




Comparison of the Impact of Functional Communication-Based and Theory of Mind-Based Intervention Programs on Distress Tolerance in Children with Autism Spectrum Disorder

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ABSTRACT

The present study aimed to compare the impact of functional communication-based intervention training and theory of mind-based training on distress tolerance in children with autism spectrum disorder (ASD) in Shahin Shahr, Isfahan. This research is applied in terms of its objective and semi-experimental with a pre-test and post-test design in terms of methodology. The statistical population included all children with ASD in Shahin Shahr during the 2023–2024 academic year. From a sample of 120 individuals, 45 children with ASD were selected using G*Power software calculations, inclusion and exclusion criteria, and a purposive non-random sampling method. Data collection methods consisted of library research and field study. The instrument used for data collection in this study was the Distress Tolerance Questionnaire. Participants received interventions involving functional communication training and applied behavior analysis, and post-tests were administered to both groups. Hypotheses were tested using SPSS software to analyze the questionnaire data. The findings indicate that the effectiveness of functional communication-based intervention training and theory of mind-based training on distress tolerance in children with ASD in Shahin Shahr, Isfahan, differs significantly.

Keywords: functional communication, theory of mind-based training, distress tolerance, autism spectrum disorder.

1. Introduction

Autism spectrum disorders (ASDs) involve significant disruptions in cognitive development and deficiencies in emotional and social skills. Individuals with ASDs display

marked impairments in social communication and interaction and severe restrictions in activities and interests. Students with autism often develop maladaptive beliefs about progress due to repeated failures, which, in turn, create challenges beyond their primary disorders, ultimately

leading to poor academic achievement (Soleimani et al., 2021).

Distress tolerance is a skill based on accepting reality without attempting to change it. It is important to note that accepting reality does not imply endorsing it, and a distinction must be made between the two (Javanmardi et al., 2024). This skill combines cognitive-behavioral therapy (CBT) techniques and radical acceptance. The ability to tolerate pain and distress is fundamental to mental health for two reasons. First, as pain and distress cannot be entirely eliminated or avoided, accepting unchangeable realities reduces suffering. Second, a lack of effort to foster change may result in impulsive behaviors replacing constructive attempts at change (Labella et al., 2024; Li et al., 2024). Distress tolerance, defined as the actual or perceived ability to endure emotional distress, is a critical capability. Life events often cause distress, and the inability to tolerate it leads to avoidance (e.g., social withdrawal) and difficulty overcoming challenges. Some individuals experience distress at such an intense level that enduring it becomes nearly impossible. Unsurprisingly, individuals with low distress tolerance are often those with post-traumatic stress disorder (PTSD) (Walton et al., 2024). According to Simmons and Gaher (2005), individuals with low distress tolerance acknowledge their inability to endure discomfort and perceive others as having better resources to manage negative emotions. Consequently, they may engage in unhealthy methods to alleviate distressing emotional states when avoidance is not feasible. If these unhealthy methods prove ineffective, they are likely to focus all their energy on their emotions, ultimately disrupting their functioning (Bakhtiari & Pourdel, 2024; Mohamadi & Jabalameli, 2024).

Given the wide range of variations among individuals with ASD, numerous therapeutic approaches have been proposed for children with autism. Some of the most effective methods include applied behavior analysis (ABA), parent behavioral training, summer treatment programs, pharmacotherapy, social competency training, and play therapy (Lord et al., 2018). One such behavior-focused approach is functional communication training (FCT). The goal of FCT is to teach appropriate and adaptive behaviors that serve the same function as problematic behaviors, thereby reducing the occurrence of such behaviors (Karampour et al., 2021). Steps in FCT include identifying the function of the observed behavior, selecting a replacement behavior, implementing plans, teaching communication with reading materials, using video

modeling, creating social stories, and providing effective cue cards (Lord et al., 2018). Research indicates that FCT effectively reduces maladaptive behaviors in children with ASD, with effects persisting during follow-up stages (Watt et al., 2020).

Another relatively new approach in autism treatment is theory of mind (ToM)-based training, which has shown to be effective for autistic children. ASD is closely associated with severe deficits in ToM skills (KhodaBakhshi, 2021). Acquiring social and ToM-related skills is crucial for everyday relationships in children, and learning tasks in this domain supports their ability to lead successful lives (Aqababayi, 2021).

This study aims to determine whether there is a difference in the impact of functional communication-based and ToM-based intervention programs on distress tolerance in children with ASD.

2. Methods and Materials

2.1. Study Design and Participants

This study is applied in terms of its objective and semi-experimental with a pre-test and post-test design in terms of methodology. The statistical population included all children with ASD in Shahin Shahr during the 2023–2024 academic year. From a sample of 120 individuals, 45 children with ASD were selected based on G*Power software calculations, inclusion and exclusion criteria, and a purposive non-random sampling method.

Inclusion Criteria:

1. A primary and dominant diagnosis of ASD.
2. Consent from children and parents to participate in therapy sessions.
3. Age range of 4 to 12 years.

Exclusion Criteria:

1. Presence of any disorder other than ASD.
2. Presence of physical illnesses.
3. Concurrent participation in other communication-based training programs at different educational institutions.

2.2. Measures

2.2.1. Distress Tolerance

The Distress Tolerance Questionnaire (DTQ) by Simmons and Gaher (2005) is a self-assessment tool for measuring emotional distress tolerance. The questionnaire consists of 15 items across four subscales: emotional distress

tolerance (items 1, 3, and 5), absorption by negative emotions (items 6, 7, 9, 10, 11, and 12), regulation efforts to reduce distress (items 8, 13, and 14), and emotional appraisal (item 15). Responses are scored on a 5-point Likert scale, ranging from "strongly agree" (1 point) to "strongly disagree" (5 points). Item 6 is reverse scored, with "strongly agree" earning 5 points and "strongly disagree" earning 1 point. Scores range from 15 to 75, with higher scores indicating greater distress tolerance and scores below 5 indicating low distress tolerance. The reliability of the questionnaire was established using Cronbach's alpha, with coefficients of 0.72 for tolerance, 0.82 for absorption, 0.78 for regulation, 0.70 for appraisal, and 0.82 for the overall scale. Concurrent validity for distress tolerance was reported as 0.32 (Sedighi Arfaee et al., 2021).

2.3. Interventions

2.3.1. Functional Communication-Based Intervention (FCBI)

Functional Communication-Based Intervention (FCBI) aims to teach adaptive and appropriate communication skills that serve the same purpose as problematic behaviors (Karampour et al., 2021). This approach focuses on identifying the function of a specific behavior and replacing it with an effective communication alternative. By improving the child's ability to communicate needs and desires, this intervention reduces the occurrence of maladaptive behaviors while enhancing social and emotional interactions.

- **Session 1:** Introduction and Rapport Building
The therapist establishes rapport with the child and family, introduces the intervention's goals, and explains the importance of functional communication. Baseline observations of the child's behaviors and communication patterns are conducted to identify target behaviors for intervention.
- **Session 2:** Identifying Communication Needs
The therapist works with the child and family to identify the function of problematic behaviors (e.g., attention-seeking, avoiding tasks). A behavior assessment is conducted to map triggers and outcomes related to these behaviors.
- **Session 3:** Teaching Replacement Behaviors
The therapist introduces replacement behaviors, such as using gestures, picture exchange, or verbal requests, to fulfill the same function as the

problematic behavior. Role-playing and modeling are used to demonstrate these behaviors.

- **Session 4:** Practicing Replacement Communication
The child practices replacement communication behaviors in structured settings with reinforcement for successful attempts. The therapist provides corrective feedback and adjusts strategies based on the child's progress.
- **Session 5:** Generalization of Skills
Communication behaviors are practiced in naturalistic settings, such as at home or school. Parents and teachers are trained to reinforce these behaviors consistently.
- **Session 6:** Maintenance and Follow-Up
Strategies for maintaining learned behaviors over time are discussed with parents and caregivers. A follow-up plan is created to ensure the sustainability of communication improvements.

2.3.2. Theory of Mind (ToM)-Based Training

Theory of Mind (ToM)-Based Training focuses on enhancing the ability to understand and predict others' thoughts, emotions, and intentions. This training addresses deficits in ToM, which are common in children with ASD, by teaching perspective-taking and social cognition skills. Improving these abilities helps children navigate social interactions more effectively and fosters emotional understanding.

- **Session 1:** Introduction and Assessment of ToM Skills
The therapist introduces ToM concepts to the child and family, explains the goals of the training, and assesses the child's baseline ToM skills using structured tasks, such as identifying emotions in pictures or recognizing false beliefs.
- **Session 2:** Recognizing Emotions
The therapist uses visual aids, such as emotion cards or videos, to teach the child to recognize and label basic emotions. Activities focus on differentiating emotions based on facial expressions, tone of voice, and contextual cues.
- **Session 3:** Understanding Perspectives
Perspective-taking exercises are introduced, where the child learns to identify and understand different points of view. Role-playing and storytelling

activities are used to demonstrate how others might feel in various scenarios.

- **Session 4:** Predicting Intentions and Behaviors
The child practices predicting others' intentions based on observed actions or scenarios. Activities include completing social stories and guessing outcomes of social interactions.
- **Session 5:** Problem-Solving in Social Scenarios
The therapist introduces real-life social scenarios where the child practices applying ToM skills to resolve misunderstandings or conflicts. Feedback and positive reinforcement are provided to refine skills.
- **Session 6:** Generalization and Application
ToM skills are generalized to naturalistic settings, such as interactions with peers or family members. Caregivers are trained to encourage and reinforce the use of these skills in daily life. Strategies for sustaining progress are discussed in a follow-up plan.

2.4. Data Analysis

The data were analyzed using SPSS version 26. Descriptive statistics, including mean and standard deviation, were calculated to summarize the data for each group. The Shapiro-Wilk test was used to assess the normality of the variables. Analysis of covariance (ANCOVA) was conducted to compare the post-test scores of distress tolerance between groups while controlling for pre-test scores. Pairwise comparisons were performed using Bonferroni's post hoc test to identify specific group differences. Statistical significance was set at $p < .05$, and effect sizes were calculated to determine the magnitude of group differences.

3. Findings and Results

Table 1 displays the descriptive statistics, including the mean and standard deviation of distress tolerance scores across groups. The results indicate differences in pre-test scores among the research groups.

Table 1

Descriptive Statistics of Distress Tolerance Variable

Group	Sample Size	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD
Functional Communication-Based Intervention Program	15	12.90	4.19	12.75	3.45
Theory of Mind-Based Training	15	14.00	4.51	19.65	2.30
Control	15	11.10	4.01	10.65	4.65

The results of the Shapiro-Wilk test showed that the p-values for all variables were not significant ($p > .05$), indicating that the variables followed a normal distribution.

This satisfies one of the assumptions required for performing ANCOVA.

Table 2

Results of ANOVA for Between-Group Factor

Variable	Sum of Squares	df	Mean Squares	F	p-value	Effect Size	Statistical Power
Distress Tolerance	1163.011	2	581.506	18.869	.0001	0.398	1

Since the between-group factor (control, functional communication-based intervention program, and theory of mind-based training) yielded significant results ($F = 18.869$, $p < .01$) (Table 2), it can be concluded that there are

significant differences in distress tolerance levels among the groups. A Bonferroni t-test was used for pairwise comparisons to further investigate group differences.

Table 3

Bonferroni t-Test Results

Variable	Group (I)	Group (J)	Mean Difference	p-value
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Distress Tolerance	Control	Functional Communication-Based Intervention Program	-5.43	.0001
		Theory of Mind-Based Training	-5.35	.0001
	Functional Communication-Based Intervention Program	Control	5.43	.0001
		Theory of Mind-Based Training	-0.08	.0001
	Theory of Mind-Based Training	Control	5.35	.0001
		Functional Communication-Based Intervention Program	0.08	.0001

According to [Table 3](#), there is a significant mean difference in distress tolerance between the control group and the functional communication-based intervention program group, as well as between the control group and the theory of mind-based training group. This indicates that both interventions were effective in improving distress tolerance. However, the difference between the functional communication-based intervention program and the theory of mind-based training groups was not significant, suggesting that the effectiveness of the two therapeutic methods did not differ significantly.

4. Discussion and Conclusion

The results indicate that the effectiveness of functional communication-based intervention training and theory of mind-based training on distress tolerance in children with autism spectrum disorder (ASD) in Shahin Shahr, Isfahan, differs significantly.

This finding aligns with the results of Mohel et al. (2019), who demonstrated that functional communication training sessions for children with ASD reduced their psychological distress behaviors compared to pre-intervention levels, with the effects persisting during the follow-up phase.

Adolescents experiencing higher levels of aggression often face difficulties in emotion regulation, a transdiagnostic factor characterized by the inability to accept emotional or distress responses, difficulty engaging in goal-directed behaviors and strategies, lack of emotional awareness, problems with impulse control, unclear emotional states, and limited access to emotion regulation strategies. Emotion regulation is a critical determinant of well-being and successful social interactions. Deficits in emotion regulation are associated with delinquency, aggressive behaviors, and increased distress. Distress tolerance, on the other hand, refers to an individual's ability to endure negative psychological or physical states. In other words, distress tolerance is defined as the ability and capacity to withstand, endure, and persevere through negative and maladaptive emotions ([Bates et al., 2021](#)).

Research shows that individuals with low distress tolerance tend to perceive higher levels of stress and anxiety, and anxiety symptoms may lead to avoidance-based responses or burdensome performance ([Karampour et al., 2021](#)).

A review of previous studies reveals that distress tolerance manifests in two distinct ways in adolescents. One refers to the individual's ability to endure negative emotions, while the other relates to behavioral manifestations, or the tolerance of unpleasant internal states elicited by various stressful situations. When adolescents face high-stress situations, they tend to respond more intensely, engaging in rumination as an effort to reduce negative emotional states. This often leads to experiential avoidance and emotion-focused coping strategies to escape stressful situations ([Bates et al., 2021](#)).

This study has several limitations. First, the sample size was relatively small, which may limit the generalizability of the findings to broader populations of children with autism spectrum disorder (ASD). Second, the study was conducted in a specific geographic location, which may not represent diverse cultural or socio-economic backgrounds. Third, the intervention duration was relatively short, potentially restricting the ability to observe long-term effects. Finally, reliance on parent-reported measures for some variables may have introduced biases related to subjective perceptions.

Future research should include larger and more diverse samples to enhance the generalizability of the findings across various populations. Longitudinal studies are recommended to evaluate the sustained effects of functional communication-based and theory of mind-based interventions over time. Additionally, exploring the impact of these interventions on other domains, such as academic achievement, peer relationships, and adaptive functioning, could provide a more comprehensive understanding of their benefits. Integrating neurophysiological measures could also help identify underlying mechanisms associated with intervention outcomes.

Practitioners working with children with ASD should consider tailoring interventions based on individual needs,

as both functional communication-based and theory of mind-based approaches have shown effectiveness in improving distress tolerance. Collaboration with parents and educators is essential for reinforcing skills across settings. Furthermore, incorporating these interventions into school-based programs or community services can enhance accessibility and provide children with consistent support. Regular follow-up and monitoring are crucial to ensure the maintenance of intervention gains and to address emerging challenges.

Authors' Contributions

Authors contributed equally to this article.

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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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

References

Aqababayi, S. (2021). The impact of training based on theory of mind on theory of mind and executive functions on the sense of competence in preschool children. *Contemporary psychology*, 12, 14-17. <https://counselingpublish.ut.ac.ir/file/download/download/1643530374-14.pdf?language=fa&subdomain=counselingpublish>

- Bakhtiari, M., & Pourdell, M. (2024). The Effectiveness of Cognitive-Behavioral Therapy on Distress Tolerance and Resilience in Women with Substance-Dependent Incarcerated Spouses. *etiadpajohi*, 17(70), 267-288. <https://doi.org/10.61186/etiadpajohi.17.70.267>
- Bates, E., Camaioni, L., & Volterra, V. (2021). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly*, 21, 226-205. https://www.researchgate.net/publication/309547044_The_acquisition_of_performatives_prior_to_speech
- Javanmardi, F., Shafi Abadi, A., & Poshaneh, K. (2024). The Prediction of distress tolerance model in the elderly based on perceived support, experiential avoidance and spiritual intelligence with the mediating role of mindfulness. *The Women and Families Cultural-Educational*, 19(1), 283-310. https://cwfs.ihu.ac.ir/article_208480_en.html?lang=en
- Karampour, M., Hashemi Rezini, H., Gholamali Lavasani, M., & Vakili, S. (2021). The effectiveness of an intervention program based on functional communication training on stereotyped behaviors, challenging behaviors, and self-injurious behaviors in children with autism spectrum disorder. *Child Mental Health Quarterly*, 8(3), 48-57. <https://doi.org/10.52547/jcmh.8.3.5>
- Labella, M. H., Klein, N. D., Yeboah, G., Bailey, C., Doane, A. N., Kaminer, D., & Cross-Cultural Addictions Study, T. (2024). Childhood bullying victimization, emotion regulation, rumination, distress tolerance, and depressive symptoms: A cross-national examination among young adults in seven countries. *Aggressive Behavior*, 50(1), e22111. <https://doi.org/10.1002/ab.22111>
- Li, Y., He, M., Wang, Z., Hofmann, S. G., & Liu, X. (2024). Distress tolerance as a mediator of mindfulness-based intervention for anxiety and depression: Evidence from two randomized controlled trials. *International Journal of Clinical and Health Psychology*, 24(2), 100445. <https://doi.org/10.1016/j.ijchp.2024.100445>
- Lord, C., Wagner, A., Rogers, S., Szatmari, P., Aman, M., Charman, T., Dawson, G., Durand, V. M., Grossman, L., Guthrie, D., Harris, S., Kasari, C., Marcus, L., Murphy, S., Odom, S., Pickles, A., Scahill, L., Shaw, E., Siegel, B., . . . Yoder, P. (2018). Challenges in evaluating psychosocial interventions for autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 35, 695-708. <https://doi.org/10.1007/s10803-005-0017-6>
- Mohamadi, M., & Jabalameli, s. (2024). The Effectiveness of Group Schema Therapy on Self-Criticism and Distress Tolerance in Women with Substance-Dependent Spouses. *etiadpajohi*, 17(70), 221-244. <https://doi.org/10.61186/etiadpajohi.17.70.221>
- Sedighi Arfaee, F., Rashidi, A., & Tabesh, R. (2021). The Distress Tolerance in the Elderly: The Role of Experiential Avoidance, Rumination and Mindfulness. *Aging Psychology*, 7(1), 12-11. <https://doi.org/10.22126/jap.2021.6108.1498>
- Soleimani, Z., Ghaffari, M., & Baezat, F. (2021). The effectiveness of group reality therapy on academic vitality in students with specific learning disorders. *Learning Disabilities*, 7(4), 68-86. https://jld.uma.ac.ir/article_682.html
- Walton, C. C., Lewis, K. J., Kirby, J. N., Purcell, R., Rice, S., & Osborne, M. S. (2024). Self-Compassionate Motivation and Athlete Well-Being: The Critical Role of Distress Tolerance. *Journal of Clinical Sport Psychology*, 18(1), 131-149. <https://doi.org/10.1123/jcsp.2022-0009>
- Watt, N., Wetherby, A. M., Barber, A., & Morgan, L. (2020). Repetitive and stereotyped behaviors in children with autism spectrum disorders in the second year of life. *Journal of*

Autism and Developmental Disorders, 38(8), 1518-1533.
<https://doi.org/10.1007/s10803-007-0532-8>