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Investigating the Effectiveness of the Integrated Intervention Model Based on Acceptance, Compassion, and Mindfulness on Psychological Distress and Intolerance of Uncertainty in Nurses with Anxiety in the Emergency Department

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A B S T R A C T

Objective: This study aimed to examine the effectiveness of an integrated intervention model based on acceptance, compassion, and mindfulness in reducing psychological distress and intolerance of uncertainty in nurses with anxiety working in emergency departments.

Methods and Materials: The study employed a quasi-experimental design with pre-test and post-test assessments and included an experimental and control group. A total of 40 nurses with anxiety working in emergency departments were selected using purposive sampling. Participants were randomly assigned to either the experimental (n=20) or control group (n=20). The experimental group underwent 12 sessions (60 minutes each) of the integrated intervention, while the control group received no intervention. Data were collected using the Kessler Psychological Distress Scale (Kessler et al., 2003) and the Intolerance of Uncertainty Scale (Freeston et al., 1994). The results were analyzed using analysis of covariance (ANCOVA).

Findings: The results showed a significant reduction in psychological distress in the experimental group compared to the control group ($F(1, 37) = 256.42$, $p < .001$). Similarly, there was a significant reduction in intolerance of uncertainty in the experimental group compared to the control group ($F(1, 37) = 63.73$, $p < .001$). These findings indicate that the intervention effectively reduced both psychological distress and intolerance of uncertainty in the experimental group.

Conclusion: The integrated intervention model based on acceptance, compassion, and mindfulness was effective in reducing psychological distress and intolerance of uncertainty in nurses with anxiety. This intervention provides a practical approach for addressing emotional difficulties faced by nurses, helping them cope with the stress of their profession, improve their psychological

flexibility, and align their actions with their life values. These findings suggest that such interventions can improve the mental well-being of healthcare workers, particularly those in high-stress environments like emergency departments.

Keywords: *Integrated Intervention Model Based on Acceptance, Compassion and Mindfulness, Psychological Distress, Intolerance of Uncertainty, Anxiety.*

1. Introduction

Today, the healthcare system is considered one of the most important institutions, as it is responsible for saving lives and promoting the health of societies. One of the professions within this system is nursing. Nurses are one of the most essential human resources in hospitals, required to work long hours on the front lines of healthcare services, interacting with other hospital staff and providing patient care during extended shifts. In many parts of the world, healthcare workers, especially nurses, face significant stress in their work environment. Research has shown that the continuous interaction with patients, responsibility for human health, conducting clinical procedures, encountering dying patients, handling emergencies, and rotating shift work are all professional stressors. Some levels of stress may be beneficial for increased focus while performing duties, but excessive and chronic stress can lead to negative outcomes such as anxiety, depression, and fatigue, which in turn reduce job satisfaction and increase psychological distress (Abdulmohdi, 2024).

Psychological distress is widely used as an indicator of mental health in public health, demographic studies, epidemiological research, and as an outcome in clinical studies and efficacy evaluations (Drapeau et al., 2017). Psychological distress is a specific emotional discomfort that individuals experience temporarily or permanently in response to particular stresses and harmful demands. Furthermore, psychological distress encompasses unpleasant mental states of stress and anxiety, which involve both physiological and emotional symptoms (Delgado et al., 2021). Additionally, Newman (2008) demonstrated in his study that individuals with higher distress tolerance are better able to cope with stress-induced anxiety and are more likely to use positive emotions to deal with challenging experiences (Falavarjani & Yeh, 2019; Ghawadra, 2019).

One of the constructs related to psychological distress is intolerance of uncertainty, which is broadly defined as a cognitive, emotional, and behavioral response to uncertainty that leads to biased information processing, heightened threat evaluation, and reduced coping (Dugas et al., 2004). Uncertainty refers to the inability to tolerate distressing conditions, which is exacerbated by the perception of uncertainty. Intolerance of uncertainty reflects individuals' negative beliefs about uncertainty (Markey et al., 2020) and is a construct that reveals one's cognitive, emotional, and behavioral responses to uncertainty in daily life situations (Gillett et al., 2018). In other words, intolerance of uncertainty is a personality trait comprising a set of negative beliefs about uncertainty. Individuals with intolerance of uncertainty believe that uncertainty is distressing. Doubts about the future inhibit their ability to act. Uncertainty is a common phenomenon in everyday life that can cause varying degrees of tension in different individuals. From a deterministic perspective, uncertainty arises from a lack or inadequacy of knowledge and is related to internal factors beyond an individual's control (Koerner & Dugas, 2008).

Furthermore, since high levels of intolerance of uncertainty are associated with anxiety disorders, depression, and obsessive-compulsive disorder, it is believed that uncertainty triggers anxiety in these conditions, leading to maladaptive behaviors such as worry, reassurance-seeking, checking, and hypervigilance to reduce uncertainty (Carleton, 2012; Dugas et al., 2004; Gillett et al., 2018), which in turn evoke emotional responses. Research has shown that intolerance of uncertainty is a predisposition to emotional problems (Koerner & Dugas, 2008; Pa, 2016) and a risk factor for the development and maintenance of anxiety and depression (Dugas et al., 2004; Dugas et al., 2022; Gillett et al., 2018; Hebert & Dugas, 2018).

One of the treatments whose effectiveness has been clearly demonstrated is cognitive-behavioral therapy. However, its application is challenging for many therapists and patients with stress and anxiety disorders, and often, even with the most precise planning and execution, these interventions do not result in the expected therapeutic response. Some patients do not benefit much from group cognitive-behavioral therapy, and it is difficult to reliably predict who will benefit and who will not. The specific mechanisms of the treatment remain unknown, and maintaining therapeutic gains is an ongoing challenge (Afarin Sadeghi et al., 2021; Aliyari Khanshan Vatan et al., 2022; Babaee et al., 2022; Karami, 2024; Mahvash et al., 2024). Today, we are witnessing the third wave of these therapies, which can be broadly referred to as acceptance-based models, such as mindfulness-based cognitive therapy,

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metacognitive therapy, and acceptance and commitment therapy (ACT). These therapies aim to enhance the individual's psychological relationship with their thoughts and feelings rather than changing cognitions. One of the therapies that has garnered significant attention from researchers is acceptance and commitment therapy (Abadi et al., 2021; Ahmadi & Raeisi, 2018; Bakhshandeh Larimi et al., 2021; Forouzanfar et al., 2017; Moradi, 2022; Rezaeian et al., 2021; Sarabadani et al., 2023). The primary goal of ACT is to promote psychological flexibility, which refers to the ability to choose a course of action that is more appropriate among various options, rather than taking action merely to avoid distressing thoughts, feelings, memories, or urges (Hayes et al., 2009; Hayes et al., 2012).

According to previous studies, one intervention that appears to play an important role in improving psychological problems is acceptance and commitment therapy (ACT). Developed by Hayes (2012) as a third-wave cognitive therapy, ACT integrates behavioral principles, mindfulness, and acceptance (Hayes et al., 2012). The main goal of ACT is to enhance psychological flexibility by promoting the ability to choose behaviors that are more appropriate rather than engaging in actions aimed solely at avoiding distressing thoughts, feelings, memories, or urges (Forman & Herbert, 2008). A review of multiple studies indicates that ACT is a practical and applicable method for addressing cognitive-behavioral issues across a range of psychological disorders. It emphasizes client-centered approaches, identifying strengths and problematic areas as the first step in treatment and teaching problem-solving skills to address these issues (Hayes et al., 2009; Hayes et al., 2012).

Healthcare workers, especially nurses, exhibit high levels of psychological inflexibility symptoms, such as stress, anxiety, and even depression (Kim & Choi, 2016). Therefore, recognizing these symptoms in nurses and other healthcare workers, as well as understanding the concerns that may exacerbate these symptoms, is crucial. Identifying and addressing any issues that may occupy the individual's mind regarding the possibility of contracting illnesses is essential to reducing the psychological burden on caregivers and improving their caregiving performance. This approach helps individuals make the best decisions based on their experiences and emotions. By integrating these three approaches into a unified intervention, nurses can experience improvements in various aspects of their lives, including effective relationships, stress, and anxiety. This integrated approach is considered a comprehensive and effective method for psychological interventions and can significantly improve nurses' quality of life. Therefore, the present study aimed to examine the effectiveness of the integrated intervention model based on acceptance, compassion, and mindfulness on psychological distress and intolerance of uncertainty in nurses with anxiety in the emergency department.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental design with experimental and control groups, using a pre-test and post-test approach. The study population included all nurses with anxiety working in the emergency departments of hospitals in Neyshabur. A total of 40 nurses were selected based on their high levels of anxiety (cut-off score of 27) and using purposive sampling, considering the inclusion criteria. They were randomly assigned to two groups, experimental and control. Due to the quasi-experimental design, a sample size of 15 participants per group was considered optimal (Gall, Borg, & Gall, 2003; as cited in Sarmad & Bazargan, 2019), and to account for potential attrition and enhance the generalizability of findings, 20 participants were included in each group. Nurses who had been working in emergency departments since before 2020 were chosen from the population for participation.

The inclusion criteria included not receiving concurrent psychological interventions, having at least three years of work experience, willingness to participate in therapy sessions, and being employed in the emergency departments of hospitals in Neyshabur. The exclusion criteria included more than two absences and unwillingness to continue participating.

After coordinating with hospital officials in Neyshabur, a call for interested participants to join the research project was made. After a specified period, 40 individuals who met the inclusion criteria were selected using purposive sampling and randomly assigned to the experimental and control groups (20 participants each). During a session held in coordination with Neyshabur hospital authorities, necessary information, including the implementation procedure, duration, and goals of the integrated intervention model based on acceptance, compassion, and mindfulness, was provided. Participants were assured of the confidentiality of their personal information and their right to withdraw from the study at any time. Written informed consent was obtained from all participants. Both groups completed a pre-test using the questionnaires. The experimental group

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received 12 sessions of 60-minute training based on the integrated intervention model. During this period, the control group received no intervention. After completing the sessions, both groups underwent post-testing.

2.2. Measures

2.2.1. Distress

This questionnaire, developed by Kessler and colleagues in 2003, contains 10 questions. It is scored on a 5-point Likert scale, ranging from 1 (never) to 5 (all the time). A score between 1 and 10 indicates low distress, 16 to 21 indicates moderate distress, 22 to 29 indicates high distress, and 30 to 50 indicates very high distress. In a study by Behnamand Zadeh and Hamai (2020) in Iran, the Cronbach's alpha coefficient for this questionnaire was found to be 0.95. Criterion validity was confirmed by calculating the cut-off point, reflecting its correlation with the criterion variable (the Composite International Diagnostic Interview), and the cut-off point was reported as 8 (Mahvash et al., 2024; Pangngay, 2024). The Cronbach's alpha in the present study was 0.73.

2.2.2. Intolerance of Uncertainty

Developed by Freeston and colleagues in 1994, this scale measures individuals' tolerance for uncertain and ambiguous situations. It consists of 27 items, and respondents rate their answers on a 5-point scale (ranging from 1 = not at all to 5 = very much). Bohr and Dugas (2002) reported a Cronbach's alpha of 0.94 and a test-retest reliability coefficient of 0.78 over a 5-week interval. In a study by Hamidpour and Andouz, Cronbach's alpha was reported to be 0.88, and test-retest reliability over a 3-week interval was reported as 0.78 (Mahvash et al., 2024). The Cronbach's alpha coefficient in this study was 0.81.

2.2.3. Anxiety

Beck Anxiety Inventory (BAI) was developed by Beck in 1988 to measure anxiety. The Beck Anxiety Inventory consists of 21 items, each assessing one of the cognitive, physical, or panic-related symptoms of anxiety. Multiple studies have confirmed the validity of this test in various contexts. The internal consistency coefficient (Cronbach's alpha) is 0.92, its test-retest reliability after one week is 0.75, and item correlations range from 0.30 to 0.76 (Aliyari Khanshan Vatan et al., 2022).

2.3. Intervention

2.3.1. Integrated Intervention Model Based on Acceptance, Compassion, and Mindfulness

The integrated intervention model based on acceptance, compassion, and mindfulness was conducted over 10 sessions, each lasting 120 minutes (one session per week) (Abyar et al., 2019; Forman & Herbert, 2008; Gilbert, 2014; Hayes et al., 2009; Hayes et al., 2012).

Session 1: Initial Contact and Introduction

In the first session, participants establish initial rapport and become familiar with the structure and nature of the sessions. The general principles of the therapy are introduced, along with the research objectives. Participants are provided with an overview of the intervention, encouraged to ask questions, and guided through the completion of the initial questionnaires. Emphasis is placed on the importance of active participation throughout the process.

Session 2: Introduction to Mindfulness and Compassion

This session focuses on teaching mindfulness practices, including body scanning and mindful breathing exercises. Participants are introduced to the brain systems related to compassion and how they impact emotional regulation. These exercises help individuals become more aware of their physical sensations and responses, promoting a greater sense of calm.

Session 3: Cultivating Compassion and Self-Kindness

Participants explore the characteristics of compassionate individuals and learn to extend compassion toward others. The session also focuses on developing warmth and kindness toward oneself. Gentle and mindful yoga movements are introduced as a method for alleviating physical stress symptoms and enhancing body awareness, encouraging a compassionate relationship with one's body.

Session 4: Self-Exploration and Compassionate Identity

Participants are encouraged to engage in self-reflection, exploring their personality traits and identifying themselves as either compassionate or non-compassionate individuals. This introspective session fosters self-awareness and supports the development of a compassionate self-identity.

Session 5: Stress Responses and Alternative Behaviors

This session discusses how participants typically respond to stress and difficult situations. It introduces alternative perspectives and behaviors, encouraging participants to reflect on how they can modify their reactions to stressful scenarios. A focus is placed on adopting more constructive and compassionate approaches to challenges.

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Session 6: Acceptance and Compassion in Practice

Participants are introduced to the concept of acceptance through creative helplessness, learning how to balance internal and external control. Through metaphors such as the "guest" metaphor, they explore the distinction between "clean" and "dirty" suffering. Compassion and empathy for oneself and others are emphasized as central values in this practice.

Session 7: Deepening Self-Compassion and Emotional Awareness

This session deepens the exploration of acceptance, focusing on cultivating compassion toward emotions and feelings. Participants work on nurturing a compassionate self, learning key concepts like wisdom, competence, warmth, and responsibility. They engage in exercises to practice self-compassion and extend it to others.

Session 8: Group Compassion Exercises

In this session, participants engage in group exercises that foster compassionate awareness through techniques such as mindful attention and self-compassion visualization. These practices encourage participants to nurture compassion for others and receive compassion from others in a supportive group setting.

Session 9: Defining Values and Health Care Goals

Participants are guided to clarify their core values and health-related goals. This session emphasizes the importance of choosing a path of self-care, aligning personal actions with meaningful life goals to enhance well-being and reduce distress.

Session 10: Review and Post-Assessment

In the final session, participants review the key concepts and practices learned throughout the intervention. A post-test is administered to assess the outcomes of the therapy, and participants reflect on their progress and the future application of the skills they have acquired.

2.4. Data analysis

The collected data were analyzed using descriptive statistical methods (e.g., frequency, percentage, mean, standard deviation, and standard error) and inferential statistics (e.g., covariance analysis) with SPSS version 22.

3. Findings and Results

Most participants, totaling 26 individuals (65%), were women. Forty percent of the target population was between 25 and 35 years old, 30% were between 36 and 45 years old, and 30% were older than 46 years. The majority of the target population (70%) had a bachelor's degree.

Table 1

Descriptive Statistics for Research Variables

Variable	Group	Pre-test M (SD)	Post-test M (SD)
Psychological Distress	Experimental	32.6 (4.43)	17.4 (4.15)
	Control	32.7 (3.40)	32.6 (3.08)
Intolerance of Uncertainty	Experimental	73.13 (5.41)	54.93 (5.93)
	Control	75.47 (5.15)	74.73 (6.91)

In this section of the study, the normality of the data was first tested using the Shapiro-Wilk test to determine the appropriateness of parametric or non-parametric tests. Afterward, the relationships between the variables were examined based on the research hypotheses. Statistical tests were chosen based on the level of measurement of the variables to evaluate the hypotheses.

The results of the Shapiro-Wilk test indicated that the data were normally distributed since the significance level was greater than 0.05. Levene's test was used to check for the equality of variances, which showed that the significance levels for the research variables were greater than 0.05, indicating that the variances (variance-covariance matrix) were equal. To assess the homogeneity of regression slopes (the linear relationship between variables), the interaction between pre-tests and groups was analyzed. The results showed that the interaction effect of independent variables was non-significant, meaning the assumption of homogeneous regression slopes was met. To evaluate the impact of the integrated intervention model based on acceptance, compassion, and mindfulness on psychological distress in anxious nurses, analysis of covariance (ANCOVA) was conducted.

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Table 2

Results of Covariance Analysis

Variable	Source	Sum of Squares	df	Mean Square	F	p-value
Psychological Distress	Group	1732.84	1	1732.84	256.42	.001
	Error	358.05	37	9.66		
	Total	21023	40			
Intolerance of Uncertainty	Group	376.568	1	376.568	63.73	.001
	Error	159.435	37	4.2		
	Total	537	40			

As shown in Table 2, the independent variable in the variance analysis for psychological distress had an F-value of 256.42, which is significant. This indicates that there is a significant difference between the experimental and control groups in the post-test for psychological distress, which is due to the effect of the independent variable. Similarly, the F-value for intolerance of uncertainty was 63.73, indicating a significant difference between the experimental and control groups in the post-test, attributed to the independent variable.

4. Discussion and Conclusion

The results showed that the integrated intervention model based on acceptance, compassion, and mindfulness was effective in reducing psychological distress in nurses with anxiety working in the emergency department. These findings are consistent with the results of prior studies (Aloufi et al., 2021; Babapoor et al., 2019; Bazgouneh & Zarbakhsh, 2021; Ebrahimi et al., 2021; Fang et al., 2023; Maarefvand & Shafiabady, 2024; Norouzi et al., 2023; Ream et al., 2020; Talebi, 2021; Tyrer et al., 2015; Yıldırım & Çiriş Yıldız, 2022).

The intervention based on acceptance, compassion, and mindfulness can significantly reduce negative emotions such as anxiety, stress, and depression by changing the way individuals think and perceive human suffering and challenges. Previous studies have shown a strong link between negative emotions and nurses' anxiety, with stress being a primary factor affecting their mental health. Nurses are more susceptible to psychological distress than others. The intervention has effectively taught nurses how to cope with the stress of their profession, identify their life values, and take steps toward them. Additionally, the intervention helps them view their negative emotions as part of the human experience and learn how to manage these emotions. The reason for this effect is the shift in perspective toward the cause of irrational thoughts, the negative cycle of these thoughts, and the therapeutic aim of initiating mindfulness-based exercises and creating "creative helplessness" regarding past solutions, cognitive defusion, and emphasizing committed action. Encouraging patients to clarify values, set goals, anticipate obstacles, and ultimately commit to actions aligned with their values leads to the achievement of goals and increased happiness, which improves the quality of life for nurses while helping them escape the cycle of negative thoughts and feelings (Babapoor et al., 2019; Ebrahimi et al., 2021).

In other words, the intervention based on acceptance, compassion, and mindfulness effectively reduces stress, anxiety, and depression by enhancing acceptance and increasing value-driven action. The effectiveness of this intervention in reducing psychological distress in anxious nurses can be attributed to its approach, which uses mindfulness, acceptance, and cognitive defusion techniques to increase psychological flexibility. Participants learn to accept their emotions instead of distancing themselves from them and link their thoughts and thinking processes to goal-directed activities through mindfulness. Additionally, the intervention emphasizes the individual's willingness to engage in inner experiences to help them view their distressing thoughts as just thoughts, recognize the inefficiency of their current approach, and focus on doing what is important to them in life.

The findings also indicated that the integrated intervention model based on acceptance, compassion, and mindfulness was effective in reducing intolerance of uncertainty in nurses with anxiety in the emergency department. These findings align with prior studies (Aghili & Kashiri, 2022; Asli azad et al., 2020; Bernstein et al., 2009; Chen et al., 2018; Dugas et al., 2022; Fairburn et al., 2003; Koerner et al., 2017).

Nurses experience higher levels of uncertainty and, as a result, greater worry about their present and future. Uncertainty about the future is stressful and distressing for

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them, and they perceive ambiguous events as negative and believe they should be avoided. Uncertainty can impair their functioning, as they perceive ambiguous and uncertain situations as threatening, overestimating the likelihood of danger, which leads to high emotional arousal and chronic worry. The main goal of the intervention based on acceptance, compassion, and mindfulness is to increase psychological flexibility. This therapeutic approach uses acceptance, mindfulness, commitment processes, and behavioral change to promote psychological flexibility in anxious nurses (Aghili & Kashiri, 2022; Asli azad et al., 2020; Bernstein et al., 2009; Chen et al., 2018; Dugas et al., 2022; Fairburn et al., 2003; Koerner et al., 2017).

In this treatment, nurses learn to engage with the present moment and accept their thoughts, emotions, and bodily sensations rather than trying to control or avoid them. The intervention teaches them to identify and observe unpleasant thoughts and emotions through metaphors and exercises, allowing them to experience the costs of their efforts to control and manage their past thoughts, emotions, and bodily sensations. Additionally, they learn to refrain from unnecessary attempts to modify or change unwanted internal experiences, such as thoughts, memories, emotions, and bodily sensations, thus reducing their intolerance of uncertainty and other psychological dysfunctions.

5. Limitations & Suggestions

This study was conducted on nurses working in the emergency department in Neyshabur, so caution should be exercised when generalizing the results to other populations. Other limitations of the study include the small sample size and the use of self-report questionnaires, which may introduce bias in responses. Future studies should be conducted on a larger scale with more diverse samples. It is also recommended that future research investigate the correlation between participants' socioeconomic and cultural differences and the psychological outcomes of the intervention. Based on the results, individual-based interventions should be compared to this study, and future research should be conducted in other settings. Psychologists specializing in psychological therapies should be present in counseling centers to provide therapeutic assistance for successful treatment. Acceptance, compassion, and mindfulness-based interventions should be prioritized for individuals with anxiety and psychological distress, as they increase cognitive flexibility and improve coping strategies.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

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

Transparency of Data

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

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Authors' Contributions

All authors equally contributed in this article.

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