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Efficacy of Acceptance and Commitment Therapy on Alexithymia, Psychological Capital, and Subjective Vitality in Mothers with COVID-19 and Autistic Children

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A B S T R A C T

The purpose of this study was to compare the efficacy of Acceptance and Commitment Therapy (ACT) in reducing Alexithymia, enhancing psychological capital, and increasing subjective vitality in mothers diagnosed with COVID-19 who have autistic children. This was a quasi-experimental study employing a pre-test, post-test, and follow-up design with a control group. The sample consisted of mothers diagnosed with COVID-19 having autistic children in the city of Mashhad, who were referred to the Ava Health Center (Total: 70 individuals). Data were collected using random cluster sampling, and finally, 30 individuals were selected and assigned to two groups of 15 participants each in the experimental and control groups. For data collection and evaluation of the desired characteristics and conditions, a demographic form and questionnaires on marital intimacy, forgiveness, and marital boredom were used. Participants in the experimental group underwent therapy in eight 90-minute sessions held twice weekly based on Bowen's (2009) family therapy protocol. Data were analyzed using repeated measures ANOVA with the SPSS-16 statistical software. The findings indicated that Acceptance and Commitment Therapy was effective in reducing Alexithymia ($p = .004$), increasing psychological capital ($p = .001$), and enhancing subjective vitality ($p = .001$) in the mothers with COVID-19 and autistic children ($p > .05$). Acceptance and Commitment Therapy can be utilized to improve Alexithymia, psychological capital, and subjective vitality in mothers diagnosed with COVID-19 who have autistic children.

Keywords: *Acceptance and Commitment Therapy, Alexithymia, Psychological Capital, Subjective Vitality, COVID-19, Autism.*

1. Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by mild to severe difficulties in social interaction and communication, along with repetitive patterns of behavior, interests, and activities (1, 2). These impairments are pervasive and become apparent in early developmental stages, affecting the individual throughout their lifetime. Autism is a developmental disorder identified by abnormal communicative and verbal behaviors. The primary cause of the disorder remains unknown. Economic status, social background, lifestyle, and parents' educational level do not play a role in the occurrence of autism (3). This disorder impacts the normal development of the brain in the areas of social interactions and communication skills. Children and adults with autism struggle with verbal and non-verbal communication, social interactions, and play-related activities (4, 5). The disorder makes it difficult for them to interact with others and the external world. Autism is a severe developmental disability that manifests in the first three years of life, with behavioral symptoms occurring in 2 to 4 cases per 10,000 births. Autism is seen four times more frequently in boys than in girls (6-8). In fact, there is a significant positive overall relationship between COVID-19 anxiety in mothers and parent-child interaction, and a significant positive relationship with aggression (9, 10). Additionally, anxiety, depression, stress, and resilience have increased in families during the COVID-19 pandemic (11). The coronavirus is a contagious disease caused by the severe acute respiratory syndrome coronavirus. The first case was identified in Wuhan, China, in December 2019. Since then, the disease has spread worldwide and has led to a pandemic. COVID-19 symptoms vary but often include fever, cough, fatigue, breathing difficulties, and loss of smell and taste. Symptoms may start one to fourteen days after exposure to the virus. At least one-third of infected individuals do not show significant symptoms (12, 13). Some people continue to experience a range of effects months after recovery - known as long COVID - and damage to body organs has been observed. Multi-year studies to further investigate the long-term effects of the disease are underway (14).

Sensory processing sensitivity can be a determinant of positive and negative emotions and feelings in an individual, and a disruption in affect can lead to emotional problems such as Alexithymia (15, 16). Poor emotional awareness has been studied for several decades and is known as Alexithymia (17, 18). Alexithymia is a multifaceted construct whose main characteristics are an inability to recognize and verbally describe personal emotions and a severe deficiency in symbolic thinking, which limits the expression of feedback, feelings, desires, and attractions (19). According to research, the inability to utilize emotions as one of the signs of emotional problems hinders abstract thinking and causes a reduction in dream recall, difficulty in distinguishing between emotional states and bodily sensations, a stiff and formal demeanor, lack of emotional facial expressions, limited capacity for empathy and self-awareness (3). Indeed, these individuals have difficulty recognizing emotions and describing their feelings; they have limited imaginative power, indicating a restriction in their imagination; and they exhibit a verbal, utilitarian, and external cognitive style (20). Studies have shown that suppression of expression is associated with difficulty in identifying and describing feelings, "as a central feature of Alexithymia" (21).

Since the mother has the highest rate of interaction with the child and most of the child's time is spent with the mother, establishing an appropriate relationship with the child can help his greater peace of mind (22, 23). As mothers generally interact with the child more than other family members, they experience more problems and stress compared to other family members when the mother has components of mental health, she can provide a rich and healthy environment for her child with autism spectrum disorders to endure unpleasantness and stress (24, 25). Reeve & Singer (2006) believe that psychological capital goes beyond mental capital and is an appropriate index for considering health. Additionally, psychological capital is one of the important factors in individual and social growth and development. When individuals have mental health and psychological capital, they are able to cope with problems and unpleasantness that occur to them and choose solutions. Therefore, providing psychological capital for all individuals in society, especially mothers, is of great importance (26, 27). Psychological capital, like human capital and social capital, is one of the intangible capitals of society that, unlike tangible capitals, can be managed with

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less expense and can yield significant results. Psychological capital is one of the key and main human resources (28, 29).

The coronavirus can affect psychological variables and mental health of mothers. Subjective vitality in individuals facing the COVID-19 pandemic and their social support are influential. Subjective vitality can be considered in two dimensions: daily experiences and cognitive aspects. Positive and negative affect, daily experiences, and subjective vitality make up the cognitive dimension of mental well-being (30). Subjective vitality in self-determination theory is the experience of feeling eager, alive, and internal energy. Subjective vitality is more than arousal, being active, or having energy resources; it is a specific psychological experience during which individuals feel a zest for life and morale (30, 31).

One of the therapeutic approaches is Acceptance and Commitment Therapy (ACT). Acceptance and Commitment Therapy is a type of clinical behavior analysis used in psychotherapy. This method is an evidence-based psychological intervention that blends acceptance and mindfulness strategies with commitment and behavior change strategies in various ways (32-34). Overall, one of the main goals of Acceptance and Commitment Therapy is to increase psychological flexibility; in other words, it helps the patient to break out of the cycle of avoidance and cognitive fusion (35, 36). Acceptance and Commitment Therapy explicitly focuses on living better, regardless of whether better living is accompanied by feeling better (32). Overall, in Acceptance and Commitment Therapy, the person is taught to stop fighting with themselves and not limit their life to escaping from unpleasant internal experiences. With the clarification and elucidation of values, the individual strives for their life (34). Given the theoretical foundations of the research and the role of Bowen family therapy and Acceptance and Commitment Therapy as key factors in relation to the psychological problems of mothers with COVID-19 who have autistic children and the research gaps in this area, the use of the results of this research in the effectiveness on Alexithymia, psychological capitals, and subjective vitality is one of the important necessities of this study; therefore, this research intends to investigate whether Acceptance and Commitment Therapy is effective on Alexithymia, psychological capital, and subjective vitality in mothers with COVID-19 who have autistic children.

2. Methods and Materials

2.1. Study Design and Participants

The present study is an applied research, characterized as a quasi-experimental study using pre-test, post-test, and follow-up designs with a control group. The statistical population consisted of mothers diagnosed with COVID-19 who have autistic children in Mashhad and were referred to the Ava Health Center (Total: 70 individuals). The samples were selected using a convenience sampling method, resulting in 30 participants who were finally divided into two groups of 15 for the experiment (two groups) and control (one group). Using G-Power software and based on an effect size of 0.25, an alpha of 0.05, and a power of 0.80 across two groups, the minimum sample size required to achieve the desired power was 15 per group, totaling 30 participants. Considering the sample attrition rate based on previous studies, a drop of two individuals per group was anticipated; therefore, the total number of sample individuals was set at 30 (15 in each of the experimental and control groups). The control group did not receive any training. Eligibility criteria included at least one month since testing negative for COVID-19, age range of 25-50 years, a minimum education level of a high school diploma, and full consent to participate in the study. Exclusion criteria included a history of psychiatric and psychological interventions in the past year, use of psychiatric medications, and absence from more than two sessions of group therapy.

In this study, after defining the objectives, the appropriate working tools were reviewed. During this review, the tests and scales described in the research tools section were selected. After sample selection, a permit for conducting the research was obtained from the welfare office of Mashhad. Subsequently, in collaboration with the prevention office of the welfare department, names of counseling service centers were obtained, and two specialized family counseling centers in District 6 of Mashhad were selected. Then, by visiting these centers and presenting the research objectives to the center officials, a call for participation was announced, and notices were posted at the selected centers for identifying and registering participants (mothers diagnosed with COVID-19 who have autistic children). Ninety-three individuals expressed willingness to participate in the treatment plan, and finally, 30 mothers diagnosed with

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COVID-19 who have autistic children were randomly selected and divided into two groups: an experimental group undergoing Acceptance and Commitment Therapy (15 individuals) and a control group (15 individuals). After the final selection of research groups, participants from both groups were asked to attend an orientation session. In this session, the research objectives were explained to motivate and obtain the necessary consent from the participants. Subsequently, the experimental group underwent treatment in eight 90-minute sessions held twice a week (on Mondays and Thursdays) based on the Acceptance and Commitment Therapy protocol in a group setting at the family counseling centers. After the last training session, a post-test was administered simultaneously and under the same conditions to the three groups. To respect the ethical rights of the participants, they were asked to fill out a consent form and informed about the confidentiality of their information, with instructions not to disclose their names or family names in the questionnaires. Participants were also informed that they could withdraw from the study at any time.

2.2. Measures

2.2.1. Psychological Capital

The Psychological Capital Questionnaire, designed by Luthans in 2007, consists of 24 questions across four subscales: hope, resilience, optimism, and self-efficacy, each subscale containing six items. It is scored on a six-point Likert scale with questions like (I examine a problem for a long time to find a solution). The reliability and validity of the questionnaire were assessed in the study by Bahadorkhoshroshahi et al. (2012), and the Cronbach's alpha coefficient calculated in the study was above 0.70 (26, 27).

2.2.2. Alexithymia

The Toronto Alexithymia Scale, a 20-item test designed by Taylor, Bagby, and colleagues in 1997 to assess individuals' alexithymia, includes three subscales: difficulty in identifying feelings (7 questions), difficulty in describing feelings (5 questions), and externally oriented thinking (8 questions). The questionnaire is scored on a five-point Likert scale ranging from strongly disagree to strongly agree, with total scores between 20 and 100. A score between 20 and 40 indicates low alexithymia, 40 to 60 indicates moderate alexithymia, and above 60 indicates high alexithymia. The psychometric properties of the Toronto Alexithymia Scale have been reviewed and validated in numerous studies. The concurrent validity of the Alexithymia scale was also confirmed based on correlations between its subscales and measures of emotional intelligence, psychological well-being, and psychological distress. The Persian version's concurrent validity was confirmed in the study by Besharat (2008). Also, the Cronbach's alpha coefficients for total alexithymia were 85%, and for the subscales difficulty in identifying feelings 82%, difficulty in describing feelings 75%, and for externally oriented thinking 72%, indicating good internal consistency. The test-retest reliability of the questionnaire over a four-week interval was confirmed from 0.71 to 0.77 for total alexithymia and its dimensions (17, 37).

2.2.3. Subjective Vitality

This scale, developed by Ryan and Frederick in 1997, consists of 7 statements scored on a seven-point Likert scale from (not at all true for me = 1 to completely true for me = 7), with statement 2 scored in reverse. Higher scores indicate higher states of subjective vitality. Ryan and Frederick (1997) explored the exploratory factor validity of this scale, achieving 70% explained variance. They also reported a Cronbach's alpha of 0.92. Tanhaei et al. (2019) also reported internal consistency and item discrimination power from 0.32 to 0.81, as well as a correlation coefficient of the questionnaire between 0.73 and 0.87, and a Cronbach's alpha of 0.91. In Iran, a Cronbach's alpha of 0.79 was obtained for the scale. The face and content validity were confirmed by 5 psychology professors (Keshavarz, 2008). In the study by Arabzadeh (2017), the reliability of the questionnaire using Cronbach's alpha was 0.79. This scale was first translated into Persian by Arizi (2003), and its face and content validity were confirmed by 5 clinical psychology professors. A Cronbach's alpha of 0.85 was obtained for the scale, and a sample question is, "I feel like a lively and active person". Taghizadeh (2006) in his research titled "Investigating the Relationship Between Job Satisfaction, Happiness, and Vigor among Faculty Members at the University of Isfahan," used the Vigor Scale questionnaire, and the internal reliability of the Vigor Scale questionnaire was again obtained in this study with a total Cronbach's alpha of 0.74. Abolghasemi (2003) in his research titled "Norming of

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Positive and Negative Affect and Concurrent Validation with Mental Health and Vigor Scales among University Students" used the Vigor Scale questionnaire, and the internal reliability of this questionnaire was again obtained in the research by Abolghasemi with a total Cronbach's alpha of 0.84 (30, 31).

2.3. Intervention

2.3.1. Acceptance and Commitment Therapy (ACT)

This intervention protocol outlines the structured approach of Acceptance and Commitment Therapy (ACT) as adapted for mothers diagnosed with COVID-19 who have autistic children. Spanning eight sessions, each lasting 90 minutes and held twice weekly, the protocol aims to facilitate acceptance of difficult emotions and thoughts, enhance mindfulness, and commit to personal values, thus fostering greater psychological flexibility. The sessions are designed to sequentially build skills in identifying, accepting, and relating to thoughts and feelings in a more adaptive manner (32-36, 38).

Session 1: Introduction and Orientation

The first session is focused on welcoming the participants and facilitating introductions among group members and the therapist. Participants share their feelings about attending the session, their reasons for coming, and their expectations from the therapy. Previous similar experiences and mandatory group rules such as punctuality, attendance, homework completion, confidentiality, and mutual respect are discussed. An overview of the principles of acceptance and commitment and their potential outcomes is presented. The session concludes with the administration of a pre-test to assess the initial state of the participants.

Session 2: Understanding the Need for Psychological Interventions

The second session explores why psychological interventions are necessary, aiming to instill hope and the expectation that therapy can reduce psychological distress. The core principle of acceptance is introduced, emphasizing the importance of recognizing thoughts as just thoughts, and feelings as just feelings. A homework assignment is given, focusing on self-acceptance and the emotions arising from the illness.

Session 3: Acceptance Without Judgment

This session begins with a review of the homework from the previous session. Group discussions center on the members' feelings and thoughts, with an emphasis on accepting these without judgment of being good or bad. Training is provided on recognizing the differences between emotions, thoughts, and feelings. Homework for this session involves reflecting on how much participants accept themselves and others.

Session 4: Mindfulness and Presence

In the fourth session, the homework is reviewed, and techniques of mindfulness and focusing on breathing are introduced. Participants practice being present in the moment and stopping intrusive thoughts. There is a reiteration of the acceptance principle in relation to understanding feelings and thoughts from a different perspective. The session's homework encourages participants to view life's stressful events differently and not as endpoints.

Session 5: Differentiating Acceptance from Resignation

The fifth session reviews the tasks and introduces the distinction between acceptance and resignation, highlighting the importance of accepting what cannot be changed. The concept of non-judgmental awareness of one's emotions is taught. Participants are encouraged to be mindful and aware of their emotions in every moment, simply observing without judgment. Homework involves practicing mindfulness with non-judgmental acceptance.

Session 6: Commitment and Action

Feedback is provided at the start of the sixth session, and a brief survey of the therapeutic process is conducted. Members are asked to express their feelings and emotions related to the previous session's homework. The principle of commitment and its necessity in the therapeutic process are discussed, emphasizing commitment to action towards valued life directions despite adversities. Techniques for selective attention to enhance calm in face of negative thoughts are practiced, along with a repetition of mindfulness and body scan exercises.

Session 7: Behavioral Patterns and Commitment to Action

The seventh session provides feedback and addresses unresolved issues among the group members. Behavioral patterns regarding accepted matters are identified, and commitment to act on these is reinforced. Participants work

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on enhancing their ability to choose actions that are appropriate rather than just convenient.

Session 8: Consolidation and Closure

The final session involves a review of the homework, a summary of the topics covered, and obtaining commitments from members to continue practicing the skills learned post-therapy. Feedback is provided to group members, and their participation is acknowledged with gratitude. The session concludes with the administration of a post-test to evaluate the outcomes of the therapy.

2.4. Data Analysis

In this study, data analysis was performed in two parts: descriptive and inferential. The descriptive section included central and dispersion indices - frequency, percentage frequency, minimum and maximum data, mean, and standard deviation. In the inferential section, the hypothesis of the normal distribution of data was first tested using the Kolmogorov-Smirnov test. Then, the hypothesis of homogeneity of error variance was examined using Levene's test. Finally, for the analysis of research hypotheses, repeated measures analysis of variance and Bonferroni post-hoc test were used. It should be noted that SPSS-16 software was used for data analysis.

3. Findings and Results

The mean (standard deviation) age of participants was 39.7 (9.4) years for the experimental group and 36.2 (7.9) years for the control group. Additionally, the minimum and maximum ages in the experimental group were 25 and 48 years, respectively, and 26 and 50 years in the control group. Descriptive statistics for the research variables, including mean and standard deviation for the three groups in both pre-test and post-test, are presented in Table 1.

Table 1

Descriptive Indices of Research Variables

Variable	Group	Phase	Mean	Standard Deviation
Alexithymia	Acceptance and Commitment	Pre-test	56.40	15.53
		Post-test	53.13	15.20
		Follow-up	54.11	16.20
	Control	Pre-test	56.73	16.38
		Post-test	57.20	16.25
		Follow-up	57.38	16.44
Psychological Capital	Acceptance and Commitment	Pre-test	91.80	26.13
		Post-test	96.33	25.49
		Follow-up	96.79	26.86
	Control	Pre-test	91.73	30.30
		Post-test	92.67	29.56
		Follow-up	92.44	29.38
Subjective Vitality	Acceptance and Commitment	Pre-test	20.27	5.57
		Post-test	22.00	5.68
		Follow-up	25.52	6.47
	Control	Pre-test	19.87	5.93
		Post-test	20.33	6.08
		Follow-up	20.40	6.18

To ensure the normality of the research data, the Shapiro-Wilk test was used, which showed that the significance levels of the Shapiro-Wilk test for all groups in both the pre-test and post-test phases were greater than .05, confirming the normality of the data related to the research variables in both the experimental and control groups at the stages in question. The M. Box test examined the null hypothesis that the observed covariance matrices of the dependent variable (research variables) are equal among different groups. Given that the significance level of the test was .984, which is more than .05, it supports the null hypothesis of equality of the observed covariance matrices of the dependent variable (research variables) among different groups, thus this assumption is confirmed.

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Table 2

Repeated Measures ANOVA for Comparing Pre-test, Post-test, and Follow-up of Alexithymia, Psychological Capital, and Subjective Vitality in Experimental and Control Groups

Scale	Source of Effect	Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance	Eta Squared
Alexithymia	Time*Group	127.467	2	63.734	6.258	.004	.243
	Group	63.734	1	63.734	6.258	.004	.243
Psychological Capital	Time*Group	109.472	2	54.736	9.650	.000	.331
	Group	54.736	1	54.736	9.650	.001	.331
Subjective Vitality	Time*Group	14.275	2	7.138	7.293	.002	.272
	Group	14.275	1	14.275	7.293	.002	.272

Results from Table 2 show that the obtained F-ratios for the group factor in the dimensions of Alexithymia, Psychological Capital, and Subjective Vitality are significant ($p < .01$). This finding indicates that Acceptance and Commitment Therapy was effective in reducing Alexithymia, increasing Psychological Capital, and enhancing Subjective Vitality in mothers diagnosed with COVID-19 who have autistic children. In this regard, a repeated measures ANOVA was conducted for the experimental group at three stages of the therapeutic intervention, showing improvement in Alexithymia, Psychological Capital, and Subjective Vitality.

Table 3

Bonferroni Post-Hoc Test Results Within the Acceptance and Commitment Therapy Group in Alexithymia, Psychological Capital, and Subjective Vitality

Variable	Time	Mean Difference	Standard Error	P-value
Alexithymia	Pre to Post	2.96	1.25	.002
	Pre to Follow-up	2.86	1.25	.002
	Post to Follow-up	0.50	1.22	.896
Psychological Capital	Pre to Post	4.56	1.25	.001
	Pre to Follow-up	5.91	1.31	.001
	Post to Follow-up	0.45	1.29	.945
Subjective Vitality	Pre to Post	4.67	1.25	.001
	Pre to Follow-up	5.43	1.31	.001
	Post to Follow-up	0.28	1.33	.835

Changes over time in the experimental group, as shown in Table 3, indicated that improvements in Alexithymia, Psychological Capital, and Subjective Vitality in the post-test compared to the pre-test were significant ($p < .001$). Also, significant differences were observed in the follow-up phase compared to the pre-test ($p < .001$), but no significant differences were observed in the follow-up phase compared to the post-test ($p > .01$).

4. Discussion and Conclusion

The objective of this study was to determine the effectiveness of Acceptance and Commitment Therapy (ACT) in reducing Alexithymia, increasing psychological capital, and enhancing subjective vitality among mothers diagnosed with COVID-19 who have autistic children. According to the findings, Acceptance and Commitment Therapy was effective in reducing Alexithymia, increasing psychological capital, and enhancing subjective vitality in this demographic. These results are consistent with those found in the prior studies (18, 39-56).

In explaining these results, it can be said that from the perspective of Acceptance and Commitment Therapy, being in difficult conditions, such as those faced by mothers with COVID-19 and autistic children, if it leads to denial, avoidance, or continual conflict, can result in stress and anxiety. Furthermore, trying to control and fight against internal events, such as emotions and feelings associated with having an autistic child, can intensify and increase the

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frequency of these emotions. Acceptance and Commitment Therapy, through the acceptance of unpleasant thoughts and emotions associated with being in these circumstances, directly targets their worries and helps these mothers to use various exercises and appropriate metaphors instead of fleeing, denying, or avoiding negative emotions about everyday events. They learn to accept rather than avoid thoughts and feelings related to having a disabled child. In other words, these mothers learn that although they cannot change the life conditions and having such a child, they can view it differently and perform behaviors consistent with parenting values tailored to the needs and characteristics of this child (24, 25). Additionally, this therapy, by using mindfulness techniques, teaches these mothers to pay attention to their internal experiences and, instead of judging them, simply observe them. Indeed, by focusing on the context in which these internal events (emotions, thoughts, memories) occur rather than the events themselves, their tolerance threshold increases, and their responses to stressful situations become more balanced. By consistently practicing this approach, these mothers learn that internal experiences are less threatening and therefore can reduce the harmful effects of these emotions on themselves. The birth of a child with autism brings stress for the family, especially for mothers who are the primary caregivers. They are forced to endure greater psychological pressure, experiencing emotions such as anger, sadness, crying, and mourning within this spectrum (33, 35). These psychological pressures can cause problems in their role as mothers and affect their mental health, psychological capital, and subjective vitality. Acceptance and Commitment Therapy, through techniques, exercises, and metaphors, helps these mothers adopt a more positive view of their unique maternal circumstances. Given what has been said about the effectiveness of Acceptance and Commitment Therapy and the ACT approach in reducing Alexithymia, increasing psychological capital, and enhancing subjective vitality in mothers diagnosed with COVID-19 who have autistic children, there is no difference.

It can be said that in the commitment and acceptance-based approach, psychological inflexibility and avoidance of accepting distressing thoughts and feelings lead to the reinforcement of these feelings and thoughts and greater distress; consequently, individuals lose a sense of competence and effectiveness, and the quality of their psychological and physical life decreases. This approach helps individuals to focus on the present rather than living in the past or future, to identify their values, and to act according to their values and goals instead of trying to control internal events (Wampler, 2020). Families with an autistic child undergoing treatment with this approach learn that instead of mentally reviewing behavioral and emotional defects of the child, marital conflicts created, and the inability to cope with these problems and drowning in feelings of sadness, anger, despair, shame, helplessness, inadequacy, and anxiety, they can identify goals aligned with their values (22, 25). They commit to these goals and consider all available social and family resources to achieve the best possible performance. Thus, Acceptance and Commitment Therapy, by committing individuals to better identify and utilize these resources, enhances their service capability. Regarding the effectiveness of this approach on Alexithymia in mothers diagnosed with COVID-19 who have autistic children, it can be said that among the values promoted in treatment based on commitment and acceptance is the presentation of the technique of acceptance or the willingness to experience coping with difficulties or other disturbing events without attempting to control them, leading to a better understanding of resilience against life challenges. Individuals come to believe that they have the ability to cope with personal, family, and social life challenges (32, 33). As a result, initially, avoidance, distress, and fear of challenges decrease, and ultimately Alexithymia decreases. In other words, an individual with high acceptance can easily be aware of the arousal of thoughts and feelings without trying to control them or avoid them, which has positive consequences. Conversely, an individual with low acceptance easily experiences psychological arousal and strategies for altering the shape and frequency of thoughts and feelings, such as trying to rationalize or suppress their thoughts; therefore, Acceptance and Commitment Therapy, by teaching acceptance and commitment to its implementation, leads to a reduction in Alexithymia.

On the other hand, Acceptance and Commitment Therapy is one of the treatments that primarily focuses on psychological flexibility and awareness of emotions and thoughts. It is a practical psychotherapeutic approach that is rooted in behavior therapy and cognitive-behavioral therapy. This treatment has six principles (acceptance, commitment,

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cognitive defusion, being present, values, and self as context) to bring clients to psychological flexibility. The goal of the therapy is to help clients experience a rich and meaningful life and to accept painful past experiences as part of themselves. Acceptance and Commitment Therapy is also very effective in thinking and reflection capacity and causes an individual to avoid aggression and quick, irrational expressions (24, 25, 35, 36). It is clear that reflection on stressful events can be regulated using cognitive coping strategies. In this treatment, which is part of the third wave of psychotherapies also known as postmodern psychotherapies, it is believed that cognitions and emotions must be considered within the conceptual context of phenomena. An individual's ability to separate the cognitive process from the emotional process they are experiencing indicates a degree of differentiation. Individuals with low levels of differentiation are at high risk of engaging with psychological problems due to high levels of anxiety; however, individuals with high levels of differentiation choose active, realistic, and problem-focused coping responses instead of avoidance or emotion-focused responses, thereby increasing the psychological capital of mothers.

Part of the findings of this study demonstrated that Acceptance and Commitment Therapy (ACT) was effective in enhancing the subjective vitality of mothers diagnosed with COVID-19 who have autistic children. Mothers of children with physical and motor disabilities often deny reality upon the diagnosis of their child's disorder. Through the process of training based on Acceptance and Commitment Therapy, mothers with COVID-19 who have autistic children acquire essential psychological skills to accept painful thoughts and feelings with the least psychological cost. Through this intervention, these mothers gain the ability to consciously change their behavior, beliefs, and attitudes and become aware of obstacles to committed action, future-oriented thoughts, and emotional reactions (such as feelings of vulnerability, depression, anxiety, stress, and painful memories) and by employing mechanisms of accepting difficulties and choosing committed actions, they experience higher hope in life and fewer conflicts regarding their child (22, 33).

Acceptance and Commitment Therapy reduces dysfunctional (irrational) beliefs, cognitive vacuums, and cognitive distortions, thereby decreasing anxiety and consequently increasing the subjective vitality of mothers with COVID-19 who have autistic children. This therapy helps the client to accept unpleasant thoughts and feelings and ultimately, by letting go of these thoughts and feelings, to stop struggling with them. During various exercises, the client learns to neutralize the destructive effects of their critical and evaluative mind. Acceptance and Commitment Therapy enables individuals to reduce the sufferings and increase joy and the ability to achieve what they want in life by regularly practicing and repeating this learning, thus ensuring the long-term sustainability of these positive effects (35, 36). In this study, training based on Acceptance and Commitment Therapy was effective in enhancing the subjective vitality of mothers with COVID-19 who have autistic children. Indeed, this therapy, by improving relationships as a key therapeutic component, enabled mothers with COVID-19 who have autistic children to interact more constructively and feel a greater closeness with their child (22, 25). Improving the quality of relationships can potentially reduce anxiety in mothers with COVID-19 who have autistic children across a broad spectrum of cognitive and behavioral disorders in the child. Family support, especially from the mother, significantly impacts various aspects of life for children with physical and motor disabilities, particularly in improving motivation and subjective vitality and presence in society, and can act as a moderating factor in coping with stressful life conditions in society (32, 38).

The data for this study were obtained using self-report tools; it is recommended that future research use other data collection methods such as interviews and observations. This study was cross-sectional; it is suggested that future researchers conduct qualitative and longitudinal studies. It is recommended that future research control demographic variables such as economic status, religion, and ethnicity. Future studies should also include participants with less than a high school education and a wider age range. It is suggested that other psychotherapeutic approaches such as logotherapy, reality therapy, dialectical behavior therapy, cognitive-behavioral therapy, and compassion-focused therapy be explored regarding mothers with COVID-19 who have autistic children to enrich the research literature in this area. The results of this research should be made available to

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counseling centers in the form of brochures, newsletters, etc., for further awareness and information.

Authors' Contributions

N.R. conceptualized the study, developed the research design, and coordinated the implementation of the Acceptance and Commitment Therapy sessions. S.S.J.T., the corresponding author, led the data analysis using repeated measures ANOVA, interpreted the findings, and was primarily responsible for drafting and revising the manuscript. M.N. assisted with the recruitment of participants, managed the data collection process, and contributed to the literature review. F.S. supported the administration of the therapy sessions, facilitated participant follow-ups, and helped in drafting sections of the manuscript. All authors participated in discussing the results, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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