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Journal of Modern Psychology

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One of the elements of modern time is reliance on scientific thinking. With respect to thought provoking philosophical nature of the present time, Modern psychology has proposed theories in the field of psychological processes based on empirical studies. Hence Journal of Modern Psychology has been launched to provide a space for scholars to publish thoughts and scientific studies in personality, abnormal and social psychology.



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Research Paper: The effectiveness of schema therapy on reducing neuroticism



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Abstract

Objective: Studies have shown that neuroticism is one of the personality traits associated with negative psychological consequences. This research was conducted with the aim of investigating the effectiveness of schema therapy on reducing neuroticism.

Methods: The current research is a quasi-experimental type with a pre-test-post-test design and a control group. The research population was the patients referred to Shariati Hospital in Tehran in 2021, and 22 of them who had obtained a high score in the neuroticism subscale were selected by purposive sampling method and randomly assigned into two experimental (n = 11) and control (n = 11) groups. Both groups completed the neuroticism subscale of the NEO Five-Factor Inventory-3 (NEO-FFI-3) in the pre-test and post-test phases. The experimental group was subjected to the schema therapy for 10 weekly sessions, but no intervention was performed on the experimental group during this period. The analysis of the collected data was done with analysis of covariance and SPSS-18 software.

Results: The obtained findings showed that schema therapy was able to significantly reduce the level of neuroticism in the experimental group compared to the control group ($P < 0.001$).

Conclusion: According to the findings, it can be concluded that schema therapy is effective in reducing neuroticism and can be used in treatment centers in this regard.

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1. Introduction

Sigmund Freud divided patients into two categories: neurotic and psychotic (Trichet, 2011). Neurotic patients were those who were struggling with their unpleasant impulses and memories, and used unhealthy defense mechanisms to deal with them, and suffered a decrease in performance. Psychotic patients, however, had lost their connection with reality and the possibility of psychoanalysis was not available for them (Trichet, 2011). The words neurotic and neuroticism were used to categorize mental patients for a long time. But gradually, with the introduction of 5 big personality factors (Costa & McCree, 1992), neuroticism was considered as a personality trait. People who score high in this personality trait are those who experience emotional instability. They are highly vulnerable to negative emotions and their ability to regulate emotions is low. Therefore, they are highly susceptible to mental disorders (Kim et al., 2023).

Therefore, it seems that working on this personality trait can help people to increase their psychological health. Although the treatment of personality disorders is considered as the most difficult type of psychotherapy (Dixon-Gordon et al., 2011; Simonsen, & Simonsen, 2014), but in the last few decades, with the introduction of schema therapy by Jeffrey Young, it has been shown that this treatment can be effective in improving the characteristics and personality disorders (Jacob & Arntz, 2013).

In schema therapy, it is assumed that the psychological needs of people in childhood, if they are not properly satisfied, can lead to

the formation of cognitive structures that are called early maladaptive schemas. Early maladaptive schemas do not only include negative cognitions, but also include emotions, bodily sensations, and behaviors, and can cause people to use coping styles based on avoidance, surrender, or extreme compensation in dealing with challenging situations (van Dijk et al., 2023). Young et al. (2003) introduce 18 maladaptive schemas. For example, a person with a failure schema may avoid situations where people with superior scores are present, or conversely, verbally and behaviorally, he may seek to show his achievements excessively. He can also surrender to this temptation and constantly go after plans and plans in which the possibility of failure is more than success.

The therapist seeks to make the patient aware of his schemas and reduce their destructive effects in different situations by using cognitive, behavioral and experiential techniques. Until now, various researches have confirmed the effectiveness of schema therapy in connection with various mental disorders (Bamelis et al., 2014; Hawke & Provencher, 2011; Sohrabi et al., 2023).

According to the stated material, the researcher in the present study intends to examine the effectiveness of schema therapy on the personality trait of neuroticism.

2. Methods

2.1. Statistical Population, Sample, and Sampling Method

The current research is semi-experimental with a pre-test-post-test design and a control group. The research population was the patients referred to Shariati Hospital in Tehran in 2021, 22 of them who had obtained a high score in the neuroticism subscale (higher than 36 on the neuroticism subscale) were selected by purposive sampling method and randomly assigned into two experimental ($n = 11$) and control ($n = 11$) groups. Having reading and writing literacy and consent to participate in the study were among the criteria of entering the research and suffering from chronic medical diseases and psychiatric disorders (based on a clinical interview according to DSM-5 criteria) and not participating in all schema therapy sessions were among the exclusion criteria. Both groups completed the neuroticism subscale of the NEO Five-Factor Inventory-3 (NEO-FFI-3) in the pre-test and post-test phases. The experimental group was subjected to the schema therapy for 10 weekly sessions, but no intervention was performed on the experimental group during this period.

2.2. Instrument

NEO Five-Factor Inventory-3 (NEO-FFI-3): This inventory was created by [Costa and McCree \(1989\)](#) and has 60 items that measures five personality traits of openness to experience, conscientiousness, extroversion, agreeableness and neuroticism. 12 items are provided to measure each characteristic. It is scored from completely disagree (0) to completely successful (4) and a higher score indicates having more of each feature. [McCrae & Costa \(2007\)](#) confirmed the factor structure of the scale and reported internal consistency of its components above 0.80. [Haqshenas \(1999\)](#) confirmed the factor structure of this scale in Iran and reported its internal consistency from 0.77 to 0.86. In this research, the neuroticism subscale was used, and its cut-off point was considered to be a score of 36 or more in this subscale.

Schema therapy: Schema therapy was conducted based on the principles proposed in Schema Therapy book of [Young et al. \(2003\)](#) and during ten weekly sessions and each session lasted for 1 hour by a licensed therapist from Iran's psychology and counseling system. The patients' schemas were first assessed and cognitive, behavioral and experiential techniques were used to work on the early maladaptive schemas. [Table 1](#) shows the sessions and the content of each session.

Table 1

Schema Therapy sessions

Sessions	Content of each session
First session	Filling out the therapeutic contract sheet and clinical interview
Second session	Getting to know schema therapy concepts such as early maladaptive schemas and coping styles
Third session	Filling out the Young schema questionnaire
Fourth session	Discuss the results of the Young schema questionnaire and performing the mental imagery technique to meaning of maladaptive schemas
Fifth session	Understanding schemas and their developmental roots and providing assignments and feedback
Sixth session	Implementation of cognitive techniques to evaluate schema validity and providing assignments and feedback
Seventh session	Evaluation of advantages and disadvantages of confrontation style and empty chair technique and providing assignments and feedback
Eighth session	Implementation of experimental techniques of imaginary conversation and writing letters to parents and providing assignments and feedback
ninth session	Behavioral pattern breaking training using the technique of preparing a list of specific behaviors as the subject of change and providing assignments and feedback
tenth session	Examining the exercises and performing the post-test

2.3. Procedure

First, consent was obtained from all participants. Ethical issues such as privacy protection and consent to withdraw from the research were observed. In the pre-test, NEO Five-Factor Inventory-3 (NEO-FFI-3) was performed on both groups. After finishing the treatment sessions for the experimental group, both groups answered this questionnaire again. All participants of the experimental group participated in the

treatment sessions. Data analysis was done using covariance analysis and SPSS-26 software

3. Results

The mean and standard deviation of the age of the subjects in the experimental group were 38.41 and 3.17 and in the control group were 40.25 and 3.15. The mean and standard deviation of the neuroticism are presented in [Table 2](#).

Table 2

The mean and standard deviation of the neuroticism

	Experiment phase	Neuroticism
Experimental group	Pre-test	43.18±3.10
	Post-test	20.71±1.15
Control group	Pre-test	44.02±0.87
	Post-test	46.94±0.43

As can be seen in [Table 2](#), the mean of neuroticism in the experimental group decreased in the post-test, but increased in the control group. The normality of the data distribution was checked with the

Kolmogorov-Smirnov test and the homogeneity of variances was checked with the Levene's test, which is presented in [Table 3](#).

Table 3

Checking the normality of data distribution and homogeneity of variances

	Neuroticism	F	P
Kolmogorov-Smirnov test	Pre-test	1.14	0.84
	Post-test	0.32	1.97
Levene's test	F	df ₁ /df ₂	p
	1.35	1/20	0.44

The non-significance of the Kolmogorov-Smirnov test and Levene's test shows that the data distribution is normal and the condition

of homogeneity of variances is established. The results of covariance analysis are presented in [Table 4](#).

Table 4

Results of covariance analysis of metacognitive strategies training on rumination and worry

variable	Source of changes	Sum of squares	df	Mean squares	F	P
Neuroticism	Pre-test	1295.72	1	1295.72	34.71	0.001
	group	673.17	1	673.17	22.34	0.001
	error	281.90	20	132.07		
	total	57499.22	22			

According to [Table 4](#), the schema therapy has been able to significantly reduce

neuroticism in the experimental group compared to the control group.

4. Discussion

This research was conducted with the aim of investigating the effectiveness of schema therapy on neuroticism. The findings showed that 10 schema therapy sessions were able to significantly reduce the amount of neuroticism in the experimental group compared to the control group.

This finding is in line with other researches that have shown the effectiveness of schema therapy on personality disorders and characteristics (Bamelis et al., 2014; Jacob & Arntz, 2013; Koppers et al., 2023; Wibbelink et al., 2023; Zhang et al., 2023).

In explaining this finding, it can be stated that schema therapy is an approach derived from different therapeutic theories (Young et al., 2003). This therapeutic approach, using various therapeutic techniques and with brakes on different cognitive, emotional and behavioral dimensions, can have an effect on deep psychological structures. For example, in the empty chair technique, the subjects sit down to talk with one of their parents and in this way express their inner feelings to their father or mother and answer their questions instead of him. Or in the imagery technique, the subjects place themselves in one of their childhood memories, where the therapist enters as a third person and shows the correct and mature behavior to the subject instead of the parent's misbehavior (limited re-parenting). . Also, with the help of cognitive techniques, the incorrect and illogical beliefs of the subjects were challenged and the evidences for and against those beliefs were examined in a conversation between the

subject and the therapist. All these techniques have shown to be fruitful and are associated with successful results for schema therapy.

The subjects of this study scored high in the personality trait of neuroticism and this shows that they are emotionally prone to negative emotions such as anger, fear and sadness and experience low emotional stability. Experiential techniques in schema therapy are presented with the aim of facing emotions and regulating them. Earlier, the effectiveness of schema therapy on improving emotion regulation has been shown (Hassas et al., 2023; Rahimi & Bazazian, 2023).

The lack of pairing of people in the two experimental and control groups may have caused some intervening variables to have an effect on the results. It is suggested that future researches remove this research limitation and examine other groups as well. Also, comparing therapeutic approaches can provide more comprehensive information regarding their effectiveness on personality traits.

5. Conclusion

The findings showed that schema therapy is effective in reducing neuroticism. Therefore, medical centers can use this treatment to reduce this important personality trait in suffering from mental disorders.

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Conflicts of Interest

No conflict of interest has been reported.

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Research Paper: The Effectiveness of Group-based Stress Immunization Training in Enhancing the Quality of Life of Mothers of Children with Autism Spectrum Disorder (ASD)

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Abstract

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Objective: Parents often exhibit diverse reactions to the birth of their child, particularly when the child is born with a specific issue or disability, such as Autism Spectrum Disorder (ASD). The current study was designed to evaluate the effects of group-based Stress Immunization Training and its subsequent impact on the Quality of Life of mothers with children diagnosed with ASD.

Methods: This quasi-experimental study utilized a pre-test-post-test control group design. The participants were mothers of children with ASD who had sought services at a temporary care center for children with Autism Spectrum in Rasht in the year 2021. Initially, forty mothers were selected through purposive sampling and were randomly divided into experimental and control groups. Both groups completed the WHOQOL-BREF Quality of Life questionnaire. The experimental group then underwent 6 sessions of Stress Immunization Training (two hours per week), while the control group received nothing. Upon completion of the sessions, the Quality of Life questionnaire was administered again to both groups. The collected data were analyzed using covariance statistical analysis with a significance level set at 0.05.

Results: The findings indicated that group-based Stress Immunization Training significantly improved the Quality of Life in mothers of children with ASD.

Conclusion: Therefore, this treatment can be used by counselors and psychologists to increase the quality of life of the mothers of children with ASD.

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1. Introduction

Autism Spectrum Disorder (ASD), a Neurodevelopmental disorder, is recognized for its lifelong persistence and is one of the most prevalent childhood disorders (Nayar et al., 2021). It is characterized by enduring difficulties in social interaction and communication, coupled with restricted and repetitive behavioral patterns, with symptoms typically manifested in the initial stages of development post-birth (Anjomani & Taklavi, 2019). The advent of a child diagnosed with ASD within a family, particularly considering the specialized care demands, poses a considerable stressor for mothers who are primarily engaged in caregiving. This stress exerts a profound impact on their psychological well-being, adaptability, and overall quality of life, thereby undermining their adjustment capabilities and posing a threat to their physical and mental health (Shaham, 2021). Furthermore, the parenting stress associated with the unique needs of these children can lead to adverse long-term effects. Empirical evidence suggests that mothers of children with ASD frequently face challenges related to life satisfaction, self-esteem, and mental health (Hsiao, 2016), and are prone to experiencing elevated stress and depressive symptoms (Kim et al., 2016). Consequently, the quality of life of the mothers in this demographic warrants significant attention and intervention.

The quality of life for parents of children with autism is diminished due to a complex matrix of environmental, genetic, social, and economic variables as well as social support,

parental characteristics, and coping strategies (Mugno et al., 2007). Additionally, research shows that the psychological and physical burden of raising most children with autism falls on the mother (Haglund et al., 2016). These issues cause mothers of children with autism to experience lower levels of quality of life compared to mothers of children with mental retardedness without autism, children with cerebral palsy, and typical children (Kheir et al., 2012).

Quality of life is defined as the feeling of well-being derived from satisfaction or dissatisfaction with various aspects of life that are important to an individual. This concept is a completely mental and personal understanding based on happiness with individual satisfaction from factors affecting welfare, physical, emotional, and social functioning, which aims to enhance or maintain an individual's ability for the best possible performance and condition (Rezayi, 2016). According to research findings, quality of life is the outcome of psychological pressures, life events, environmental and social factors on the one hand, and programs such as general health and individual resources like cognition, coping ability, sense of competence, sense of security, adaptive skills, a stable system of value beliefs, and support systems on the other (Moazedi, 2019). Quality of life encompasses a concept beyond physical health and must be independently assessed as one of the most important outcomes. Zablotzky et al. (2013) supported the relationship between the severity of autism symptoms and the lower quality of life of the mothers of children with ASD. Moreover, in the research by Zamani et

al. (2022), it was determined that middle-aged homemakers with children suffering from ASD had the lowest average quality of life score among all the mothers studied. Rezayi (2016) showed that the quality of life of mothers with children with ASD was lower compared to two groups of mothers with deaf and blind children, and the quality of life of mothers with blind children was better than both the deaf and autistic groups.

Stress Immunization Training emerges as a significant intervention for improving the quality of life of mothers with children with ASD. A cognitive-behavioral technique, widely recognized for its therapeutic and preventative benefits, has been refined by Meichenbaum (2003). This method functions analogously to a medical vaccine, fortifying individuals against potential psychological afflictions (Ghaderi et al., 2020). It equips individuals with the foresight and tools to manage future stressors effectively, thereby mitigating the impact of stress (Ghanimi et al., 2019).

Empirical studies have explored the efficacy of Stress Immunization Training across diverse populations. Ghanimi et al. (2019) discovered that such training, particularly in managing perceived social support and stress, significantly enhances the physical health aspect of mothers' quality of life. Hosseini et al. (2011) confirmed the positive effects of stress-coping skills training on the mental health and cognitive well-being of mothers with autistic children. Additionally, Sohrabi et al. (2011) concluded that Stress Immunization Training substantially reduces stress, anxiety, and depression among employed women.

A review of existing research on interventions designed to improve the quality of life for mothers of children with ASD revealed a modest number of studies focusing on the benefits of Stress Immunization Training. While these studies have not been extensive, they highlighted the significance of such training in enhancing maternal well-being. Ensuring a high quality of life for these mothers is crucial, as it directly influences their capacity to effectively care for and nurture their children with autism. This research delved into the effects of group-based Stress Immunization Training, offering insights and strategies for specialists and program developers to bolster the quality of life for these dedicated mothers.

2. Methods

This research was a quasi-experimental one employing a pretest-posttest control group design. The participants were mothers of children diagnosed with ASD who, in 2021, had sought services at a temporary care center for Autism Spectrum in Rasht and their children had enrolled there. Given that the minimum required sample size for experimental studies is 15 (Delavar, 2022), a purposive sampling method was used to select 40 mothers from this population. They were then randomly divided into experimental and control groups. Eligibility for the study required the absence of acute neurological and psychiatric disorders and a minimum educational level of middle school. Before the educational intervention, both groups filled out the WHOQOL-BREF Quality-of-Life Scale. The experimental group subsequently underwent six sessions of group-based Stress Immunization Training,

each lasting two hours per week, while the control group received no such training. Following the completion of these sessions, the Quality-of-Life Scale was re-administered to both groups. The collected data were analyzed using SPSS version 27, with a significance threshold set at 0.05.

2.1. Instruments

The World Health Organization Quality-of-Life Scale (WHOQOL-BREF): This is a 26-item questionnaire developed in 1996 by experts from the World Health Organization. It was derived by modifying items from the original 100-question version. The questionnaire provides an overall quality-of-life score and includes four sub-scales: physical health (questions 3, 4, 10, 15, 16, 17, 18), mental health (questions 5, 6, 7, 11, 19, 26), social relationships (questions 20, 21, 22), and environmental health (questions 8, 9, 12, 13, 14, 23, 24, 25). Each item is rated on a 5-point Likert scale, with scores ranging from 1 to 5. The first two questions, which are not part of any sub-scale, assess overall health and quality of life. Scores within each

Table1

Schedule of Stress Immunization Training according to Meichenbaum's (1985) protocol

Session	Task
First	Taking a medical history and being acquainted with the patients, completing questionnaires, and participants filling out informed consent forms. Reconceptualizing the problem, describing stress, symptoms, and its impact on mothers' quality of life, explaining the role of Stress Immunization Training for better stress control, and assigning homework.
Second	Teaching muscle relaxation using an audio CD and without an audio CD, assigning homework, and practicing muscle relaxation at home.

domain are calculated to range from 4 to 20, where 4 represents the poorest and 20 is the best possible condition for the respective domain. These scores can be transformed into a 0-100 scale. The questionnaire's validity was confirmed using the Kuder-Richardson formula, and its reliability was measured using Cronbach's alpha, with the original version achieving scores of 0.87 and 0.81, respectively (WHOQOL group, 1996). Nejat et al. (2006) reported the test-retest reliability for this questionnaire among 1167 individuals in Tehran to be 0.77 for physical health, 0.77 for mental health, 0.75 for social relationships, and 0.84 for environmental health. The questionnaire's validity was also determined to be above 0.8 for all components and the overall score.

2.2. Training Sessions

Six educational sessions, structured around **Meichenbaum's Stress Immunization Training** method (1985), are outlined in **Table 1**.

Session	Task
Third	Familiarization with cognitive concepts and the role of thoughts in creating stress, the connection between thoughts, emotions, and behavior, identifying them, practicing muscle relaxation during the session, assigning homework, and practicing muscle relaxation at home.
Fourth	Challenging stress-inducing thoughts and testing negative thoughts, teaching self-talk, and identifying the role of negative self-talk in creating stress, practicing muscle relaxation during the session, assigning homework, and practicing muscle relaxation at home.
Fifth	Focusing thoughts and techniques for redirecting attention and getting distracted from unresolved stressful subjects; plus problem-solving training, practicing muscle relaxation during the session, assigning homework, and practicing muscle relaxation at home.
Sixth	Practicing skills learned in previous sessions and emphasizing the necessity of applying these skills when encountering stressful situations to improve the quality of life.

3. Results

The study sample consisted of 40 mothers with autistic children in the city of Rasht. The

mean, standard deviation, and research variables are reported in [Table 2](#):

Table 2

Mean and Standard Deviation of Pre-test and Post-test Quality of Life in Control and Experimental Groups

Index Criterion	Groups	Test	Mean	Standard Deviation
Quality of Life	Control	Pre-test	29.7	4.13
		Post-test	30.8	4.22
	Experimental	Pre-test	28.21	4.21
		Post-test	59.51	7.72

According to the results of [Table 2](#), the mean of the quality of life in the control group was 29.7 in the pre-test and 30.8 in the post-test, and in the experimental group, it was 28.21 in the pre-test and 59.51 in the post-test. As observed, changes in the control group from pre-test to post-test were negligible, but the changes in the

experimental group's quality of life from pre-test to post-test were significant.

For the covariance analysis, the Kolmogorov-Smirnov test yielded p-values above 0.05, confirming the normal distribution of the data (experimental group pre-test $p < 0.05$, $z = 0.401$; post-test $p < 0.05$, $z = 0.296$; control group pre-test $p < 0.05$, $z =$

0.288; post-test $p < 0.05$, $z = 0.309$). Furthermore, Levene's test for equality of variances returned a non-significant F-value

($p > 0.05$, $F = 0.353$), supporting the assumption of homogeneity of variances between the groups.

Table 3

Results of the Covariance Analysis on the Impact of Group Stress Immunization Training on Quality of Life

Index	Source	Total	Mean	df	F	Sig	Effect Size
Quality of Life	Pre-test	117.39	117.39	1	2.12	0.02	0.18
	Group	588.87	588.87	1	5.67	0.02	0.698
	Error	294.76	12.28	38			

As observed in [Table 3](#), the results indicated that the F-value was 5.67, which was significant at an error level less than 0.05. Therefore, the Stress Immunization Training was effective in improving the quality of life for mothers with children diagnosed with Autism Spectrum Disorder. The effect size suggested that 69 percent of the variance in the quality of life can be explained through group differences.

4. Discussion

The research results demonstrated that group-based Stress Immunization Training was effective in improving the quality of life of mothers with children diagnosed with Autism Spectrum Disorder. These findings are consistent with the research conducted by [Zablotsky et al. \(2013\)](#), [Zamani et al. \(2022\)](#), and [Rezayi et al. \(2016\)](#). It can be explained that psychological Stress Immunization Training is a combination of cognitive

restructuring, problem-solving, relaxation training, mental and behavioral visualization exercises, self-instruction, self-reinforcement, and efforts to change the environment. Utilizing Stress Immunization Training enhances positive motivation, behavioral, emotional, cognitive, and social skills, leading to reduced tension and unrest, increased coping with challenging events, and consequently, an improvement in quality of life ([Ashori & Jalil Abkenar, 2019](#)). The training program impacts emotional reactions, leading to changes in acceptance, positive refocusing, planning, thinking about the positive aspects of an event or personal growth, and thoughts related to the insignificance of the event or its relativity compared to other events ([Kang et al., 2009](#)). By increasing knowledge, skills, confidence, and self-efficacy, the psychological Stress Immunization program enhances individuals' ability to understand situations and challenges and creates practical

strategies for understanding the situation and appropriate response. The program teaches practical and effective strategies for emotional self-regulation, independence, and problem-solving skills. Acquiring these skills also leads to the development of successful peer relationships and prepares individuals for success in depressive situations and mental health, thereby improving quality of life. The goal of Stress Immunization is to assist individuals in developing and acquiring coping skills for current and future problems. Experts introduce the model of psychological Stress Immunization by linking components of psychological education, cognitive-behavioral therapy, rational-emotive therapy, problem-solving training, and social skills training. Therefore, as a cognitive strategy encompassing the mentioned components, the psychological Stress Immunization method can play an effective role in reducing the emotional negativity of mothers with children diagnosed with ASD. The program also focuses on practical strategies for emotional self-regulation, independence, and problem-solving skills. These skills contribute to successful interpersonal relationships and equip individuals to succeed in difficult situations, thereby enhancing mental health and overall quality of life. The ultimate goal of Stress Immunization is to help individuals develop a wider range of coping skills to effectively handle current and future challenges. By integrating elements of psychological education, cognitive-behavioral therapy, rational-emotive therapy, problem-solving training, and social skills training, professionals have developed the psychological Stress Immunization model.

Thus, as a comprehensive cognitive strategy, psychological Stress Immunization can significantly reduce emotional distress in mothers of children with ASD. The program addresses emotional negativity by 1) increasing knowledge, skills, confidence, and self-efficacy; 2) providing practical solutions through problem-solving by modeling and cognitive understanding of events; 3) enhancing cognitive-behavioral capabilities and creating an environment with minimal conflict for an individual and 4) reinforcing positive motivation and reducing tension as well as unrest in parents (Purnamaningsih, 2017).

The present study also encountered certain constraints. Notably, the researcher faced limitations that affected her ability to monitor the ongoing implementation of the psychological Stress Immunization program. Consequently, future research designs are advised to incorporate extended follow-up periods for treatment. The findings of this study promote the creation of a psychological Stress Immunization Training program that integrates cultural and religious doctrines, assessing its impact on personality traits, mental health, and other cohorts of children with special needs. It is further suggested that such training programs be offered to psychologists, counselors, and educators of families and couples during different stages of life. Additionally, it is proposed that existing programs be revised and educational workshops be developed for professionals in education, teachers, coaches, family education lecturers, and students specializing in psychological Stress Immunization Training.

5. Conclusion

Based on the findings of the current research, group-based Stress Immunization Training led to a reduction in stress and a relative increase in the quality of life for mothers with children diagnosed with ASD. Therefore, group-based Stress Immunization Training can be used in clinical settings such as psychological clinics, temporary care centers for children with ASD, and special education schools to enhance the quality of life of these mothers.

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Conflict of Interest

The Author declares that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: The Relationship between Emotional Creativity and Pregnancy Anxiety in Five to Eight Months Pregnant Women



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Abstract

Objectivity: Pregnancy is a critical period that may entail various challenges such as pregnancy anxiety. Thus, early and timely detection of this anxiety can be crucial for the well-being of pregnant women. This study aimed to examine the association between emotional creativity and pregnancy anxiety among women in their second and third trimesters.

Methods: The study employed a descriptive-correlational design. The sample consisted of 200 pregnant women of 5 to 8 months in Mazandaran province in 1401 who were recruited by purposive sampling from health and treatment centers. They completed the Emotional Creativity Inventory (ECI) and the Pregnancy Related Anxiety Questionnaire (PRAQ). The data were analyzed using SPSS 24 and correlation analysis.

Results: The results indicated a negative correlation between emotional creativity and pregnancy anxiety ($r = -0.322$, $P < 0.01$).

Conclusion: It can be inferred that improving emotional creativity during pregnancy can help reduce pregnancy anxiety.

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1. Introduction

Pregnancy is a critical stage in a woman's life that involves significant physiological and psychological alterations, which may sometimes lead to pathological outcomes, despite the joy of motherhood (Littlewood & McHugh, 1997). During this stage, women commonly experience anxiety, known as pregnancy anxiety, as a result of various concerns, mental preoccupations, and fears regarding pregnancy and its associated changes, as well as childbirth, infant health, and child care. However, this anxiety may have adverse effects on the pregnant mother's physical and mental well-being (Basharpoor et al., 2013). Studies have shown that fetal health is a source of worry for mothers and most pregnant women are anxious about the possibility of fetal anomalies and the performance of screening tests (Smith et al., 2019).

Individuals differ in their responses to anxiety-inducing factors based on their genetic makeup, personality characteristics such as how they appraise the stressor, their coping abilities with the anxiety-inducing factor, their living situations and surroundings, their social support networks, and their prior experiences (Sarani et al., 2016). Folkman et al. (1986) suggested that a woman's emotional and behavioral coping responses to stress are shaped by how she evaluates anxiety during pregnancy. Therefore, emotional creativity can be one of the factors in managing pregnancy anxiety. Averill and Nunley (1992) introduced the concept of Emotional Creativity along with Emotional Intelligence by Salovey and

Mayer. From a social constructivist viewpoint, Averill (1999) argued that emotions were not merely the result of biological forces, but rather a form of social interactions that were constructed by social norms and rules. Moreover, when these norms and rules change, so do the emotions. He proposed the possibility of Emotional Creativity based on this feature of variability. Averill and Nunley (1992) specified the dimensions of the elements of this kind of creativity. According to this definition, Emotional Creativity is the expression of oneself (honesty) in a novel way (innovation) that leads to the expansion of the individual's lines of thought and the enhancement of his interpersonal relationships (effectiveness). According to this definition, innovation, effectiveness, and honesty are the three main elements of Emotional Creativity (Ajam et al., 2016).

Emotional Creativity is a constellation of cognitive capacities and personality characteristics that enable originality and appropriateness in emotional and affective experience. This is a crucial element in the creative process. It entails the capacity to generate novel outcomes by drawing on emotions elicited from personal or others' experiences (Beidel & Turner, 2007). Emotional creativity facilitates the regulation and guidance of one's inner emotions in a suitable manner, implying that individuals with this trait can cope with their inner emotions according to the context and maintain them under control, as well as make innovative decisions or actions. Emotional Creativity and its awareness allow individuals to comprehend their inner

emotions better and behave more rationally and deliberately in their actions and choices. Individuals with high emotional creativity derive more pleasure from emotional experiences and new learning (Averill & Nunley, 2010).

Research has demonstrated the influence of Emotional Creativity on anxiety. For instance, Kiani et al. (2018) revealed that the factors of emotional intelligence, emotional creativity, and emotion regulation difficulty affected the processing of emotional information of individuals and impacted their perception, interactions, and engagement with the educational setting. High competence in these factors results in adaptation, whereas low competence leads to heightened stress and maladaptive behaviors. Emotions and emotional abilities have a significant role in dealing with challenges and anxieties (such as pregnancy anxiety).

Chronic anxiety and daily stress are common in modern life, but they can have adverse effects on pregnancy outcomes, such as preterm birth or low birth weight (Akhlaghi, 2012). Therefore, it is important to reduce anxiety and learn to cope with it in a way that enhances interpersonal relationships and creates healthier conditions for pregnant women. However, there is a lack of research on this topic among pregnant women in Iran. Thus, this study aimed to examine the relationship between emotional creativity and pregnancy anxiety among pregnant women in their second or third trimester.

2. Methods

2.1. Research Design

This study employed a descriptive-correlational design. The study population consisted of pregnant women in their second or third trimester in Mazandaran province in 1401, who were recruited from health and treatment centers using a purposive sampling technique, based on the criterion of having fifteen subjects per observed variable (Kline, 2016). A total of 200 women participated in the study. The inclusion criteria were being pregnant, not having serious psychological problems, and being willing to cooperate in the study. After selecting the participants and following the general ethical principles and ensuring the confidentiality of their information, the researcher administered the following questionnaires to the participants: Emotional Creativity Inventory (ECI; Averill, 1999) and the Pregnancy-Related Anxiety Questionnaire (PRAQ; Vandenberg, 1990). The data were analyzed using SPSS software version 24 employing the correlation statistical method.

2.2. Instruments

Emotional Creativity Inventory (ECI): Averill (1999) developed this questionnaire to assess emotional creativity across four dimensions: novelty, effectiveness, honesty, and readiness. The questionnaire consists of 30 items, with 7 items measuring emotional readiness, 14 items measuring novelty, 5 items measuring effectiveness, and 4 items measuring honesty. Each item is rated on a five-point Likert scale ranging from very low (0 points) to very high (4 points). The

Cronbach's alpha method indicated a high reliability of the total score of emotional creativity (0.91) and the four dimensions (0.80, 0.89, 0.80, and 0.85, respectively). The validity of the questionnaire was evaluated through factor analysis and correlation with similar tests. The factor analysis revealed three dimensions instead of four, with the following values: 0.88, 0.82, and 0.81. The dimensions of effectiveness and honesty merged into one factor. Sabet (2014) confirmed the reliability of the test by obtaining a Cronbach's alpha coefficient of 0.83. The correlation between the subtests of Torrance creativity and ECT was 0.74, indicating a good concurrent validity of the test.

Pregnancy-Related Anxiety Questionnaire (PRAQ): Vandenberg (1990) designed this questionnaire, 58 items, to assess pregnancy-related fears and worries. Five factors emerged from the exploratory factor analysis of the questionnaire data: fear of childbirth (14 items), fear of having a physically or mentally handicapped child (5 items), fear of changes in marital relationships (13 items), fear of mood changes and their impact on the child (16 items), and self-centered fears or fear of changes in the mother's personal life (7 items). Each item is rated on a seven-point

Likert scale from completely disagree (0 points) completely to agree (7 points). The total score of pregnancy anxiety can vary from zero to 385 (Vandenberg, 1990). Huizink et al. (2004) reported a high reliability of the questionnaire using Cronbach's alpha method (0.76) and a good validity of the questionnaire using the correlation method with the Spielberger state anxiety questionnaire (1970; cited in Spielberger & Richard, 1970) (0.70). Babanazari and Kafi (2008) confirmed the reliability of the questionnaire using Cronbach's alpha method (0.70) and the validity using the confirmatory factor analysis method (0.74).

3. Results

The study sample consisted of two hundred pregnant women in their second or third trimester in Mazandaran province. Among them, 32 respondents were aged 20-25 years (13.8%), 88 were aged 25-30 years (48.2%), and 80 were aged 30-35 years (38%). Table 1 presents the mean and standard deviation of the scores of the participants in the pregnancy anxiety questionnaire and the emotional creativity questionnaire and their subscales of readiness, innovation, effectiveness, and originality.

Table 1

Mean and standard deviation of emotional creativity and pregnancy anxiety dimensions in pregnant women

Factors	Mean	Standard deviation
Pregnancy anxiety	77.5	9.8
Readiness	36.1	3.9
Innovation	33.3	5.7
Effectiveness	31.5	5.34
Originality	34.1	4.22
Emotional Creativity (total)	92.1	8.9

Table 2 showed the correlation coefficients between pregnancy anxiety and emotional creativity (and its dimensions).

Table 2

Correlation between pregnancy anxiety and emotional creativity

	Readiness	Innovation	Effectiveness	Originality	Total (emotional creativity)
Pregnancy anxiety	-0.76**	-0.17*	-0.29*	-0.12**	-0.322*

* P<0.01

** P<0.05

The results indicated a significant negative correlation between pregnancy anxiety and emotional creativity ($r = -0.322$, $p < 0.01$), meaning that higher levels of emotional creativity were associated with lower levels of pregnancy anxiety.

4. Discussion

This study examined the relationship between pregnancy anxiety and emotional creativity among pregnant women. The findings revealed a negative correlation between the two variables, indicating that

higher emotional creativity was associated with lower pregnancy anxiety. This study has been the first of its kind in Iran, and therefore it relies on similar and related studies for comparison. The findings are in line with [Razmi et al. \(2023\)](#), who found a significant inverse relationship between social interaction anxiety and emotional creativity among female high school students in Shiraz.

The results can be explained by the fact that expressing emotions creatively with a novel style and method enhances pregnant women's awareness of their emotions and

possibly enables them to control stress and manage negative emotions, which in turn reduces pregnancy anxiety. Cognitively, expressing positive emotions helps people to see new connections between ideas, organize information, and integrate as well as create new solutions for problems. Creativity stemming from these emotions improves and increases the readiness of people to engage in various activities. Consequently, people become more flexible in the face of obstacles and challenges, and positive emotions are directly related to high levels of creativity. Based on the above cases, when confronted with stressful and anxious situations, pregnant women who have a high score of emotional creativity use a variety of coping strategies that include their preference for solutions that focus on self-regulation, problem-solving planning, social support seeking, and re-evaluation. In this situation, they reject negative emotions and replace them with positive emotions to find a positive meaning when faced with stress (Issazadegan et al., 2012).

The present study had some limitations; one of which was conducting research only on pregnant women limiting the generalization of the results to other members of society. Therefore, it is recommended that similar research be conducted on other people in the future.

5. Conclusion

Based on the results of this study, it is concluded that emotional creativity will be one of the effective factors in predicting pregnancy anxiety.

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Conflict of interest

The Author declares that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: Effect of Cognitive Restructuring in Reducing Cognitive Dimensions of Ethnic Intolerance among Adolescents in Taraba State, Nigeria



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Abstract

Objective: This study investigated the effect of cognitive restructuring in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State.

Methods: This study is quasi-experimental with one-group pretest-posttest design. The population of this study was 1,514 secondary school students of SS1 in Wukari Education Zone, Taraba State, Nigeria. The researcher utilized purposive sampling technique in drawing a sample of 20 adolescents which were used as subjects of the study. The instrument used for data collection was the Ethnic Intolerance Questionnaire (EIQ). The data collected were analyzed using paired and independent samples t-test.

Results: The findings revealed that cognitive restructuring was effective in reducing cognitive dimensions of ethnic intolerance. However, the findings revealed that cognitive restructuring has no significant gender difference in reducing cognitive dimensions of ethnic intolerance.

Conclusion: The study concluded that cognitive restructuring is an effective intervention for reducing cognitive dimensions of ethnic intolerance among adolescents.

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1. Introduction

History has shown the existence of violence and conflict among individuals living in the various communities around the globe. The reason for this has mostly been attributed to intolerance. Intolerance according to [Si and Zhang \(2017\)](#) refers to the unwillingness to accept beliefs, opinions, and views that are not similar to the opinions and beliefs of one's self. It can also be seen as the refusal to view with respect contrary beliefs and other people's ways of life. [Shaista \(2011\)](#) maintains that this refusal is habitually ingrained in unawareness and fear: fear of unfamiliar, of other cultures, nations and religions. According to the [United Nations \(1992\)](#), ethnic intolerance refers to the attitudes and behaviour of individuals and groups that are based on the belief that some individuals or groups are inherently superior to others because of their ethnic or national origin. [Koshmanova and Holm \(2007\)](#) believe that ethnic intolerance is a major obstacle to the development of a democratic and inclusive society. Consequences such as social tension, conflict, and human rights violations are associated with ethnic intolerance. These consequences cause significant challenge in many societies and has implications for social cohesion and harmony.

Adolescents are at a stage of growth and development where they can be influenced by the beliefs and perceptions of the adults around them. It has been observed by the researcher that most adults rather than nurture, teach and preach peace to these young ones, end up polluting their minds

thereby leading to more and more unacceptable intolerant acts. The evolution of these intolerant acts seems to originate from the cognitive level. At this level, intolerance is manifested through rigidity, narrow and closed thoughts about other groups. Ethnic intolerance exhibited by adolescents is an attitudinal and psychological problem which needs to be addressed with appropriate counselling or psychological technique. [Lawan and Hassan \(2022\)](#) imply that the intolerant individual has a defect in their personality: a flaw, an inadequacy, a vice, an incapacity or a sickness. This personality defect could be referred to as cognitive distortion.

[Corey \(2009\)](#) assert that cognitive distortion is an error in the way of thinking that can interfere with a person's behaviour. Distortions related to ethnic intolerance are the negative cognitive dimensions which involves how the intolerant individual perceives, thinks, acts/behaves and what beliefs he/she has towards members of other ethnic groups. These perceptions, beliefs, attitudes and thoughts could reflect through forms of cognitive distortions such as polarized thinking (where an individual believes that all members of a certain ethnic group are inherently bad, without considering the diversity and complexity within that group), and overgeneralization (the intolerant person makes a complete judgment about an entire ethnic group based on limited experience). In the same vein, [Joe \(2011\)](#) points out another form of cognitive distortion to be mental filter: a situation where an individual is unable to think flexibly because their point of view is very limited and for that reason, they limit

themselves to only information that support their thoughts and beliefs. Joe believes that people who experience this mental filter will ignore thoughts and assumptions that are not in accordance with their beliefs. This also happens in cases of ethnic intolerance.

The presence of ethnic intolerance can cause immeasurable ill to the society and individuals living in it. Several incidents in recent history have shown clearly how lack of tolerance have made people to attack others and their communities because their beliefs do not align ([Biam et al., 2022](#)). Ethnic intolerance has become a thing of concern especially in Wukari Education Zone of Taraba State where it is one of the factors responsible for conflict which have displaced thousands and damaged the relationship among members of different ethnic and tribal communities. There is therefore need to seek for appropriate intervention which would help in reframing the mindset and attitude of adolescents. The reason for this is because, these young people are the future pillars of the country and if they should grow with hatred, disrespect and disregard for other people's diversities, conflict is bound to occur. One of the interventions that could help in that regard is cognitive restructuring.

Cognitive restructuring according to Ellis' statement, is the process of learning to refute cognitive distortion or fundamental faulty thinking with the goal of replacing one's irrational counter belief with more beneficial ones. [Beck \(2011\)](#) believes that cognitive restructuring involves the process of reframing negative and unrealistic thoughts to more realistic and positive thinking. Cognitive dimensions of ethnic intolerance

encompass all the faulty thinking and beliefs which adolescents harbour. The belief and thought that other people's beliefs, ideas and ways of living are of less significance is baseless, irrational, illogical and unacceptable. Individuals who harbour such a belief, are distorted cognitively. It is this form of faulty thinking that leads to the exhibition of unacceptable emotions and behaviours.

Several researchers ([Aliero et al., 2023](#); [Ahmad et al., 2020](#); [Astuti et al., 2020](#); [Alnaimat, 2022](#); [Egbunike & Nwankwo, 2021](#); [Eseadi et al., 2020](#); [Motevalli et al., 2020](#); [Oparaduru, 2017](#)) have utilized cognitive restructuring in order to handle irrational beliefs and thoughts that lead to bullying, stress, anxiety, proneness to maladaptive behaviour, procrastination, and motivation. These previous studies have added to the body of literatures in confirming the effectiveness of cognitive restructuring in treating various forms of disorders, psychological and behavioural problems. However, none of these studies were conducted to address negative cognitive dimensions of ethnic intolerance. Even if such a study may have been investigated elsewhere which is yet to be captured in literature, it is not in Nigeria and certainly has not been conducted in Taraba State or Wukari Education Zone. Thus, the concern of this study was on utilizing cognitive restructuring in a group counselling session in order to address the cognitive dimensions of ethnic intolerance among adolescents in Wukari Education Zone, Taraba State, Nigeria. The hypotheses of the research were:

1. Cognitive restructuring has no significant

effect in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State.

2. Cognitive restructuring has no significant gender difference in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State.

2. Methods

2.1 Research Design

This study is quasi-experimental with one-group pretest-posttest design. The rationale behind the selecting of this type of design is because the results obtained from the administration of the pre-test and post-test are analyzed and compared in order to determine if the intervention was effective or not.

2.2 Area of the Study

The area of the study was Wukari Education Zone which is located in the Southern part of Taraba State, Nigeria. The zone comprises of two Local Government Areas i.e., Ibi and Wukari LGAs. The main reason why this area was selected for this study is because, there has been a lot of conflicts and violence between members of different ethnic groups due to the intolerance and lack of respect for one another's beliefs and ways of living.

2.3 Population, Sampling and Sampling Method

The population of the study was 1,514 SS 1 students in the public secondary schools

located in Wukari Education Zone, Taraba State, Nigeria. In order to select the sample for the study, the researchers administered a pretest which served as a baseline for the selection of the subjects. A total of 20 students who fulfilled the requirements for selection as participants of this study were then drawn using purposive sampling technique.

2.4 Instrument

Ethnic Intolerance Questionnaire (EIQ):The items of this instrument were adapted from "Tolerance Index" by Soldatova and Shaigerova (2008). The items of the EIQ are scored on a 4-point scale of Strongly Agree, Agree, Disagree and Strongly Disagree. The EIQ was validated by three experts in Counselling, Psychology, and Measurement and Evaluation from the Faculty of Education, Taraba State University, Jalingo. Thereafter, the instrument was trial tested on 30 adolescents who were randomly drawn from 2 public secondary schools in Takum Education Zone which is not part of the study area but share similar characteristics in terms of religious intolerance and religious conflicts. In order to measure the reliability of the instrument, the researchers used a test-retest method which involved administering the instrument two times in an interval of two weeks. The scores obtained from the first and second administration were subjected to Pearson Product Moment Correlation and a reliability coefficient of 0.83 was obtained. This reliability co-efficient of 0.83 signifies that the instrument is statistically suitable for conducting the study.

2.5 Procedure

In order to conduct this study, the researchers adopted a three-phase method of data collected. The first phase was the pre-treatment phase and it involved administration of the EIQ to students in order to serve as baseline for the selection of the participants to be involved in the study. The second phase was the treatment phase and it involved the utilization of the techniques of rational emotive behaviour therapy to serve as the intervention in reducing levels of cognitive distortions with regards to ethnic intolerance. The treatment phase took the form of sessions which lasted for a period of eight (8) weeks and involved the utilization of techniques such as cognitive restructuring, and challenging irrational beliefs and thoughts. The third stage was the post-treatment phase and it involved the re-administration of the EIQ to the subjects in order to compare the effectiveness of the treatment. It also involved a follow up which

was done in order to monitor the progress, help reinforce and maintain the change which the participants attained.

2.6 Data Analysis

The data collected were analyzed using inferential statistics of t-test to analyze the hypotheses. Paired samples t-test was used to test hypothesis 1, while independent samples t-test was used to test hypothesis 2. All hypotheses were tested at 0.05 level of significance. The choice of t-test as the statistical tool for analysis is based on the assertion by [Bevans \(2023\)](#) that t-test is a statistical tool which is often used in hypothesis testing and to determine whether a process or treatment actually has an effect on the sample of the study, or whether two groups are different from one another.

3. Results

Table 1
Demographic Information of the Sample

1	School	N	Percentages
	School A	10	50.0
	School B	10	50.0
	Total	20	100
2	Gender		
	Male	10	50.0
	Female	10	50.0
	Total	20	100
3	Age Range		
	12-15	7	35.0
	16-19	13	65.0
	Total	20	100

The participants' demographic results revealed that 10 (50.0%) participants represented adolescent students from School A, another 10 (50.0%) were drawn from School B. The participants were selected equally based on gender signifying 10 males representing (50.0%) and 10 females representing (50.0%) respectively.

Table 2

Paired Samples t-test on the Effect of Cognitive Restructuring.

Variable	Test	N	Mean	SD	df	t-cal	Sig (p)
Ethnic Intolerance scores	Pretest	20	17.95	2.23	19	13.183	.000
	Posttest	20	10.45	1.90			

$P < 0.05$, t computed > 1.96 at df 19

Results of the analysis in table 1 showed that cognitive restructuring has significant effect on cognitive dimensions of ethnic intolerance ($t = 13.183$, $p = 0.000$). The mean score of the participants' cognitive dimensions of ethnic intolerance before exposure to the treatment was 17.95 and it was reduced to 10.45 after exposure to treatment, implying a mean reduction difference of 7.50 in favour of the post test scores. This shows that cognitive restructuring has positive effect on ethnic

Participants within the age brackets of 12 and 15 years of age were 7 (35.0%) while those between age 16 and 19 were 13 (65.0%).

To investigate the first hypothesis of the research, a paired t-test was used, the results of which are presented in Table 2.

intolerance as it relates to cognitive dimensions. Therefore, the null hypothesis which states that cognitive restructuring has no significant effect in reducing cognitive dimensions of ethnic intolerance among adolescents is rejected.

In order to investigate the second hypothesis of the research, independent t-test was used, the results of which are presented in Table 2.

Table 3

Independent samples t-test on Gender Difference.

Variable	Test	N	Mean	SD	df	t-cal	Sig (p)
Ethnic Intolerance scores	Pretest	10	11.80	2.44	18	.814	.426
	Posttest	10	10.10	1.19			

$P > 0.05$, t computed > 1.96 at df 18

The result of the analysis in table 2 shows that cognitive restructuring has no gender difference in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State. The outcome of the t-test shows

that the p value of .426 is higher than the 0.05 alpha level of significance and the calculated t value of .814 is higher than the t critical value of 1.96 ($P > 0.05$; $t < 1.96$) at 18 df implying that cognitive restructuring has no

gender difference in the treatment of cognitive distortions related to ethnic intolerance. Therefore, the null hypothesis which states that cognitive restructuring has no significant gender difference in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State is accepted.

4. Discussion

This study investigated the effect of cognitive restructuring in reducing cognitive dimensions of ethnic intolerance among adolescents in Taraba State. The results of the analysis showed that cognitive restructuring has significant effect in reducing cognitive dimensions of ethnic intolerance among adolescents. The effectiveness of the technique could be because it is a technique under the cognitive behaviour and rational emotive behaviour therapies. This technique helped in the reduction of cognitive distortions and helping the clients to challenge their irrational and unrealistic beliefs of ethnic intolerance. The finding of the study aligns with [Motevalli et al. \(2020\)](#) who conducted a study to find out the effect of a new cognitive restructuring and critical thinking intervention on test anxiety. The researchers concluded that cognitive restructuring is an important intervention that helps young people to think rationally and logically. The finding also agrees with [Eseadi et al. \(2020\)](#) who conducted a study on the effect of rational emotive behaviour therapy on re-offending thoughts of prisoners at Nsukka Prisons, Enugu State, Nigeria. Their findings suggest that cognitive restructuring as REBT technique has a significant positive effect on the thoughts of participants. The

sessions helped the participants in acquiring rational and more acceptable beliefs about themselves and people around them. Similarly, the finding of this study corroborates with findings by [Ahmad et al. \(2020\)](#) and [Astuti and Wangid \(2020\)](#) who found positive effect of cognitive restructuring in reducing irrational thoughts and beliefs in relation to procrastination and motivation among participants of the study. The finding of the present study suggests that the intervention played a meaningful role in promoting positive changes in the participants' beliefs and thoughts towards different ethnic groups. Cognitive restructuring as a technique under the umbrella of REBT and cognitive behaviour therapy (CBT) is an effective intervention that can be used in helping adolescents to decrease levels of irrational beliefs and thoughts as it relates to ethnic intolerance. This is evident in the fact that the participants displayed more tolerant attitudes as was observed in their post-test scores and during the follow-up period.

Another finding of this study indicates that cognitive restructuring has no significant gender difference in reducing cognitive dimensions of ethnic intolerance among adolescents. The implication here is that the intervention positively reduced both male and female adolescents' cognitive levels of ethnic intolerance equally. The reason could be attributed to the neutral nature of the therapy's content and the possibility that the participants exhibited a similar level of openness to change. The finding of this study is in agreement with findings by previous researchers ([Aliero et al., 2023](#); [Egbunike & Nwankwo, 2021](#); [Oparaduru, 2017](#)) who

reported the effectiveness of cognitive restructuring on both male and female adolescents. However, the findings of this study disagree with previous findings as reported by [Alnaimat \(2022\)](#) which indicated that cognitive restructuring has significant positive effectiveness on participants of the study who were all female students. Cognitive restructuring can provide both male and female adolescents with opportunities to challenge and dispute the irrational thoughts and beliefs of ethnic intolerance and to acquire better and healthy ways of thinking.

The implication discovered due to the findings of this study is that helping adolescents to acquire more rational and logical beliefs, and thoughts of ethnic tolerance, enabled them in exhibiting respect towards members of other ethnic groups, thereby leading to peaceful co-existence in the society. Another implication is that counsellors in Wukari Education Zone can be able to utilize Cognitive restructuring as a technique of rational emotive behaviour therapy (REBT) and adopt or adapt the treatment package which the researcher designed in order to help address ethnic intolerance among adolescents and adults who exhibit it.

5. Conclusions

This study examined the effectiveness of rational emotive behaviour therapy in reducing cognitive dimensions of ethnic intolerance among adolescents. Based on the findings of the study, the researcher concluded that cognitive restructuring is effective in reducing cognitive issues

associated with ethnic intolerance. The study found out that the technique resulted in a significant decrease in the irrational beliefs and thoughts which the participants exhibited prior to the treatment. The findings therefore, suggest that cognitive restructuring as a technique of REBT could be a veritable tool that can be applied in decreasing ethnic intolerance and enhancing peaceful co-existence in the community.

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Conflict of interest

The researcher declares that there is no conflict of interest.

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Research Paper: The Effects of Participation in Physical Activity and Exercise on Mental Health and Quality of Life of the Nurses



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Abstract

Objective: Despite numerous studies on the influence of regular engagement in physical activity and sports on mental health and quality of life across various demographics, there has been limited focus on its impact within the nursing profession. As a result, this study seeks to explore the effects of sports and physical activity participation on the mental health and quality of life of nurses.

Methods: The current study utilized a descriptive correlational design and was conducted in a cross-sectional manner. The target population consisted of all nurses employed in the hospitals of Tehran. The research sample was selected using an available sampling method, specifically among nurses who expressed their willingness to participate in the study. A total of 384 male and female nurses took part in the research and successfully completed the provided questionnaires. Standard questionnaires were used for data collection. Pearson correlation test and the structural equation modeling were used for data analysis.

Results: Results revealed that physical activity significantly affected depression ($T = -5.254$), anxiety ($T = -6.471$) and stress ($T = -4.527$). In addition, physical activity significantly affected quality of life ($T = 3.627$). Results of model fit are presented in Table 3 and indicated that the research model has good fit.

Conclusion: This implies that nurses could greatly enhance their well-being through increased engagement in physical activity and a decrease in sedentary habits. As a result, we strongly urge healthcare policymakers to implement measures aimed at increasing physical activity levels among nurses.

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1- Introduction

Nurses who work long daily and night shifts caring for patients with severe physical injuries are tasked with handling the care of dying patients, cardiorespiratory resuscitation, patients experiencing severe bleeding after surgery, and other high-stress situations that can lead to symptoms and physical ailments, eventually manifesting into psychological issues (Abdi et al., 2022; Afsanepurak et al., 2012; Dana & Shams, 2019; Dana et al., 2021). Nursing is a profession that exposes individuals to numerous mental health challenges, making nurses one of the most frequent groups to seek help from mental health professionals (Letvak et al., 2012; Mikkelsen et al., 2017; Newhan et al., 2014; Ohler et al., 2010). Furthermore, nurses tend to have poorer physical health compared to other sectors of society. Studies have shown that the prevalence of mental disorders among nurses is 8.38% in Taiwan, 22.8% in England, and 18.3% in Iran (Farsi et al. 2016; Ghorbani & Bund, 2014, 2017; Ghorbani et al., 2020; Khosravi et al., 2023; Moradi et al., 2020; Sadeghipor & Aghdam, 2021).

Nurses, by virtue of their profession, are consistently exposed to patients, pain, suffering, incidents, and stressors. The continuous interaction with patients and the round-the-clock responsibility for their care exposes nurses to various stressors, which in turn have detrimental effects on their physical, mental, and social well-being (American Psychological Association, 2014; Davidson, 2003; Jolivet, et al. 2010). These stress factors manifest as job stress, job

burnout, and physical and mental health issues, ultimately leading to a decline in quality of life, overall health, job satisfaction, and productivity (Sadeghipor et al., 2021; Sadeghipor et al., 2021; Seyedi-Asl et al., 2021; Seyedi-Asl et al., 2016; Taghva et al., 2020).

Sustainable development relies heavily on health, which is a crucial component of prosperity and enhancing the overall quality of life. According to the World Health Organization (WHO), health encompasses physical, mental, and social well-being, rather than just the absence of illness or disability (Ramachandra et al., 2013; Ulger & Yagli, 2010; Vasconcelos et al., 2013; Sharma, 2014; Masten, 2001; Sadeghipor & Aghdam, 2021). Mental health is recognized as a key aspect of overall well-being, alongside physical and social health. Factors such as age, social and economic status, marital status, social support, parental education, and exercise can all impact mental health. In particular, exercise and physical activity are vital for enhancing the mental health, facilitating socialization, psychological growth, and spiritual intelligence (Sadeghpour & Sangchini, 2020; Taso et al. 2014).

Enhancing health and quality of life can be achieved through engaging in physical activity and exercise. Sports offer recreational, therapeutic, and competitive benefits that contribute to the overall physical and mental well-being (Bandura, 1997; Conner & Davidson, 2003; Hartfiel et al., 2011; Herrick & Ainworth, 2000; Chris et al., 2010). Participation in sports helps in reducing stress, anxiety, and depression,

while also boosting self-efficacy, self-confidence, and mental health (Ellis, et al. 2013). By enhancing mental health and spiritual intelligence, individuals can provide better live, increase satisfaction, boost productivity, and reduce health costs. Incorporating regular physical and sports activities into their weekly routine can further improve the physical and mental health and spiritual intelligence. The importance of regular physical activity and exercise in promoting human well-being and mental health is highlighted by the World Health Organization's slogan in 2002, "Movement, the secret of health" (Faircloth, 2017).

Despite numerous studies on the influence of regular engagement in physical activity and sports on mental health and quality of life across various demographics, there has been limited focus on its impact within the nursing profession. As a result, this study seeks to explore the effects of sports and physical activity participation on the mental well-being and overall quality of life of nurses.

2. Methods

2.1. Research Design, Population, Sampling, Sampling Method

The current study utilized a descriptive correlational design and was conducted in a cross-sectional manner. The target population consisted of all nurses employed in the hospitals of Tehran. The research sample was selected using an available sampling method, specifically among nurses who expressed their willingness to participate in the study. A total of 384 male and female

nurses took part in the research and successfully completed the provided questionnaires. In order to be included in the study, participants were required to meet certain criteria, including: 1) providing written consent to participate, 2) completing all the questionnaires, and 3) being employed as a nurse in one of the hospitals in Tehran. On the other hand, participants were excluded from the study if they failed to complete the questionnaires or did not provide written consent.

2.2. Instruments

The physical activity questionnaire: This questionnaire developed by Sharkey (Letvak et al., 2012) comprises four five-choice questions focusing on duration, intensity, number of sessions, and sports activity history. Responses are scored using a five-point Likert scale, with each qualitative value corresponding to a numerical value ranging from one to five. The total physical activity score is calculated by summing up the scores of all questions, resulting in a score between 5 and 25. Individuals scoring above 15 can be classified as active, while higher scores reflect a greater level of activity in the respondent.

Depression, Anxiety, Stress Scale (DASS-21): The mental health of nurses was assessed in this study using DASS-21 (Connor & Davidson, 2003). DASS-21 consists of three self-report scales that evaluate negative emotional states related to depression, anxiety, and stress. The purpose of using this scale is to measure the intensity of the primary symptoms associated with depression, anxiety, and stress. To complete

the questionnaire, individuals are required to indicate the frequency of experiencing each symptom during the past week. This scale allows for a comparison of symptom severity across different weeks, enabling the assessment of treatment progress over time. Each subscale of DASS-21 comprises 7 questions, and the final score for each subscale is calculated by summing the scores of the corresponding questions. Each question is scored on a scale of 0 (not applicable to me at all) to 3 (extremely applicable to me). As DASS-21 is a condensed version of the original scale (which includes 42 questions), the final score for each subscale should be multiplied by two.

The quality-of-life questionnaire (Sharma, 2014): This questionnaire is based on the criteria proposed by the World Health Organization (BREF-WHOQOL). This questionnaire consists of questions that assess various aspects of quality of life, including four dimensions and two general questions about overall quality of life and health. The structure of the questionnaire is as follows: 1) Physical health domain: This domain focuses on physical health and covers areas such as daily activities, drug dependence, energy levels, fatigue, mobility, pain, sleep, rest, and work capacity; 2) Mental and psychological realm: This realm evaluates the psychological aspect of quality of life. It includes the individual's perception of their body and appearance, level of life enjoyment, sense of meaning in life, self-satisfaction, assessment of mental states like depression, despair, and sadness, as well as concentration and memory levels; 3) Social

communication domain: This domain encompasses personal communication, social situations, and sexual activities; 4) Environmental domain: This domain examines the environmental factors that influence quality of life. It includes financial resources, physical security and freedom, access to healthcare and social services, the physical environment of one's home, opportunities for skill development and access to information, engagement in creative activities and leisure time, transportation, and the overall physical environment; Each question in the questionnaire has five options, and a score is assigned to each option. The scoring ranges from one to five, with the scoring reversed for negative questions.

2.3. Data Analysis

The normality of the data was assessed using the Kolmogorov-Smirnov test. To examine the relationships between research variables, the Pearson correlation coefficient was employed. Structural equation modeling using Lisrel was used to calculate the study model. All statistical analyses were conducted at a significance level of $P < 0.05$ using SPSS version 24 software.

4. Results

Demographic data showed that mean age of the participants was 33.08 years old. Among the research participants, 63% were women while 37% were men. Out of the total of 384 individuals included in the research, 122 engaged in physical activity. This data indicates that the majority of the nurses

examined, specifically 68% of them, did not engage in physical activity throughout the week. In addition, the initial findings of this study indicated that nurses exhibit moderate to low levels of physical activity, moderate to high levels of depression, moderate to high levels of anxiety, moderate to high levels of stress, and medium level of quality of life.

To assess the normality of the data, the Kolmogorov-Smirnov test was utilized. Accordingly, it was found that distribution of the research variables' scores is normal (all $P > 0.05$).

Table 1
Correlation matrix between variables

	Mean±SD	1	2	3	4	5
1. Physical activity	10.24±4.34	1				
2. Depression	14.15±5.94	r=-0.528 P<0.001	1			
3. Anxiety	13.64±3.94	r=-0.637 P<0.001	r=0.634 P<0.001	1		
4. Stress	15.47±4.09	r=-0.410 P<0.001	r=0.528 P<0.001	r=0.413 P<0.001	1	
5. Quality of life	3.15±0.67	r=0.357 P<0.001	r=-0.854 P<0.001	r=-0.369 P<0.001	r=-0.257 P<0.001	1

The correlation test results presented in [Table 1](#) demonstrate the relationship between physical activity and variables such as depression, anxiety, stress, and quality of life. The results reveal a correlation coefficient between physical activity and depression, suggesting that depression decreases as physical activity levels increase. Furthermore, the correlation coefficient for physical activity level and anxiety was inverse and significant, suggesting that as physical activity increases, anxiety

decreases. Also, the correlation between physical activity level and stress was an inverse and significant association, indicating that as physical activity increases, stress levels tend to decrease. Also, there was a significant relationship between physical activity and quality of life. The current study suggests that engaging in exercise and physical activity can enhance one's quality of life. [Table 2](#) and [Figure 1](#) show the results of structural equation modelling.

Table 2
Results of structural equation modelling

	Path	β	T-value
1	Physical activity => depression	0.526	- 5.254
2	Physical activity => anxiety	0.632	- 6.471
3	Physical activity => stress	0.410	- 4.527
4	Physical activity => quality of life	0.328	3.627

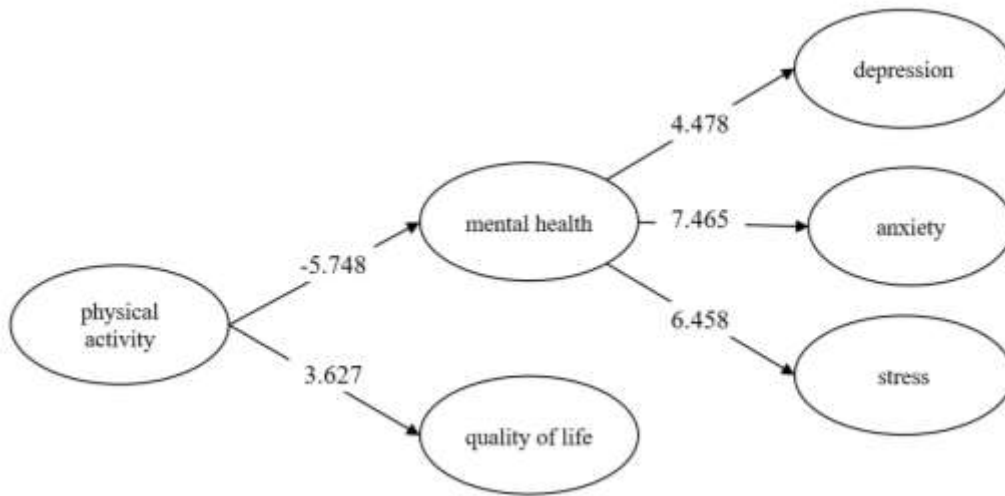


Figure 1

Structural equation modelling in the form of T-values

Results revealed that physical activity significantly affected depression (T= - 5.254), anxiety (T= - 6.471) and stress (T= - 4.527). In addition, physical activity

significantly affected quality of life (T=3.627). Results of model fit are presented in Table 3 and indicated that the research model has good fit.

Table 3

Results of model fit

Index	Optimal Range	Obtained Value	Conclusion
RMSEA	< 0.08	0.06	Good fit
X ² / df	< 3	2.84	Good fit
RMR	Closer to 0	0.02	Good fit
NFI	> 0.9	0.96	Good fit
CFI	> 0.9	0.95	Good fit

4. Discussion

The aim of this study was to explore the correlation between physical activities and mental health and quality of life among nurses. First, it was found that physical activity level of the nurses is low. Also, their mental health in lower than the average. Finally, the quality of life of nurses in about the medium level. These findings are clearly

showing that nurses are not in a good physical and mental condition and need special attention for improving their lifestyle and quality of life. Health assessment is one of the key dimensions in evaluating various societies, revealing that the societal significance is intertwined with the research variables. Mental health is crucial for maintaining the vitality and effectiveness of any system, including health system, and is

deemed a fundamental requirement for the well-being of the nurses (Khosravi et al., 2023; Moradi et al., 2020; Sadeghipor & Aghdam, 2021; Sadeghipor et al., 2021). Enhancing the drive to engage in sports activities leads to the generation of vitality and the proper alignment of their conduct, interests, and necessities with valuable and defined objectives. Hence, it is evident that meticulous and comprehensive planning is indispensable for ensuring mental health, and the more profound and precise this planning is, the more enduring the advancement and reinforcement of the motivation for sports participation will become (Sadeghipor et al., 2021; Seyedi-Asl et al., 2021; Seyedi-Asl et al., 2016; Taghva et al., 2020).

In elucidating the aforementioned findings, it is worth noting that engaging in exercise and physical activity regimens can serve as an effective method for enhancing the cognitive, social, and emotional aspects of individuals. Physical exercise plays a crucial role in mental well-being. Enhancing physical fitness can potentially lead to psychological well-being, and it is widely acknowledged that engaging in physical activities can yield positive impacts on individuals' anxiety and mood (Bandura, 1997; Conner & Davidson, 2003; Hartfiel, et al. 2011; Herrick & Ainworth, 2000). While the precise mechanisms behind the mental health benefits of exercise remain unclear, the significance of physical activity in promoting and fortifying mental health is evident. Physical activity boosts the body's metabolic rate, enhances blood circulation, burns excess calories, and elevates mood through the release of endorphins. Numerous

studies have demonstrated that exercise can alleviate symptoms of depression, which aligns with the findings of the current research. A study concluded that engaging in aerobic exercise 1 to 4 times per week at low to moderate intensity for 14 to 44 minutes can effectively treat depression. This exercise regimen can be complemented with pharmacotherapy, psychotherapy, behavioral interventions, and electroconvulsive therapy (Dana et al., 2021; Ghorbani & Bund, 2014).

Furthermore, numerous studies have documented the positive effects of exercise in treating depression (Masten, 2001; Sadeghipor & Aghdam, 2021). It has been concluded that exercise has a moderate impact on depression and should be incorporated into long-term treatment plans. However, the specific details regarding the number, duration, and intensity of the sports activities in these studies remain unknown. Exercise has the potential to influence various physiological factors, such as the increased secretion of beta-endorphins and monoamines, as well as the reduction of cortisol secretion (Davidson, 2003; Jolivet et al., 2010). Additionally, it serves as an uplifting activity, promotes social communication, facilitates skill acquisition, provides a distraction from daily routines, and fosters self-confidence. These factors collectively contribute to its role in alleviating the effects of depression. These findings align with previous research that has demonstrated the effectiveness of physical activity in improving mental health. Some studies have attributed the positive impact of physical activity and exercise on mental well-being to physiological adjustments. By

enhancing general health through skill development, self-assurance, social support, improved physical performance, balance, strength, flexibility, and increased serotonin secretion, sports activities contribute to overall mental well-being (Ramachandra et al., 2013; Ulger & Yagli, 2010; Vasconcelos et al., 2013; Sharma, 2014).

The utilization of a questionnaire in this study for data collection may have been influenced by the nurses' busy schedules and lack of patience, potentially impacting the responses. Additionally, limitations were encountered in terms of accessing the society and the target sample. Furthermore, the unavailability of accurate statistics on nurses and the difficulty in obtaining desired samples suggest the use of random sampling method and other data collection tools like observation and interviews to enhance the generalizability of the findings. Lastly, researchers are advised to compare various sports in order to assess their impact on improving the quality of life, overall health, and depression levels among nurses.

5. Conclusion

The study's results indicated a significantly low level of physical activity among nurses, underscoring the pressing requirement for interventions and policies focused on improving health-related physical activity within this demographic. Furthermore, a connection was noted between physical activity, improved mental health, and quality of life. This implies that nurses could greatly enhance their well-being through increased engagement in physical activity and a

decrease in sedentary habits. As a result, we strongly urge healthcare policymakers to implement measures aimed at increasing physical activity levels among nurses.

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Conflicts of Interest

No conflict of interest has been reported.

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Research Paper: The Relationships between Parent-child Interaction and Critical Thinking Disposition: Mediating Role of Cognitive Flexibility 

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Abstract

Objective: Critical thinking is considered a vital life skill for learning especially among students. The current research aims to determine a causal model of the relationship between parent-child interaction and the disposition towards critical thinking, with cognitive flexibility playing an intermediary role.

Methods: The research design was descriptive-correlational, utilizing structural equation modeling. The population included male and female middle school students from the city of Lahijan during the 2023-2024 academic year. A sample of 200 students was selected through convenience sampling. For data collection in this research, the Parent-Child Relationship Scale (PCRS), The California Critical Thinking Disposition Inventory (CCTDI), and the Cognitive Flexibility Inventory (CFI) were used. The data were then analyzed using Pearson's correlation test and structural equation modeling, with the help of SPSS 26 and LISREL 10.2 software.

Results: The results indicated that the proposed model was a good fit. Additionally, parent-child interaction and cognitive flexibility had a direct effect on the disposition toward critical thinking ($P > 0.05$). Parent-child interaction had a significant and positive indirect impact on the disposition toward critical thinking through cognitive flexibility ($P > 0.05$).

Conclusion: Therefore, it can be concluded that parent-child interaction and cognitive flexibility can predict critical thinking skills in students. School authorities and parents should pay special attention to these variables.

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1. Introduction

What kind of parents wouldn't want their offspring to become proficient in wise decision-making skills and effective problem-solving?

The significance of critical thinking is undeniably magnified in today's world, where misinformation, fraud, and deceit are commonplace. Reflecting on one's thought processes is one of the crucial aspects of critical thinking (Pulatova, 2023). Students engage in critical thinking when they analyze, evaluate, interpret, or synthesize information, and employ creative thinking to guide discussions, resolve dilemmas, and formulate conclusions. Critical thinking is vital for cultivating independence and motivating students to make choices and establish personal beliefs. It is essential not only for educational purposes but also for life's broader spectrum. Some experts assert it to be the paramount skill of the 21st century (Akbar, 2023), even though some research in Iran rates students' critical thinking as moderate.

Thinking, a core component of cognition is the mental action invoked during problem solving. It is a crucial mental operation that aids in defining and structuring experiences, strategizing, assimilating knowledge, reflecting, and innovating (Baron, 2023). Critical thinking, a specific type of thinking, is indispensable for progress in our times. With the surge of information, the need for an inquisitive mind becomes more pressing. Critical thinking contributes to developing long-term strategies and methods that support youth in selecting and pursuing their ambitions. It is an invaluable tool for young

individuals to interpret and evaluate a plethora of information they encounter (Rasmussen et al., 2016).

Critical thinking stands at the vanguard of education, assisting students in reflecting upon and comprehending their perspectives. This skill enables students to understand the world through observations and interpretations (Gafurova, 2023). Furthermore, critical thinking provides individuals with the means to approach decision-making and problem-solving with clarity, logic, and an organized methodology. Consequently, it leads to more enlightened decisions, inventive solutions, and improved outcomes (Liao et al., 2022). Critical thinking is the scrutiny of facts, observations, evidence, and arguments to inform judgment. It is a sophisticated subject, involving self-corrective, self-monitoring, disciplined, and autonomous thought (Clark et al., 2019). Therefore, a critical thinker is a person who either actively applies critical thinking skills or has been trained in its practices. Critical thinking shields people from deception and manipulation and enables them to address problems with greater creativity, autonomy, and efficiency (Sternberg & Halpern, 2020).

The inclination toward critical thinking is associated with factors such as the parent-child interaction. The parent-child relationship is a distinct and impactful connection essential for the adolescents' physical and mental development (Zwiers & Crawford, 2023). Research has shown that the parent-child relationship is a crucial element for the psychological health of children, and aggressive behavior in children is often a consequence of troubled families

with dysfunctional structures and inadequate parent-child communication. In such families, ranges of stressors are commonly observed. These include marital strife, lack of parental acceptance (evidenced by an absence of intimacy and support), parental rejection (characterized by a lack of positive emotions and harmful behaviors), inconsistent parental behaviors, psychological control over children, and challenging temperaments (Shigeto et al., 2014; Akcinar & Baydar, 2014; Rohner et al., 2012; Gulay & Onder, 2011). Consequently, the family dynamics, the nature of relationships among family members, the quality of parent-child communication, and the child's temperament play a pivotal role in the emergence of behavioral disorders.

Given that parents spend a considerable amount of time with their children, their relationship with their offspring and parenting approaches significantly influence the children's behavioral development. Factors such as leniency, inadequate supervision, hostile interactions, punitive measures, criminality, depression, personality disorders, inconsistent upbringing, contradictory behaviors, frequent failures, threats, humiliation, discrimination, and insufficient parental support can be primary contributors to behavioral issues (Matthys & Lochman, 2010).

Additionally, studies have demonstrated a correlation between cognitive flexibility and critical thinking (Ionescu, 2012). While critical thinking assists individuals in dissecting problems, cognitive flexibility is crucial in the quest for solutions. Information

and data inform us of past occurrences, yet the past is not always a reliable predictor of the future, particularly in swiftly evolving situations. Hence, it is imperative to practice flexible and critical thinking (Scheibling-Sève et al., 2022). Cognitive flexibility, known as cognitive shifting, pertains to the brain's capacity to adjust to novel, evolving, or unexpected events. Essentially, cognitive flexibility is the ability to transition from one thought process to another (Ionescu, 2012). Individuals with flexible thinking employ alternative rationales, positively reframe their cognitive schemas, embrace stressful or challenging circumstances, and demonstrate greater psychological resilience than those without flexibility (Burton et al., 2010). Some researchers regard cognitive flexibility as an individual's evaluation of the controllability of situations, which varies across different contexts (Zong et al., 2010).

Karimi and Fatemi (2019) studied the relationship between parent-child interaction quality and the tendency towards critical thinking in adolescent female students considering mental health components; they concluded that the quality of the relationship with the father significantly predicts mental health and the inclination towards critical thinking in adolescent female students. However, the quality of the mother's relationship did not significantly predict these outcomes. In their research involving 319 female high school students from Chalus City's public schools, Neymvari et al. (2023) found a positive and significant relationship between family communication patterns and the tendency towards critical thinking ($r=0.34$, $p<0.05$). They also reported a

positive and significant relationship between cognitive flexibility and the tendency towards critical thinking ($r=0.73$, $p<0.01$). The role of cognitive flexibility in children's learning power under dynamic experimental conditions was explored by [Stad et al. \(2019\)](#) who discovered that cognitive flexibility positively correlates with children's reasoning and conclusion abilities. [Daks and Rogge \(2020\)](#), investigated the correlations of psychological flexibility in romantic relationships and family dynamics in a meta-analysis and concluded that psychological flexibility and inflexibility were crucial in shaping interactions within couples and families. This finding underscored the link between psychological flexibility and family communication. [Güner and Gökçe \(2021\)](#) explored the reciprocal effects between the tendency toward critical thinking, cognitive flexibility, math anxiety as well as math achievement in 1628 students across 4, 8, and 12 grades using structural equation modeling. The results indicated a direct and reciprocal influence between the tendency towards critical thinking and cognitive flexibility. [Zwiers and Crawford \(2023\)](#) demonstrated that establishing a two-way dialogue in the classroom is an effective method for enhancing critical thinking, suggesting that a similar dialogue-based relationship between

parents and children could be beneficial. [Campo et al. \(2023\)](#) conducted a study with 263 Spanish students, revealing that the students perceived a relationship with teachers and parents as influential on critical thinking.

Upon examination of existing literature and reports, it is apparent that systematic investigations into cognitive flexibility within the dynamics of parent-child interactions, particularly about the propensity for critical thinking among students, are lacking. In light of the significance of these topics, the researcher has studied these variables to improve the caliber of critical thinking and elevate the educational standards of students. The question arises: Does cognitive flexibility serve as an intermediary factor in the nexus between parent-child interactions and the tendency of the students for critical thinking?

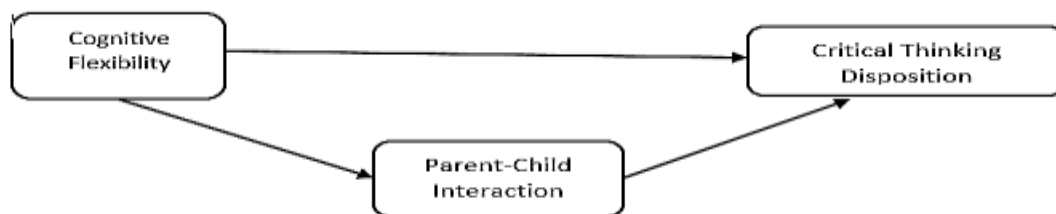


Figure 1
Conceptual model of research

2. Methods

This study was applied in nature and employed a descriptive-correlational approach through structural equation modeling. It encompassed a diverse group of middle school students, both girls and boys, from Lahijan city in the academic year 2021-2022. According to [Habibi and Kolahi \(2022\)](#), the minimum sample size for correlational research that utilizes structural equation modeling is 200.

2.1. Instruments

Parent-Child Relationship Scale (PCRS): The PCRS, developed by [Fine et al. \(1983\)](#), consists of 24 items used to assess the quality of parent-child relationships. It has two forms, one for evaluating the child's relationship with the mother and the other with the father. Both forms are identical except for the interchangeable terms "father" and "mother." The scale measures four dimensions: positive feelings, father's involvement as well as enmeshment, communication, and anger for the father's version; and positive feelings, role confusion/disgust, and communication determination for the mother's version. It is scored on a 7-point Likert scale, with the total score being the average of the subscales. The score range is 24 (low), 96 (medium), and 168 (high). In [Iraqi's research \(2008\)](#), the alpha coefficients ranged from 0.89 to 0.94 for the father-related subscales and 0.96 overall, and from 0.61 (identification) to 0.94 for the mother-related subscales, with an overall alpha of 0.96, indicating excellent internal consistency. The scale's creators

obtained these alpha coefficients by administering the questionnaire to 241 students.

The California Critical Thinking Disposition Inventory (CCTDI): [Facione \(1992\)](#) created this instrument comprising 34 questions to measure an individual's critical thinking skills (analysis, evaluation, inference, inductive reasoning, and deductive reasoning). Each item has four or five options, and since there is only one correct answer, the test-taker scores 0 or 1 per item. The total individual score ranges from 0 to 34. In [Khalili and Soleymani's study \(2003\)](#), the test reliability was 0.62 using the Kuder-Richardson method, and factor analysis for construct validity indicated that the test consists of five factors (analysis, inference, evaluation, deductive reasoning, and inductive reasoning), all of which correlated positively and significantly with the total test score. The test also distinguished the level of critical thinking skills between nursing and philosophy students. [Facione \(1997\)](#) reported the test reliability as 0.68-0.70 using the Kuder-Richardson method.

The Cognitive Flexibility Inventory (CFI): Introduced by [Dennis and VanderWal \(2010\)](#), the CFI is a brief 20-item self-report tool used to measure the cognitive flexibility necessary for an individual's success in challenging and replacing inefficient thoughts with more efficient ones. This tool is used to evaluate an individual's progress in clinical and non-clinical trials and in developing flexible thinking in cognitive-behavioral therapy for depression and other mental illnesses. It is scored on a 7-point Likert scale, with 1 for (strongly disagree,) 2

for (disagree), 3 for (somewhat disagree), 4 for (neutral), 5 for (somewhat agree), 6 for (agree), and 7 for (strongly agree). The lowest and highest possible scores are 20 and 140, respectively. In [Soltani et al.'s research \(2013\)](#), the concurrent validity of this inventory with Beck's Depression Inventory (BDI-II) was 0.39, and its convergent validity with Martin and Rubin's Cognitive Flexibility Scale was 0.75. The test-retest reliability of the entire scale was reported as 0.71, and Cronbach's alpha coefficients for the scale were reported as 0.90.

2.2. Procedure

Within the defined statistical population, a sample of 200 individuals was selected through a convenience sampling method implemented in educational institutions. Then, the research instruments were printed and disseminated within the designated demographic. Precautionary measures were taken to ensure the distribution of 260 questionnaires since the inherent playfulness and potential restlessness of the student participants could lead to incomplete or compromised questionnaires. This approach was taken to ensure the collection of 200 fully completed questionnaires, which were rigorously analyzed statistically. The analytical methodology employed in this study included Pearson correlation tests and structural equation modeling techniques. The statistical analysis was conducted using the advanced capabilities of SPSS 26 and LISREL 10.2 software.

3. Results

The study's demographic breakdown included 81 girls and 119 boys, constituting 40.5% and 59.5% of the sample, respectively. The participants' ages averaged 14.34 years, with a standard deviation of 2.08 years. Specifically, girls had an average age of 14.07, while boys were slightly older, averaging 14.61 years. Grade-wise distribution revealed 57 seventh graders (28.5%), 45 eighth graders (22.5%), and 98 ninth graders (49%), indicating a predominant representation of ninth graders in the sample. [Table 1](#) presents the mean and standard deviation of the research variables, categorized accordingly.

Table 1

Mean and standard deviation of research variables

	Variable Source	Mean	Standard Deviation
Critical Thinking (total)		91.88	12.29
	Truth-Seeking	12.65	2.97
	Consistency	10.21	2.71
	Self-Control	7.51	1.79
Critical Thinking	Analytical Mindset	12.68	1.83
	Problem-solving Orientation	13.43	3.17
	Curiosity	14.95	2.98
	Self-Confidence	10.31	1.85
	Perfection and Maturity	10.17	1.66
Parent-Child Interaction		93.78	13.15
Cognitive Flexibility (total)		80.67	12.06
Cognitive Flexibility-	Control	37.36	5.85
Control	Justification	21.11	4.16
	Perception of Different Options	22.20	3.45

The Kolmogorov-Smirnov test was utilized to assess the normal distribution of the research variables. The results for critical thinking ($P = 0.10$, $Z = 0.09$) and its sub-scales, such as truth-seeking ($P = 0.37$, $Z = 0.91$), organized action ($P = 0.20$, $Z = 0.03$), self-control ($P = 0.49$, $Z = 0.83$), analytical thinking ($P = 0.09$, $Z = 0.07$), inclination towards problem situations ($P = 0.19$, $Z = 1.07$), curiosity ($P = 0.51$, $Z = 0.81$), self-confidence ($P = 0.06$, $Z = 1.33$), perfection and maturity ($P = 0.10$, $Z = 1.21$), and parent-child interaction ($P = 0.85$, $Z = 0.41$), along with the sub-scales of cognitive flexibility including control ($P = 0.26$, $Z = 0.71$), justification ($P = 0.25$, $Z = 1.01$), and perception of different options ($P = 0.09$, $Z = 0.07$), were not statistically significant. This indicated a normal distribution of data.

Furthermore, the tolerance index and variance inflation factor for dependent variables of the study were greater than 0.1 (parent-child interaction and cognitive flexibility at 0.837 and 0.724, respectively) and less than 10 (parent-child interaction and cognitive flexibility at 1.145 and 1.381), respectively. This suggests that multicollinearity is not present among the research variables.

Table 2

Correlation matrix of research variables

Research variables	1	2	3
1. Parent-Child Interaction	1		
2. Critical Thinking	0.25**	1	
3. Cognitive Flexibility	0.33**	0.31**	1

*p < 0.05 **p < 0.01

It was noted that a positive correlation existed among parent-child interaction, cognitive flexibility, and critical thinking.

A specialized model fitting program was employed in assessing the proposed model's fit. This program is advantageous as it generates indices that gauge the model's

compatibility with the empirical data. Essentially, these indices reveal the model's capacity accurately to represent the data. Thompson suggests that the most critical indices for evaluating model fit are the Chi-Square Test (χ^2), Comparative Fit Index (CFI), and Incremental Fit Index (IFI), as corroborated by [Meyers et al. \(2006\)](#).

Table 3

Model fit indices

Index	Estimated Model	Saturated Model	Independent Model	Criteria	Result
NPAR	35	120	15	-	-
χ^2	366.108	0	1167.969	-	-
Df	85	0	105	-	-
χ^2/df	0.0000	-	11.124	< 3	Unacceptable
IFI	0.740	1	0	> 0.8	Unacceptable
CFI	0.736	1	0	> 0.8	Unacceptable
RMSEA	0.129	0	0.229	< 0.07	Unacceptable

[Table 3](#) revealed that the estimated model's Chi-square to degrees of freedom ratio stands at 11.124, surpassing the acceptable threshold of 3, as per [Kline \(2011\)](#), thus deeming it unsatisfactory. The model's RMSEA value was measured at 0.129, exceeding the upper limit of 0.07, which further signified a poor fit. Moreover, the IFI and CFI values, which should exceed 0.8, fall short at 0.74 and 0.736, respectively,

rendering them inadequate. These indicators collectively suggested a significant discrepancy between the current model and the theoretical framework. The model underwent revisions to address this, with the enhanced fit indices detailed in [Table 4](#).

Table 4

Improved Model Fit Indices

Index	Modified Model	Result
NPAR	43	-
χ^2	148.366	-
Df	77	-
χ^2/df	1.927	Acceptable
IFI	0.935	Acceptable
CFI	0.933	Acceptable
RMSEA	0.068	Acceptable

Table 4 illustrated that for the updated model, the Chi-square to degrees of freedom ratio stood at 1.927. With an RMSEA value of 0.068, the model achieves an acceptable

level of fit. Furthermore, the NFI and CFI values exceed the 0.8 benchmark, confirming the model's satisfactory alignment with the data.

Table 5

Overview of the Revised Model's Direct Coefficients

Path	Standardized Effect Coefficient	Significance Level	Significance at 95% Level	
			Lower Bound	Upper Bound
Parent-Child Interaction on Critical Thinking Disposition	0.215*	0.006	0.078	0.354
Cognitive Flexibility on Critical Thinking Disposition	0.195*	0.037	0.043	0.374

* $p < 0.05$

Table 5 showed that parent-child interaction had a direct positive effect on the variance of the criterion variable, namely the inclination towards critical thinking, by 0.22 units ($p < 0.05$). Considering the estimation error, these coefficients can range from 0.08 to 0.4 in the population. Therefore, parent-child interaction had a direct impact on the inclination toward critical thinking ($p < 0.05$). Additionally, Table 5 indicates that cognitive flexibility has a direct positive

effect on the variance of the criterion variable, namely the inclination towards critical thinking, by 0.195 units ($p < 0.05$). Considering the estimation error, these coefficients can range from 0.04 to 0.4 in the population. Consequently, cognitive flexibility has a direct effect on the inclination toward critical thinking ($p < 0.05$).

Table 6

Indirect Coefficients Summary in the Revised Model of Parent-Child Interaction via Cognitive Flexibility and Its Impact on Critical Thinking Disposition

Indirect Path	Total Standard Effect	Significance Level	Indirect Effect Standard	Significance Level
Parent-Child Interaction on Critical Thinking Disposition	0.270**	0.004	0.056*	0.037
*p < 0.05	**p < 0.01			

The results of [Table 6](#) demonstrated that through cognitive flexibility, parent-child interaction had a positive and significant indirect effect on the inclination towards critical thinking by 0.07 units ($p < 0.05$). Therefore, parent-child interaction indirectly influences the tendency towards critical thinking via cognitive flexibility.

4. Discussion

The results underscored that the interaction between parents and children positively and directly influences the propensity for critical thinking. This concurs with the findings of [Fouladchang and Ghodoumi Zadeh \(2015\)](#). [Kouroshnia and Latifian \(2012\)](#) also demonstrated that the various interactive scenarios families encounter throughout life can cultivate critical thinking in offspring. [Ennis \(1996\)](#) posited that the higher the parent-child relationship quality, the more pronounced the emergence and enhancement of critical thinking in adolescents. Critical thinking comprises at least two fundamental elements: the analysis and evaluation of arguments, necessitating the acquisition of skills for accurate comprehension and appraisal of reasons and assertions; and a critical spirit, encompassing attitudes

towards the family, as well as mental attributes and personality traits. A family's environment is conducive to the development of critical thinking. Indeed, children who maintain a positive and robust relationship with their parents are more inclined to utilize various thinking styles, particularly critical thinking; however, this is contingent upon the approach adopted by the parents. Parents who exhibit greater flexibility can significantly contribute to the intellectual growth of their progeny. In essence, parents who engage in positive interactions tend to nurture children who are critical thinkers. From the discourse, it is evident that the interactions between parents and children have a direct bearing on the inclination toward critical thinking. Thus, the research hypothesis is validated.

Moreover, the present study revealed that cognitive flexibility had a positive direct impact on critical thinking. These findings are in harmony with those of [Güner and Gökçe \(2021\)](#). To elucidate this hypothesis further, it was noted that in 1985, [Ennis](#) identified several characteristics integral to successful critical thinking, including the pursuit of diverse and flexible approaches devoid of bias, and the formulation of conclusions from different observations that

are thoughtfully and reasonably subject to judgment. This aspect of critical thinking is also discernible within the facets of cognitive flexibility. An individual endowed with critical thinking, who internalizes the competencies associated with critical thinking in posing essential questions and issues, collating and evaluating pertinent information, articulating results and substantiated solutions, and subjecting them to scrutiny, fortifies their intellectual frameworks. Such an individual is adept at identifying assumptions, rationales, and consequences, and forging effective connections to unearth solutions to intricate dilemmas. As [Paul and Elder \(2000\)](#) have articulated, critical thinking is a mode of contemplation about any topic or problem wherein the thinker augments the caliber and method of their thought process through the adept application of cognitive constructs, grounding it in rational standards. Engaging in this process necessitates cognitive flexibility traits, culminating in the cultivation of a critical thinker. Consequently, the research hypothesis was corroborated.

A recent study has revealed that the dynamics of parent-child interaction indirectly foster critical thinking through the lens of cognitive flexibility. Nowadays, there is a lack of comparative research on this specific topic, yet the outcomes of this investigation seem to resonate with the work of [Karimi and Fatemi. \(2019\)](#). The bond between adolescents and children in general, with their parents is instrumental in shaping their critical thinking abilities. The greater the flexibility parents exhibit in their

everyday interactions with their adolescents, particularly in fostering open dialogue and opinion exchange, the more they aid in cultivating their children's critical thinking skills. Parents who adopt a democratic approach in child rearing and respond flexibly to their children's viewpoints and critiques are exceptionally effective in nurturing critically minded offspring. It is acknowledged that cognitive flexibility evolves throughout an individual's life. Researchers define cognitive flexibility as the ability to adapt one's focus and thought process across various tasks or functions, particularly in adapting to new demands and changing rules. Consequently, it is inferred that parents who practice flexibility in their interactions are likely to develop critical thinking skills in their children, and cognitive flexibility, along with an understanding of cognitive components; this serves as a mediating factor in the relationship between parent-child interactions and critical thinking. In essence, adaptable parents indirectly mold their children's critical thinking capabilities. Hence, the research hypothesis stands validated.

A notable limitation of this study is its reliance on convenience sampling. The research, conducted among high school students in Lahijan city, is cross-sectional and correlational, limiting its applicability to other educational stages and locales. Being cross-sectional, it fails to capture the temporal evolution of variable relationships. Using self-reported questionnaires for data collection might introduce biases in the findings. The investigation was confined to two variables affecting critical thinking,

notwithstanding the potential influence of other psychological factors.

5. Conclusion

In light of these considerations, it is proposed that future research should expand to different educational levels and cities, employing varied data-gathering techniques like observation and interviews, and examining additional variables that may affect critical thinking, in a longitudinal format. Experimental methods should be utilized to explore causal connections. Based on the insights gained, it is advised that educational institutions and families emphasize enhancing parent-child interactions and cognitive flexibility among students, thereby fostering individuals with heightened critical faculties. Given the established direct impact of cognitive flexibility on critical thinking, it is recommended to organize workshops in schools to educate students on strategies to augment cognitive flexibility.

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Conflict of interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant

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