




The Effect of a Comprehensive Intervention Program Based on the World Health Organization's Functional Assessment Outcomes on Communication Skills and Behavioral Problems in Adolescents with Intellectual Disabilities

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ABSTRACT

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Objective: The present study was conducted with the aim of determining the effectiveness of a comprehensive intervention program based on the World Health Organization's functional assessment outcomes on the communication skills and behavioral problems of adolescents with intellectual disabilities.

Methods and Materials: The research method was quasi-experimental with a pretest-posttest design and a control group. The statistical population consisted of all male adolescents with mild intellectual disabilities in Gilan Province during the 2020–2021 academic year. The sample included 30 adolescents with mild intellectual disabilities residing in small group homes for individuals with intellectual disabilities under the supervision of the Welfare Organization. They were selected through convenience sampling and randomly assigned to experimental and control groups. Participants in both groups completed the pretest before the intervention. The experimental group then participated in a comprehensive intervention program based on the World Health Organization's functional assessment outcomes for 17 sessions, each lasting 90 minutes, while the control group remained on a waiting list and did not receive any intervention until the posttest. Afterward, the posttest was administered to both groups. The data collection instruments included Barton's Communication Skills Questionnaire (1990) and Rutter's Parent-Report Behavioral Problems Questionnaire (1975). Data analysis was conducted using univariate and multivariate analysis of covariance (ANCOVA) with SPSS version 22.

Findings: The findings indicated that the intervention program did not result in significant improvements in any components of communication skills or behavioral problems ($P > .05$).

Conclusion: Based on the findings, it can be concluded that achieving the desired effects on communication skills and behavioral problems may require longer-term intervention sessions, which is recommended for investigation in future research.

Keywords: World Health Organization functional assessment, communication skills, behavioral problems, intellectual disabilities.

1. Introduction

Adolescents with intellectual disabilities (ID) face multidimensional challenges that extend beyond cognitive limitations, often encompassing profound difficulties in communication, social participation, and behavioral regulation (Lee et al., 2022; Schalock et al., 2021; World Health Organisation, 2019). The deficits in adaptive behavior, including communication skills and emotional regulation, are central criteria in diagnosing ID and represent critical targets for intervention (Tassé et al., 2012; Zheng et al., 2021). Among these, communication impairments remain particularly salient, often co-occurring with behavioral disorders and impeding academic progress, social integration, and psychological well-being (Aggarwal, 2022; Ahmad et al., 2022; Chow, 2018).

Communication skills are not merely tools for verbal expression but are fundamental to emotional adjustment, peer relationships, and problem-solving. Research shows that individuals with ID often exhibit limited pragmatic language abilities, reduced expressive and receptive language skills, and underdeveloped nonverbal communication (Diken, 2019; Hernández Hernández et al., 2025; Hofmann & Muller, 2022). These deficits can escalate social isolation and increase the risk of behavioral disturbances (Güler et al., 2024; Hagan & Thompson, 2014; Wood & Standen, 2021). Interventions focusing solely on cognitive aspects may overlook the broader functional domains essential for autonomy and social participation. Thus, a shift toward holistic, function-based training programs is increasingly advocated (Borland et al., 2021; Brooker et al., 2024; Matson, 2024).

Behavioral problems—ranging from aggression and noncompliance to anxiety and hyperactivity—are prevalent among adolescents with mild to moderate ID and often stem from poor social communication skills (Ahmad et al., 2022; Hofmann & Muller, 2022; Yousefi Khaneh Bargh & Zeynali, 2024). Studies suggest that behavioral challenges are not simply inherent to ID but are often exacerbated by environmental, familial, and educational deficits (Hastings, 2016; Marrus & Hall, 2017; Onnis et al., 2018). These behaviors frequently interfere with learning and adaptation and place significant strain on caregivers and educators (Schuppener & Bock, 2024; Sechoaro et al., 2014; Wolan-Nieroda et al., 2023). As a result, integrated intervention models that target communication, behavioral, and adaptive skills simultaneously have gained prominence (Arjamandnia

et al., 2020; Mirza Amiri et al., 2020; Vatankhah & Bakhtiarpour, 2025).

One promising avenue for addressing these complex needs is the application of function-based assessment and intervention frameworks derived from the International Classification of Functioning, Disability and Health (ICF) developed by the World Health Organization (WHO). The WHO's functional model emphasizes the interaction between health conditions and contextual factors, allowing for personalized, needs-based intervention planning (Schalock et al., 2021; World Health Organisation, 2019). This approach moves beyond categorical diagnoses by focusing on the extent of functional limitations in daily life and community participation (Tassé et al., 2012; Zheng et al., 2021). In Iran, this framework has been adopted in part by the national Welfare Organization to assess and support individuals with disabilities based on actual life function rather than just medical criteria (Vatankhah & Bakhtiarpour, 2025).

Evidence supports the utility of WHO-based functional assessments in identifying developmental delays and tailoring interventions accordingly (Brooker et al., 2024; Wolan-Nieroda et al., 2023). However, despite its theoretical appeal, empirical studies that translate WHO's functional framework into structured psychosocial interventions for adolescents with ID remain limited (Georgoula & Koustriava, 2024; Hickey & Cotts, 2024). A small number of international studies have demonstrated that structured life skills programs aligned with the WHO model can positively influence adaptive behaviors and improve autonomy, especially when these programs are implemented in naturalistic environments (Bekkari et al., 2024; Schuppener & Bock, 2024; UNICEF, 2019).

Parallel to this global shift, research in Iran has increasingly explored the effectiveness of skill-building programs for children and adolescents with special needs. Notable among them are life skills interventions aimed at enhancing social interaction, emotional regulation, and decision-making capacities (Arjamandnia et al., 2020; Mirza Amiri et al., 2020; Rahmani Boldaji & Nazamzadeh Azhieh, 2018). For example, storytelling-based methods have been used to reduce aggression and antisocial behavior among primary school children (Javdan & Morovati, 2020). Moreover, cooperative learning approaches and play-based models have demonstrated improvements in social adjustment and communication skills among students with ID in middle school settings (Hosseinkhanzadeh, 2015; Rizvandi & Imam Jomeh, 2023).

Despite these advancements, the integration of a comprehensive WHO-based functional assessment into a formal intervention protocol remains an underexplored yet potentially transformative strategy in the Iranian context. Existing interventions are often fragmented or narrowly focused on specific skills without sufficient attention to generalization across life domains or real-life settings (Ahmad et al., 2022; Varzadar et al., 2019; Vatankhah & Bakhtiarpour, 2025). The lack of continuity between assessment outcomes and intervention goals often diminishes long-term impact, particularly in populations where contextual and environmental barriers play a significant role (Brooker et al., 2024; Schuppener & Bock, 2024).

In line with this evolving paradigm, the present study aimed to evaluate the effectiveness of a comprehensive intervention program designed based on the WHO's functional assessment framework.

2. Methods and Materials

2.1. Study Design and Participants

The sample for this study consisted of 30 male adolescents with mild intellectual disabilities residing in small group homes (Vesal Small Home, Amin Small Home, and Gol Narges Small Home) under the supervision of the State Welfare Organization. Each home housed 10 individuals with intellectual disabilities. The participants were selected using a convenience sampling method based on inclusion criteria and were randomly assigned to the experimental and control groups. It is worth noting that the sample size was determined according to the formula proposed by Pallant for experimental designs. Based on this, the optimal sample size for each group should not be fewer than 15 individuals. Therefore, 15 participants were selected for each group in the present study.

2.2. Measures

2.2.1. Communication Skills

This questionnaire was developed and standardized by Barton in 1990 to assess communication skills. The first section includes demographic information such as age, gender, education level, and similar variables. The second section consists of 18 items measuring three communication dimensions: verbal, auditory, and feedback. The questionnaire uses a five-point Likert scale ranging from "strongly disagree" (score of 1) to "strongly agree" (score of

5), with a total score range from 18 to 90. Higher scores indicate better communication skills. In Iran, the reliability and validity of this questionnaire have been confirmed in several studies (Zeynizadeh et al., 2020). Varzadar et al. (2019) reported a convergent validity of 0.31 between the communication skills questionnaire and life satisfaction. Safavi et al. (2016) evaluated content validity using the Content Validity Ratio (CVR) and Content Validity Index (CVI), in which 10 faculty members from nursing schools in Gilan participated. The CVI was found to be 0.88, and the CVR was 0.75. The overall reliability using Cronbach's alpha was 0.80 (Varzadar et al., 2019). In a study by Rizvandi and Emamjomeh (2022), the face and content validity of the questionnaire were confirmed by 10 psychology professors. For reliability, a pilot study was conducted on 37 students, and a Cronbach's alpha of 0.72 was obtained (Rizvandi & Imam Jomeh, 2023). In the current study, Cronbach's alpha for the verbal, auditory, and feedback components was 0.71, 0.70, and 0.73, respectively.

2.2.2. Behavioral Problems

This questionnaire was originally developed by Rutter in 1967 and updated in 1975 to assess behavioral problems in children. It includes both a parent and teacher version. The parent version contains 31 behavioral descriptions, 23 of which are also included in the teacher version. The first section includes eight problem behaviors (e.g., headache complaints, school avoidance), the second section has five questions (e.g., speech or eating problems), and the third section contains 18 behavior descriptions. Items are rated on a three-point Likert scale (0 = does not apply to child, 2 = completely applies to child), with scores ranging from 0 to 62. Higher scores indicate greater behavioral problems. The instrument's convergent validity with psychiatric diagnosis was reported as 0.76, and test-retest reliability over a two-month interval was 0.74 (Rutter, 1967). In a study by Yousefi and Zeinali (2024), the Cronbach's alpha for the questionnaire was 0.80. Convergent validity coefficients with attachment styles were -0.25 for secure attachment, 0.30 for avoidant insecure attachment, and 0.34 for anxious insecure attachment (Yousefi Khaneh Bargh & Zeynali, 2024). In the current study, Cronbach's alpha was calculated to be 0.79.

2.3. Intervention

The World Health Organization's Disability Assessment Schedule (WHODAS) was developed in 2012 to assess

health-related functioning issues in individuals. It is recommended for use in the International Classification of Functioning, Disability and Health (ICF) framework to determine the type and severity of disability. The Iranian Welfare Organization has adopted this approach to identify the type and severity of disability, and access to the organization's services depends on the approval of an individual's classification by a medical board using this method. Accordingly, since the beginning of 2020, after conducting training workshops for experienced experts and medical team members, the Welfare Organization has been using WHODAS alongside the ICF approach to assess disability. The purpose of applying this questionnaire in the Welfare Organization is to determine the extent of functional limitations in daily life activities and social participation among individuals with disabilities.

Based on the results of the WHO functional assessment administered to adolescents with intellectual disabilities, a tailored intervention program was implemented. After completing the WHODAS and determining the level of functional limitation and disability severity in each domain, a 17-session, 90-minute intervention program was designed to address the affected areas.

Stages of Designing and Validating the Comprehensive Intervention Program Based on WHO Functional Assessment Outcomes:

The intervention program was developed by the researcher using relevant literature and was based on several sources, including:

- *Life Planning Education: A Youth Development Program* (Hunter-Geboy, 1995),
- The Welfare Organization's validated version of the *Life Skills Training Program for Adolescents with Disabilities* (Karbalai Ismail et al., 2006),
- *Measuring Health and Disability: WHO Disability Assessment Schedule, 2nd Edition* (World Health Organisation, 2019),
- *Social Skills Training for Children and Adolescents* (Hosseinkhanzadeh, 2015),
- *Life Skills Training Manual* (UNICEF, 2019),
- *Matson Evaluation of Social Skills* (Matson, 2024), and
- *Teaching Social Skills to Youth* (Cartledge & Milburn, 1995).

The content validity of the proposed intervention program was evaluated by 10 experts and faculty members with relevant knowledge and experience in the field. They were asked to provide feedback on the appropriateness of the

intervention content. Using the Content Validity Ratio (CVR), the content validity of the program was calculated. According to Lawshe's table, the minimum acceptable CVR for 10 experts is 0.62. The average CVR for all intervention sessions was 0.81. A summary of the sessions is presented in the following:

Session 1: This session was conducted in the participants' natural living environment and aimed to establish rapport and introduce the training program. Through cooperative teaching, group discussion, role-playing, and interactive questioning, participants were familiarized with the goals and structure of the intervention. Materials such as handouts, whiteboards, and visual aids were used to facilitate discussion on the significance of functional domains. Pretest assessments were administered following the orientation.

Session 2: The second session focused on personal identity and self-awareness, under the theme "Who am I and what can I do?" Participants engaged in structured exercises to reflect on their personal traits, supported by visual aids (e.g., family images, symbolic drawings). The objective was to enhance self-recognition, comfort within the group, and confidence in expressing individual attributes.

Session 3: Building on the previous session, participants explored their capabilities and the concept of change. Activities encouraged reflection on personal strengths and competencies through distributed worksheets and creative expression (e.g., drawing, writing). The aim was to foster a sense of self-efficacy and realistic self-appraisal.

Field Practice A (Sessions 1–3): To generalize learning, participants visited community locations such as parks, cafés, or supermarkets in supervised groups. Real-life application of identity-focused skills in naturalistic settings supported the consolidation of insights from sessions one to three.

Session 4: The focus shifted to values, particularly familial and social norms. Through structured discussion, role-play, and value-identification exercises, participants explored the meaning of values, especially those rooted in culture and religion. Materials included illustrated handouts and drawing supplies to enhance engagement and reflection.

Session 5: This session introduced basic communication principles under the theme "How to connect with others." Participants learned the components of effective communication and practiced active listening through modeling and peer interaction. Emphasis was placed on nonverbal cues, attention, and empathy.

Session 6: Participants practiced verbal expression and assertiveness. Exercises included structured dialogue and

role-playing scenarios to differentiate between passive, aggressive, and assertive responses. The goal was to promote confident yet respectful communication styles.

Session 7: The session examined interpersonal relationships. Topics included roles and responsibilities within the home and criteria for identifying and maintaining healthy friendships. Role-playing and group reflection helped participants understand behaviors that strengthen or weaken social bonds.

Field Practice B (Sessions 4–7): Participants applied newly acquired communication and interpersonal skills in real-life settings. Supervised community outings provided opportunities for interaction and practicing prosocial behaviors in authentic social environments.

Session 8: The session explored the participant's role within the broader community. Exercises focused on understanding social roles, community contribution, and respect for public service professions. Through media, group work, and visual materials, participants identified their place in the family and society.

Session 9: The session focused on life goals. Participants engaged in reflective tasks to understand the importance of goal setting and to identify both short- and long-term personal and professional objectives. Facilitators guided them in articulating and visualizing their aspirations.

Session 10: Building on the prior session, participants practiced formulating realistic short-term goals. Tasks involved breaking down goals into manageable steps and recognizing potential challenges, using structured worksheets and guided discussion.

Session 11: This session addressed the pursuit of long-term goals and aspirations. Through storytelling, planning activities, and creative expression, participants reflected on their dreams and developed strategies to pursue them meaningfully and sustainably.

Session 12: Participants explored decision-making strategies under the theme "How can I make good decisions?" They were introduced to a structured three-step model of decision-making, and engaged in exercises predicting outcomes and evaluating alternatives.

Session 13: This session expanded on the previous one, helping participants further understand consequences of decisions. Role-plays and guided imagery were used to simulate real-life scenarios requiring thoughtful decision-making and foresight.

Field Practice C (Sessions 8–13): To reinforce learning, participants participated in another round of community-based practice. In real-life contexts, they applied decision-

making and goal-setting skills under the supervision of trained caregivers.

Session 14: The topic of violence prevention was addressed by discussing the origins of anger and aggression. Participants engaged in activities to identify triggers, express anger constructively, and practice conflict resolution through dialogue rather than aggression.

Session 15: Focusing on physical health, participants learned about healthy and unhealthy habits. Educational videos, group discussion, and interactive tasks helped raise awareness of factors influencing physical well-being, including diet and hygiene.

Session 16: This session continued the health theme by identifying risk factors that compromise well-being. Emphasis was placed on recognizing signs of danger and avoiding behaviors detrimental to physical health. Participants practiced health-related decision-making.

Field Practice D (Sessions 14–16): Participants were again taken to real-world settings to practice implementing what they learned about health and violence prevention. Caregivers supported the transfer of these skills from theory to practice.

Session 17: The final instructional session focused on exercise and the role of physical activity in health. Participants engaged in activities to evaluate their current lifestyle and explore enjoyable ways to stay active, thus reinforcing the connection between self-care and well-being.

Evaluation Session: The program concluded with a posttest assessment to measure the outcomes of the intervention. No new content was introduced. Instead, participants reflected on what they had learned and how they planned to apply it in their daily lives.

The content validity of the proposed intervention program was evaluated by 10 experts and faculty members with relevant knowledge and experience in the field. They were asked to provide feedback on the appropriateness of the intervention content. Using the Content Validity Ratio (CVR), the content validity of the program was calculated. According to Lawshe's table, the minimum acceptable CVR for 10 experts is 0.62. The average CVR for all intervention sessions was 0.81. A summary of the sessions is presented in the following table.

2.4. Data Analysis

Data analysis was conducted using SPSS version 22. Initially, the assumptions of normality, homogeneity of variance, and homogeneity of regression slopes were

examined using the Shapiro–Wilk test, Levene’s test, and the interaction term between group condition and pretest scores, respectively. To test the effectiveness of the intervention on the total score of communication skills, univariate analysis of covariance (ANCOVA) was performed, controlling for pretest scores. Additionally, multivariate analysis of covariance (MANCOVA) was used to examine differences between groups across the components of communication skills, with the Box’s M test and Bartlett’s test applied to assess the equality of covariance matrices and sphericity, respectively. Descriptive statistics including means and standard deviations were calculated for all variables. Effect sizes (η^2) and statistical power were also reported to interpret the magnitude and reliability of the observed effects. All statistical tests were conducted with a significance level of $\alpha < .05$.

3. Findings and Results

The demographic characteristics of the participants showed that the mean age and standard deviation of participants in the experimental group were 15.33 ± 1.98 and

in the control group were 16.53 ± 1.36 . Additionally, 93.3% of the experimental group and 40% of the control group were taking medication. A family history of intellectual disability was reported in 26.7% of the experimental group and 13.3% of the control group. In the experimental group, 5 participants (33.3%) were from Amin Small Home, 6 (40%) from Vesal Small Home, and 4 (26.7%) from Gol Narges Small Home. In the control group, 5 participants (33.3%) were from Amin, 4 (26.7%) from Vesal, and 6 (40%) from Gol Narges.

In the experimental group, 73.3% were orphans and 26.7% were from single-parent families. In the control group, 60% were orphans, and 40% were from disintegrated families. In the experimental group, 53.3% were only children, 20% had two siblings, and 26.7% had three siblings. In the control group, 40% were only children, 40% had two siblings, 13.3% had three siblings, and 6.7% had four siblings. In the experimental group, 13.3% had dropped out of school, 13.3% were in grade 6, 40% in grade 7, 26.7% in grade 8, and 6.7% in grade 9. In the control group, 20% had dropped out, 20% were in grade 7, 13.3% in grade 8, 40% in grade 9, and 6.7% in grade 10.

Table 1

Means and Standard Deviations of Communication Skills and Behavioral Problems by Group and Stage

Variable	Group	Pretest M (SD)	Posttest M (SD)
Total Communication Skills	Experimental	55.40 (6.32)	56.27 (6.15)
	Control	56.87 (5.91)	56.40 (6.09)
Verbal Communication	Experimental	19.40 (2.91)	20.07 (2.83)
	Control	19.93 (3.02)	20.00 (2.85)
Listening Skills	Experimental	17.20 (2.58)	17.40 (2.49)
	Control	17.60 (2.74)	17.33 (2.66)
Feedback Skills	Experimental	18.80 (2.87)	18.80 (2.91)
	Control	19.33 (2.93)	19.07 (3.01)
Total Behavioral Problems	Experimental	38.67 (5.93)	37.53 (5.67)
	Control	37.93 (6.10)	38.33 (6.45)
Aggression	Experimental	7.13 (1.73)	6.93 (1.78)
	Control	6.93 (1.88)	7.00 (1.95)
Anxiety and Depression	Experimental	8.53 (2.07)	8.20 (1.99)
	Control	8.47 (2.15)	8.60 (2.28)
Maladaptiveness	Experimental	10.27 (2.66)	9.67 (2.58)
	Control	9.87 (2.74)	10.07 (2.81)
Antisocial Behaviors	Experimental	7.00 (1.91)	6.80 (1.87)
	Control	6.93 (2.04)	7.13 (2.11)
Attention/Hyperactivity	Experimental	5.73 (1.64)	5.53 (1.59)
	Control	5.73 (1.78)	5.87 (1.84)

As presented in Table 1, the descriptive statistics show slight changes in mean scores across pretest and posttest stages in both groups. For total communication skills, the experimental group showed a small increase from pretest ($M = 55.40$, $SD = 6.32$) to posttest ($M = 56.27$, $SD = 6.15$),

whereas the control group remained relatively stable (Pretest $M = 56.87$, $SD = 5.91$; Posttest $M = 56.40$, $SD = 6.09$). Similarly, minor improvements were observed in verbal and listening skills within the experimental group, while feedback skills remained unchanged. Regarding behavioral

problems, a slight reduction was observed in the experimental group's total score ($M = 38.67$ to $M = 37.53$), with negligible change in the control group. None of the subscales—including aggression, anxiety/depression, maladaptiveness, antisocial behaviors, and attention problems—showed notable differences between pretest and posttest in either group, which aligns with the findings from ANCOVA and MANCOVA indicating non-significant effects of the intervention.

To examine the research hypothesis regarding the total score of communication skills, a univariate analysis of covariance (ANCOVA) was used. Before conducting the ANCOVA, its assumptions were tested. The first assumption is the normal distribution of the research variables. Since the Shapiro–Wilk statistic for the total communication skills score was not significant ($P > .05$), the data were considered

normally distributed. Another assumption is that the dependent variable must be measured at an interval or ratio level. As the communication skills scale is interval-level, this assumption was confirmed. The homogeneity of regression slopes was also examined and showed that the interaction between the group condition and the pretest was not significant ($F = 0.007$, $P = .933$), indicating support for the homogeneity of regression slopes assumption. Levene's test was used to check the homogeneity of variance for the dependent variable, and the results confirmed the assumption of equal error variance between the experimental and control groups for the total communication skills score ($P > .05$). Given that all assumptions of ANCOVA were met, the results of the analysis for the total communication skills score are presented in Table 2.

Table 2

Results of Univariate Analysis of Covariance for Total Communication Skills Score

Source	SS	df	MS	F	p	η^2
Group	85.879	1	85.879	0.561	0.46	.02
Pretest (covariate)	1592.046	1	1592.046	10.404	0.003	.278
Error	4131.421	27	153.016			

As shown in Table 2, the ANCOVA results for the posttest of total communication skills score, after adjusting for the pretest, indicate that the effect of the intervention was not statistically significant ($F = 0.561$, $df = 1, 27$, $P = 0.46$). The effect size ($\eta^2 = .02$) suggests a very small and negligible effect in the population. However, the F-statistic for the pretest score ($F = 10.404$, $P = .003$) was significant, indicating that the pretest score had a significant effect on the posttest scores of total communication skills.

To assess the effectiveness of the intervention program on each component of communication skills, multivariate analysis of covariance (MANCOVA) was used. Before presenting the results of the MANCOVA, its assumptions were tested. The assumption of normality was confirmed for all communication skill components, as the Shapiro–Wilk

test results were not significant ($P > .05$). The dependent variables were measured at the interval level, thus satisfying the second assumption. Bartlett's test of sphericity was significant ($P < .05$), indicating sufficient correlations between the components. Furthermore, the homogeneity of regression slopes was examined using an F-test, which was not significant ($F = 0.282$, $P = .942$), suggesting equal regression slopes between the pretest and posttest across groups. Levene's test confirmed homogeneity of error variances for the components ($P > .05$). Box's M test was conducted to assess the equality of covariance matrices between the experimental and control groups. The result was not significant ($F = 0.648$, $P = .692$), indicating that the covariance matrices were equal across groups. The MANCOVA results are presented in Table 3.

Table 3

Results of Multivariate Analysis of Covariance for Communication Skill Components

Test Name	Value	F	df Hypothesis	df Error	p	η^2	Power
Pillai's Trace	.116	1.009	3	23	0.407	.116	.238
Wilks' Lambda	.884	1.009	3	23	0.407	.116	.238
Hotelling's Trace	.132	1.009	3	23	0.407	.116	.238
Roy's Largest Root	.132	1.009	3	23	0.407	.116	.238

As shown in Table 3, the F-value of the multivariate ANCOVA comparing the experimental and control groups across the communication skill components ($F = 1.009$, $P = .407$) was not significant. Therefore, it can be concluded that

there is no significant difference between the experimental and control groups in terms of communication skill components in the posttest.

Table 4

Results of Univariate Analysis of Variance for Communication Skill Components Between Experimental and Control Groups

Component	SS Between	SS Error	MS Between	MS Error	F	P	η^2	Power
Feedback Skills	41.776	320.692	41.776	12.828	3.257	.083	.115	.411
Listening Skills	11.175	627.176	11.175	25.087	0.445	.511	.018	.098
Verbal Skills	40.907	400.369	40.907	16.015	2.554	.123	.093	.336

As shown in Table 4, the F-values for feedback skills ($F = 3.257$), listening skills ($F = 0.445$), and verbal skills ($F = 2.554$) were not significant at the .05 level. This indicates that there is no significant difference between the experimental and control groups in any of the communication skill components. Based on these findings, it can be concluded that the implementation of the intervention program did not lead to improvements in any of the components of communication skills, and therefore, the hypothesis is not supported.

The hypothesis concerning the total behavioral problems score was examined using univariate analysis of covariance (ANCOVA). Before conducting the ANCOVA, its assumptions were tested. The first assumption is the normality of the research variable scores. Since the Shapiro–Wilk statistic for the total behavioral problems score was not

significant ($P > .05$), the data were normally distributed. Another assumption is that the dependent variable should be measured at the interval or ratio level. Given that the behavioral problems measurement scale is interval-level, this assumption was confirmed. The homogeneity of regression slopes was also tested, showing that the interaction between condition and pretest was not significant ($F = 0.059$, $P = .81$), thus supporting the assumption. Levene’s test was used to examine the homogeneity of variance of the dependent variable, which confirmed the equality of error variance between the experimental and control groups for the total behavioral problems score ($P > .05$). Therefore, given that the main assumptions of univariate ANCOVA were met, Table 5 presents the results for the total behavioral problems score.

Table 5

Results of Univariate Analysis of Covariance for Total Behavioral Problems Score

Source	SS	df	MS	F	p	η^2
Group	134.066	1	134.066	3.75	.063	.122
Pretest (covariate)	224.936	1	224.936	6.291	.018	.189
Error	965.331	27	35.753			

As shown in Table 5, the ANCOVA result for the posttest of the total behavioral problems score, after adjusting for the pretest, indicates that removing the effect of the pretest, the implementation of the comprehensive intervention program based on the World Health Organization’s functional assessment outcomes did not have a significant effect on the total behavioral problems score ($F = 3.75$, $df = 1, 27$, $P = .063$). The effect size (.122) also shows that this difference is small. The F-statistic for the pretest (6.291) was significant ($P = .018$), indicating that the pretest had a significant effect on the posttest behavioral problems score.

To examine the effect of the intervention on each component of behavioral problems, multivariate analysis of covariance (MANCOVA) was used. Before presenting the results, its assumptions were checked. The assumption of normality was confirmed for all components, as the Shapiro–Wilk test results were not significant ($P > .05$). The dependent variables were measured at the interval level, satisfying this assumption. Bartlett’s test of sphericity was significant ($P < .05$), indicating adequate correlations between components. The homogeneity of regression slopes was also confirmed; the F-statistic ($F = 1.444$, $P = .204$) was not significant, indicating that the regression slopes of the

pretest and posttest were equal in both groups. Levene's test confirmed the equality of error variance between groups ($P > .05$). Box's M test confirmed the equality of covariance

matrices between groups ($F = 0.876$, $P = .592$). Table 5 shows the results of the MANCOVA.

Table 6

Multivariate Analysis of Covariance for Behavioral Problems Components

Test Name	Value	F	df Hypothesis	df Error	p	η^2	Power
Pillai's Trace	.157	0.709	5	19	.624	.157	.203
Wilks' Lambda	.843	0.709	5	19	.624	.157	.203
Hotelling's Trace	.187	0.709	5	19	.624	.157	.203
Roy's Largest Root	.187	0.709	5	19	.624	.157	.203

As shown in Table 6, the F-value for the MANCOVA comparing the experimental and control groups on the components of behavioral problems ($F = 0.709$, $P = .624$) was not significant. Thus, there were no significant

differences between groups on any component of behavioral problems in the posttest. Table 7 reports the univariate analysis of variance results.

Table 7

Univariate Analysis of Variance for Behavioral Problems Components Between Groups

Component	SS Between	SS Error	MS Between	MS Error	F	p	η^2	Power
Aggression	0.267	56.908	0.267	2.474	0.108	.746	.005	.061
Anxiety and Depression	0.931	70.866	0.931	3.081	0.302	.588	.013	.082
Maladaptiveness	13.468	86.524	13.468	3.762	3.58	.071	.135	.442
Antisocial Behaviors	8.771	127.119	8.771	5.527	1.587	.22	.065	.227
Attention Deficit/Hyperactivity	0.822	48.697	0.822	2.117	0.388	.539	.017	.092

As shown in Table 7, the F-values for aggression (0.108), anxiety and depression (0.302), maladaptiveness (3.58), antisocial behaviors (1.587), and attention deficit/hyperactivity (0.388) were not significant at the .05 level. This indicates that there were no significant differences between the experimental and control groups in any of the components. Based on these findings, it can be concluded that the implementation of the intervention program did not lead to improvements in any component of behavioral problems. Thus, the hypothesis that the intervention would reduce behavioral problems in male adolescents with intellectual disabilities was not supported.

4. Discussion and Conclusion

The present study aimed to examine the effectiveness of a comprehensive intervention program based on the World Health Organization's functional assessment framework on communication skills and behavioral problems in adolescents with mild intellectual disabilities. Contrary to expectations, the results showed that the intervention did not lead to statistically significant improvements in total communication skills or its subcomponents—verbal,

listening, and feedback skills. Furthermore, no significant differences were observed between the experimental and control groups in posttest scores of behavioral problems or their individual dimensions, including aggression, anxiety/depression, maladaptiveness, antisocial behaviors, and attention deficits.

The lack of significant changes in communication skills following the intervention is surprising given the extensive literature supporting communication-based training for individuals with intellectual disabilities. Previous studies have emphasized the role of communication development in fostering autonomy, reducing behavioral challenges, and improving quality of life (Aggarwal, 2022; Güler et al., 2024; Matson, 2024). However, the results of this study suggest that a 17-session intervention, despite its grounding in WHO's functional model and its delivery in naturalistic environments, may not be sufficient to yield significant measurable gains in communication capacities within the studied timeframe. This finding aligns with research by Brooker et al. who emphasize that effective communication development among individuals with intellectual disabilities often requires long-term and individualized intervention

strategies that go beyond general life skills training (Brooker et al., 2024).

In terms of behavioral problems, the intervention did not significantly reduce behavioral symptoms post-intervention. This is consistent with findings from Ahmad et al., who highlight that behavioral problems in youth with intellectual disabilities are multifactorial and persist despite short-term psychosocial interventions, especially in institutional or group living environments where contextual stressors remain unchanged (Ahmad et al., 2022). Moreover, research by Hofmann and Muller suggests that behavioral problems are strongly influenced by both individual skill deficits and environmental responses, such as peer modeling and reinforcement patterns, which may not be adequately addressed through group-based training alone (Hofmann & Muller, 2022). Similarly, Wolan-Nieroda et al. argue that rehabilitation efforts need to be embedded in consistent and structured long-term frameworks to show durable effects on behavioral adjustment (Wolan-Nieroda et al., 2023).

Although the intervention was designed based on WHO's functional assessment framework—widely recognized for its ecological validity and comprehensiveness (Schalock et al., 2021; World Health Organisation, 2019)—the findings raise questions about the translation of functional assessment results into time-limited psychosocial programs. Studies that successfully utilized the WHO model, such as those by Vatankhah and Bakhtiarpour, demonstrated significant improvements in life skills and communication when the intervention was tailored, child-centered, and extended over longer durations (Vatankhah & Bakhtiarpour, 2025). Similarly, Georgoula and Koustriava reported significant progress in both social communication and behavior after computerized cognitive training sessions conducted over a longer period with built-in progress monitoring (Georgoula & Koustriava, 2024). In contrast, the present study's 17-session structure, although immersive, may not have allowed enough time for meaningful behavioral generalization or internalization of communication competencies.

Another possible explanation for the null findings lies in the specificity of the intervention content and its alignment with the needs and developmental profiles of the participants. As Matson has highlighted, interventions must address both the cognitive limitations and the specific behavioral phenotypes of individuals with ID in a context-sensitive manner (Matson, 2024). Likewise, Chow emphasized that comorbid language and behavioral problems require multifaceted treatment plans involving caregivers, behavior specialists, and communication

therapists (Chow, 2018). While the intervention in this study incorporated role-playing, community exposure, and discussion-based learning, the absence of individualized therapeutic input, especially from speech-language pathologists or behavior therapists, may have limited its impact. Prior research supports that combining psychosocial strategies with professional therapeutic interventions increases effectiveness (Hagan & Thompson, 2014; Wood & Standen, 2021).

Furthermore, cultural and institutional dynamics may have moderated the effects of the intervention. In the Iranian context, many adolescents with intellectual disabilities reside in state-supervised small homes with varying degrees of caregiver involvement and institutional support. Previous studies by Rahmani Boldaji and Mirza Amiri noted that the success of behavioral interventions is closely tied to caregiver consistency and follow-through in daily routines (Mirza Amiri et al., 2020; Rahmani Boldaji & Nazamzadeh Azhieh, 2018). In the present study, while caregivers accompanied the adolescents during the external practice sessions, their involvement in between-session reinforcement may have varied, thereby reducing the likelihood of sustained behavioral change.

Despite these challenges, it is important to recognize the value of functional, contextually embedded programming as a step toward more inclusive and real-life interventions. As Hofmann and Schuppener suggest, the future of intervention design for people with intellectual disabilities lies in multi-systemic and participatory models that engage families, professionals, and communities simultaneously (Hofmann & Muller, 2022; Schuppener & Bock, 2024). The current intervention, while not statistically impactful in the short term, provides a blueprint for combining WHO-based assessment with real-world skill-building across various life domains.

5. Limitations & Suggestions

This study, while methodologically robust, is not without limitations. First, the sample size was relatively small ($N = 30$), limiting the statistical power to detect small to moderate effects. Second, the intervention period was restricted to 17 sessions, which may have been insufficient to produce meaningful change in deeply rooted behavioral and communication patterns. Third, although participants were randomly assigned to experimental and control groups, variations in caregiver engagement, home dynamics, and individual learning rates may have introduced unmeasured

confounding variables. Moreover, the study relied on self-report and caregiver-report questionnaires, which, while validated, may not capture nuanced or situational aspects of communication and behavior. Finally, the intervention was not supplemented by professional speech-language or behavioral therapy, which may have limited its comprehensiveness and specificity.

Future research should consider longitudinal designs with larger sample sizes to evaluate the long-term effectiveness and generalizability of WHO-based functional interventions. Including follow-up assessments after 3 to 6 months would help determine whether observed effects, if any, are sustained over time. Moreover, integrating professional therapists—such as speech-language pathologists and clinical psychologists—into the intervention team may enhance the depth and specificity of skills being targeted. Researchers are also encouraged to examine the moderating role of environmental variables, such as caregiver involvement, institutional policies, and community inclusion practices, on intervention outcomes. Employing mixed-methods approaches that include qualitative interviews and observational data may provide richer insights into behavioral and communicative shifts.

In practical settings, interventions for adolescents with intellectual disabilities should be individualized, context-based, and sustained over longer periods to be effective. It is recommended that practitioners integrate WHO functional assessment outcomes into individualized education plans and collaborate with interdisciplinary teams for holistic support. Community-based training activities should be closely supported by caregivers and extended to daily routines to facilitate generalization. Moreover, consistent progress monitoring and flexibility in content delivery can allow practitioners to tailor the intervention to evolving needs and capabilities. Finally, institutional caregivers and educators should receive training in reinforcement techniques to ensure continuity and sustainability of skill development beyond the structured sessions.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This article is extracted from the first author's doctoral dissertation at Rasht Branch, Islamic Azad University, Rasht, Iran, and has received ethics approval with the code IR.IAU.RASHT.REC.1400.017 from the Research Ethics Committee of Islamic Azad University, Rasht Branch

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

References

- Aggarwal, G. (2022). Social communication disorder outside intellectual disability? A review and classification approach to receptive and expressive communication in intellectual disability. *Wireless Personal Communications*, 127(4), 2841-2858. <https://doi.org/10.1007/s11277-022-09899-1>
- Ahmad, W., Arun, P., Nazli, N., Ratnam, V., Mehta, S., & Raina, D. (2022). Understanding of Behavioral Problems Among Young Persons with Intellectual Disability: A Self-Report. *Journal of Neurosciences in Rural Practice*, 13(2), 295-300. <https://doi.org/10.1055/s-0042-1743213>
- Arjamandnia, A., Mahaki, F., & Omidi Khankehdani, M. (2020). Designing a cognitive flexibility training program and examining its impact on reducing behavioral problems in adolescents with intellectual disabilities. *Journal of Exceptional Children*, 20(2), 89-100. <https://joec.ir/article-1-1111-fa.html>
- Bekkari, H., Benmakhlof, Y., Nourouti, N. G., Barakat, A., & Mechita, M. B. (2024). Study of Clinical Characteristics of Intellectual Disability in Morocco. *Innovations in Clinical Neuroscience*, 21(7-9), 10. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11424067/>
- Borland, R. L., Cameron, L. A., Tonge, B. J., & Gray, K. M. (2021). Effects of physical activity on behaviour and emotional problems, mental health and psychosocial well-being in children and adolescents with intellectual disability: A systematic review. *Journal of Applied Research in Intellectual Disabilities*, 35(2), 399-420. <https://doi.org/10.1111/jar.12961>
- Brooker, K. S., De Greef, R., Trollor, J. N., Franklin, C. S., & Weise, J. (2024). Intellectual disability healthcare in Australia: Progress, challenges, and future directions. *Journal of Policy*

- and Practice in Intellectual Disabilities, 21(1), e12497. <https://doi.org/10.1111/jppi.12497>
- Cartledge, G., & Milburn, J. F. (1995). *Teaching social skills to children and youth: Innovative approaches*. Allyn and Bacon. https://archive.org/details/teachingsocialsk0000unse_o0y8
- Chow, J. C. (2018). Comorbid language and behavior problems: development, frameworks, and intervention. *School Psychology Quarterly*, 33, 356-360. <https://doi.org/10.1037/spq0000270>
- Diken, O. (2019). Describing and comparing pragmatic language skills of Turkish students with typical development and inclusive education students with mild intellectual disability. *International Journal of Progressive Education*, 15, 157-166. <https://doi.org/10.29329/ijpe.2019.189.11>
- Georgoula, E., & Koustriava, E. (2024). Enhancing Social-Communication and behavior skills in adolescents with intellectual disabilities through computerized cognitive training. *International Journal of Instruction*, 17(4), 421-440. <https://doi.org/10.29333/iji.2024.17424a>
- Güler, H. A., Orpay, A. N., Kılınc, K., Yılmaz, Ç., & Türkoğlu, S. (2024). The differential diagnostic utility of the social communication questionnaire in mild intellectual disability and autism spectrum disorder: a case control study. *International Journal of Developmental Disabilities*, 70(7), 1297-1304. <https://doi.org/10.1080/20473869.2024.2392973>
- Hagan, L., & Thompson, H. (2014). It's good to talk: developing the communication skills of an adult with an intellectual disability through augmentative and alternative communication. *British Journal of Learning Disabilities*, 42(1), 66-73. <https://doi.org/10.1111/bld.12041>
- Hastings, R. P. (2016). Do children with intellectual and developmental disabilities have a negative impact on other family members? The case for rejecting a negative narrative. *International Review of Research in Developmental Disabilities*, 50, 165-194. <https://doi.org/10.1016/bs.iridd.2016.05.002>
- Hernández Hernández, S., Marín Quinto, S., Guillén Martín, V. M., & Mumbardó-Adam, C. (2025). Assessing Pragmatic Skills in People with Intellectual Disabilities. *Behavioral Sciences*, 15(3), 281. <https://doi.org/10.3390/bs15030281>
- Hickey, E., & Cotts, K. G. (2024). *Intellectual disability. Care of Adults with Chronic Childhood Conditions: A Practical Guide*. https://doi.org/10.1007/978-3-031-54281-7_33
- Hofmann, V., & Muller, C. M. (2022). Challenging behaviour in students with intellectual disabilities: the role of individual and classmates' communication skills. *Journal of Intellectual Disability Research*, 66, 353-367. <https://doi.org/10.1111/jir.12922>
- Hosseinkhanzadeh, A. A. (2015). *Teaching Social Skills to Children and Adolescents*. Rooshd-e Farhang.
- Hunter-Geboy, C. (1995). *Life planning education: A youth development program*. Advocates for Youth. <https://www.advocatesforyouth.org/wp-content/uploads/storage/advfy/documents/lpe.pdf>
- Javdan, M., & Morovati, Z. (2020). The Impact of Storytelling on Improving Social Problems, Aggressive Behaviors, and Law-Breaking Behaviors of Primary School Children. *Iranian Evolutionary Educational Psychology*, 2(2), 81-88. <https://doi.org/10.29252/ieepj.2.2.81>
- Karbalai Ismail, H., Anvari, Q., Jorabi, N., & Khajeh Hosein, H. (2006). *Investigating the effectiveness of life skills training on changing attitudes, its application in daily life, and social participation leading to personal and social independence of adolescents with disabilities*. Welfare Organization of Iran.
- Lee, K., Cascella, M., & Marwaha, R. (2022). *Intellectual Disability*. StatPearls [Internet]. <https://doi.org/10.35361/KJID.24.3.9>
- Marrus, N., & Hall, L. (2017). Intellectual disability and language disorder. *Child and Adolescent Psychiatric Clinics of North America*, 26(3), 539. <https://doi.org/10.1016/j.chc.2017.03.001>
- Matson, J. L. (2024). *Handbook of psychopathology in intellectual disability: Research, practice, and policy*. Springer Nature. <https://doi.org/10.1007/978-3-031-66902-6>
- Mirza Amiri, A., Sajadi, F., & Yazdani Pour, M. (2020). The effectiveness of life skills training on behavioral problems of students with mild intellectual disabilities in primary school in Isfahan. *New Advances in Psychology, Educational Sciences, and Teaching*, 3(33), 66-76. <https://civilica.com/doc/1501062/>
- Onnis, L., Truzzi, A., & Ma, X. (2018). Language development and disorders: possible genes and environment interactions. *Research in Developmental Disabilities*, 82, 132-146. <https://doi.org/10.1016/j.ridd.2018.06.015>
- Rahmani Boldaji, A., & Nazamzadeh Azhieh, A. (2018). Examining the impact of Montessori method training on learning mathematical concepts and improving communication skills in students with intellectual disabilities. *Exceptional Education*, 2(151), 51-60. <https://ensani.ir/fa/article/392844/>
- Rizvandi, P., & Imam Jomeh, M. (2023). Examining the impact of cooperative learning on the social development and communication skills of female middle school students in Kermanshah. *Curriculum Development*, 1(1), 123-133. <https://www.sid.ir/FileServer/SF/6251394H0471>
- Rutter, M. (1967). A children's behaviour questionnaire for completion by teachers: Preliminary findings. *Child Psychology & Psychiatry & Allied Disciplines*, 8(1), 1-11. <https://doi.org/10.1111/j.1469-7610.1967.tb02175.x>
- Schalock, R. L., Luckasson, R., & Tassé, M. J. (2021). An overview of intellectual disability: Definition, diagnosis, classification, and systems of supports. *American Journal on Intellectual and Developmental Disabilities*, 126(6), 439-442. <https://doi.org/10.1352/1944-7558-126.6.439>
- Schuppener, S., & Bock, B. M. (2024). *Intellectual disability and accessible communication*. Handbook of Accessible Communication. https://doi.org/10.57088/978-3-7929-9120-6_11
- Sechoaro, E. J., Scrooby, B., & Koen, D. P. (2014). The effects of rehabilitation on intellectually-disabled people - a systematic review. *Health Sa Gesondheid*, 19(1), 1-9. <https://doi.org/10.4102/hsag.v19i1.693>
- Tassé, M. J., Schalock, R. L., Balboni, G., Bersani Jr, H., Borthwick-Duffy, S. A., Spreat, S., & Zhang, D. (2012). The construct of adaptive behavior: Its conceptualization, measurement, and use in the field of intellectual disability. *American Journal on Intellectual and Developmental Disabilities*, 117(4), 291-303. <https://doi.org/10.1352/1944-7558-117.4.291>
- UNICEF. (2019). *Basic Life Skills Course Student Book*. <https://www.unicef.org/azerbaijan/reports/basic-life-skills-course-student-book>
- Varzadar, F., Ranjabari Pour, T., & Rezabakhsh, H. (2019). Predicting life satisfaction based on spiritual well-being and communication skills in parents of children with disabilities. *Growth of Psychology*, 8(10), 150-143. <https://frooyesh.ir/article-1-1459-fa.html>
- Vatankhah, M., & Bakhtiarpour, S. (2025). The effectiveness of the child-centered solution-focused skills training method on life and communication skills of children with intellectual

- disabilities. *Quarterly Journal of Psychology of Exceptional Individuals*, 13(15), 25-32.
https://jpe.atu.ac.ir/article_16431.html
- Wolan-Nieroda, A., Wojnarska, A., Mańko, G., Kiper, A., Guzik, A., & Maciejczak, A. (2023). Assessment of rehabilitation effects in children with mild intellectual disability. *Scientific reports*, 13(1), 15541. <https://doi.org/10.1038/s41598-023-42280-1>
- Wood, S., & Standen, P. (2021). Is speech and language therapy effective at improving the communication of adults with intellectual disabilities?: A systematic review. *International Journal of Language & Communication Disorders*, 56(2), 435-450. <https://doi.org/10.1111/1460-6984.12601>
- World Health Organisation. (2019). *Definition: Intellectual disability*. <http://www.euro.who.int/en/health-topics/noncommunicable-diseases/mental-health/news/news/2010/15/childrens-right-to-family-life/definition-intellectual-disability>
- Yousefi Khaneh Bargh, H., & Zeynali, A. (2024). The role of child temperament and maternal attachment and parenting styles in predicting behavioral problems in 3-5 year-old children with working mothers. *Quarterly Journal of Child Mental Health*, 11(1), 61-47. <https://doi.org/10.61186/jcmh.11.1.5>
- Zeynizadeh, S., Pirzadeh, A., & Tabrizian, S. (2020). Communication skills and its related factors in Ardabil Alavi Hospital nurses and staff. *International Journal of Community Medicine and Public Health*, 7(2), 416-419. <https://doi.org/10.18203/2394-6040.ijcmph20200407>
- Zheng, S., LeWinn, K., Ceja, T., Hanna-Attisha, M., O'Connell, L., & Bishop, S. (2021). Adaptive Behavior as an Alternative Outcome to Intelligence Quotient in Studies of Children at Risk: A Study of Preschool-Aged Children in Flint, MI, USA. *Frontiers in psychology*, 12, 692330. <https://doi.org/10.3389/fpsyg.2021.692330>