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EFFECTIVENESS OF ACCEPTANCE AND COMMITMENT THERAPY ON COVID-19 PROTECTION INDICATORS, PHYSICAL DISORDER SYMPTOMS, AND PERCEIVED STRESS IN HEALTHCARE PERSONNEL IN MASHHAD HOSPITALS

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Abstract

Introduction: *The COVID-19 pandemic has placed significant psychological and physical pressures on nurses, who are at the frontline of this crisis. This study aimed to investigate the effectiveness of Acceptance and Commitment Therapy group therapy on COVID-19 protection indicators, perceived stress, and physical disorder symptoms in nurses.*

Material and Methods: *This study used a quasi-experimental, pretest-posttest design with a control group. The study's statistical population consisted of nurses working in hospital wards caring for COVID-19 patients. From this population, 30 people were selected using convenience sampling and randomly assigned to two experimental groups (n=15) and a control group (n=15). The experimental group received the Acceptance and Commitment Therapy intervention in 8 90-minute sessions, while the control group received no intervention during this period. Data collection tools included the comprehensive health belief mModel questionnaire, the perceived stress scale, and the physical disorder symptoms checklist. The data obtained were analyzed using SPSS version 16 software and through the multivariate analysis of covariance test.*

Results: *The results showed a statistically significant difference between the post-test scores of the experimental and control groups in the linear combination of dependent variables ($P < 0.05$). Acceptance and commitment group therapy led to a significant improvement in the total score of protective behaviors against COVID-19 ($P < 0.001$), a considerable reduction in perceived stress ($P < 0.001$), and a significant decrease in physical disorder symptoms ($P < 0.001$) in the experimental group.*

Conclusion: *Based on the findings, acceptance and commitment therapy is an effective intervention for promoting preventive health behaviors, reducing stress, and alleviating psychosomatic symptoms in nurses during the COVID-19 pandemic. It is recommended that such psychological interventions be included in medical centers' support programs.*

Keywords: *Acceptance and commitment, nurses, COVID-19, perceived stress, physical symptoms, protection from coronavirus.*

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Introduction

The COVID-19 pandemic, as a global health crisis, has had profound impacts on healthcare systems and medical staff [*Bao Y et al., 2020; Mehta Set al., 2021*]. The novel coronavirus causing this disease is highly infectious and has been reported with widespread and rapid global transmission [*Zhu N et al., 2020*]. The World Health Organization has declared this disease a significant global public health concern [*WHO, 2020*]. Originating in Wuhan, China, the disease has now seriously affected over 187 countries worldwide [*Chan JF et al., 2020*]. Despite a mortality rate of around 2%, the disease is considered highly fatal due to causing severe damage to the respiratory system and pulmonary failures [*Chen H et al., 2020; Huang C et al., 2020*]. Healthcare workers, especially nurses, are at high risk of infection due to their direct contact with COVID-19 patients [*Kang L et al., 2020*]. They are responsible for caring for infected patients, communicating with patients' families, and monitoring patients' general condition [*Liu Q et al., 2020*]. A significant portion of infected patients are hospitalized in intensive care units, and nurses in these units face additional psychological pressure stemming from unprofessional behaviors, feelings of lack of control, and value conflicts [*Li L et al., 2015*]. These factors ultimately lead to stress and other psychological problems for nurses [*Haljin R, Krasevitborn S, 2010*]. Stress occurs when an individual needs significant adaptation to new conditions [*Zahra Shirbim et al., 2008*]. When facing stress, if coping strategies are unsuccessful, the individual may experience physical problems, impaired cognitive function, and behavioral issues such as anxiety and depression [*Brooks SK et al., 2020*]. Therefore, possessing appropriate coping skills is essential to reduce the effects of [*Levenson JL, 2006*]. Stress management and providing effective coping skills help individuals deal with life's challenges more effectively [*Mahmoodi N, Malekshahi M, 2012*]. A significant consequence of stressors is the compromise of an individual's mental health and the emergence of psychosomatic disorders [*Creed F et al., 2011*]. Psychosomatic disorders are conditions where psychological distress negatively affects physiological functioning [*Riahi M E, 2009*]. These disorders result from the inappropriate activation of the nervous system and biochemical responses and involve complex interactions between mind and body [*Milne S et al., 2000*]. The role of psychosocial stress is recognized as one of the most important factors in causing various physical and mental illnesses [*Floyd DL et al., 2000*]. The protection motivation theory, proposed by Rogers, serves as a framework for predicting and intervening in health behaviors [*Cismaru M*]. It includes seven main constructs: perceived susceptibility, perceived severity, intrinsic and extrinsic rewards, perceived self-efficacy, response costs, response efficacy, and protection motivation [*Darafshi Ghahroudi S et al., 2013*]. These constructs fall into two processes: threat appraisal and coping appraisal [*Azadbakht M et al., 2014*]. Acceptance and commitment therapy is one of the third-wave psychological therapies focusing on developing psychological flexibility [*Hayes SC et al., 2012*]. Instead of changing cognitions, this therapy aims to increase the individual's psychological connection with their thoughts and feelings [*Thomas N et al., 2014*]. A major advantage of this method over other psychotherapies is its simultaneous consideration of motivational and cognitive aspects for greater impact and durability of treatment effectiveness [*A-tjak JG et al., 2015*]. There is growing empirical evidence for the effect of this method on various psychological disorders [*Anvari MH et al., 2014*]. Given the contagious negative emotions in therapeutic environments and the high importance of the psychological state of intensive care unit nurses, it is essential to design and implement efficient strategies tailored to the conditions of medical staff [*Li W et al., 2020*]. Previous studies have shown the effectiveness of interventions such as mindfulness-based stress reduction and cognitive-behavioral therapy [*Xiang YT et al., 2020*]. Therefore, this study was designed to investigate the effectiveness of Acceptance and Commitment Therapy on COVID-19 protection indicators, somatic symptom disorders, and perceived stress in nurses in Mashhad hospitals.

Material and Methods

Study Design and Participants: This study was conducted as a quasi-experimental research with a pre-test-post-test design with a control group in 2021. The statistical population included all nurses in Mashhad hospitals who were directly or indirectly providing medical services to COVID-19 patients. From among nurses who met the inclusion criteria

and were available for the study, 30 were selected via purposive sampling and randomly assigned to either the control or experimental group (to receive group acceptance and commitment therapy interventions). Sample size calculation:

$$N=\frac{z^2pq}{d^2}=\frac{1.96^2\times0.5\times0.5}{0.08^2}=30$$

Inclusion and Exclusion Criteria: Inclusion criteria included: Employment in COVID-19 patient care wards in the past month; possession of at least a Bachelor's degree in Nursing; willingness to participate in the research; no diagnosis of major psychiatric disorders; and not receiving concurrent psychotherapy interventions. Exclusion criteria included: Diagnosis of an acute psychiatric disorder during the study; participation in other psychological interventions; absence from more than two sessions of the intervention; failure to complete questionnaires at either the pre-test or post-test stage; starting any new psychological or pharmacological treatment related to emotional problems during the research period; and withdrawal of the participant from continued cooperation at any stage of the research.

Instruments: Data collection tools included a demographic information form (including gender, age, marital status) as well as the following questionnaires:

a) Health Behavior Questionnaire (champion health belief model - based on health belief model) A 24-item tool developed to assess various aspects of the health belief model [*Tarrant MA et al., 1997*]. This questionnaire evaluates four components of the health belief model. Each component relates to 6 items (Perceived Susceptibility e.g., "I know that the coronavirus disease is very contagious"; Perceived Severity e.g., "Coronavirus disease can kill thousands of people in a short time"; Perceived Benefits e.g., "Frequent hand washing largely prevents coronavirus disease"; and Perceived Barriers e.g., "COVID-19 prevention guidelines can create occupational problems for me"). Each dimension is measured on a 5-point Likert scale from 1 (Completely False) to 5 (Completely True). In the original study, the intraclass correlation coefficient (ICC) was 0.91; reliability as Cronbach's alpha was 0.79; and the content validity index of this scale was 0.8 [*Tarrant MA et al., 1997*]. Cronbach's alpha in the present study was 0.77.

b) Perceived Stress Scale The Perceived Stress Scale, developed by Cohen et al., is used to assess general perceived stress over the past month. It measures thoughts and feelings about stressful events, control, overcoming, coping with psychological pressure, and experienced stresses. This scale also examines risk factors in behavioral disorders and shows the process of stressful relationships. Cronbach's alpha for this scale was obtained as 0.84 in three studies [*Cohen S et al., 1983*]. The Cronbach's alpha coefficient for the reliability of this test has been reported as 0.75

TABLE 1.

Group acceptance and commitment therapy program

Weeks	Description
1-2	Reviewing and assessing the client's problem history. Discussing treatment goals and the possibility of change. Explaining the intervention philosophy based on the ACT approach. Counseling contract including timely attendance and completing assignments.
3-4	Examining the interaction of thoughts, feelings, and actions. Creating creative hopelessness regarding previous methods used by the individual. Teaching that any action aimed at avoiding or controlling unwanted mental experiences is ineffective. Leading the client to creative hopelessness. Clarifying the client's values.
5	Continuing value clarification. Teaching acceptance. Changing concepts of language using metaphors.
6-7	Awareness of mental and bodily feelings and focus on activities (such as walking) and emotions. Discussing obstacles and practicing the exploration of feasibility of value-related activities. Processing exercises related to satisfaction and dissatisfaction with life's sufferings without judgment.
8	Introduction to setting effective goals related to values. Paying attention to thoughts and feelings without clinging to their content. Giving assignments and receiving feedback. Continuing to set effective goals related to values. Expressing the difference between values, goals, and needs.
9-10	Continuing discussion about satisfaction with having suffering. Value clarification exercises and emphasizing client empowerment. Building motivation for committed action along with acceptance of mental experiences.

ACT - acceptance and commitment therapy

[*Salehi Ghadri J, 1994*]. In Sepahvand's research, the Cronbach's alpha coefficient was reported as 0.80 [*Sepahvand T et al., 2009*].

c) Somatic Symptom Disorder Questionnaire The somatic symptom scale for non-clinical settings was used to assess psychosomatic symptoms. This self-report questionnaire measures the intensity of psychosomatic symptoms experienced by the individual and consists of 20 items answered on a 5-point Likert scale [*Huang C, 2020.*]. Mohr reported the internal reliability of this questionnaire in various studies and with different samples to be between 0.7 and 0.93 [*Mohr GB, 2000*]. In Iran, Babamiri also reported the reliability of this questionnaire using Cronbach's alpha as 0.89 and its factorial validity as appropriate [*Babamiri M et al., 2015*].

Intervention: acceptance and commitment therapy protocol: ***Procedure:*** After obtaining approval from the Ethics committee of Mashhad university of medical sciences and coordinating with the selected hospitals, the research implementation process began. In the first stage, the pre-test was administered to both groups (Table 1). Then, the experimental group underwent 8 weeks of group Acceptance and Commitment Therapy, consisting of weekly 90-minute sessions covering skills such as acceptance, mindfulness, value clarification, and committed action. These sessions were held in groups with full adherence to health protocols. The control group received no intervention during this period. Immediately after the intervention ended, the post-test was administered to both groups. Finally, to adhere to ethical principles, group counseling sessions were held for the control group participants. Ethical considerations included obtaining written informed consent from all participants, complete confidentiality and coding of data, the freedom to withdraw from the study at any stage, and providing free counseling services to the control group after the research ended. All procedures were carried out in compliance with health protocols and social distancing.

Data Analysis: he collected data were analyzed using SPSS software version 16, employing descriptive statistics (mean and standard deviation) and inferential statistics (analysis of covariance). The significance level was set at 0.05.

Results

***Descriptive Statistics*:** In this study, 30 nurses who met the inclusion criteria were examined, with 15 in the experimental group and 15 in the control group. The mean and standard deviation of the participants' age was 32.4 ± 5.7 years in the experimental group and 34.1 ± 6.2 years in the control group. Regarding gender, in the experimental group, 12 (80%) were female and 3 (20%) were male, and in the control group, 13 (86.7%) were female and 2 (13.3%) were male (Table 2).

Table 2.

Central and dispersion indicators of research variable scores in Pre-test and Post-test stages

Stage	Protection Behaviors	Perceived Stress	Somatic Symptoms
Experimental group			
Pre-test	68.93±7.21	31.60±5.84	52.20±8.73
Post-test	85.47±6.15	19.13±4.56	36.80±6.94
Control group			
Pre-test	67.33±6.58	32.27±6.40	50.93±7.85
Post-test	69.20±7.04	31.40±5.99	51.60±8.10

Before conducting the analysis of covariance, the assumptions of this test, including the normal distribution of data (using the Kolmogorov-Smirnov test), homogeneity of variances (Levene's test), and homogeneity of regression slopes, were checked and confirmed for all variables.

Inferential Statistics: Results from Table 3 showed that after removing the effect of pre-test scores, there was a significant difference between the experimental and control groups regarding the linear combination of the dependent variables (protection behaviors, perceived stress, somatic symptoms) at the post-test stage ($p < 0.001$, $F(3,26)=18.73$). Subsequently, one-way analysis of covariance was used to examine the intervention's effect on each dependent variable separately.

The analysis of covariance results in Table 4 indicated that acceptance and commitment therapy

Table 3.

Results of multivariate analysis of covariance for Comparing post-test scores of groups controlling for pre-test

Effect	Value	F	Hypothesis df	Error df	p-value	Effect Size (Partial η^2)
Group	0.26	18.73	3	26	0.001	0.74

Note: *Value = Wilks' Lambda*

Table 4.

Results of one-way analysis of covariance for examining the effect of group on each dependent variable separately

Source	Sum of Squares	df	Mean Square	F	p-value	Effect Size (Partial η^2)
Protection Behaviors						
Group	1188.21	1	1188.21	45.82	0.001	0.63
Error	700.34	27	25.94			
Perceived Stress						
Group	1125.58	1	1125.58	38.17	0.001	0.59
Error	796.42	27	29.50			
Somatic Symptoms						
Group	980.45	1	980.45	33.05	0.001	0.55
Error	800.89	27	29.66			

significantly increased protection behavior scores in the experimental group compared to the control group ($p < 0.001$, $F(1,27)=45.82$). The effect size (partial η^2) was 0.63, indicating a strong intervention effect. The findings also showed that implementing acceptance and commitment therapy led to a significant decrease in perceived stress scores among nurses in the experimental group compared to the control group ($p < 0.001$, $F(1,27)=38.17$). The effect size (partial η^2) for this variable was calculated as 0.59. According to the findings, somatic symptom scores in the experimental group decreased significantly after the intervention, and this difference was significant compared to the control group ($p < 0.001$, $F(1,27)=33.05$). The effect size (partial η^2) was 0.55, indicating considerable intervention effectiveness on this variable. Based on these results, the research hypotheses regarding the effect of Acceptance and Commitment Therapy on improving COVID-19 protection behaviors, reducing perceived stress, and reducing somatic symptom disorders in nurses were confirmed.

Discussion

The findings of this research showed that Acceptance and Commitment Therapy was effective in improving COVID-19 protection behaviors, reducing perceived stress, and reducing somatic symptom disorders in nurses. These results are consistent with the theoretical foundations of this therapy and the findings of previous studies. The improvement in COVID-19 protection behaviors can be attributed to increased psychological flexibility, which is the core aim of acceptance and commitment therapy. This therapy, by enhancing skills such as acceptance, cognitive defusion, and value clarification, helps individuals take effective, values-based actions (such as adhering to health protocols) instead of automatic, avoidance-based reactions. This finding aligns with the results of [*Li W et al., 2020*] study, which showed that acceptance and commitment therapy based intervention can increase preventive health behaviors. Furthermore, this result supports the study by [*Moghimi S et al., 2024*], which emphasized the positive correlation between health literacy and performance in COVID-19 prevention behaviors. The significant reduction in perceived stress in the experimental group is also consistent with the mechanisms of action of acceptance and commitment therapy.

The techniques of this therapy helped nurses change their relationship with stressful thoughts and feelings, accept them as transient mental events, and cease the futile struggle with them. This process leads to reduced mental turmoil and the subjective experience of stress. This result confirms the findings of [*Xiang YT et al., 2020*] study, which indicated the effectiveness of this therapy in reducing nurses' stress. Additionally, the research by [*Talebi M, Teymuri H, 2022*] showed that online acceptance and commitment therapy training leads to reduced psychological distress in nurses, which reinforces the present result. Furthermore, the reduction in somatic symptoms can be explained by the decrease in stress and anxiety levels. Chronic stress is a primary factor exacerbating or triggering psychosomatic symptoms. By managing and reducing stress through the acceptance and commitment therapy intervention, the allostatic load on the body is reduced, and consequently, the physical manifestation of psychological distress is alleviated. This finding is consistent with the results of [*A-tjak JG et al., 2015*] study, which showed the effectiveness of acceptance and commitment-based interventions on reducing somatic symptoms. Also, the study by [*Bahrami Nasab M, Motevalli M S, 2022*] indicated that psychological factors such as anxiety sensitivity can affect nurses' self-care behaviors, emphasizing the importance of psychological interventions in reducing somatic symptoms. The core processes of acceptance and commitment therapy - promoting psychological flexibility, mindful acceptance,

and values-based action—are transdiagnostic and applicable to the wide range of occupational pressures faced by healthcare professionals. The intense pressures caused by COVID-19 provided a powerful context for testing this intervention; however, the results suggest that acceptance and commitment therapy can serve as a valuable tool for building long-term resilience against job burnout, compassion fatigue, and the general psychological demands of nursing, thus constituting a sustainable investment. Overall, it can be said that acceptance and commitment therapy, by teaching adaptive coping skills to nurses, empowered them to better manage high-pressure job conditions and the psychological consequences of the COVID-19 pandemic.

Conclusion

Based on the findings of this study, it can be concluded that group Acceptance and Commitment Therapy is an effective intervention for improving health behaviors related to COVID-19, reducing stress, and alleviating associated somatic symptoms in nurses. These findings emphasize the importance of attending to the mental health of healthcare workers and the necessity of implementing evidence-based intervention programs, especially in critical situations. However, the generalizability of these findings should be considered in light of its limitations, the most important of which include the relatively small sample size, the use of purposive sampling, and the lack of a long-term follow-up phase to examine the durability of the intervention effects. Accordingly, it is suggested that future studies be conducted with larger sample sizes and using random sampling methods. Also, including a several-month follow-up phase in future study designs to assess the stability of therapeutic effects is recommended. Investigating the effectiveness of this intervention on other medical and treatment groups, as well as analyzing the role of mediating variables, such as psychological flexibility, in the mechanism of this therapy's effect, can pave the way for valuable future research. Given the observed effectiveness, it is recommended that health system officials and managers take effective steps towards promoting mental health and increasing the resilience of nurses and other medical personnel by organizing workshops based on the principles of Acceptance and Commitment Therapy.

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