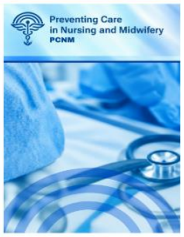
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Original Article

Cognitive-Behavioral Anger Management Training and Communication Skills, Resilience, and Quality of Life Among Nurses: A Quasi-Experimental Study

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Abstract

Background: Occupational stress may negatively affect nurses' anger management, communication skills, resilience, and quality of life. Evidence on cognitive-behavioral anger management training among Iranian nurses is limited.

Objectives: To evaluate the effects of group-based cognitive-behavioral anger management training on communication skills, resilience, and quality of life among nurses at Shohada Hospital, Tabriz, Iran.

Methods: This quasi-experimental study used a pretest-posttest design with a control group. Thirty nurses from inpatient wards were purposively selected and assigned to an experimental group (n = 15) or a control group (n = 15) through non-random allocation. The experimental group participated in 12 cognitive restructuring-based anger management training sessions. Data were collected using the Queendom Communication Skills Scale, the Connor-Davidson Resilience Scale (CD-RISC), and the 36-Item Short Form Health Survey (SF-36). Data were analyzed using multivariate and univariate analyses of covariance (MANCOVA and ANCOVA) in SPSS version 25.

Results: The intervention group showed significantly greater improvements in communication skills than the control group (Wilks' $\Lambda = 0.213$, $F(5,23) = 16.94$, $p < 0.001$, $\eta^2 = 0.737$). Significant between-group differences were also observed for resilience ($F(1,27) = 62.30$, $p < 0.001$, $\eta^2 = 0.70$) and the eight SF-36 subscales (Wilks' $\Lambda = 0.200$, $F(8,19) = 9.50$, $p < 0.001$, $\eta^2 = 0.80$), with higher adjusted post-test scores in the intervention group.

Conclusion: Cognitive behavioral anger management training may improve nurses' communication skills, resilience, and quality of life; however, larger randomized studies are needed to confirm its effectiveness.

Implications for Nursing and Midwifery Preventive Care

- Integrating CBT anger management into staff development may reduce burnout and improve nurses' resilience and communication skills.
- Group-based interventions offer a cost-effective approach to enhancing staff well-being and preventive care.

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Introduction

Nursing is widely recognized as a demanding healthcare profession, with nurses frequently exposed to multiple occupational stressors, including heavy workloads, shift work, staffing shortages, exposure to suffering, and interpersonal conflicts [1–3]. Persistent exposure to these stressors has been associated with adverse psychological and occupational outcomes, including burnout, anxiety, depressive symptoms, and reduced job satisfaction [4]. These challenges highlight the importance of interventions that can strengthen nurses' psychological resources and interpersonal functioning.

Anger is a common emotional response to perceived threats, frustration, or stressful situations. Although anger itself is a normal emotional experience, frequent or poorly regulated anger may adversely affect nurses' interpersonal relationships and professional functioning [5]. Previous research has associated unmanaged anger among nurses with difficulties in interpersonal communication, reduced empathy, workplace hostility, and poorer patient-related outcomes [6]. Persistent anger may also contribute to psychological distress and emotional dysregulation, potentially affecting nurses' overall well-being [7]. Therefore, interventions that promote more adaptive responses to anger may have implications for both nurses' well-being and their workplace interactions.

Cognitive-behavioral therapy (CBT) provides a well-established framework for addressing maladaptive emotional and behavioral responses. Cognitive restructuring, a core component of CBT, focuses on identifying and challenging inaccurate or unhelpful thoughts and developing more balanced interpretations of stressful situations [8]. In anger management, this approach can help individuals recognize maladaptive appraisals, reconsider hostile interpretations, and develop more adaptive coping responses to anger-provoking situations [9]. These mechanisms provide a theoretical basis for incorporating cognitive restructuring into anger management training for nurses.

Resilience is an important psychological resource in nursing. It refers to the capacity to adapt to adversity and maintain effective psychological functioning in challenging circumstances [10]. Higher resilience has been associated with more effective coping, greater emotional stability, and lower vulnerability to occupational burnout among nurses [11]. Importantly, resilience is considered a dynamic capacity that can be strengthened through appropriate psychosocial and skills-based interventions [12]. Interventions targeting cognitive and emotional coping processes may therefore strengthen resilience among nurses exposed to persistent occupational stress.

Quality of life (QOL) is a multidimensional construct encompassing physical and psychological health, social functioning, and other aspects of daily life. Occupational stress and emotional exhaustion can adversely affect QOL among nurses, with potential implications for both individual well-being and professional functioning. Improving nurses' psychological well-being may therefore be relevant not only to their personal health but also to the quality and sustainability of their professional performance.

Communication skills are fundamental to effective nursing practice. Therapeutic communication supports accurate assessment, patient education, emotional support, and the development of therapeutic relationships [13]. Effective communication has also been associated with fewer interpersonal difficulties and greater job satisfaction among nurses [14]. Conversely, communication difficulties may intensify interpersonal tension and make it harder to manage stressful interactions. Because cognitive-behavioral anger management addresses maladaptive cognitions and emotional responses, it may also offer opportunities to strengthen communication skills, including emotional regulation, assertiveness, active listening, and constructive responses to interpersonal conflict.

Previous studies provide preliminary support for anger management and cognitive-behavioral interventions among nurses. Şahin et al. reported that anger management training reduced anger and improved psychological resilience and quality of care among hospital nurses [15]. Similarly, Yun and

Yoo found that a structured anger management program was associated with reductions in anger and job stress and improvements in psychological well-being and job satisfaction [16].

Among Iranian nurses, Zarei and Mohammadi reported beneficial effects of cognitive-behavioral anger management training on behavioral activation and inhibition systems and impulsive aggressive responses [17]. Qalipour et al. found that group anger-control training improved self-control and social competence among nurses working in COVID-19 wards [18]. In addition, Akbarinasab et al. reported improvements in resilience following cognitive-behavioral group therapy among female nurses [19]. Collectively, these findings suggest that cognitive-behavioral and group-based approaches may be promising strategies for addressing psychological and interpersonal challenges among nurses.

Despite these findings, evidence regarding the effects of cognitive-behavioral anger management training on multiple interrelated outcomes among nurses remains limited. In particular, few studies have examined communication skills, resilience, and QOL concurrently within a single intervention study. This is an important gap because these outcomes may be interconnected: improved emotional regulation may facilitate more effective interpersonal communication, strengthen adaptive coping, and contribute to better perceived well-being. Moreover, group-based interventions may provide opportunities for experiential learning, role-play, peer interaction, and feedback, which are particularly relevant to the development of interpersonal and emotional-regulation skills [16, 20]. Group delivery may also be a practical approach for implementing psychosocial interventions within hospital staff development programs.

Objectives

This study aimed to evaluate the effectiveness of group-based cognitive-behavioral anger management training on communication skills, resilience, and quality of life among nurses at Shohada Hospital in Tabriz, Iran.

Methods

Study Design

This quasi-experimental study used a pretest-posttest design with a control group and was conducted at Shohada Hospital in Tabriz, Iran, from March to June 2023. All participants provided written informed consent before enrollment. Because the intervention involved group-based psychological training, blinding the participants was not feasible. However, the statistician who conducted the analyses was blinded to group allocation. Participant recruitment, allocation, follow-up, and analysis are presented in Figure 1.

Participants

The study population consisted of 290 nurses working at Shohada Hospital. Nurses were eligible if they had a bachelor's or master's degree in nursing, had no psychiatric or physical condition that would prevent participation, were not receiving concurrent psychological training, and provided written informed consent. Nurses with low levels of emotional control were excluded to avoid a floor effect. Emotional control was assessed using the emotional control subscale of the Queendom Communication Skills Scale, and participants scoring below the 25th percentile were excluded. Eligibility criteria were assessed through self-report and review of employee health records. Participants were excluded if they missed more than two intervention sessions, submitted incomplete questionnaires, or voluntarily withdrew from the study.

Purposive sampling with maximum variation was used to recruit nurses from different inpatient wards and with varying levels of clinical experience. Participants were assigned to the intervention or control group using a non-random allocation procedure.

Sample Size Calculation

The required sample size was estimated using G*Power version 3.1.9.7. An a priori power analysis was conducted for a one-way analysis of covariance (ANCOVA; F-test) with one covariate (pretest resilience score) to compare the two groups on the posttest resilience total score.

Based on an effect size (Cohen's f) of 0.80, which was reported in a previous randomized controlled trial using the total score of the Connor-Davidson Resilience Scale [15], with a two-sided α of 0.05 and 80% power, the minimum required sample size was 26 participants (13 per group). To allow for potential attrition, 30 nurses were recruited, with 15 allocated to each group.

Intervention/Procedure

The intervention was based on the cognitive restructuring approach to anger management described by Riely and Shopshire [20] and was adapted to the Iranian nursing context. Adaptations included replacing examples from the original protocol with clinically relevant situations, such as conflicts with patients' families, disagreements during shift handovers, and frustration related to workload. Assertiveness strategies were also adapted to reflect the cultural and professional context of Iranian nurses.

The intervention consisted of 12 weekly group sessions, each lasting 120 minutes. Sessions were delivered by a doctoral-level clinical psychologist with more than five years of experience in cognitive-behavioral therapy. The content of the sessions is summarized in Table 1.

To assess treatment fidelity, all sessions were audio-recorded, and 20% were randomly selected for independent review by a clinical psychologist using a predefined fidelity checklist. The review indicated 92% adherence to the intervention protocol.

The control group received no psychological intervention during the study period and was offered the same training after the posttest.

The flow of participants through the study, including enrollment, group assignment, follow-up, and analysis, is illustrated in Figure 1.

Outcome Measures

Outcomes were assessed at two time points: one week before the intervention (pretest) and one week after completion of the intervention (posttest). Assessments were conducted under standardized conditions.

The primary outcome was resilience, assessed using the total score of the Connor-Davidson Resilience Scale (CD-RISC). Secondary outcomes were communication skills, assessed using the five subscale scores of the Queendom Communication Skills Scale, and health-related quality of life, assessed using the eight domains of the 36-Item Short Form Health Survey (SF-36). Baseline demographic characteristics (age, gender, educational level, work experience, and ward) were also collected using a researcher-developed checklist, as described in the Instruments section.

Instruments and Measures (Validity & Reliability)

Demographic information form: A researcher-developed checklist was used to collect participants' demographic characteristics, including age, gender, educational level (bachelor's or master's degree), years of nursing experience, and ward of employment.

All participants at the pretest assessment completed this form.

Communication skills were assessed using the Queendom Communication Skills Test-Revised [21].

This instrument was developed by Queendom (Plumeus, Inc.) in 2004 to assess communication skills in adults. The scale consists of 34 items rated on a 5-point Likert scale from 1 (never) to 5 (always), yielding a total score of 34–170, with higher scores indicating better communication skills. The questionnaire assesses five subscales: ability to receive and send messages, emotional control, listening skills, assertiveness, and insight into the communication process.

The Persian version was validated and normed by Hossein Chari and Fadakar (2005) [22], who reported a Cronbach's alpha of 0.88 for the total scale and confirmed its content validity. In the present study, Cronbach's alpha was 0.86.

Resilience was measured using the 25-item Connor-Davidson Resilience Scale (CD-RISC) [23]. The scale consists of 25 items rated on a five-point scale from 0 (not true at all) to 4 (true nearly all the time), yielding a total score from 0 to 100, with higher scores indicating greater resilience. The scale includes five subscales: personal competence, trust/tolerance of negative affect, acceptance of change, control, and spiritual influences. The

psychometric properties of the Persian version have been extensively evaluated in the Iranian population. Sharif Nia et al. [24] confirmed its validity and reliability among the general Iranian population. Similarly, Khoshouei [25] reported good internal consistency, with Cronbach's alpha values ranging from 0.84 to 0.89 among Iranian students. In the present study, Cronbach's alpha was 0.88 for the total scale and ranged from 0.74 to 0.86 across the subscales. Given the scale's established sensitivity to change, it has been widely employed in interventional studies examining resilience enhancement following psychological treatments [26].

Health-related quality of life was assessed using the 36-Item Short Form Health Survey (SF-36) [27]. The questionnaire assesses eight domains of health-related quality of life, with scores transformed to a 0–100 scale; higher scores indicate better quality of life. The Iranian version has demonstrated acceptable internal consistency, with Cronbach's α values ranging from 0.70 to 0.85, and reported test-retest reliability values ranging from 0.43 to 0.79 [28]. In the present study, Cronbach's α was 0.82.

Statistical Analysis

Data were analyzed using SPSS version 25. Statistical assumptions were assessed before the main analyses. The normality of continuous variables was examined using the Shapiro–Wilk test, with no statistically significant departures from normality detected (all $p > 0.05$). Homogeneity of variance was assessed using Levene's test, which showed no statistically significant differences between groups (all $p > 0.05$). The assumption of homogeneity of regression slopes was also examined and was satisfied for all dependent variables (all $p > 0.05$). Box's M test indicated no statistically significant violation of the homogeneity of covariance matrices for the communication skills subscales ($p = 0.163$) or SF-36 domains ($p = 0.156$). Descriptive statistics were used to summarize the total communication skills and total SF-36 scores. MANCOVA was used to assess between-group differences in the five communication skills subscales and eight SF-36 domains, with the corresponding pretest scores entered as covariates. Thus, the total communication skills and total SF-36 scores were retained as descriptive outcomes, whereas inferential analyses were conducted at the subscale/domain level. ANCOVA was used to compare posttest resilience scores between groups, with pretest resilience scores entered as the covariate. Although the CD-RISC includes five subscales, the prespecified primary outcome was the total resilience score; therefore, analyses focused on the overall score.

Effect sizes were reported as partial eta squared (ηp^2). All statistical tests were two-sided, and $p < 0.05$ was considered statistically significant. No missing outcome data were observed.

Table 1. Summary of Intervention Sessions

Session	Topic	Key Activities
1-2	Psychoeducation & Anger Awareness	Defining anger, anger meter, trigger identification
3-4	Cognitive-Behavioral Strategies	Progressive muscle relaxation, identifying cognitive distortions
5-6	Cognitive Restructuring (A-B-C-D Model)	Thought stopping, challenging irrational beliefs
7-8	Assertiveness & Conflict Resolution	Role-playing, differentiating assertiveness vs. aggression
9-10	Cognitive Reappraisal & Automatic Thoughts	Reframing provocations, coping statements
11-12	Review & Relapse Prevention	Program evaluation, developing a personalized maintenance plan

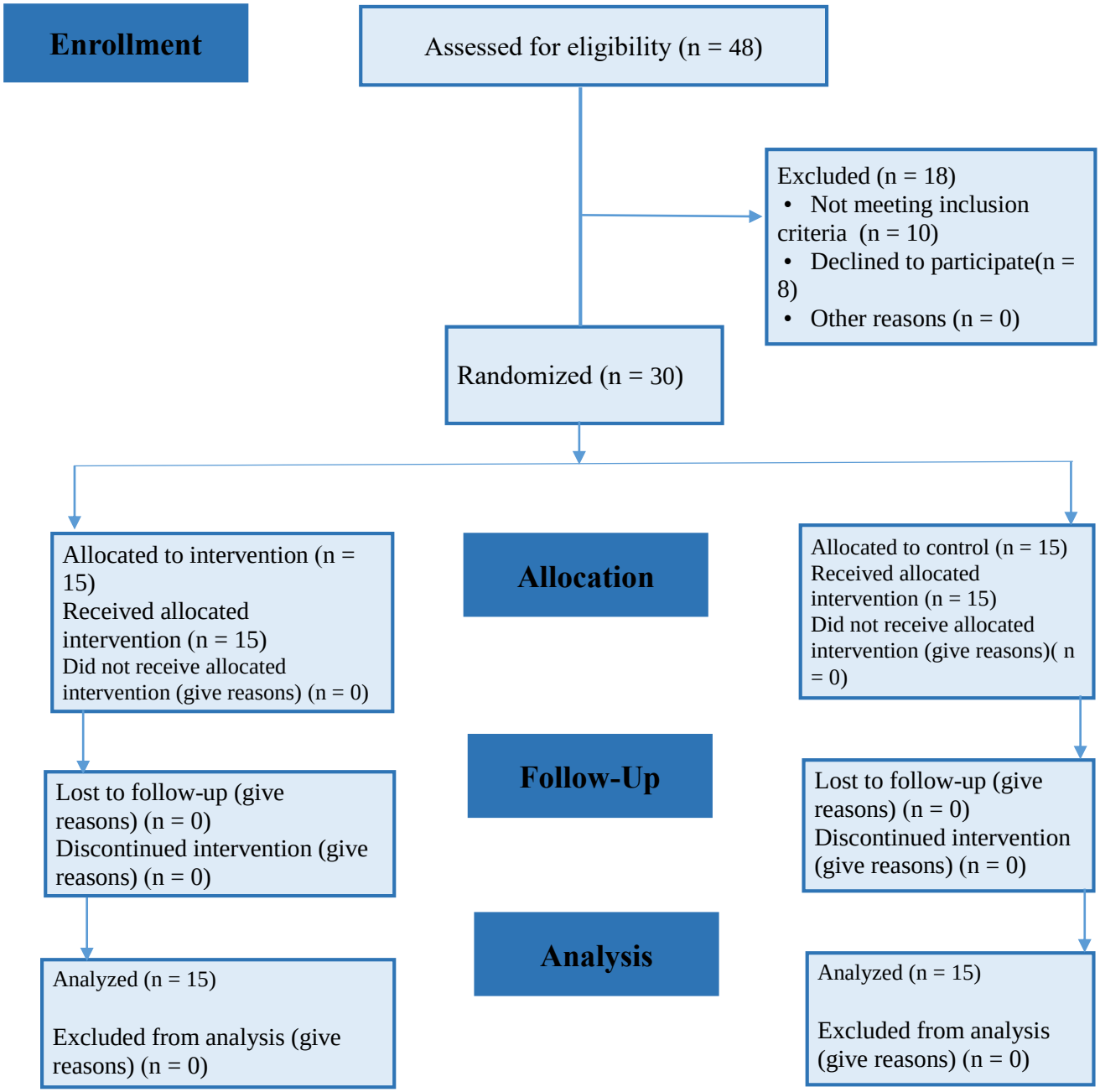


Figure 1. Participant Flow Diagram Through the Study

Results

Descriptive Findings

A total of 30 nurses participated in the study, with 15 assigned to each group. All participants completed the pretest and posttest assessments, with no attrition or missing outcome data. The mean age was 34.67 years (SD = 6.23) in the intervention group and 35.20 years (SD = 5.98) in the control group. In both groups, 11 participants (73.3%) were female, and 4 (26.7%) were male. Regarding educational level, 12 participants (80.0%) in the intervention group and 13 (86.7%) in the control group held a bachelor's degree, while 3 (20.0%) and 2 (13.3%), respectively, held a master's degree.

The mean work experience was 8.13 years (SD = 4.21) in the intervention group and 8.67 years (SD = 3.98) in the control group. Regarding ward of employment, 4 nurses (26.7%) in the intervention

group and 5 (33.3%) in the control group worked in internal medicine wards; 5 (33.3%) and 4 (26.7%), respectively, worked in surgical wards; 3 (20.0%) and 4 (26.7%) worked in ICU/CCU; and 3 (20.0%) and 2 (13.3%) worked in emergency departments. Baseline comparisons showed no statistically significant differences between the intervention and control groups in demographic characteristics (all $p > 0.05$). Table 2 presents the descriptive statistics for the study outcomes at pretest and posttest. Pretest scores were similar between groups for communication skills, resilience, and quality of life. At posttest, the intervention group had higher mean scores than the control group across all three outcomes.

Assessment of Statistical Assumptions

The assumptions required for the planned analyses were assessed before hypothesis testing. The Shapiro–Wilk test showed no statistically significant departures from normality (all $p > 0.05$). Levene's test indicated no significant differences in error variances between groups (all $p > 0.05$). The assumption of homogeneity of regression slopes was also satisfied for all dependent variables (all $p > 0.05$). Box's M test indicated no statistically significant violation of the homogeneity of covariance matrices for the communication skills subscales ($p = 0.163$) or SF-36 domains ($p = 0.156$).

Communication Skills

MANCOVA showed a significant multivariate between-group effect across the five communication skills subscales after adjustment for pretest scores, Wilks' $\Lambda = 0.213$, F (5, 23) = 16.94, $p < 0.001$, $\eta^2 = 0.737$. Follow-up ANCOVAs showed statistically significant between-group differences across all five subscales [Table 3]. Adjusted posttest scores were higher in the intervention group than in the control group for ability to receive/send messages, emotional control, listening skills, assertive communication, and insight into the communication process. Effect sizes were large, ranging from $\eta^2 = 0.60$ to 0.72.

Resilience

ANCOVA showed a significant between-group difference in posttest resilience scores after adjustment for pretest resilience, F (1, 27) = 62.30, $p < 0.001$, $\eta^2 = 0.70$. The adjusted posttest mean was higher in the intervention group (M = 92.33, SE = 1.94) than in the control group (M = 62.47, SE = 1.94).

Quality of Life

MANCOVA showed a significant multivariate between-group effect across the eight SF-36 domains after adjustment for pretest scores, Wilks' $\Lambda = 0.200$, F (8, 19) = 9.50, $p < 0.001$, $\eta^2 = 0.80$.

Follow-up ANCOVAs showed statistically significant between-group differences across all eight SF-36 domains [Table 4].

Adjusted posttest scores were higher in the intervention group than in the control group for physical functioning, social functioning, role-physical, role-emotional, mental health, vitality, bodily pain, and general health.

Effect sizes (partial η^2) ranged from 0.48 to 0.59, indicating moderate to large between-group effects.

Table 2. Descriptive Statistics for Study Variables by Group and Assessment Point

Variable	Group	Pretest, M (SD)	Posttest, M (SD)
Communication skills (total)	Experimental	92.33 (12.45)	131.47 (14.28)
	Control	91.87 (13.01)	94.20 (12.96)
Resilience (total)	Experimental	58.40 (15.23)	92.33 (13.67)
	Control	59.13 (14.87)	62.47 (14.91)
Quality of life (SF-36 total)	Experimental	58.67 (11.34)	79.80 (10.56)
	Control	59.20 (10.98)	61.33 (11.23)

Note. M = mean; SD = standard deviation. Higher scores indicate better outcomes for all variables.

Table 3. ANCOVA Results for Communication Skills Subscales

Subscale	Group	Adjusted M (SE)	F (1, 27)	*p*	η²
Ability to Receive/Send Messages	Experimental	35.60 (0.89)	57.08	< 0.001	0.68
	Control	29.07 (0.89)			
Emotional Control	Experimental	34.40 (0.91)	56.72	< 0.001	0.68
	Control	28.13 (0.91)			
Listening Skills	Experimental	24.27 (0.61)	69.77	< 0.001	0.72
	Control	19.47 (0.61)			
Assertive Communication	Experimental	18.27 (0.51)	40.12	< 0.001	0.60
	Control	14.67 (0.51)			
Insight into Communication Process	Experimental	18.80 (0.64)	50.98	< 0.001	0.65
	Control	15.33 (0.64)			

Note. Adjusted means are adjusted for pretest scores. SE = standard error; η² = partial eta squared.

Table 4. ANCOVA Results for Quality of Life Subscales (SF-36)

Subscale	Group	Adjusted M (SE)	F (1, 27)	*p*	η²
Physical Functioning	Experimental	85.67 (2.07)	24.56	< 0.001	0.48
	Control	70.53 (2.07)			
Social Functioning	Experimental	82.33 (1.94)	34.23	< 0.001	0.56
	Control	63.47 (1.94)			
Role-Physical	Experimental	78.67 (2.56)	26.11	< 0.001	0.49
	Control	62.53 (2.56)			
Role-Emotional	Experimental	76.00 (2.47)	33.39	< 0.001	0.55
	Control	58.40 (2.47)			
Mental Health	Experimental	74.67 (2.14)	29.47	< 0.001	0.52
	Control	60.53 (2.14)			
Vitality	Experimental	72.33 (1.94)	33.75	< 0.001	0.56
	Control	56.20 (1.94)			
Bodily Pain	Experimental	79.33 (2.01)	36.01	< 0.001	0.57
	Control	61.80 (2.01)			
General Health	Experimental	73.67 (1.83)	38.26	< 0.001	0.59
	Control	58.93 (1.83)			

Note. Adjusted means are adjusted for pretest scores. SE = standard error; η² = partial eta squared.

Discussion

This study evaluated the effectiveness of group-based cognitive-behavioral anger management training on communication skills, resilience, and quality of life among nurses. The findings showed significantly higher adjusted posttest scores in the intervention group across all three outcomes.

The intervention had a significant multivariate effect on communication skills and quality of life, with large effect sizes, and a significant effect on overall resilience.

These findings provide preliminary evidence that cognitive-behavioral anger management training may be a useful approach for improving several aspects of nurses' psychological and interpersonal functioning. The intervention was associated with significant improvements across all five communication skill domains, including receiving and sending messages, emotional control, listening skills, assertive communication, and insight into the communication process. This finding is consistent with previous research suggesting that cognitive-behavioral and anger management interventions can improve interpersonal functioning and communication-related outcomes [29, 30]. Recent evidence has also indicated that cognitive-behavioral approaches can reduce anger and improve anger control among nurses [31]. The present findings extend this evidence to nurses and suggest that addressing maladaptive anger responses may have broader benefits for interpersonal communication in the workplace.

Several mechanisms may explain these findings. Cognitive restructuring helps individuals identify and challenge irrational or unhelpful thoughts that contribute to emotional reactions and replace them with more balanced interpretations [8]. The neural mechanisms underlying this process are well-documented; meta-analyses of neuroimaging studies have consistently shown that cognitive reappraisal engages prefrontal regions and reduces amygdala reactivity [32], and recent training studies have further confirmed that reappraisal strategies can modulate emotional responses at the neural level [33]. In the context of workplace interactions, this process may reduce hostile interpretations of others' behaviors and allow nurses to respond more deliberately to stressful situations. The assertiveness and conflict-resolution components of the intervention may have further supported nurses' ability to express their needs and concerns appropriately, while avoiding passive or aggressive responses [9]. In addition, the group format provided opportunities for role-playing, peer interaction, and feedback, which may have reinforced the practical application of communication and emotional regulation skills [20].

The intervention also produced a significant improvement in overall resilience. The adjusted posttest resilience score was substantially higher in the intervention group than in the control group, with a large effect size ($\eta^2 = 0.70$). This finding is consistent with previous research indicating that cognitive-behavioral and anger-management interventions can improve resilience and adaptive coping among nurses [15, 18, 19]. Importantly, the present result should not be interpreted as a 70% increase in resilience; rather, the partial eta squared indicates a large group effect on posttest resilience after controlling for baseline scores.

The improvement in resilience may be related to the intervention's emphasis on cognitive restructuring and emotional self-regulation. Resilience is considered a dynamic capacity that can be strengthened through adaptive coping, emotional regulation, and effective responses to adversity [10, 12]. By helping nurses recognize maladaptive thought patterns and develop more balanced appraisals of stressful situations, cognitive restructuring may reduce the emotional impact of workplace stressors. Relaxation and self-regulation strategies included in the intervention may have further supported nurses in managing physiological and emotional responses to anger and stress [11]. These processes may collectively strengthen perceived coping capacity and psychological adaptation.

This interpretation is also consistent with evidence emphasizing the importance of communication skills and emotional resilience in supporting preventive, person-centered care among healthcare professionals [34].

Quality of life also improved significantly across all eight SF-36 domains in the intervention group. Significant differences were observed in physical functioning, social functioning, role-physical, role-emotional, mental health, vitality, bodily pain, and general health, with large effect sizes across domains. These findings are broadly consistent with previous evidence that psychological and cognitive-behavioral interventions can positively influence well-being and quality of life among nurses [35, 36]. The consistency of the findings across all eight domains is noteworthy, as it suggests that the intervention's potential benefits were not limited to psychological functioning.

The improvement in quality of life may partly reflect the interconnected nature of the study outcomes. Better emotional regulation and communication may reduce interpersonal conflict and facilitate more supportive relationships with colleagues, patients, and families [13, 14]. Similarly, greater resilience may help nurses cope more effectively with occupational demands and reduce the negative psychological effects of chronic workplace stress [37]. The intervention also provided practical skills, including cognitive reappraisal, relaxation, assertiveness, and problem-solving, which may be applicable beyond the workplace. However, because the study did not directly measure changes in workplace conflict, burnout, stress, or interpersonal relationships, these proposed mechanisms remain interpretive and should be examined in future research.

The group-based format may also have contributed to the observed effects. Group sessions provide opportunities for nurses to practice communication skills in realistic interpersonal situations, observe peers, receive feedback, and share experiences with colleagues facing similar occupational challenges [16, 20].

These features may enhance learning and provide social support in addition to the specific therapeutic components of cognitive restructuring. The relatively high treatment fidelity observed in the present study further supports the consistency of intervention delivery. Nevertheless, the specific contribution of the group format cannot be determined because the study did not include an individual-treatment comparison group.

The findings have potential implications for nursing practice and staff development. Cognitive-behavioral anger management training could be considered as part of continuing education or workplace well-being programs for nurses, particularly in settings characterized by high interpersonal and emotional demands. The group-based format may also make the intervention feasible to implement in hospital settings. However, the large effect sizes observed in this study should be interpreted cautiously because the sample was small and participants were not randomly allocated. Larger randomized controlled trials are needed before firm conclusions can be drawn regarding the effectiveness and scalability of the intervention.

This study has several strengths. The use of a control group, standardized outcome measures, a structured 12-session intervention, and documented treatment fidelity strengthen the study's internal validity. The absence of attrition and missing outcome data also reduces concerns related to incomplete follow-up. However, several limitations should be considered. First, the non-random allocation of participants limits causal inference and leaves the possibility of selection bias. Although baseline characteristics did not differ significantly between groups and pretest scores were statistically controlled, these procedures cannot fully compensate for the lack of randomization. Second, the small sample of 30 nurses limits statistical precision and generalizability, potentially leading to inflated effect estimates. Third, participants could not be blinded to group assignment because of the nature of the intervention, which may have introduced expectancy or performance effects. Fourth, the study was conducted in a single hospital in Tabriz, limiting the transferability of the findings to other nursing populations and healthcare settings. Fifth, outcomes were assessed only immediately after the intervention, so the durability of the observed improvements remains unknown. Finally, although participants with low anger levels were excluded, the anger criterion was based on the emotional control subscale of the communication skills measure rather

than a dedicated standardized anger assessment, which should be considered when interpreting the findings.

Future studies should use adequately powered randomized controlled designs involving nurses from multiple hospitals and diverse clinical settings. Longer follow-up periods would help determine whether improvements in communication skills, resilience, and quality of life are maintained over time. Future research should also compare group-based and individual interventions to determine whether the observed effects are attributable primarily to the cognitive-behavioral content or are enhanced by group interaction and peer support. Examining changes in anger severity, occupational stress, burnout, interpersonal conflict, and job satisfaction alongside the current outcomes could further clarify the mechanisms through which anger management training affects nurses' well-being. Such studies would provide stronger evidence for the effectiveness and practical implementation of this intervention in nursing practice.

Conclusion

This study found that group-based cognitive-behavioral anger management training was associated with significant improvements in communication skills, resilience, and quality of life among nurses. Large effect sizes were observed across the study outcomes, suggesting potentially meaningful benefits of the intervention. The structured group format and high treatment fidelity support its feasibility as a staff development approach. However, the small sample size, non-random allocation, and absence of follow-up assessments limit the strength and generalizability of the findings. Larger randomized controlled trials with longer follow-up are needed to confirm the effectiveness and sustainability of this intervention and to determine its potential role in routine nursing staff development.

Ethical Considerations

This study was approved by the Ethics Committee of Islamic Azad University, Tabriz Medical Branch (IR.IAU.TABRIZ.REC.1402.444). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments. Written informed consent was obtained from all individual participants included in the study.

Participants were assured of the confidentiality and anonymity of their data and were informed that they could withdraw from the study at any time without penalty. The control group was placed on a waiting list and received the intervention after the study was completed.

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Conflict of Interest

The authors declare that they have no conflict of interest, financial or otherwise, related to the publication of this manuscript.

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Authors' Contributions

Conceptualization: M. Tabatabaei
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Formal Analysis: S. Pourmohammad
Visualization: S. Pourmohammad
Writing – Original Draft: S. Pourmohammad
Writing – Review & Editing: M. Tabatabaei, S. Pourmohammad
Supervision: M. Tabatabaei
Project Administration: M. Tabatabaei
All authors read and approved the final manuscript.

Artificial Intelligence Utilization

During the preparation of this manuscript, minor assistance from artificial intelligence (AI) tools was utilized to enhance English phrasing and improve the clarity of scientific writing in accordance with the standards of the Preventive Care in Nursing and Midwifery Journal. Specifically, ChatGPT (OpenAI, GPT-4.5) was used for language refinement and editorial suggestions. The authors made all analytical decisions, interpreted the data, and performed the final editing. The use of AI complied with ethical standards of academic publishing and did not replace the authors' scientific responsibility or intellectual contributions.

Data Availability Statement

The datasets generated and/or analyzed during the current study are not publicly available due to the confidentiality of participant information. Still, they are available from the corresponding author on reasonable request.

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