method compared to other brain interventions, such as deep brain stimulation. It is a method of manipulating neuronal activity that allows researchers to evaluate changes in neuronal activity and gain important information about the relationship between brain activity and disease symptoms (Gruzelier, Egner, & Vernon, 2006; Munoz-Moldes & Cleeremans, 2020). Researchers have suggested that neurofeedback affects psychological disorders such as depression, anxiety, fatigue, stress, sleep problems, and pain in patients with cancer. In a study, Mennella et al. (2017) found that neurofeedback training reduced anxiety and negative emotion (depression) in women. Alino Costa et al. (2016) realized that neurofeedback training reduced anxiety.

The psychological consequences of cancer affect society, the individual, and the family. Therefore, the effective treatments for depression and anxiety in these patients must be identified to prevent the occurrence or exacerbation of their psychological problems. In this study, the researchers tried to answer the question of whether there is a difference in the effectiveness of reality therapy and neurofeedback training in reducing anxiety and depression in men with PC.

Methods

The method of the present study was quasi-experimental with a pretest-posttest, follow-up design with a control group. The statistical population of the study consisted of men with PC who were referred to Baghdad Teaching Hospital in Baghdad, Iraq, for treatment for six months (January to June, 2020). Using the G*Power software with effect size = 0.15 and $\alpha = 0.05$ and also the sample size of previous studies, the sample size of the present study was considered to be 60 (20 people for each group) (Garrett, Tao, Taverner, Cordingley, & Sun, 2020; Huang, Lin, Han, Peng, & Huang, 2021). Finally, three population groups of 20 people in each group were randomly divided. It should be mentioned that 20 people were in the reality therapy group, 20 in the neurofeedback group, and 20 in the control group. Individuals in the three groups were barred from meeting during research and discussing the content of their treatment.

Inclusion criteria were symptoms of depression and anxiety based on the doctor's diagnosis, being 35 to 60 years old, at least one month passed since the diagnosis of PC and surgery, no history of mental illness and hospitalization, not having another cancer, having a high school education or higher, ability to participate in group therapy sessions, and willingness to cooperate. Exclusion criteria of the study were

not attending meetings for more than three sessions, unwillingness to continue attending meetings, and using psychotropic drugs to reduce anxiety and depression during the study. Due to ethical considerations, prior to the plan's implementation, participants were promised that the information received from each member remained strictly secret and that each member could withdraw from the training at any time when they did not want to continue.

Each patient's files in the mentioned hospital were studied to accomplish the research. The patients who met the inclusion criteria were found. Individuals who wanted to participate in the study were asked to come to the center to answer Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI) questionnaires. A total of 184 patients agreed to attend the center. After answering the questions by the invited patients and according to the scores obtained by each patient, 60 patients were selected using the simple random sampling method and divided into three groups: reality therapy, neurofeedback, and control.

In each group, the initial scores of the selected individuals were recorded as a pretest for their STAI and BDI questionnaires. The reality therapy group received reality therapy training for 12 sessions, and the neurofeedback group received neurofeedback training for 18 sessions. The control group had simple appointments (10 sessions) with the therapist.

After this stage, the posttest stage began. The control group also completed the questionnaires again after 12 sessions with the therapist. Five months later, the follow-up stage started, the patients' questionnaires were again completed, and the data were extracted as a result. In short, the classes of the reality therapy group were held as follows: group formation and acquaintance, self-acknowledging to strengthen self-confidence, promoting responsibility and giving responsibility to group members, examining the level of responsibility by controlling what should be done, discussing the wrong choice, successful and unsuccessful communication, and their perceptions of themselves, and finally reviewing previous sessions.

Neurofeedback was treated three times a week for 15 sessions. The neurofeedback device used in the current investigation was a Canadian device made by Thought Technology, FlexComp Infiniti model with ten channels. In this paper, neurofeedback therapy was performed on the experimental neurofeedback group for six weeks and three 40-minute sessions per week. In neurofeedback, first, according to the international 10-20 system, the electrodes were installed in F4-PZ locations according to the treatment protocol.

This study measures anxiety using a state-trait anxiety questionnaire, including separate self-assessment scales to measure overt and covert anxiety. The STAI explicit anxiety scale (Form Y-1) consists of twenty sentences that assess a person's feelings at "the moment and the time to respond." The STAI hidden anxiety scale (Form Y-2) also includes twenty sentences that measure a person's general and normal emotions. The minimum score for the trait and state anxiety subscale is 20, and the maximum score is 80. The reliability of the STAI test was calculated by Quek et al. (2004).

The BDI consists of 21 questions designed to assess the feedback and symptoms of patients with depression, and its items are based on the observation and summary of shared attitudes and symptoms among depressed mental patients. The minimum score in this test is zero, and the maximum is 63. The score for every person is obtained directly by adding the individual scores in each item: 0 to 13: no or minimal depression, 14 to 19: mild depression, 20 to 28: moderate depression, and 29 to 63: severe depression. Findings showed that this questionnaire had a high

validity (Stefan-Dabson, Mohammadkhani, & Massah-Choulabi, 2007; Yang & Stewart, 2020).

Data were analyzed using a multivariate analysis of covariance (MANCOVA). To do this, SPSS software (version 16, SPSS Inc., Chicago, IL, USA) was used.

Results

In table 1, the number of disabled people covered by the Welfare Organization of the whole country from 2011 to 2019 is reported (since the statistical yearbook of 2010 has not yet been published, the information of this yearbook is not available).

In the statistical yearbooks of 2011 and 2012, the division and presentation of statistics based on disability severity have not been reported. As you can see, according to figure 1, the number of people with disabilities covered has increased over the past years, and more people with disabilities and their families are receiving support and well-being services. According to the country's Welfare Statistical Yearbook (2019), the severity of disability is the extent of "size and extent of harm" in the performance and social participation of a person determined by the outcome of the size and extent of the injury in "physiological function and anatomy of the body" on the one hand, and "limitation in capacity and ability to perform daily activities of life or social participation", on the other hand. Its degrees include mild, moderate, severe, and very severe. In the yearbooks studied, the number of disabled persons was not present by age and therefore, according to the records and documents in the organization, the number of exceptional children and adolescents was estimated as follows:

In 2021, 200000 disabled people under the age of 7 and about 500000 disabled people aged 7 to 20 were covered by welfare. The following results were obtained in a checklist completed by families with exceptional children and adolescents covered by welfare: 40 exceptional girls and adolescents and 60 exceptional children and adolescents participated in this study and answered a researcher-made questionnaire (families answered the questionnaire).

Table 1. The number of disabled people covered by well-being from 2011 to 2019 by the severity of disability in the whole country

Year	Mild	Medium	Severe	Very severe	Uncertain	Total
2011	-	-	-	-	-	851386
2012	-	-	-	-	-	1093855
2013	133793	292233	376024	226475	83169	1111694
	(12.03)	(26.38)	(33.82)	(20.37)	(7.48)	
2014	143225	311036	407222	234113	83429	1179005
	(12.14)	(26.38)	(34.53)	(19.85)	(7.07)	
2015	158121	331604	433404	220883	76755	1220767
	(12.95)	(27.16)	(35.50)	(18.09)	(6.28)	
2016	180692	361404	474921	226169	286574	1319430
	(13.69)	(27.39)	(35.99)	(17.14)	(21.71)	
2017	211194	399496	517249	217620	112255	1415710
	(14.91)	(28.21)	(36.53)	(15.37)	(8.63)	
2018	263461	462611	578511	221546	63798	1590113
	(16.58)	(29.09)	(36.38)	(13.93)	(4.01)	
2019	309395	503093	622086	219431	56470	1710475
	(18.08)	(29.41)	(36.36)	(12.82)	(3.36)	

Data are presented as number and percent.

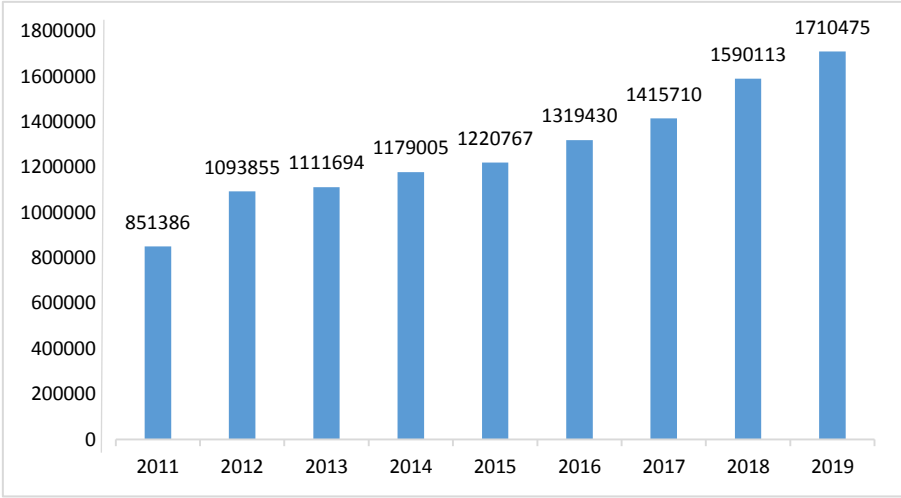

Figure 1. Number of disabled people covered by the Welfare Organization of the whole country from 2011 to 2019

The mean age of exceptional children and adolescents was 16.60, with a standard deviation (SD) of 3.21. Of these, 44% had physical and motor disability, 10% had multiple disabilities, 16% had intellectual disabilities, 13% had visual disabilities, 8% had mental disabilities, and 9% had hearing disabilities. The level of education of those who responded to the questionnaires was as follows: 25% of the subjects were illiterate, 61% had a diploma, and 14% had a diploma. Exceptional children and adolescents in this study were 28% only child, 40% two, 25% three, 4% four, and 3% five children. Fifty-two percent of these exceptional children and adolescents were first-born, 31 percent were second children, 15 percent were third children, and 2 percent were fourth children. In this study, 101 welfare officials had access to the files; 84 were women, and 17 were men, with an average of 19.49 years and a SD of 7.42 years.

As can be seen in table 2, in 2020, 90% of families reported that they did not receive services from rehabilitation centers, while 73.3% of welfare officials stated that disabled people did not benefit from rehabilitation assistance. Phi coefficient was used to investigate the correlation between families and welfare authorities, which in 2020 was very small at about 0.030.

Table 2. Percentage of rehabilitation assistance services received or not received by families of disabled persons and welfare authorities during 2011-2020

Group	Status	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Family	Yes*	7.0	8.0	8.0	9.0	10.0	10.0	11.0	10.0	10.0	10.0
	No**	93.0	92.0	92.0	91.0	90.0	90.0	89.0	90.0	90.0	90.0
Officials	Yes*	21.8	22.8	22.8	22.8	24.8	25.7	26.7	26.7	26.7	26.7
	No**	78.2	77.2	77.2	77.2	75.2	74.3	73.3	73.3	73.3	73.3
Phi coefficient		0.051	0.021	0.021	0.086	0.047	0.038	0.010	0.030	0.030	0.030
P-value		0.610	0.830	0.830	0.390	0.640	0.700	0.919	0.761	0.761	0.761

*Rehabilitation assistance services received or provided; **Received or not provided rehabilitation assistance services

Another critical point is that the opinion of families and authorities during the years 2011 to 2020 has been almost constant, and we are seeing a slight change in the status of receiving rehabilitation assistance services; therefore, according to the opinion of the authorities, the percentage of non-receiving rehabilitation assistance services has increased from 78% in 2011 to 73% in 2020, and only 5% improvement was seen. These figures were extracted from researcher-made questionnaires that families with exceptional children and adolescents and welfare officials responded to. The information in table 3 comes from articles, documents, and reports provided by the authorities.

In table 3, following the opinion of the authorities, in one place, exceptional children and adolescents (Seraj 2021), and in another place, 25% (website of disabled people, 2020) receive rehabilitation assistance, while UNICEF statistics are reported to be 5 to 15 percent.

Table 3. Comparison of United Nations International Children's Emergency Fund (UNICEF) comments and the relevant authorities of the country on rehabilitation assistance services

UNICEF (2015)	5% to 15% of children with disabilities and exceptional children in developing countries have access to rehabilitation aids.
Hemmat Mahmoudnejad (2020)	On behalf of the Planning and Budget Organization, for one million and 400 thousand disabled people in the country, 1300 billion tomans has been allocated, and this budget is 928 thousand tomans for each disabled per year and 80 thousand tomans for each disabled per month while 38 thousand billion tomans is needed.
Asadi (2021)	Thirty percent of the physically-disabled people with severe and severe mobility, 40 percent of moderate disabilities, 60 percent of hearing disabilities and deaf people, and 80 percent of disabled people in the field of severe blindness and severe visual impairment require rehabilitation assistance.
Nafarieh (2021)	One million five hundred fifty-three thousand nine hundred fifty-eight people cover people with disabilities. Healthcare provides 50% of the rehabilitation costs for these people.
Seraj (2013)	Of the 1.5 million people covered by welfare, 50% of disabled people receive rehabilitation aids, of which 240000 are children, 120000 of whom receive rehabilitation assistance; although this figure represents 50% of the cost efficiency, it does not include the quality of items and the quality of the needs (UNICEF figures were 5%-15%). Of course, the beneficiaries who help the Welfare Organization provide some of the costs. But if we consider one-third of the country's disabled population, which is three million people, half of them are not covered by welfare (i.e., children). Of a total of 480000 exceptional and disabled children in the country, 120000 benefit from rehabilitation assistance from Welfare Organization, and the rest, 360000, do not receive these facilities (equivalent to 25 percent). Of course, some people who are not covered come from families which use rehabilitation assistance facilities in the form of free shopping from the market, which is not an accurate statistics.

UNICEF: United Nations International Children's Emergency Fund

Discussion

This study showed that providing rehabilitation assistance services to exceptional children and adolescents in Iran was better than UNICEF statistics. According to the statistics obtained by a checklist of families with exceptional children and adolescents and welfare authorities, in 2020, according to the families, 10% and 26% of disabled people used rehabilitation assistance services. In explaining the disagreement between the welfare authorities and families of disabled children, it can be said that in completing questions and forms, considering the officers of the cases observing the papers to complete the form and answering the questions, they had a more objective and accurate opinion than the families who mentally completed the forms. In addition, due to the lack of meeting all needs and shortcomings, families usually reflect their complete dissatisfaction in their statements, comments, and answers to questions. However, the authorities' answer is based on the file and documentation and is more reliable.

Moreover, according to Yusuf, 5 to 15 percent of disabled and exceptional children in developing countries have access to rehabilitation aids, while according to the relevant authorities in Iran, 50 percent of these children have access to rehabilitation aids (Seraj, 2021). Although the statistics presented in the statements of the authorities and the documents and cases of disabled well-being have a significant difference (50% and 26%), it can be concluded that among developing countries, Iran has a better place in providing rehabilitation services to disabled people. He has (Bornstein, Davidson et al. 2003).

According to this research, Iran has a better position than UNICEF statistics in developing countries. One of the reasons is that, despite the economic problems in the country, due to religious and national culture and teachings, a significant part of the costs related to people in need are in the form of altruism, charity, charity, and charity vows. Participation is done with the country's support systems. In 2019, the statistics of public participation with well-being were generally 10512071593518 rials, 2759614968724 of which was cash and 6256881021088 of which was non-cash, and 1495575603706 rials of services (Hemmat Mahmoudnejad, 2020). A significant part of this assistance is allocated to exceptional children and young people, including providing rehabilitation aid.

The results of study by Shirmohammadi and Kelishadi (2018) showed that support for the rehabilitation of disabled children was one of the ordinary laws of Iran, the United States of America (USA), China, and India. According to Taheri's research (2012), one of the common laws between Germany, Sweden, and Iran is rehabilitation support for disabled children. Overall, the results of this study, in line with previous studies, show that Iran is advancing towards the rights of children with disabilities, and in this regard, it has successfully implemented the relevant laws.

Some limitations for the lack of rehabilitation assistance services for the disabled, high costs, inadequate government credits, cultural challenges, lack of adequate education, lack of proper accommodation and passageways for the presence and participation of disabled people, lack of fair executive laws, poverty, and livelihood problems of families (Iravani, Riahi, Abdi, & Tabibi, 2021).

This study has some limitations. In the statistics in the yearbook of welfare, the number of disabled people was not provided by age and therefore, access to the number of exceptional children and adolescents under welfare protection was limited. The statistics were reached based on the reports and opinions of the authorities. The lack of coordination of support devices in providing services was

another limitation in such a way that the services were done in the form of partisanship and the devices did not have complete and accurate knowledge of the services of other devices, which made it difficult for the researcher to collect information. Additionally, there was no strict executive policies in providing rehabilitation services to disabled and exceptional children and mastering organizational tastes in delivering services instead of a codified program. Therefore, the views of the authorities were different, setting up different systems to provide services and support devices to people with disabilities. This multiplicity of systems, on the one hand, leads to a lack of accurate information for the audience, and on the other hand, the researcher is confused (Rosenthal, 2009).

Considering the researcher's 30-year experience and expertise on exceptional and disabled children, and according to the research, which has been tried to be very accurate due to the existence of effective communication with authorities and support organizations, especially the Welfare Organization, suggestions are presented as follows: Prevent the distribution of credits for exceptional and disabled children and their families and the organization of the program and budget in a specific row and allocate to the custodian of this group for particular programs such as rehabilitation aids the welfare organization. International experiences have shown that establishing the Ministry of Family can be combined with scattered organizations, goals, programs, and human resources credits-command in one direction and centrally, avoiding leakage and waste of credits and human resources facilities. Monitoring in this mechanism will be more effective, and services will be given to individuals and families with greater quantity and quality. The Office of Studies and Research in Welfare must carefully examine services and activities. By establishing such an office, activities are monitored, and continuous improvement of the quality of services is achieved. In addition, this office can help researchers and students by providing more accurate and focused information. It is also suggested that other social welfare indicators be researched scientifically and compared with international standards and the country's position, and a more favorable service model for supporting devices should be designed.

Conclusion

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Conflict of Interests

Authors have no conflict of interests.

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