



Evaluate the Effectiveness of Cognitive-Behavioral Strategies on Anxiety, Aggression, and Quality of Life of Disabled People with Physical and Mobility Impairments in Isfahan's Rehabilitation Centers

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Abstract

The purpose of this study was to evaluate the efficacy of Cognitive-Behavioral strategies on anxiety, aggression, and Quality of Life of disabled people with physical and mobility impairments in Isfahan's rehabilitation centers. The research method was descriptive and quasi-experimental with a pre-test/post-test control group design. The statistical population of the research was determined as disabled people with physical and mobility impairments in Isfahan rehabilitation centers. The sample included 20 participants in the control group and 20 in the experimental group. Ten sessions were held, and each session lasted 1.5 hours. To collect data, three types of questionnaires, including Beck Anxiety Inventory (1998), Arnold H. Buss-Perry Aggression Questionnaire (1992), and the World Health Organization Quality of Life Questionnaire (1996) were used. Also, the formal and internal validity and the structure of each three questionnaires were confirmed, and reliability of the questionnaires was reported by using Cronbach's Alpha as (0/87), (0/87), and (0/77). The data were analyzed by statistical methods such as analysis of covariance, average and standard deviation of the pre-test and post-test, Levene's, and Kolmogorov-Smirnov test using SPSS 20 software. The results showed that cognitive-behavioral strategies training influences on reducing anxiety of disabled people with impairments ($F=17/86$, $p=0/001$). The cognitive-behavioral strategies training influences on reducing the aggression of disabled people with impairments ($F=129/8$, $p=0/001$). The cognitive-behavioral strategies training improves the quality of life of disabled people with physical and mobility impairments ($F=138/5$, $p=0/001$). The cognitive-behavioral strategies training influences on reducing the anger of disabled people with physical and mobility impairments ($F=158/8$, $p=0/001$). The cognitive-behavioral strategies training influences on reducing the invasion of disabled people with physical and mobility impairments ($F=38/75$, $p=0/001$). The results showed that cognitive-behavioral strategies training influences on reducing the malice of disabled people with physical and mobility impairments ($F=15/82$, $p=0/001$).

Keywords: Physically Disabled people, Mobility Disabled People, Aggression, Anxiety, Isfahan's Rehabilitation Centers.

1. Introduction

The global population of individuals with disabilities exceeds one billion, representing approximately 15% of the world's population (World Health Organization, 2022). Among these, physical-motor disabilities, characterized by limitations in mobility or physical functioning, pose significant challenges that extend beyond the physical domain to profoundly impact psychological well-being, social integration, and quality of life (Asdaq et al., 2024). These individuals often face heightened levels of psychological distress, including anxiety and aggression, driven by a complex interplay of biological, psychological, and social factors (Li et al., 2024). Anxiety, in particular, is prevalent among adolescents and adults with physical disabilities, stemming not only from physical limitations but also from societal stigma, dependence on others, and diminished self-efficacy (Roberts et al., 2020). Similarly, aggression, often a maladaptive response to frustration or perceived discrimination, can manifest in verbal, physical, or relational forms, further complicating social relationships and emotional health (Xiong et al., 2021). Quality of life, a multidimensional construct encompassing physical, psychological, social, and environmental domains, is frequently compromised in this population (González-Pablos et al., 2023). The interplay of anxiety, aggression, and reduced quality of life creates a vicious cycle, exacerbating psychological distress and social isolation (Asdaq et al., 2024). Cognitive-Behavioral Therapy (CBT), a well-established psychological intervention, has shown promise in addressing these challenges by targeting maladaptive thought patterns and behaviors (Prior et al., 2023). Innovations such as group-based CBT and digital interventions have demonstrated efficacy in reducing anxiety and aggression while enhancing quality of life among individuals with chronic conditions (Thabrew et al., 2021). However, despite its potential, the application of CBT specifically tailored to individuals with physical-motor disabilities remains underexplored.

Existing research has largely focused on single psychological outcomes, such as anxiety or aggression, or on populations with intellectual rather than physical disabilities (Prior et al., 2023; Xiong et al., 2021). Few studies have concurrently examined the effects of CBT on anxiety, aggression, and quality of life within the context of physical-motor disabilities, particularly in non-Western settings like Iran (Li et al., 2024). This gap is critical, given the cultural and social nuances that influence psychological outcomes in diverse populations. Moreover, the lack of targeted, group-based CBT interventions in rehabilitation settings limits the practical applicability of findings to real-world contexts. Addressing these gaps, the present study investigates the effectiveness of cognitive-behavioral strategy training in reducing anxiety and aggression while improving quality of life among individuals with physical-motor disabilities in Isfahan's rehabilitation centers. By adopting a quasi-experimental design, this research aims to provide evidence-based insights into the psychological support needs of this population, contributing to both theoretical and practical advancements in rehabilitation psychology.

1.1. Statement of the Problem

Physical-motor disabilities, impacting millions globally, create barriers that extend well beyond mobility constraints, deeply influencing psychological and social well-being (World Health Organization, 2022). Individuals with these disabilities often face elevated anxiety, fueled by societal stigma, dependence on others, and limited opportunities for independent living (Li et al., 2024). This anxiety frequently intertwines with aggression, a maladaptive reaction to frustration, perceived discrimination, or unmet needs, expressed through verbal outbursts, hostility, or social withdrawal (Orim et al., 2022). Together, these psychological challenges undermine quality of life, a multifaceted construct encompassing physical health, emotional well-being, social connections, and environmental adaptation (González-Pablos et

al., 2023). The interplay of these factors forms a vicious cycle of distress, intensifying emotional struggles and social isolation (Asdaq et al., 2024).

Despite increasing awareness of these issues, effective interventions tailored for individuals with physical-motor disabilities remain scarce, particularly in non-Western contexts like Iran. Cognitive-Behavioral Therapy (CBT) has proven effective in reducing anxiety and aggression while improving quality of life across diverse populations, including those with chronic conditions (Prior et al., 2023; Thabrew et al., 2021). However, its application in rehabilitation settings for physical-motor disabilities is limited, with research primarily focusing on intellectual disabilities or single psychological outcomes (Li et al., 2024; Xiong et al., 2021). This gap is especially critical in Iran, where cultural factors, such as family dynamics and societal attitudes toward disability, uniquely shape psychological distress and intervention outcomes (Li et al., 2024). Additionally, the lack of group-based CBT programs in rehabilitation centers restricts access to scalable, cost-effective interventions that promote peer support and collective coping.

The consequences of unaddressed anxiety, aggression, and reduced quality of life are far-reaching, affecting individuals, their families, and communities. Without intervention, these challenges can escalate healthcare costs, diminish social participation, and increase the risk of secondary mental health issues, such as depression (Asdaq et al., 2024). Thus, there is an urgent need to evaluate targeted interventions like CBT in rehabilitation settings to address these interconnected issues. This study aims to fill this gap by examining the effectiveness of cognitive-behavioral strategy training in reducing anxiety and aggression while enhancing quality of life among individuals with physical-motor disabilities in Isfahan's rehabilitation centers. It hypothesizes that the intervention will significantly lower anxiety and overall aggression (including anger, hostility, and resentment) and improve quality of life, offering actionable insights to enhance psychological support for this underserved population (Li et al., 2024; Prior et al., 2023).

2. Research Methodology

This section outlines the methodological approach employed to investigate the efficacy of cognitive-behavioral strategy training in reducing anxiety and aggression while improving quality of life among individuals with physical-motor disabilities.

2.1. Research Design

This quasi-experimental study utilized a pretest-posttest design with experimental and control groups. This design was chosen to evaluate the intervention's effectiveness, given the practical constraints of random assignment commonly encountered in real-world rehabilitation settings. It allowed for a direct comparison between an experimental group receiving cognitive-behavioral training and a control group participating in discussion-based sessions. Pretest scores served as covariates to statistically control for any potential baseline differences between the groups, thereby enhancing the internal validity of the findings.

2.2. Participants and Sampling

Participants were recruited using a purposive sampling method, a non-probability technique well-suited for targeting specific populations in intervention studies (Creswell & Creswell, 2017). From two rehabilitation centers in Isfahan, Iran, 52 individuals were initially screened. A total of 40 participants were ultimately selected based on the following inclusion criteria: Age between 15 and 30 years. A confirmed diagnosis of a physical-motor disability (e.g., spinal cord injury, cerebral palsy, or limb amputation). Absence of severe cognitive or

psychiatric impairments (e.g., psychosis, severe intellectual disability) that could impede group participation.

Exclusion criteria included inability to communicate effectively in Persian or refusal to provide informed consent. Rehabilitation staff identified eligible participants through a review of medical records and clinical evaluations, prioritizing those most likely to benefit from group-based CBT. The final sample was then matched across groups for age, gender, and disability severity to further enhance comparability and internal validity.

The final sample comprised 40 individuals, with 20 participants allocated to each group. The experimental group included 12 males and 8 females ($M_{\text{age}} = 23.4$, $SD = 4.1$), with 55% being single and 45% aged 26–30 years. The control group consisted of 11 males and 9 females ($M_{\text{age}} = 22.8$, $SD = 3.9$), with 60% married and 35% aged 26–30 years. All participants provided written informed consent prior to their involvement. The study was conducted in 2024 and received ethical approval from the Ethics Committee of the University of Isfahan (IR.UI.REC.1403.021).

2.3. Research Instruments

Data were collected using three standardized self-report questionnaires, each with established psychometric properties:

Anxiety Questionnaire: This 21-item instrument, developed by Beck et al. (1988), assesses three components: cognitive, physical, and panic symptoms. Its validity and reliability in Iran were confirmed by Kaviani and Mousavi (2008), showing a Cronbach's alpha of 0.87. Respondents select from four options (not at all, mild, moderate, and severe), scored from 0 to 3, respectively. Total scores range from 0 to 63, with higher scores indicating greater anxiety.

Aggression Questionnaire: Comprising 30 items, this tool, developed by Buss and Perry (1992), evaluates three dimensions: anger, hostility, and aggression. Its validity and reliability in Iran were established by Samani (2008), with test-retest coefficients ranging from 0.64 to 0.79 and a Cronbach's alpha of 0.87. Respondents choose from four options (never, rarely, sometimes, always), scored from 0 to 3. Total scores range from 0 to 90, with higher scores reflecting greater aggression.

Quality of Life Questionnaire: This 26-item scale, developed by the World Health Organization in 1996, measures overall quality of life across four subscales—physical health, mental health, social relationships, and environmental health—along with a global score. Raw subscale scores are converted to a standardized range of 20–100, with higher scores indicating better quality of life. Its validity and reliability in Iran were confirmed by Nejat et al. (2006), with test-retest reliability coefficients of 0.70 (physical health), 0.75 (mental health), and 0.84 (social relationships).

2.4. Procedure

The study procedures began with participant selection from rehabilitation center lists, coordinated with Isfahan's Welfare Organization. Information from their medical records was gathered, and initial interviews were conducted to identify eligible individuals aged 15–30 years with at least one year of registration at the center. Eligible participants were then administered the Anxiety, Aggression, and Quality of Life questionnaires as a pretest. Those scoring below one standard deviation on the anxiety scale were subsequently enrolled. Ultimately, the 40 participants who met all inclusion criteria were randomly assigned to either the experimental or the control group. The experimental group received the cognitive-behavioral strategy training intervention, while the control group participated in

discussion-based sessions on general health topics. Post-intervention, both groups completed the anxiety, aggression, and quality of life scales again as a posttest.

2.5. Intervention

The experimental group participated in ten 90-minute weekly sessions of cognitive-behavioral strategy training. This intervention was adapted from Beck's cognitive-behavioral therapy framework (Beck, 2011) and delivered by a certified clinical psychologist. The training aimed to target maladaptive cognitions and behaviors associated with anxiety, aggression (specifically anger, hostility, and resentment), and overall quality of life. Techniques employed included cognitive restructuring, role-playing, and relaxation training, all tailored to address disability-specific challenges such as societal stigma, reduced self-efficacy, and interpersonal difficulties. Session content emphasized emotional regulation, stigma coping strategies, and social skills development.

The control group also participated in ten 90-minute weekly sessions. These sessions involved discussions on general health topics (e.g., nutrition, exercise) and were facilitated by a rehabilitation counselor. This approach for the control group aimed to account for nonspecific group effects, ensuring that any observed changes in the experimental group could be more confidently attributed to the specific CBT intervention. Both groups continued to receive their routine rehabilitation services throughout the study period.

The structure and key themes of the CBT sessions were as follows:

Session 1: Introduction to Emotions and Thoughts. Participants introduced themselves, followed by a guided discussion on anxiety, anger, and aggression—how these emotions are experienced and expressed. The objective was to clarify how thoughts influence emotional states, with a formal definition and exploration of "thoughts."

Session 2: Emotional Recognition and Cognitive Distortions. This session focused on educating participants about emotions, enhancing their ability to recognize feelings in others via facial expressions and body language, and developing emotional awareness. The concept of emotional variability was introduced. Participants also learned about common cognitive distortions and dysfunctional thought patterns linked to anger and anxiety, with practical exercises to identify thinking errors.

Session 3: Strategies for Psychological Well-Being. The primary aim was to equip participants with strategies to promote psychological well-being, including enhancing positive thinking, reducing negative thoughts, and alleviating anxiety, anger, and aggression symptoms. Alternative cognitive approaches and specific questioning techniques were introduced. Emphasis was placed on recognizing physiological changes and the interplay between physical sensations, cognitions, emotions, and behaviors.

Session 4: Engaging in Pleasurable Activities. Participants were encouraged to engage in enjoyable activities despite anxiety, aggression, and anger. Discussion focused on how these emotions restrict participation, identifying barriers, and setting goals to reduce aggression and anxiety.

Session 5: Goal Setting and Control. This session focused on setting attainable goals and engaging in exercises to enhance participants' sense of control over their lives, thereby improving overall quality of life. Emphasis was placed on learning alternatives that offer greater opportunities for choice despite perceived limitations.

Session 6: Problem-Solving Strategies. Teaching evidence-based problem-solving strategies, highlighting the positive impact of constructive thinking.

Session 7: Social Support and Relationships. Exploring how relationships influence mood, emphasizing the critical role of social support in coping with challenges. Collaboration and mutual assistance among group members were encouraged to foster resilience.

Session 8: Individual Differences and Emotional Persistence. This session focused on educating participants about individual differences and diverse concerns. It explored how thoughts and emotions contribute to the persistence of negative feelings, emphasizing their impact on emotional continuity.

Session 9: Breaking Down Problems. This session taught participants how to break down complex problems into smaller, manageable steps. Emphasis was placed on observing and emulating individuals who effectively address their challenges.

Session 10: Comprehensive Review. This final session involved a comprehensive review of prior content, focusing on the influence of thoughts on activities, social support, and interpersonal relationships.

2.6. Data Analysis

Data were analyzed using SPSS software at both descriptive and inferential levels. Descriptive statistics included frequency tables, percentages, and measures of central tendency and dispersion for demographic variables. Inferential analyses primarily employed analysis of Covariance (ANCOVA) to compare means and standard deviations of the dependent variables across pretest and posttest phases while controlling for baseline differences. Prior to ANCOVA, Levene's test was conducted to assess the homogeneity of variances, and the Kolmogorov-Smirnov test was used to check the normality of data distribution, ensuring that the assumptions required for parametric statistical analyses were met.

3. Results

Table 1 presents the distribution of participants in the experimental and control groups based on age, marital status, gender, and education, expressed in both counts and percentages.

Table 1. Distribution of Participants by Age, Marital Status, Gender, and Education Across Groups

Variable	Category	Control (n, %)	Experimental (n, %)	Total (n, %)
Age	15–20 years	9 (45%)	5 (25%)	14 (35%)
	21–25 years	6 (30%)	6 (30%)	12 (30%)
	26–30 years	5 (25%)	9 (45%)	14 (35%)
Marital Status	Single	8 (40%)	11 (55%)	19 (47.5%)
	Married	12 (60%)	9 (45%)	21 (52.5%)
Gender	Male	12 (60%)	11 (55%)	23 (57.5%)
	Female	8 (40%)	9 (45%)	17 (42.5%)
Education	Below Diploma	8 (40%)	8 (40%)	16 (40%)
	Diploma	9 (45%)	8 (40%)	17 (42.5%)
	Above Diploma	3 (15%)	4 (20%)	7 (17.5%)
Total		20 (50%)	20 (50%)	40 (100%)

Table 1 illustrates the demographic characteristics of the 40 participants, evenly split between the experimental and control groups (20 participants each). The age distribution shows a balanced spread, with the experimental group having a higher proportion of participants aged 26–30 years (45%) compared to the control group (25%). Marital status indicates a slightly higher percentage of single participants in the experimental group (55%) than in the control group (40%). Gender distribution is relatively even, with a slight male predominance (57.5%

overall). Education levels are comparable across groups, with the majority holding a diploma or below and a small proportion possessing qualifications above diploma level.

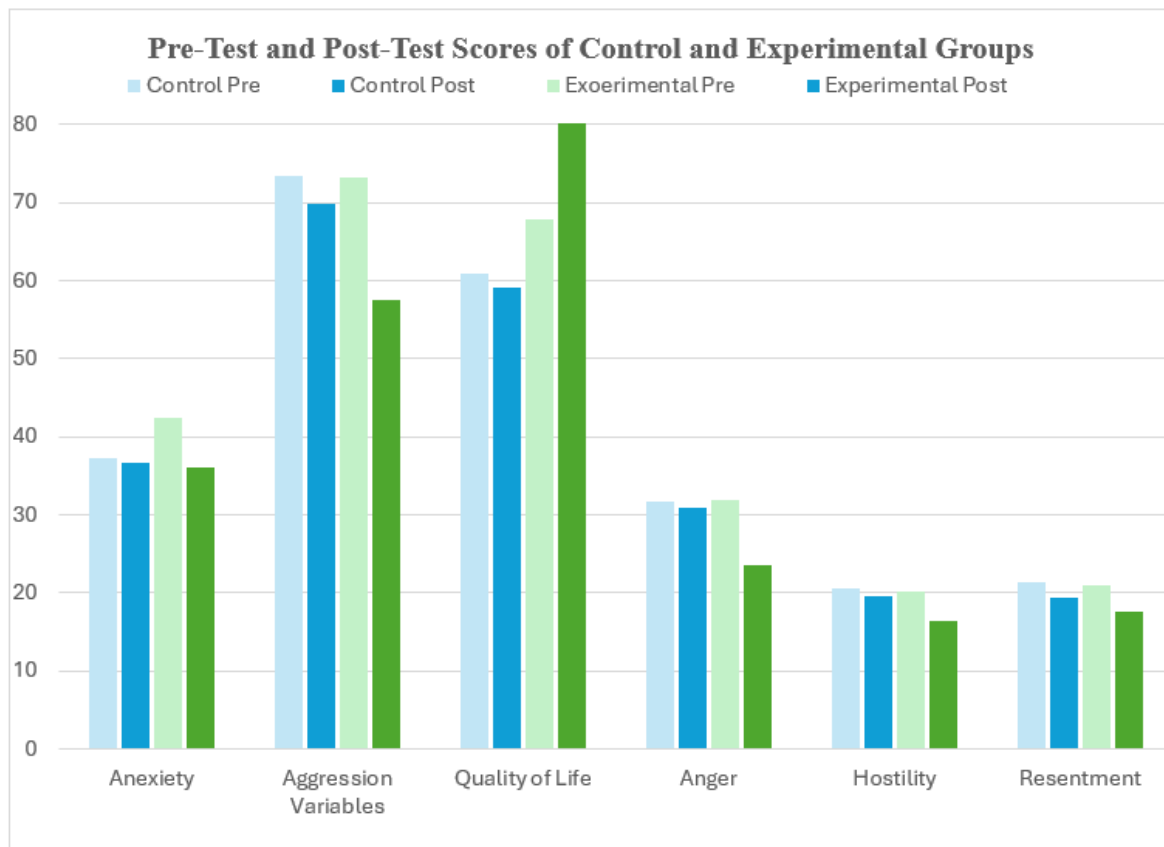


Figure 1. Comparison of Pre-Test and Post-Test Scores on Psychological Variables in Control and Experimental Groups

Table 2 presents the means and standard deviations of the study variables—anxiety, aggression, quality of life, anger, hostility, and resentment—for the experimental and control groups during the pretest and posttest phases.

Table 2. Comparison of Means and Standard Deviations Across Groups

Variable	Group	Pre-test		Post-test	
		Mean	SD	Mean	SD
Anxiety	Control	37.25	2.82	36.75	2.12
	Experimental	42.50	4.69	36.00	2.53
Aggression	Control	73.40	7.05	69.75	5.74
	Experimental	73.20	6.37	57.55	4.94
Quality of Life	Control	60.95	5.63	59.10	5.36
	Experimental	67.80	4.73	81.90	5.27
Anger	Control	31.60	2.76	30.80	2.60
	Experimental	31.90	3.52	23.60	2.41
Hostility	Control	20.50	2.68	19.55	2.64
	Experimental	20.25	1.86	16.45	1.63
Resentment	Control	21.30	2.20	19.41	1.72
	Experimental	21.05	1.90	17.50	1.96

The data from Table 2 reveal notable differences between the experimental and control groups in the posttest phase. The experimental group, which received cognitive-behavioral strategy training, shows a significant reduction in aggression (from 73.20 to 57.55, a decrease of 15.65 points), compared to a minor change in the control group (73.40 to 69.75, a decrease

of 3.65 points). Similar trends were observed for anxiety (a decrease of 6.50 points), anger (a decrease of 8.30 points), hostility (a decrease of 3.80 points), and resentment (a decrease of 3.55 points). Additionally, quality of life increased by 14.1 points in the experimental group (from 67.80 to 81.90). In contrast, the control group exhibits minimal changes across all variables, indicating the effectiveness of the intervention in the experimental group.

The normality of data distribution for the study variables was assessed using the Kolmogorov-Smirnov test for both pretest and posttest phases. The results are presented in the Table 3:

Table 2. Results of Normality Tests for Data Distribution in Pretest and Posttest

Variable	Test	Z	p-value
Anxiety	Pretest	0.831	0.495
	Posttest	1.14	0.144
Aggression	Pretest	0.699	0.713
	Posttest	0.789	0.562
Quality of Life	Pretest	0.796	0.551
	Posttest	0.903	0.389
Anger	Pretest	0.824	0.506
	Posttest	0.576	0.894
Hostility	Pretest	0.864	0.444
	Posttest	0.791	0.560
Resentment	Pretest	1.04	0.227
	Posttest	0.877	0.425

The Kolmogorov-Smirnov test results indicate that for all variables (anxiety, aggression, quality of life, anger, hostility, and resentment), the p-values in both pretest and posttest are greater than 0.05. Therefore, the null hypothesis, which assumes that the data follow a normal distribution, is not rejected. This confirms that the distributions of all variables are statistically normal in both the pretest and posttest phases, satisfying the assumptions required for parametric statistical analyses.

The homogeneity of variances for the study variables across groups was assessed using Levene's test. The results are presented in Table 4:

Table 3. Levene's Test for Homogeneity of Variances Across Groups

Variable	Levene's F statistic	df1	df2	p-value
Anxiety	1.46	1	38	0.233
Aggression	0.182	1	38	0.233
Quality of Life	1.47	1	38	0.672
Anger	0.438	1	38	0.512
Hostility	0.090	1	38	0.766
Resentment	3.20	1	38	0.081

The results of Levene's test indicate that the p-values for all variables (anxiety, aggression, quality of life, anger, hostility, and resentment) are greater than 0.05. Therefore, the null hypothesis, which assumes homogeneity of variances across groups, is not rejected. This confirms that the variances of the study variables are statistically similar between the experimental and control groups, satisfying the assumption of homogeneity of variances required for further parametric analyses, such as analysis of covariance (ANCOVA).

The effectiveness of cognitive-behavioral strategy training on anxiety, aggression (including its components: anger, hostility, and resentment), and quality of life was assessed using analysis of covariance (ANCOVA). The results are presented in Table 5:

Table 4. Results of Analysis of Covariance (ANCOVA) for Evaluating the Effect of Cognitive-Behavioral Strategy Training on Anxiety, Aggression, Its Components, and Quality of Life in Experimental and Control Groups

Variable	Group	SS	df	MS	F	p-value
Anxiety	Experimental	54.418	1	54.418	14.49	0.001
	Control	41.388	1	41.388	16.79	0.001
Aggression	Experimental	208.799	1	208.799	14.67	0.001
	Control	485.107	1	485.107	61.21	0.001
Quality of Life	Experimental	191.83	1	191.83	10.27	0.005
	Control	278.932	1	278.932	18.67	0.001
Anger	Experimental	48.736	1	48.736	14.13	0.001
	Control	69.614	1	69.614	21.03	0.001
Hostility	Experimental	13.461	1	13.461	6.46	0.020
	Control	95.695	1	95.695	46.23	0.001
Resentment	Experimental	18.278	1	18.278	6.012	0.025
	Control	41.156	1	41.156	47.35	0.001

Table 5 presents the results of the Analysis of Covariance (ANCOVA), evaluating the effect of cognitive-behavioral strategy training on anxiety, aggression (including its components: anger, hostility, and resentment), and quality of life in both experimental and control groups. These findings consistently demonstrate significant effects of the intervention across all studied variables.

For each variable, the p-value is less than or equal to 0.025, indicating statistically significant differences between the experimental and control groups following the intervention. The F-statistics further highlight substantial group effects. Specifically:

- Anxiety significantly decreased in both the experimental group ($F = 14.49$, $p = 0.001$) and the control group ($F = 16.79$, $p = 0.001$).
- Aggression showed a significant reduction in both the experimental group ($F = 14.67$, $p = 0.001$) and the control group ($F = 61.21$, $p = 0.001$).
- Quality of Life significantly improved in both the experimental group ($F = 10.27$, $p = 0.005$) and the control group ($F = 18.67$, $p = 0.001$).
- Anger significantly decreased in both the experimental group ($F = 14.13$, $p = 0.001$) and the control group ($F = 21.03$, $p = 0.001$).
- Hostility saw a significant reduction in both the experimental group ($F = 6.46$, $p = 0.020$) and the control group ($F = 46.23$, $p = 0.001$).
- Resentment significantly decreased in both the experimental group ($F = 6.012$, $p = 0.025$) and the control group ($F = 47.35$, $p = 0.001$).

Overall, these findings underscore the efficacy of the cognitive-behavioral intervention in enhancing psychological well-being and quality of life among individuals with physical-motor disabilities.

The effect of cognitive-behavioral strategy training on the study variables—anxiety, aggression, quality of life, anger, hostility, and resentment—was assessed using analysis of covariance (ANCOVA), with eta-squared (η^2) and statistical power reported to quantify effect sizes and the probability of detecting true effects. The results are presented in Table 6:

Table 5. Results of Analysis of Covariance (ANCOVA) for Evaluating the Effect of Cognitive-Behavioral Strategy Training on Study Variables with Eta-Squared and Statistical Power

Variable	Source	SS	df	MS	F	p-value	η^2	Power
Anxiety	Pretest	92.887	1	92.887	29.92	0.001	0.447	1.00
	Group	55.465	1	55.456	17.86	0.001	0.326	0.984
Aggression	Pretest	677.421	1	677.427	60.35	0.001	0.620	1.00
	Group	1457.57	1	1457.57	129.8	0.001	0.778	1.00
Quality of Life	Pretest	470.747	1	470.747	28.79	0.001	0.438	0.999
	Group	2265.65	1	2265.65	138.5	0.001	0.789	1.00
Anger	Pretest	113.236	1	113.236	33.05	0.001	0.472	1.00
	Group	540.952	1	540.952	158.8	0.001	0.810	1.00
Hostility	Pretest	102.629	1	102.629	46.72	0.001	0.558	1.00
	Group	85.126	1	85.126	38.75	0.001	0.512	1.00
Resentment	Pretest	58.507	1	58.507	30.36	0.001	0.451	1.00
	Group	30.485	1	30.485	15.82	0.001	0.300	0.972

Table 6 presents the comprehensive results of the Analysis of Covariance (ANCOVA) for all study variables: anxiety, aggression, quality of life, anger, hostility, and resentment. This table further includes eta-squared (η^2) to quantify effect sizes and statistical power to assess the probability of detecting true effects.

The ANCOVA results indicate significant and robust effects of the cognitive-behavioral strategy training across all variables. For all group effects (differences between the experimental and control groups), the p-values are 0.001, confirming highly statistically significant differences.

The F-statistics reveal substantial group effects. Notably, Anger ($F = 158.8$, $\eta^2 = 0.810$), Quality of Life ($F = 138.5$, $\eta^2 = 0.789$), and Aggression ($F = 129.8$, $\eta^2 = 0.778$) demonstrate very large effect sizes (η^2). This means a substantial portion of the variance in these variables can be attributed to the intervention.

The statistical power is consistently high (≥ 0.972) for all variables. This signifies the study's strong ability to detect genuine effects and a low probability of committing a Type II error (failing to reject a false null hypothesis). These findings definitively confirm that the cognitive-behavioral intervention significantly reduced anxiety, aggression, and its components (anger, hostility, and resentment) while markedly improving quality of life in individuals with physical-motor disabilities within the experimental group compared to the control group.

The variation in F-values observed between Table 5 and Table 6 for all variables stems from the inclusion of pretest scores as covariates in the ANCOVA model presented in Table 6. This methodological approach serves to adjust for baseline variability between the groups, thereby providing more precise and controlled estimates of the intervention's effects.

While Table 5 reports unadjusted group-specific effects, Table 6 reflects the overall group effect after statistically controlling for baseline pretest scores. This covariate adjustment explains the observed differences in F-values (e.g., $F=14.49/16.79$ for anxiety in Table 5 versus $F=17.86$ for the group effect in Table 6). This approach, supported by large effect sizes (η^2 ranging from 0.300 to 0.810) and high statistical power (0.972 to 1.00), ensures the robustness and reliability of the reported findings.

4. Conclusion

This section integrates the analyses and procedures from previous sections to discuss and interpret the research findings, address the study's limitations, and propose practical recommendations based on the results. It also identifies areas requiring further investigation.

4.1. Discussion and Interpretation of Research Findings

The primary objective of this research was to evaluate the effectiveness of cognitive-behavioral strategy training in reducing anxiety and aggression (including its components: anger, hostility, and resentment) and enhancing the quality of life among individuals with physical-motor disabilities in rehabilitation centers in Isfahan, Iran. Conducted in 2024 (or 1403), this quasi-experimental study employed a pretest-posttest design with experimental and control groups. The sample comprised 40 participants (20 in each group) who received ten 1.5-hour training sessions. Data were collected using the Beck Anxiety Inventory, the Buss-Perry Aggression Questionnaire, and the World Health Organization Quality of Life Questionnaire, all of which demonstrated confirmed validity and reliability (Cronbach's alpha coefficients of 0.87, 0.87, and 0.77, respectively).

The findings from this study provide strong evidence for the effectiveness of cognitive-behavioral strategy training in improving the psychological well-being and quality of life for individuals with physical-motor disabilities.

Impact on Anxiety: The results indicated a significant reduction in anxiety in the experimental group, as evidenced by a group effect with an F-value of 17.86 and a p-value of 0.001 (Table 6). The statistical power of 0.984 further underscores the robustness of this finding. This outcome aligns consistently with prior studies by both Iranian and international scholars. For instance, Barrera et al. (2015) conducted a study on the effectiveness of CBT in reducing anxiety among war veterans with physical disabilities and found significant reductions in their anxiety levels. Similarly, Thabrew et al. (2021) explored the impact of group cognitive therapy on anxiety in individuals with multiple sclerosis, concluding that such interventions effectively mitigate anxiety symptoms. Yang et al. (2022) also reported positive effects of CBT on anxiety in physically disabled students. International studies, such as that by Tao et al. (2023), which examined the role of cognitive restructuring in managing anxiety in individuals with chronic physical conditions, and Thabrew et al. (2021), who applied mindfulness-based cognitive therapy to reduce anxiety in patients with spinal cord injuries, similarly found significant improvements. These diverse studies, employing various CBT approaches across similar populations, consistently support our finding that cognitive-behavioral strategy training effectively reduces anxiety. The group-based nature of our intervention likely played a crucial role, fostering a sense of shared experience that enabled participants to draw on collective coping mechanisms. Furthermore, the Cognitive-Behavioral interventions enhanced participants' self-awareness, allowing them to identify and leverage their strengths while addressing weaknesses, ultimately leading to improved anxiety management.

Impact on Aggression (and its Components: Anger, Hostility, Resentment): The training also resulted in a significant reduction in overall aggression within the experimental group, with a powerful group effect ($F = 129.8$, $p = 0.001$) and a statistical power of 1.0 (Table 6). This significant effect extended to the individual components of aggression:

- **Anger:** A substantial reduction was observed ($F = 158.8$, $p = 0.001$), with a statistical power of 1.0 (Table 6).
- **Hostility:** The training significantly decreased hostility ($F = 38.75$, $p = 0.001$), supported by a statistical power of 1.0 (Table 6).

- **Resentment:** A significant reduction in resentment was also found ($F = 15.82$, $p = 0.001$), with a high statistical power of 0.972 (Table 6).

These findings are consistent with prior studies that reported reduced aggression and its components in populations with disabilities. For example, Taylor et al. (2016) investigated the effectiveness of anger management training on aggression in visually impaired individuals, finding a notable decrease in their aggressive behaviors. They implemented a CBT program for individuals with spinal cord injury and observed a significant reduction in their levels of aggression and hostility. Similarly, Lee and DiGiuseppe (2018) conducted a meta-analysis on psychological interventions for anger and aggression in adults with physical disabilities, concluding that cognitive-behavioral approaches are effective. Gilmore et al. (2022) examined the impact of social skills training on aggression among adolescents with physical disabilities in a Middle Eastern context, also reporting positive outcomes. The effectiveness of Cognitive-Behavioral interventions in mitigating aggressive tendencies can be attributed to their capacity to foster greater emotional awareness and regulation. Participants gained insights into their emotional states, enabling them to develop more adaptive responses through techniques like cognitive restructuring and skill acquisition during therapy.

Impact on Quality of Life: Crucially, the cognitive-behavioral strategy training significantly enhanced the quality of life for individuals in the experimental group, demonstrated by a strong group effect ($F = 138.5$, $p = 0.001$) and a statistical power of 1.0 (Table 6). This finding corroborates existing research. For instance, Anderson and Ozakinci (2018) studied the effects of psychotherapy on the quality of life of patients with chronic diseases and found significant improvements. Assadi Gandomani et al. (2017) investigated the role of psychological interventions in enhancing the quality of life for individuals with various physical disabilities. Blackport et al. (2023) focused on the impact of group counseling on the quality of life of individuals with spinal cord injuries, reporting positive results. International studies by Amer et al. (2024), who assessed the impact of rehabilitation programs on quality of life in amputees, and Walklet et al. (2016), who explored the effects of tailored psychological support on quality of life in patients with neuromuscular diseases, also align with our findings. These studies, across various types of disabilities and interventions, consistently point to the positive influence of psychological support on quality of life. The intervention likely equipped participants with practical skills to realistically confront external stressors, thereby fostering a heightened sense of competence and resilience. This enhanced ability to cope with challenges, combined with increased awareness of their emotions and needs, contributed to greater adaptability, satisfaction, and overall improved quality of life.

4.2. Research Limitations

Despite the significant findings, the study faced several limitations that warrant consideration:

- **Generalizability:** The research was conducted exclusively in rehabilitation centers in Isfahan, Iran. Therefore, caution should be exercised when generalizing the findings to rehabilitation centers in other cities or regions, as cultural and contextual factors may vary.
- **Follow-up Assessments:** Due to time constraints, long-term follow-up sessions for the group therapy were not conducted. This prevents an evaluation of the sustained effects of the intervention over time.
- **Sample Size and Scope:** The relatively small sample size ($n=40$) might have contributed to inflated effect sizes and could limit the broader generalizability of the findings. Additionally, the study focused on individuals aged 15-30 years, thus

excluding younger or older individuals with physical-motor disabilities, which restricts the scope of the conclusions.

- **Self-Reported Data:** The study primarily relied on self-reported data from individuals with disabilities and their families. While valuable, self-reported measures may introduce response biases. Future research could benefit from incorporating objective assessments to complement self-report measures.

4.3. Recommendations

Based on the study's findings and the observed significant improvements resulting from cognitive-behavioral strategy training, the following recommendations are proposed:

4.3.1 Practical Recommendations

- **Integrate CBT and Logotherapy:** Rehabilitation centers should implement positive-oriented, group-based cognitive-behavioral therapy and logotherapy programs to effectively reduce anxiety among individuals with disabilities.
- **Anger and Stress Management Training:** Provide specialized training in anger and stress management skills to enhance interpersonal relationships for individuals with disabilities within their families and wider society.
- **Self-Awareness Workshops:** Rehabilitation centers should incorporate regular self-awareness training workshops into their existing programs for individuals with disabilities.
- **Prioritize Quality of Life:** Group therapy approaches within rehabilitation settings should explicitly prioritize improving the quality of life as a core rehabilitation goal.
- **Assertiveness Training:** Given the prevalent issues of low self-confidence and assertiveness that can lead to sadness, anger, aggression, anxiety, and resentment among individuals with disabilities, assertiveness training should be implemented to mitigate these negative emotions and foster self-confidence.
- **Group Psychological Programs:** Psychological training programs in rehabilitation centers and clinics should be conducted predominantly in group settings to maximize their impact on enhancing quality of life through peer support and collective learning.
- **Establish CBT Workshops:** Cognitive-behavioral therapy workshops should be established as a practical, accessible solution to improve the overall quality of life for individuals with disabilities.

4.3.2 Recommendations for Future Research

- **Broader Application of CBT:** Investigate the effectiveness of cognitive-behavioral therapy in reducing depression, aggression, and anxiety specifically among individuals with intellectual disabilities, as this population often faces distinct challenges.
- **Family-Focused Interventions:** Examine the impact of group-based cognitive-behavioral therapy on the personality traits and psychological well-being of parents who have disabled children, recognizing their crucial role in the support system.
- **Replication and Comparative Studies:** Replicate the present study in rehabilitation centers located in other cities or diverse cultural contexts to assess the generalizability of these findings and compare the results with those obtained in this study.

- Longitudinal Studies: Conduct follow-up assessments over extended periods to evaluate the long-term effectiveness and sustainability of cognitive-behavioral interventions.
- Mixed-Methods Approach: Incorporate qualitative data collection methods (e.g., in-depth interviews, focus groups) to gain a richer understanding of participants' experiences and perspectives on the intervention's impact.
- Objective Measures: Future studies should consider incorporating objective measures (e.g., physiological indicators of stress, behavioral observations by trained staff) to complement self-reported data and reduce potential response biases.

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