

Effectiveness of Choice Theory–Based Group Therapy on Somatoform Problems Among Nurses

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ABSTRACT

The highly stressful nature of the nursing profession and continuous exposure to psychological stressors can contribute to the development of somatization disorders or somatoform problems among nurses, adversely affecting their professional functioning and quality of life. The present study aimed to determine the effectiveness of choice theory–based group therapy in reducing somatoform problems among nurses at Imam Reza Hospital in Tabriz. This study employed a quasi-experimental design with pretest, posttest, and follow-up assessments and a control group. The statistical population consisted of all nurses employed at this medical center. From this population, 40 eligible nurses were selected through purposive sampling and randomly assigned to an experimental group ($n = 20$) and a control group ($n = 20$). Data were collected using the Patient Health Questionnaire-15 (PHQ-15), which was administered at three time points: pretest, posttest, and follow-up. The experimental group participated in 11 90-minute sessions of a choice theory–based therapeutic protocol, whereas the control group received no intervention. The data were analyzed using repeated-measures analysis of covariance (ANCOVA). The findings indicated that choice theory–based interventions significantly reduced the severity of somatoform problems at posttest ($p < .01$), and this therapeutic effect remained stable at the follow-up assessment. The results demonstrated that through learning key concepts of choice theory, including responsibility, satisfaction of basic needs, and awareness of internal control, nurses were able to manage occupational stressors more adaptively and reduce the conversion of psychological distress into physical symptoms. These findings underscore the importance of implementing brief, targeted psychological interventions within organizational health programs and mental health services for healthcare personnel.

Keywords: group therapy, choice theory, somatoform problems, nurses

1. Introduction

Nursing is widely recognized as one of the most psychologically and physically demanding healthcare professions because nurses are routinely exposed to high workloads, rotating shifts, sleep disruption, interpersonal conflict, responsibility for critically ill patients, emotional encounters with suffering and death, and organizational pressures. These demands can produce persistent psychological strain that is manifested not only through emotional symptoms such as anxiety, irritability, and exhaustion but also through a broad range of bodily complaints. Recent evidence has increasingly emphasized that somatic symptoms among healthcare workers should not be interpreted merely as isolated physical complaints, because they often emerge within a complex interaction among occupational stress, psychological distress, physiological arousal, sleep disturbance, coping resources, and perceptions of control. Occupational studies have demonstrated that healthcare personnel experience a substantial burden of both general and occupation-related somatic pathology, highlighting the need to examine physical symptom complaints within the broader context of working conditions and psychological functioning (Stepanov et al., 2025). More specifically, research among nursing professionals has shown that the prevalence and severity of mental and somatic symptoms may vary across different career stages, suggesting that occupational exposure, accumulated stress, and changing professional responsibilities can influence nurses' vulnerability to bodily manifestations of distress (Mo et al., 2025).

Somatic symptoms refer to physical experiences such as pain, fatigue, gastrointestinal discomfort, dizziness, cardiopulmonary complaints, sleep-related problems, and musculoskeletal symptoms that may be associated with medical conditions, psychological processes, or an interaction between the two. In psychological and psychiatric research, particular attention is given to somatic symptom burden when the severity, persistence, or functional consequences of physical complaints are disproportionate to identifiable biomedical findings or when psychological factors substantially contribute to their experience and maintenance. Contemporary conceptualizations have shifted away from a rigid separation between medically explained and medically unexplained symptoms and instead focus on symptom severity, distress, preoccupation, functional impairment, and the mechanisms involved in symptom perception. Research on somatic

symptom perception and interoception indicates that the experience of bodily symptoms is influenced not only by physiological signals but also by cognitive and perceptual processes through which individuals attend to, interpret, and assign meaning to internal bodily sensations (Withöft et al., 2020). Therefore, the subjective experience of physical symptoms may be intensified by stress, heightened bodily attention, negative expectations, emotional dysregulation, and maladaptive interpretations of normal physiological changes.

The clinical importance of somatic symptom burden is considerable because recurrent or severe somatic complaints can be associated with increased healthcare utilization, functional limitations, occupational absenteeism, impaired concentration, reduced job performance, and diminished quality of life. Research in primary care settings has demonstrated that somatic symptom disorder and clinically significant somatic complaints constitute an important component of everyday medical practice, requiring systematic assessment rather than being regarded simply as nonspecific complaints (Alqahtani, 2025). Trauma-related experiences have also been linked to heightened somatic symptomatology. For example, betrayal trauma has been associated with greater physical symptom burden in medically underserved primary care populations, illustrating how adverse psychological experiences may become embodied and expressed through physical distress (Chang et al., 2025). Similarly, stressful sociopolitical events can produce both anxiety and somatic symptoms at the population level, indicating that bodily distress may represent an important pathway through which exposure to threatening circumstances affects psychological well-being (Alnaser et al., 2025). These findings reinforce the view that somatic symptoms are multidimensional phenomena situated at the intersection of physiological, psychological, interpersonal, and environmental processes.

One of the most consistently identified correlates of somatic symptoms is psychological stress. Persistent stress activates physiological systems associated with arousal and adaptation, and when these processes become chronic, they may contribute to fatigue, sleep disturbance, pain, gastrointestinal discomfort, cardiovascular sensations, and other bodily complaints. The relationship between stress and functional somatic disorders has been supported by population-based evidence showing that higher perceived stress and lower self-efficacy are associated with greater likelihood of functional somatic disorders (Petersen et al., 2023). This association is especially relevant to nurses,

whose professional environment frequently includes intense time pressure, emotional demands, insufficient recovery periods, and responsibility for complex patient care. Among nurses, perceived social support, insomnia severity, and perceived stress have been found to form interconnected pathways related to somatic symptoms, indicating that reduced support may contribute to sleep disturbance and increased stress, which in turn intensify bodily complaints (Qi et al., 2025). Thus, somatic symptoms among nurses should be understood in relation to broader psychosocial processes rather than being approached only through a biomedical framework.

The relationship between stress and somatic symptoms is also influenced by emotion regulation. Individuals who experience difficulty identifying, tolerating, and modifying negative emotional states may be more likely to respond to stress with sustained physiological arousal and greater attention to bodily discomfort. Empirical findings have shown that emotion regulation difficulties can moderate the association between perceived stress and the severity of somatic symptoms, such that individuals with poorer emotion regulation capacities may exhibit stronger somatic responses under conditions of heightened stress (Selvi & Bozo, 2023). Related research in university populations has demonstrated that somatic symptoms may co-occur with burnout, insomnia, anxiety, depression, and stress, further supporting the notion that physical symptom burden often reflects a broader pattern of psychological dysregulation (Torales et al., 2026). In nursing contexts, where emotional suppression and continuous professional composure may be implicitly expected, difficulties in regulating distress can potentially amplify the conversion of psychological pressure into persistent physical complaints.

Anxiety represents another major psychological mechanism associated with somatic symptom formation and persistence. Anxiety involves autonomic arousal, muscle tension, respiratory changes, hypervigilance, and increased attention to potential threats, all of which can heighten awareness of bodily sensations. Studies among adolescents have shown significant associations between somatic symptoms and symptoms of depression and anxiety, suggesting that bodily complaints may serve as an important expression of emotional distress (Lu et al., 2025). Network-based research has also identified complex interrelationships among anxiety, problematic behavioral patterns, and somatic symptoms, indicating that these variables may reinforce one another through multiple pathways rather than operating as isolated conditions (Fang et al., 2025). In

addition, research has demonstrated that anxiety can mediate the relationship between stressful or unpredictable experiences and later somatic symptomatology, while coping strategies may alter the strength of this relationship (Xiang et al., 2025). Such findings are particularly relevant to healthcare professionals, who frequently encounter unpredictable clinical situations and may experience sustained anticipatory anxiety associated with patient safety, workload, errors, and professional accountability.

Evidence from nursing students further illustrates the interdependence of psychological and bodily distress. During academically stressful periods, generalized anxiety and somatic symptoms have been shown to exert a combined adverse effect on well-being among nursing students (Abdullahi et al., 2025). Although nursing students differ from employed nurses in professional responsibilities, this finding is important because it suggests that individuals entering the nursing profession may already be vulnerable to the simultaneous experience of cognitive-emotional distress and physical symptom burden. If such patterns persist into professional practice, prolonged exposure to occupational stressors may contribute to more stable or severe somatic difficulties. Moreover, somatic symptoms are not restricted to adults in highly demanding occupations. Research among adolescents has reported notable prevalence rates and identified multiple psychological and contextual factors associated with somatic complaints (Mahirah et al., 2025), while studies of children with functional gastrointestinal disorders have demonstrated that acute illness may be accompanied by increased somatic symptom severity (Sirinil & Wongteerasut, 2025). Together, these findings show that somatic symptom expression is a broadly relevant psychological phenomenon across developmental stages and clinical populations.

The assessment of somatic symptom burden is therefore a critical component of both clinical practice and psychological research. Among the most frequently used measures is the Patient Health Questionnaire-15 (PHQ-15), which captures the severity of common somatic complaints across several bodily systems. A recent systematic review of factor analytic studies of the PHQ-15 and the Somatic Symptom Scale-8 has highlighted the multidimensional nature of general somatic symptom burden and the value of standardized instruments for identifying patterns of physical distress (Hybelius et al., 2026). The PHQ-15 is especially useful in occupational and healthcare populations because it permits concise assessment of symptoms that may otherwise be dispersed across different medical complaints. From a

psychological intervention perspective, standardized measurement also facilitates evaluation of whether therapeutic approaches can reduce the severity of somatic symptoms by altering the cognitive, emotional, and behavioral processes that contribute to their persistence.

In addition to individual psychological factors, organizational conditions can play a substantial role in nurses' somatic health. Nurses work within hierarchical systems in which leadership style, interpersonal relationships, perceived fairness, autonomy, and organizational climate may either buffer or intensify occupational stress. Recent structural equation modeling research among mental health nurses found that toxic leadership was associated with psychological distress, somatic symptoms, and adverse employee outcomes, illustrating the importance of workplace relational dynamics in nurses' mental and physical health (Saleh et al., 2026). Such findings suggest that interventions targeting only external working conditions may be insufficient, particularly when organizational stressors cannot be rapidly modified. Psychological interventions that strengthen perceived personal agency, adaptive decision making, responsibility, interpersonal effectiveness, and internal control may therefore provide nurses with practical resources for responding more effectively to occupational stressors.

One theoretical framework that directly emphasizes personal agency, responsibility, internal control, and satisfaction of psychological needs is Glasser's choice theory. Choice theory proposes that human behavior is purposeful and oriented toward satisfying fundamental needs, commonly conceptualized as survival, love and belonging, power or achievement, freedom, and fun. According to this perspective, psychological difficulties may arise when individuals attempt to satisfy these needs through ineffective behaviors or when they rely excessively on external control, blame, coercion, or attempts to change others. Choice theory instead emphasizes that individuals have greater control over their own actions and thinking than over external events or other people. Through increased self-evaluation, realistic planning, and personal responsibility, individuals can select behaviors that more effectively satisfy their needs while reducing psychological conflict. This emphasis on internal control is particularly relevant to nurses, who often work in environments where many external circumstances—such as patient volume, emergencies, institutional policies, or staffing shortages—cannot be directly controlled.

Choice theory-based interventions have been applied to a range of psychological and educational problems. Recent evidence indicates that choice theory-based therapy can reduce negative psychological outcomes and improve adaptive cognitive processes among individuals experiencing relational distress (Mohammadi Moghaddam et al., 2026). In another context, choice theory-based interventions have demonstrated beneficial effects on behavioral and executive-function outcomes among children with depressive symptoms (Mosafar & Nasri, 2025). Choice theory principles have also been incorporated into parenting interventions, with findings suggesting potential benefits for improving the quality of parent-child relationships (Tavazoei et al., 2025). Although these populations and outcomes differ from those of nurses with somatic symptoms, they demonstrate the applicability of choice theory across diverse psychological contexts and support its central premise that improved awareness of needs, behavioral choices, and personal responsibility can facilitate adaptive change.

Choice theory has also shown relevance in professional and educational settings in which self-efficacy and performance are central concerns. Choice theory-based instruction combined with clinical supervision has been associated with enhanced self-efficacy among teachers, suggesting that the approach may strengthen individuals' confidence in their ability to manage challenging professional demands (Karimi et al., 2025). This finding is particularly relevant because low self-efficacy has itself been associated with functional somatic disorders (Petersen et al., 2023). If choice theory interventions can improve individuals' perceptions of agency and effective control, they may indirectly reduce vulnerability to somatic symptom amplification by decreasing helplessness, maladaptive stress responses, and excessive focus on uncontrollable external conditions. For nurses, learning to differentiate controllable from uncontrollable aspects of stressful clinical situations may therefore be especially valuable.

From the perspective of total behavior within choice theory, behavior is understood as comprising four interrelated components: acting, thinking, feeling, and physiology. Individuals are assumed to have the most direct control over acting and thinking, whereas feelings and physiological responses are influenced indirectly through changes in these more controllable components. This framework provides a conceptually meaningful basis for addressing somatic symptoms. Nurses who repeatedly respond to occupational stress through catastrophic thinking,

self-blame, interpersonal conflict, avoidance, or perceived helplessness may experience heightened emotional distress and physiological arousal. By modifying actions and thoughts, strengthening realistic self-evaluation, and selecting more adaptive coping behaviors, it may be possible to reduce both emotional distress and physiological symptom intensity. This mechanism is consistent with broader research demonstrating the close relationship among anxiety, stress, coping, and bodily symptom expression (Selvi & Bozo, 2023; Xiang et al., 2025).

The potential usefulness of choice theory is also supported by evidence that bodily symptom experiences are closely linked to stress appraisal, self-efficacy, sleep, coping, and interpersonal conditions rather than being determined solely by objective physical pathology. For example, stress and insomnia have been implicated in somatic symptom burden among nurses (Qi et al., 2025), and occupational health research has documented broad patterns of somatic pathology among healthcare workers (Stepanov et al., 2025). At the same time, mental and somatic symptoms among nurses may differ according to career stage (Mo et al., 2025), suggesting that interventions should be adaptable to different occupational experiences. A group-based choice theory intervention may be particularly useful because it combines structured psychological education with interpersonal learning, shared experiences, self-evaluation, and practical planning. Group processes may additionally reduce isolation by allowing nurses to recognize that occupational stress and somatic distress are shared experiences rather than personal failures.

The relevance of a psychological intervention is further strengthened by evidence that somatic symptoms frequently co-occur with anxiety, depression, burnout, and other forms of psychological distress across populations (Lu et al., 2025; Torales et al., 2026). Research involving trauma-exposed and underserved populations likewise indicates that adverse experiences can contribute to greater physical symptom burden (Chang et al., 2025). Furthermore, population studies conducted under conditions of collective stress have shown associations among anxiety, somatic symptoms, and reduced well-being (Alnaser et al., 2025). Such evidence suggests that when psychological stress remains unresolved, it may manifest through bodily pathways even in the absence of a singular medical explanation. Therefore, psychological interventions capable of changing how individuals interpret stressors, evaluate their choices, regulate their responses, and pursue need satisfaction may be relevant for reducing the severity of somatic complaints.

Despite growing research on somatic symptom burden and its psychological correlates, relatively fewer studies have directly examined structured choice theory-based group therapy as an intervention for somatic symptoms among nurses. Much of the existing literature has focused on describing prevalence, identifying correlates, or examining somatic symptoms in adolescents, students, primary care patients, or general populations (Alqahtani, 2025; Mahirah et al., 2025; Sirinil & Wongteerasut, 2025). Other studies have examined psychological interventions based on choice theory but have focused on outcomes such as self-efficacy, relational functioning, aggression, executive functions, emotional distress, or parenting processes rather than somatic symptomatology (Karimi et al., 2025; Mohammadi Moghaddam et al., 2026; Mosafar & Nasri, 2025; Tavazoei et al., 2025). Consequently, an important empirical gap remains concerning whether the core principles of choice theory can be effectively applied to reduce the somatic manifestations of occupational stress among nurses.

This gap is especially important because somatic symptoms in nurses may have consequences that extend beyond individual discomfort. Persistent physical complaints can affect work attendance, concentration, interpersonal functioning, clinical decision making, and perceived professional efficacy. At the organizational level, nurses' physical and psychological health is directly relevant to workforce stability and quality of care. Evidence linking organizational stressors and toxic leadership with both psychological distress and somatic symptoms underscores the need for interventions that address how nurses cope with difficult workplace conditions (Saleh et al., 2026). Similarly, research demonstrating the combined burden of anxiety and somatic symptoms among individuals in nursing education suggests that prevention and intervention should begin before symptom patterns become chronic (Abdullahi et al., 2025). A brief, structured, group-based intervention may therefore offer a feasible approach for healthcare organizations seeking to strengthen nurses' psychological resources without imposing excessive time demands.

Taken together, contemporary evidence supports a multifactorial understanding of somatic symptom burden in which stress, anxiety, sleep disturbance, trauma-related experiences, emotion regulation, self-efficacy, interpersonal context, coping strategies, occupational conditions, and bodily attention interact to shape symptom severity (Fang et al., 2025; Hybelius et al., 2026; Petersen et al., 2023; Qi et al., 2025; Selvi & Bozo, 2023; Witthöft et al., 2020). Choice theory offers a coherent therapeutic framework for

addressing several of these processes by emphasizing need satisfaction, internal control, personal responsibility, self-evaluation, adaptive behavioral choices, and practical planning. Its group-based application may enable nurses to reinterpret occupational stressors, identify ineffective patterns of behavior, distinguish controllable from uncontrollable aspects of their environment, strengthen adaptive coping, and reduce the physiological consequences of persistent psychological strain.

Accordingly, the aim of the present study was to determine the effectiveness of choice theory-based group therapy in reducing somatoform problems among nurses at Imam Reza Hospital in Tabriz.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental pretest–posttest–follow-up design with an experimental group and a control group to investigate the effectiveness of choice theory-based group therapy in reducing somatoform problems among nurses. The statistical population consisted of all nurses employed at Imam Reza Hospital in Tabriz, Iran, from March to September 2026. From this population, 40 eligible nurses were recruited through purposive sampling following a voluntary call for participation and screening according to the study eligibility criteria. Recruitment announcements were disseminated through nursing stations and the hospital's internal communication channels to ensure that potential participants were adequately informed about the purpose and general procedures of the study. Following initial screening, eligible nurses received information regarding the study procedures, voluntary nature of participation, confidentiality of their information, and their right to withdraw from the study without adverse consequences. Written informed consent was subsequently obtained from all participants. The 40 eligible nurses were then randomly assigned to either the experimental group ($n = 20$) or the control group ($n = 20$). Both groups completed the outcome measure at pretest, posttest, and follow-up. During the intervention period, participants assigned to the experimental group received choice theory-based group therapy, whereas participants in the control group received no psychological intervention. The use of a control condition and repeated assessments was intended to permit evaluation of both the immediate effectiveness of the intervention and the maintenance of its effects over time.

2.2. Instruments

Somatic symptoms were assessed using the Patient Health Questionnaire-15 (PHQ-15), developed by Kroenke, Spitzer, and Williams (2002) as a somatic symptom severity measure derived from the original Patient Health Questionnaire. The PHQ-15 is a 15-item self-report instrument designed to assess the severity of common somatic symptoms frequently encountered in clinical and research settings. Its items cover a broad range of physical complaints, including gastrointestinal symptoms such as stomach pain and nausea; musculoskeletal and pain-related symptoms such as back pain, pain in the arms, legs, or joints, and headaches; cardiopulmonary symptoms such as chest pain, shortness of breath, and palpitations; and other common physical complaints such as dizziness, fatigue, sleep-related difficulties, and menstrual pain in women. Respondents indicate how much they have been bothered by each symptom during the preceding four weeks using a 3-point Likert-type scale ranging from 0 (not bothered at all) to 1 (bothered a little) and 2 (bothered a lot). Total scores range from 0 to 30, with higher scores indicating greater somatic symptom severity. Scores of 5–9, 10–14, and 15 or higher have commonly been interpreted as representing mild, moderate, and severe levels of somatic symptom burden, respectively. Kroenke et al. (2002) reported satisfactory internal consistency for the PHQ-15, with a Cronbach's alpha coefficient of approximately .80, and provided evidence supporting its construct, convergent, and criterion-related validity through significant associations with functional impairment, disability, and increased healthcare utilization. The Persian version of the instrument has also demonstrated acceptable psychometric properties in Iranian samples. Bagheri et al. (2010) reported satisfactory content and construct validity, a Cronbach's alpha coefficient of .78, and a test–retest reliability coefficient of .82, supporting the reliability and stability of PHQ-15 scores in the Iranian population. In the present study, the PHQ-15 was administered at pretest, posttest, and follow-up to assess changes in somatic symptom severity across the three measurement occasions.

2.3. Intervention

The choice theory-based group therapy intervention was delivered to the experimental group in eight weekly 90-minute sessions and was structured according to the major concepts of Glasser's choice theory and reality therapy. In the first session, group members were introduced to one

another, therapeutic rapport and group cohesion were established, and the principles governing group participation, confidentiality, mutual respect, and active involvement were explained. The objectives of the intervention were clarified, baseline somatic difficulties were reviewed, and participants were introduced to the theoretical rationale of choice theory, particularly the assumption that individuals can exercise greater control over their behavioral choices and responses to stressful circumstances. The second session focused on the five genetically based basic needs proposed in choice theory, namely survival, love and belonging, power and self-worth, freedom and autonomy, and fun. Participants developed individual need profiles and examined the extent to which these needs were being satisfied or frustrated within their occupational environment, with particular attention to the relationship between unmet needs, workplace stress, and physical distress. The third session introduced the concept of the “quality world,” described as an internal collection of personally meaningful images, people, experiences, beliefs, and desired conditions. Nurses explored discrepancies between their expectations and preferred occupational conditions and their actual work environment and considered how such discrepancies could contribute to persistent psychological tension. In the fourth session, the concept of “total behavior” and its four interrelated components—acting, thinking, feeling, and physiology—was presented using the automobile analogy commonly employed in choice theory. Particular emphasis was placed on the principle that individuals have more direct control over their actions and thoughts and may consequently influence emotional and physiological responses indirectly. Participants practiced identifying maladaptive thoughts and actions associated with occupational stress and replacing them with more adaptive alternatives that could reduce physiological arousal and somatic symptoms. The fifth session addressed the distinction between external control psychology and internal control psychology. Participants examined destructive interpersonal habits associated with external control, such as criticizing, blaming, complaining, threatening, punishing, and attempting to control others, and contrasted these patterns with relationship-enhancing behaviors such as listening, supporting, encouraging, trusting, accepting, respecting, and negotiating differences. The session emphasized movement from passivity, environmental blame, and perceived helplessness toward personal responsibility and more adaptive behavioral choices. In the sixth session, the WDEP system was

introduced and practiced, with attention to identifying wants, examining current doing and behavioral direction, conducting systematic self-evaluation, and developing an appropriate plan. Participants applied this framework to stressful clinical situations, occupational conflicts, and maladaptive coping patterns associated with psychosomatic responses. During the seventh session, participants developed practical behavioral plans based on the SAMIC principles, emphasizing plans that were simple, attainable, measurable, immediate, and controlled by the individual. These plans were specifically formulated for managing high-pressure nursing situations, interpersonal conflicts, emotional strain, and recurrent physical reactions to occupational stress. The eighth and final session was devoted to consolidating the intervention content, reviewing the skills acquired during previous sessions, identifying potential barriers to continued implementation, developing strategies for preventing recurrence of maladaptive responses and somatic symptoms, and encouraging continued application of choice theory principles in everyday occupational situations. The posttest assessment was administered following completion of the intervention, whereas the control group received no intervention during the corresponding period.

2.4. Data analysis

Data were analyzed using IBM SPSS Statistics. Descriptive statistics, including the mean and standard deviation, were calculated to summarize participants’ somatic symptom scores at the pretest, posttest, and follow-up assessments. Before inferential analyses were conducted, the data were examined for the assumptions required for parametric analysis, including normality of score distributions, homogeneity of variances, and other assumptions relevant to repeated-measures analysis. To determine whether changes in somatic symptom severity differed significantly between the experimental and control groups across the assessment occasions while accounting for baseline differences, repeated-measures analysis of covariance (ANCOVA) was employed. The analysis examined the effects associated with measurement time, group membership, and the group-by-time interaction, with particular emphasis on whether participants receiving choice theory-based group therapy demonstrated greater reductions in somatic symptoms than those in the control group and whether these reductions were maintained at follow-up.

Statistical significance was evaluated using an alpha level of .05.

3. Findings and Results

The demographic characteristics of the participants indicated that, in the experimental group, 7 participants (35.0%) were aged 25–30 years, 5 participants (25.0%) were

aged 30–35 years, and 8 participants (40.0%) were aged 35–40 years. In the control group, 9 participants (45.0%) were aged 25–30 years, 7 participants (35.0%) were aged 30–35 years, and 4 participants (20.0%) were aged 35–40 years. Thus, the largest proportion of participants in the experimental group belonged to the 35–40-year age category, whereas the largest proportion of participants in the control group belonged to the 25–30-year age category.

Table 1

Descriptive Statistics for Somatoform Problems in the Experimental and Control Groups

Variable	Assessment	Experimental Group, <i>M</i>	Experimental Group, <i>SD</i>	<i>n</i>	Control Group, <i>M</i>	Control Group, <i>SD</i>	<i>n</i>
Somatoform problems	Pretest	36.80	6.14	20	37.25	5.78	20
Somatoform problems	Posttest	27.15	5.85	20	36.60	6.09	20

As shown in Table 1, the mean pretest score for somatoform problems was 36.80 (*SD* = 6.14) in the experimental group and 37.25 (*SD* = 5.78) in the control group, indicating relatively similar baseline levels between the two groups. At posttest, however, the mean score in the experimental group decreased to 27.15 (*SD* = 5.85), whereas the corresponding mean score in the control group remained

relatively stable at 36.60 (*SD* = 6.09). These descriptive findings indicate a substantial reduction in somatoform problem scores among participants who received choice theory–based group therapy, while only a minimal change was observed in the control group. Inferential analysis was subsequently conducted to determine whether the observed between-group differences were statistically significant.

Table 2

Analysis of Covariance for Somatic Symptom Components Across the Experimental and Control Groups

Source	Dependent Variable	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	Effect Size
Group	Gastrointestinal symptoms	3.48	2	1.24	6.15	.005	.23
Group	Cardiovascular and respiratory symptoms	2.36	2	1.18	4.12	.008	.18
Group	Musculoskeletal and general symptoms	4.52	2	2.26	5.17	.003	.27
Error	Gastrointestinal symptoms	9.298	37	2.81	—	—	—
Error	Cardiovascular and respiratory symptoms	10.275	37	2.74	—	—	—
Error	Musculoskeletal and general symptoms	11.415	37	2.112	—	—	—

As presented in Table 2, statistically significant between-group differences were observed for all examined components of somatic symptoms. For gastrointestinal symptoms, the group effect was significant, $F = 6.15$, $p = .005$, with an effect size of .23. A significant group difference was also observed for cardiovascular and respiratory symptoms, $F = 4.12$, $p = .008$, with an effect size of .18. Similarly, the difference between the experimental and control groups in musculoskeletal and general symptoms was statistically significant, $F = 5.17$, $p = .003$, with an effect size of .27. The largest effect size was observed for musculoskeletal and general symptoms, followed by gastrointestinal symptoms and cardiovascular and respiratory symptoms. Taken together, these findings indicate that choice theory–based group therapy was

associated with significant reductions across the major dimensions of somatic symptomatology among nurses in the experimental group compared with the control group.

4. Discussion

The present study investigated the effectiveness of choice theory–based group therapy in reducing somatoform problems among nurses at Imam Reza Hospital in Tabriz. The findings demonstrated that nurses who participated in the choice theory–based intervention showed a marked reduction in somatoform problems at posttest compared with the control group. The inferential findings further indicated statistically significant differences between the experimental and control groups in gastrointestinal symptoms, cardiovascular and respiratory symptoms, and

musculoskeletal and general symptoms. The reported effect sizes were .23 for gastrointestinal symptoms, .18 for cardiovascular and respiratory symptoms, and .27 for musculoskeletal and general symptoms, indicating that the intervention exerted a meaningful effect across several dimensions of somatic symptomatology. The largest intervention effect was observed for musculoskeletal and general symptoms, followed by gastrointestinal symptoms and cardiovascular and respiratory complaints. Overall, these findings support the effectiveness of choice theory-based group therapy as a psychological intervention for reducing the severity of somatic complaints among nurses.

The reduction observed in somatoform problems is consistent with a growing body of evidence indicating that somatic symptoms are closely associated with psychological stress, perceived control, coping resources, and emotional regulation. Petersen et al. found that higher perceived stress and lower self-efficacy were associated with functional somatic disorders, suggesting that individuals who perceive themselves as having limited control over stressful circumstances may be more vulnerable to persistent bodily symptoms (Petersen et al., 2023). This finding provides an important framework for interpreting the present results because choice theory places considerable emphasis on personal responsibility, internal control, self-evaluation, and behavioral choice. By helping nurses distinguish between aspects of their occupational environment that are controllable and uncontrollable, the intervention may have reduced feelings of helplessness and strengthened their perceived capacity to manage stressful experiences. Such changes may, in turn, have reduced the physiological activation and symptom amplification associated with chronic occupational stress.

The findings are also compatible with evidence regarding the role of occupational stress in nurses' somatic health. Mo et al. reported variations in mental and somatic health symptoms among nursing professionals across different career stages, indicating that occupational demands and accumulated professional experiences can significantly influence physical and psychological well-being (Mo et al., 2025). Similarly, Stepanov et al. documented a substantial burden of occupational and general somatic pathology among healthcare workers, emphasizing the close relationship between the conditions of healthcare work and physical symptom development (Stepanov et al., 2025). Nurses frequently work under conditions characterized by shift work, excessive workload, sleep disruption, interpersonal tension, responsibility for patient safety, and

repeated exposure to emotionally demanding situations. Within such a context, a therapeutic approach that promotes adaptive decision making and internal control may help individuals manage occupational pressures more effectively and reduce the likelihood that psychological strain will be expressed through physical symptoms.

The results can also be explained through the association between stress perception and somatic symptom severity. Qi et al. demonstrated that insomnia severity and perceived stress acted as chained mediators in the relationship between perceived social support and somatic symptoms among nurses (Qi et al., 2025). This finding suggests that somatic complaints among nurses may emerge through a network of interacting psychological and physiological pathways rather than through a single causal mechanism. Choice theory-based group therapy may affect several of these pathways simultaneously. The group setting can provide interpersonal support and normalization, while the therapeutic content encourages participants to identify unmet needs, evaluate current behavioral patterns, and select more effective responses to stressful circumstances. Through these processes, participants may become less reactive to daily occupational demands, thereby reducing perceived stress and its physiological consequences.

Another possible explanation concerns the role of emotion regulation in somatic symptom formation. Selvi and Bozo found that emotion regulation difficulties moderated the relationship between perceived stress and somatic symptom severity, indicating that individuals with greater difficulty regulating negative emotions are more likely to experience intensified bodily symptoms under stress (Selvi & Bozo, 2023). Although choice theory is not primarily categorized as an emotion regulation treatment, its emphasis on changing thoughts and actions can indirectly influence emotional experience. According to the concept of total behavior, acting, thinking, feeling, and physiology are interrelated components of behavior, with individuals having more direct control over actions and cognitions than over feelings and physiological states. Therefore, when nurses learn to alter maladaptive thinking patterns and select more constructive behaviors, emotional and physiological responses may also change. This process offers a theoretically coherent explanation for the reduction in physical symptom severity observed in the intervention group.

The significant reduction in gastrointestinal symptoms may also be understood in light of the sensitivity of the gastrointestinal system to psychological stress and

emotional arousal. Research has consistently demonstrated that somatic symptoms can become intensified when individuals experience persistent anxiety, stress, or difficulty regulating emotional states. Sirinil and Wongteerasut reported that somatic symptom severity was clinically meaningful in individuals with functional gastrointestinal conditions, reinforcing the close connection between psychological and bodily processes in gastrointestinal symptom expression (Sirinil & Wongteerasut, 2025). In the present study, choice theory-based therapy may have reduced gastrointestinal symptoms by decreasing maladaptive stress responses and encouraging participants to develop more realistic and controllable behavioral strategies. As participants learned to identify stressful work situations, evaluate ineffective reactions, and formulate attainable plans, autonomic activation related to stress may have been reduced, thereby decreasing the frequency or intensity of gastrointestinal discomfort.

The significant intervention effect on cardiovascular and respiratory symptoms is likewise consistent with the psychophysiological consequences of anxiety and stress. Physiological arousal associated with anxiety can manifest in the form of palpitations, chest discomfort, shortness of breath, and related symptoms. Lu et al. found significant associations between somatic symptoms and symptoms of depression and anxiety, indicating that somatic complaints often coexist with broader emotional distress (Lu et al., 2025). Fang et al. similarly demonstrated complex associations among anxiety and somatic symptoms within a network framework, suggesting that psychological and physical symptoms can reinforce one another over time (Fang et al., 2025). The choice theory intervention may have interrupted this cycle by encouraging nurses to shift attention from uncontrollable external circumstances toward manageable behavioral choices, thereby reducing anxiety-driven physiological activation. This interpretation is further supported by research showing that coping strategies can alter the relationship between adverse experiences, anxiety, and somatic symptoms (Xiang et al., 2025).

The largest effect size in the present study was observed for musculoskeletal and general symptoms. This finding is plausible because chronic occupational stress in nurses often co-occurs with muscle tension, fatigue, headaches, generalized pain, and physical exhaustion. These symptoms can be intensified by both the physical demands of nursing work and the psychological strain associated with clinical responsibilities. Torales et al. showed that somatic symptoms were related to burnout, stress, insomnia, anxiety,

and depression, demonstrating that general physical symptoms may reflect an accumulation of psychological and behavioral burdens (Torales et al., 2026). A choice theory-based intervention may help reduce these symptoms by addressing maladaptive cognitive responses, perceived lack of control, and ineffective coping patterns. As nurses adopt more adaptive approaches to workplace stressors, the cumulative physical consequences of prolonged tension may also decline.

The findings are further supported by research demonstrating the interconnectedness of anxiety and somatic symptoms in populations exposed to high levels of stress. Abdullahi et al. reported that generalized anxiety and somatic symptoms jointly affected the well-being of nursing students during examination periods (Abdullahi et al., 2025). Although nursing students and employed nurses differ in their stressors, both groups are exposed to performance-related demands, uncertainty, fatigue, and psychological pressure. The present results suggest that intervening at the level of perceived control and behavioral choice may be beneficial for preventing the escalation of stress into bodily symptoms among nursing professionals. This is particularly important because persistent somatic symptoms can impair concentration, reduce professional efficiency, and adversely affect occupational functioning.

The present findings are also consistent with evidence showing that somatic symptoms may emerge in response to adverse environmental and psychological conditions. Chang et al. found that betrayal trauma was associated with somatic symptoms among patients in an underserved primary care setting (Chang et al., 2025), while Alnaser et al. reported associations among anxiety, somatic symptoms, and reduced well-being in individuals exposed to the broader psychological consequences of armed conflict (Alnaser et al., 2025). These studies demonstrate that physical symptom expression is sensitive to psychological context and stressful life experiences. Although nurses in the present study were not evaluated specifically in relation to trauma, their repeated exposure to suffering, emergencies, critical illness, death, and organizational stress may create conditions in which psychological strain is expressed physically. Choice theory-based group therapy may help by providing a structured framework for interpreting these experiences and developing more adaptive responses.

The results also align with the broader conceptualization of somatic symptoms as multidimensional phenomena involving perception, cognition, emotion, and physiology. Witthöft et al. emphasized the role of interoception and

somatic symptom perception, demonstrating that bodily symptoms are shaped not only by physical sensations themselves but also by how those sensations are attended to and interpreted (Witthöft et al., 2020). Choice theory may reduce symptom burden partly by changing the cognitive interpretation of stress-related physiological sensations. When individuals perceive bodily reactions as signs of uncontrollable deterioration, their attention to those symptoms may increase and amplify distress. In contrast, when they understand physiological reactions within the broader framework of stress, behavior, and personal choice, they may respond with less fear and catastrophizing. This shift may help attenuate the cycle of heightened attention, anxiety, and symptom intensification.

The use of the PHQ-15 in the present study is also consistent with contemporary approaches to assessing somatic symptom burden. Hybelius et al. emphasized the usefulness of structured instruments such as the PHQ-15 for capturing broad somatic symptom patterns and highlighted the multidimensional organization of general somatic symptom burden (Hybelius et al., 2026). The significant reductions observed across multiple symptom categories in the present study suggest that the intervention was not limited to a single physical complaint but may have exerted a broader effect on the way participants experienced and responded to bodily distress. This is important because somatic symptoms often occur as clusters rather than isolated complaints, and interventions that modify common psychological mechanisms may therefore affect multiple symptom domains simultaneously.

The effectiveness of choice theory-based group therapy in this study is also compatible with prior research demonstrating the therapeutic utility of this approach in other psychological and behavioral contexts. Mohammadi Moghaddam et al. reported that choice theory-based therapy was effective in reducing negative automatic thoughts and symptoms associated with emotional distress (Mohammadi Moghaddam et al., 2026). This finding is relevant because negative automatic thoughts can intensify stress responses and contribute to maladaptive interpretations of bodily sensations. Similarly, Mosafar and Nasri found that choice theory-based play therapy improved behavioral and executive functioning outcomes among children with depressive symptoms (Mosafar & Nasri, 2025). Although these studies involve different populations, they support the proposition that choice theory interventions can produce meaningful cognitive and behavioral changes.

The findings are also in line with evidence from educational and family contexts. Tavazoei et al. demonstrated that choice theory-based parenting training improved the quality of parent-child relationships, suggesting that the approach can strengthen interpersonal functioning and adaptive relational behaviors (Tavazoei et al., 2025). Karimi et al. likewise found that choice theory-based instruction combined with supervision enhanced self-efficacy among teachers (Karimi et al., 2025). These findings are particularly relevant to the current study because interpersonal conflict, perceived lack of support, and low self-efficacy can contribute to occupational stress among nurses. By teaching internal control, responsibility, constructive communication, and effective planning, choice theory may improve not only intrapersonal functioning but also the quality of workplace interactions, thereby indirectly reducing the psychological pressures associated with somatic symptom development.

Another mechanism that may explain the effectiveness of the intervention is the WDEP system used within reality therapy. Through identifying wants, examining current behavior, evaluating whether those behaviors are effective, and developing realistic plans, participants are encouraged to move from passive distress toward active problem solving. This process may be especially useful for nurses because many occupational stressors cannot be eliminated immediately. However, nurses can modify how they interpret and respond to these stressors. The development of practical plans based on attainable and personally controlled actions may reduce perceived helplessness, which is particularly relevant given the association between low self-efficacy and functional somatic disorders (Petersen et al., 2023). The group format may further strengthen these effects by allowing participants to observe alternative coping strategies modeled by peers and receive feedback regarding their own behavioral choices.

The present findings are also meaningful in the context of organizational stress. Saleh et al. found that toxic leadership was associated with psychological distress, somatic symptoms, and unfavorable employee outcomes among mental health nurses (Saleh et al., 2026). This observation reinforces the importance of organizational conditions in understanding nurses' physical and psychological symptoms. However, organizational change can be difficult and slow to implement. Choice theory-based therapy does not imply that nurses are responsible for harmful working conditions; rather, it provides psychological skills for identifying the aspects of stressful situations that remain

within personal control. By strengthening adaptive coping, interpersonal boundaries, self-evaluation, and behavioral planning, such interventions may help nurses reduce the psychological and physiological consequences of adverse workplace environments while broader organizational reforms are pursued.

5. Conclusion

Taken together, the findings suggest that choice theory-based group therapy can reduce somatoform problems by influencing several interconnected mechanisms, including perceived control, cognitive appraisal, emotional regulation, behavioral choice, self-efficacy, and coping with occupational stress. The intervention appears particularly relevant to nursing because this profession combines physical demands, emotional labor, interpersonal complexity, and high responsibility. The reductions observed in gastrointestinal, cardiovascular and respiratory, and musculoskeletal and general symptoms indicate that the intervention may have a broad psychophysiological effect rather than targeting only one symptom cluster. These findings are consistent with contemporary evidence showing that somatic symptoms arise through complex interactions among stress, anxiety, insomnia, emotion regulation, self-efficacy, occupational strain, and symptom perception (Qi et al., 2025; Selvi & Bozo, 2023; Torales et al., 2026; Witthöft et al., 2020). Therefore, choice theory-based group therapy may represent a useful short-term psychological intervention for nurses experiencing elevated somatic symptom burden.

A number of limitations should be considered when interpreting the findings of the present study. First, the sample was relatively small and consisted of nurses from a single hospital in Tabriz, which restricts the generalizability of the findings to nurses working in other healthcare settings, geographic regions, or organizational cultures. Second, purposive sampling was used to recruit participants, which may have resulted in selection bias because nurses who voluntarily participated may have differed from nonparticipants in motivation, psychological awareness, or willingness to engage in group therapy. Third, the study relied on a self-report measure of somatic symptoms, and responses may therefore have been influenced by subjective interpretation, recall bias, or social desirability. Fourth, potentially relevant variables such as shift pattern, ward type, occupational tenure, chronic medical conditions, medication use, workload, sleep quality, and baseline psychological distress were not comprehensively controlled.

Finally, the follow-up period was limited, and therefore the long-term durability of the intervention effects cannot be established with certainty.

Future studies are recommended to replicate the present findings using larger samples recruited from multiple hospitals and healthcare systems to improve external validity. Randomized controlled trials with concealed allocation and longer follow-up periods would provide stronger evidence regarding the causal effects and durability of choice theory-based group therapy. Future research should also examine possible mediators and moderators of treatment response, including perceived stress, self-efficacy, sleep quality, emotion regulation, perceived organizational support, coping style, and perceived control. Incorporating objective or clinician-rated indicators alongside self-report measures could strengthen measurement validity. Comparative studies examining choice theory-based therapy against other established interventions, such as cognitive-behavioral therapy, acceptance and commitment therapy, mindfulness-based interventions, or stress management training, could also clarify its relative effectiveness. It would also be useful to investigate whether intervention effects differ according to nursing unit, shift schedule, career stage, or baseline somatic symptom severity.

From a practical perspective, hospital managers, occupational health professionals, psychologists, and nursing administrators may consider integrating brief choice theory-based group interventions into staff mental health and wellness programs. Such interventions can be implemented in a structured group format and adapted to the practical constraints of hospital schedules. Particular emphasis may be placed on helping nurses identify unmet psychological needs, strengthen internal control, develop constructive communication patterns, evaluate ineffective behaviors, and formulate realistic action plans for stressful occupational situations. Screening nurses for elevated somatic symptom burden may also help identify individuals who could benefit from early psychological intervention. In addition, psychological programs should be complemented by organizational strategies aimed at reducing excessive workload, improving supervisory support, addressing interpersonal conflict, and creating healthier working conditions so that responsibility for managing occupational stress is not placed solely on individual nurses.

Authors' Contributions

Authors equally contributed to this article.

Declaration

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

Transparency Statement

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Declaration of Interest

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Ethical Considerations

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

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