

Original Article

The effectiveness of compassion therapy and meta-cognitive therapy on the level of nurses' meta-emotion

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Abstract

Tough and most intense job conditions make nurses unable to control negative emotion and meta-emotion and weaken their job performance. The present study was conducted with the aim of comparing the effectiveness of compassion therapy and meta-cognitive therapy on nurses' meta-emotion levels. The research method was experimental with a pre-test, post-test and follow-up design. The sample included 60 nurses from hospitals in Tabriz in 2022, and they were randomly assigned to three groups of compassion therapy, meta-cognitive therapy and the control group. To collect the data, Mitmansgruber et al.'s (2009) meta-emotions scale was used. Then, the data were analyzed using the mixed analysis of variance model, Tukey's and Bonferroni's post hoc tests with the use of SPSS statistical software (version 22). The results showed that the effect of time factor on the amount of meta-emotion and its dimensions is significant. In other words, except compassion and interest, the amount of other dimensions of meta-emotions has decreased from pre-test to follow-up. Also, the interaction effect of time and group indicated that there was a significant difference between the compassion therapy and meta-cognitive therapy and control groups in the amount of anger ($p < 0.000$; $F=20.98$; Partial $\eta^2=0.424$), shame ($p < 0.000$; $F=17.47$; Partial $\eta^2=0.380$), anger control ($p < 0.000$; $F=21.39$; Partial $\eta^2=0.429$), suppression ($p < 0.000$; $F=8.93$; Partial $\eta^2=0.329$), compassion ($p < 0.000$; $F=21.51$; Partial $\eta^2=0.430$) and interest ($p < 0.000$; $F=36.79$; Partial $\eta^2=0.564$). But, no significant difference was observed between the effectiveness of these two interventions in reducing and increasing the amount of nurses' meta-emotions. Considering the effectiveness of compassion and meta-cognitive therapies on the level of nurses' meta-emotion, it seems that the application of compassion-based therapy and meta-cognitive therapy interventions will improve and moderate the level of meta-emotion in nurses.

Keywords

Compassion
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Introduction

One of the most significant areas of health development in societies is the health and treatment part, which is directly related to human health. This is because not only do healthcare workers deliver care, but they are also the administrators of patients' care situation; they play the role of advisors and guides in health issues. Additionally, they have acquired the necessary professional knowledge and skills in this area and they are active in performing their basic duties, i.e. improving the health of the society, preventing diseases, as well as ensuring and maintaining the health of all family and society members (Cheraghpour et al., 2021). Therefore, despite the demographic and epidemiological changes as well as the

emergence of health threats, most of which, can be prevented at the level of prevention, using nurses' abilities to promote the health of individuals, families, groups, and the population at a social level appears necessary (Jamshidi & Sadeghi, 2021). In the new era, the need to have nurses with a specialized role is felt more and more due to reasons such as the advancement of technology, increasing age, and the emergence of chronic diseases in order to receive high-quality care and reduce treatment costs (Hashemi et al., 2021).

Nurses suffer from a lot of stress due to working in the night shift and frequent communication with patients, which can have unpleasant effects on managing their emotions and meta-emotions (Babaei et al., 2017). Meta-emotion is defined as an organized set of emotions and beliefs related to one's own and others' emotion (Ojala,

2021). Meta-emotion is closely related to the clinical field of emotional schemas and meta-cognitive theory, and still these fields have mainly developed independently of each other (Mansell et al., 2020). In a narrower sense, this construct refers to an awareness of emotions and more generally it means organizing a set of thoughts, feelings and emotions about emotions (Miceli & Castelfranchi, 2019). The concept of meta-emotion is used to describe an individual's emotions by himself and his excitement towards them (Jadhav et al., 2017). These constructs include emotions that occur in response to other emotions, such as feeling shame about anger or feeling anger about anxiety (Bailen et al., 2019). Meta-emotion is defined as feelings about one's own emotions, which firstly moderate the intensity and quality of emotion, and secondly, contribute to individuals' psychological well-being by managing behavior and decisions (Miceli & Castelfranchi, 2020). Meta-emotion is divided into positive meta-emotion and negative meta-emotion, and just as emotion influences cognition directly and indirectly, meta-emotion acts in the same manner, impacting meta-cognition directly and indirectly (Norman & Furness, 2016). Positive meta-emotion (such as love or compassion) refers to the awareness, recognition and acceptance of positive emotions and the proper expression of these emotions, whereas negative meta-emotion (such as anger or worry) refers to awareness, recognition and acceptance of negative emotions and their prevention. Therefore, positive meta-emotion, unlike negative meta-emotion, is associated with a tendency for less suppression, better acceptance of emotions, more appropriate decision-making power and better use of coping strategies (Hurrell et al., 2017).

One of the beneficial treatments in the field of meta-emotion and nurses' emotion regulation is compassion treatment. Compassion involves having positive feelings with empathy towards others, but in one type of compassion, the existing feelings and thoughts go back to the individual himself (Rockliff et al., 2008). This component is known as self-compassion, and it is considered a key component (Germer, 2009) in the fields of personality, pathology, and psychotherapy (Leary et al., 2007). Compassion is not only a process that confirms the establishment of friendly social relations with others, but it also has a great ability to heal the mind and body (Waddington, 2021). Compassion-based treatment is a suitable treatment option for improving mindfulness skills, cognitive regulation of emotions and preparation for experiencing shame and guilt in individuals with mixed depression anxiety disorder (Ghasemi et al., 2019). Among psychotherapists and counselors, there is a growing interest in compassion-based therapy to reduce emotional disorders such as depression and anxiety (Finlay-Jones, 2017). Compassion-based therapy can impact the level of emotional disorders and impulsive emotions of individuals and affect their tendency to anorexia nervosa (Breiner et al., 2022). By increasing compassion in parents who have children with behavioral problems, it is possible to decrease emotional disorders

and increase psychological well-being (Shenaar-Golan et al., 2022).

Meta-cognitive therapy is another treatment that enables to have an impact on nurses' positive and negative meta-emotion. It is a new approach that has attracted worldwide acceptance in recent years owing to its unique features such as the limited number of therapy sessions, a regular structure, emphasis on the cognitive process rather than its content, and the design of special techniques (Araghi et al., 2020). This model is based on the fundamental theory of "self-regulatory executive function model", which was formulated in order to adjust and fill in the gaps of cognitive theories (Wells, 2002). In meta-cognitive therapy, meta-cognitive beliefs play a central role in the way individuals respond to negative thoughts, beliefs, symptoms, and emotions, and the treatment should include removing anxiety, giving up threat detection strategies, and helping individuals to experience disturbing thoughts without avoiding them (Fajja et al., 2019). In this treatment, in order to understand patients' thinking processes, in addition to paying attention to the patient's beliefs about thinking and thought control strategies, the type of meta-cognitive beliefs is also taken into account (Nordahl & Wells, 2018). Wells et al. (2021) conducted a study to investigate the effectiveness of group meta-cognitive therapy on anxiety, worry and depression of patients with heart diseases who were undergoing rehabilitation. Findings indicated that meta-cognitive therapy significantly reduced anxiety and depression in the post-treatment and follow-up stage. Short-term meta-cognitive therapy is effective in reducing emotional disorders and increasing the mental health of adolescents with cancer (Fisher et al., 2019). McPhillips et al. (2019) conducted a study with the aim of comparing the effectiveness of CBT and meta-cognitive therapy in the treatment of emotional disorders in patients with heart diseases and found that meta-cognitive therapy is more cost-effective and effective than CBT. The direct impact of meta-cognitive beliefs on emotional failure is significant such that meta-cognitive beliefs lower the possibility of emotional failure (Mansueto et al., 2022). Meta-cognitive therapy is a self-supporting treatment that can influence the level of emotional disorders (e.g. anxiety, depression, fear...) of cardiac patients (Wells et al., 2022).

One of the important factors in the evaluation of health of an organization is the mental and emotional health of the human resources of that organization. Undoubtedly, the evaluation of mental and emotional health plays a significant role in ensuring the dynamism and efficiency of every organization, and it is necessary to continuously think of measures to evaluate and improve mental and emotional health in organizations, and the importance of this axis can be also seen in some organizations, including hospitals. Nurses and hospital staff are under the influence of stress factors due to the responsibilities related to the provision of comfort for patients and their treatment. All professions dealing with human health and life are always tense, and the emotional and mental health of those working in these professions can be threatened;

among these stressful jobs is the nursing profession (Koozheshin Taromi et al., 2021). Since more nurses have not emotional and mental health, which makes patients dissatisfied with the care and treatment services, therefore, it is necessary for managers and health policy, to have programs for continuous monitoring of health and quality of work of nurses and use appropriate solutions to improve their emotional and mental health (Azizi et al., 2020). For this purpose, the emphasis of the current research will be to investigate and compare the effectiveness of compassion therapy and meta-cognition on nurses' negative and positive meta-emotion.

Method

Participants

The research method was experimental with a pre-test, post-test and follow-up design. Treatment methods at two levels of compassion therapy training, meta-cognitive therapy, and no training (control group) were considered as the independent variables and meta-emotion was employed as the dependent variable. In the present study, two interventions, i.e. meta-cognitive therapy and compassion-based therapy, were applied to test groups 1 and 2 in Tabriz and in Persian. For experimental group A, compassion educational-therapeutic protocol was provided for 8 sessions; as for experimental group B, it received the meta-cognition educational-therapeutic protocol for 8 sessions. A description of these methods is given below (Table 1 and 2):

Table 1. Description of compassion intervention training sessions

Sessions	Session Objectives
First	Evaluating meta-emotion, describing and explaining the causes and factors related to its symptoms, explaining the rules of group training such as confidentiality, preliminary explanations about the number of sessions and the duration of each session and its purpose, as well as the basic explanation of compassion and its types (self-compassion, compassion for others)
Second	Explanation of the sources of pain (comparisons, musts, failures, communication, etc.), introduction of emotional systems and principles governing emotions in human response to pain.
Third	Teaching how the nervous system works (old and new brain) and explaining the emergence of emotional problems in the exchange of information between these two brains and the result of this exchange, i.e. the inability to be sympathetic.
Fourth	Familiarizing with the two basic concepts of compassion (1. participation, lack of avoidance and confirmation of the presence of pain - 2. healing), the components of self-compassion according to Gilbert (twelve components)
Fifth	Teaching to recognize a kind person and his qualities (wisdom, responsibility, warmth and courage)
Sixth	Teaching Gilbert's skills such as kind reasoning, kind attention, kind behavior, kind feeling, kind sensory experience, and kind imagery and explaining how to use them.
Seventh	Teaching the known methods of compassion to endure distress and teaching how to apply compassionate behavior skills such as caressing, giving chances and structure and creating challenges.
Eighth	Learning the skills of the kind letter and empty chair technique, reviewing and practicing the skills presented in the previous sessions, and expressing the final solutions to the maintenance and application of the skills in life and final summing up.

Table 2. Description of meta-cognitive intervention training sessions

Sessions	Session Objectives
First	Carrying out the pre-test, preparing and introducing meta-cognitive therapy, presenting the logic behind meta-cognitive therapy.
Second	Familiarity with cognitive-attention syndrome and how it affects the persistence of mental disorders, presenting questions about the effectiveness of self-regulation behaviors (contrastive), testing thought suppression.
Third	Challenge with negative meta-cognitive beliefs related to the uncontrollability of ruminations, negative thoughts and emotions, teaching detached mindfulness practice, practicing detached mindfulness about neutral thoughts.
Fourth	Continuing the challenge with the belief of uncontrollability (examining contrary evidence), performing the rumination postponement test, conducting the loss of control test in the treatment session.
Fifth	Challenge with meta-cognitive beliefs related to the uncontrollability of risk and harm, familiarization with verbal methods and behavioral experiments.
Sixth	Challenging with positive meta-cognitive beliefs, presenting the inconsistency strategy, implementing the rumination adjustment experiment.
Seventh	Presenting a new processing program including: identifying the process of ruminations – anxieties – stresses - emotions and worries, emphasizing the use of detached mindfulness for stimulating thoughts, allowing emotions and ruminations to rise and fall without trying to investigate them, frequently implementing new styles of thinking
Eighth	Monitoring progress, providing a summary of the techniques presented in all treatment sessions, addressing questions and problems regarding the application of these techniques, getting feedback from all sessions, carrying out post-tests.

Instrument

Mitmansgruber et al.'s (2009) Meta-Emotion Scale:

This questionnaire has 28 items and is answered on a six-point Likert scale. It includes the six components of anger, shame, anger control, and suppression (negative emotions) as well as compassionate care and interest (positive emotions). Regarding the scoring system, the scores ranged from 1 (is not at all true for me) to 6 (is completely true for me). Based on the scoring system, higher scores on a component of meta-emotions indicate higher levels of that component in the respondent. The reliability coefficient reported using Cronbach's alpha coefficient is 0.91 for the subscale of positive meta-emotions and 0.85 for the subscale of negative meta-emotions (Mitmansgruber et al., 2009). Rezaei and et al.'s (2014) reported that the scale of Cronbach's alpha coefficient is 0.78 in Iran, which the results of the factor analysis confirmed the two main dimensions of positive and negative meta-emotions. In order to check the validity of the questionnaire, these researchers have checked the correlation of the questionnaire with the dimensions of the emotional intelligence questionnaire, and the subscale coefficient of negative emotion was obtained by understanding emotions ($r=-0.20$), controlling emotions ($r=-0.31$), social skill ($r=-0.28$) and optimism ($r=-0.22$). As well, they reported the subscale coefficient of positive meta-emotion with understanding of emotions ($r=-0.45$), emotions control ($r=-0.51$) social skills ($r=-0.62$) and optimism ($r=-0.58$), which shows the congenial validity of the meta-emotion questionnaire.

Procedure

The sample in the present study comprised all the nurses working in hospitals in Tabriz in 2022. To select the sample, 60 people were selected randomly from among the nurses in the hospitals in Tabriz, and were then

randomly assigned to three groups (metacognition therapy group, compassion therapy group and control group), with each group comprising 20 nurses. According to recommendations, a minimum of 15 people should be selected per group in experimental research (Delavar, 2012). In this study, 20 people were considered for each group ($n=60$) due to the possibility of subject dropout (for various reasons). The research participation criteria included: working in non-infectious departments in hospitals, not suffering from or suspected to have COVID-19, and being willing to cooperate with the researchers. The only criterion for leaving the study was the individual's refusal to continue working with the researchers. In this research, the data were analyzed using mixed analysis of variance, Tukey and Bonferroni post hoc tests with the use of SPSS 22 software.

Results

The sample of the present study consisted of 60 people (22 males and 38 females) from non-infectious wards in hospitals in Tabriz (Shahid Mahalati, Shahid Madani, Imam Reza, Waliar and Nooranjat) with an average age and standard deviation of $32/38 \pm 5/91$. The participants were ranged in age from 24 to 52 years. Regarding their university degrees, 83.3% of the respondents had a bachelor's degree and 16.7% had a master's degree. Among these participants, 16.7% were working in the maternity department; 13.3% were in the dialysis department; 16.7% were in the emergency department; 20% were in the heart department; and 11.7% were in the pediatrics department; and 21.7% were working in other patient care departments. In terms of work experience, 75% of nurses had 1 to 10 years of experience; 21.6% had 11 to 20 years; and 3.3% had 21 to 30 years of work experience. The mean and standard deviation for meta-emotion variable and its dimensions in the three stages of pre-test, post-test and follow-up stage are displayed in Table 3.

Table 3. The Mean and Standard Deviation for Meta-Emotion Dimensions in the Three Groups during Pre-Test, Post-Test and Follow-up Stage

Variable	Group	Pretest		Posttest		Follow-up Stage	
		Mean	Std.Deviation	Mean	Std.Deviation	Mean	Std.Deviation
Anger	Meta-cognitive therapy	11.9	3.21	8.75	2.73	8.85	2.62
	Compassion-based therapy	11.75	4.12	9.05	3.06	8.95	2.92
	Control	11.55	4.09	11.65	3.88	11.60	4.74
Shame	Meta-cognitive therapy	18.35	5.12	15.40	4.76	15.25	5.18
	Compassion-based therapy	17.40	5.97	14.70	4.98	14.95	4.98
	Control	19.85	5.45	19.95	5.14	19.65	4.91
Anger control	Meta-cognitive therapy	16.70	3.71	13.80	3.56	13.75	3.85
	Compassion-based therapy	16.55	3.89	13.60	3.26	13.55	3.50
	Control	17.11	2.73	17.95	2.66	17.10	2.57
Suppression	Meta-cognitive therapy	6.55	2.64	3.90	3.19	4.35	3.32
	Compassion-based therapy	7.55	2.45	5.90	2.71	5.95	2.96
	Control	7.70	1.92	8.20	2.83	8.15	2.83
Compassion	Meta-cognitive therapy	28.30	5.01	30.95	4.83	30.90	4.82
	Compassion-based therapy	24.55	8.45	29.45	6.99	30.15	7.09
	Control	25.40	5.92	25.50	5.92	25.35	5.78

Interest	Meta-cognitive therapy	22.10	3.85	25.15	3.92	24.95	3.18
	Compassion-based therapy	19.20	5.68	24.15	5.72	24.20	6.62
	Control	20.65	5.92	20.70	5.62	20.70	5.64

With the aim of data analysis via mixed analysis of variance, first the researchers examined the presuppositions related to parametric statistics and mixed analysis of variance. The non-significance of the output of Kolmogorov-Smirnov tests in the three stages of pre-test, post-test and the follow-up indicated normal score distribution for the meta-emotion variable and its dimensions. As well, to check the homogeneity of the variance of meta-emotion variable, Levine's test was used and the result of the p-value in pre-test, post-test and follow-up respectively is as follows (0.241, 0.122,

and 0.653). The numbers clearly declare the non-significance of Levine's test, as well as the homogeneity of the variance of meta-emotion variable. To check the sphericity assumption, Mauchly's Sphericity Test is used, and the results (p-value=0.49) show the heterogeneity of the variance covariance matrix in the meta-emotion variable. Therefore, the researchers used the more conservative Greenhouse-Geisser test, which is used with the aim of adjusting the degree of freedom for the interpretation of F.

Table 4. Results of Mixed Analysis of Variance via Greenhouse-Geisser Test

Variable	Source	SS	DF	MS	F	P	Partial Eta
Anger	Stage	148.23	1.77	83.43	76.76	0.00	0.574
	Group*Stage	81.03	3.55	22.80	20.98	0.00	0.424
	Error	110.06	101.26	1.08			
Shame	Stage	142.01	1.82	77.85	70.71	0.00	0.554
	Group*Stage	70.18	3.64	19.23	17.47	0.00	0.380
	Error	114.46	103.97	1.10			
Anger control	Stage	158.67	1.89	83.92	92.07	0.00	0.618
	Group*Stage	73.75	3.78	19.50	21.39	0.00	0.429
	Error	98.23	107.77	0.911			
Suppression	Stage	57.47	1.99	28.82	16.77	0.00	0.227
	Group*Stage	61.22	3.98	15.35	8.93	•/••	0.239
	Error	195.30	113.67	1.71			
Compassion	Stage	278.21	1.99	139.29	64.25	0.00	0.530
	Group*Stage	186.32	3.99	46.64	21.51	0.00	0.430
	Error	246.80	113.84	2.16			
Interest	Stage	282.74	1.68	167.67	127.06	0.00	0.690
	Group*Stage	163.75	3.37	48.55	36.79	0.00	0.564
	Error	126.83	96.11	1.32			

In Table 4, the nurses' scores for the variable of meta-emotion and its dimensions were analyzed via the mixed analysis of variance model, and in this design, three groups (compassion therapy group, meta-cognitive therapy group, and control group) were used as between-group factor and time (pre-test, post-test and follow-up stage) was considered an intra-group factor. Based on the findings, it can be said that the impact of the time factor on the level of meta-emotion and its dimensions was significant; in other words, except for compassion and interest, the level of meta-emotion dimensions decreased from pre-test to follow-up stage. Additionally, the interaction effect of time and group

also indicates that there is a significant difference among the three groups (compassion-based therapy group, meta-cognitive therapy group, and control group) in terms of anger scores (Partial Eta² = 0.424; F = 20.98; p < 0.000), shame (Partial Eta² = 0.380; F = 17.47; p < 0.000), anger control (Partial Eta² = 0.429; F = 21.39; p < 0.000), suppression (Partial Eta² = 0.329; F = 8.93; p < 0.000), compassion (Partial Eta² = 0.430; F = 21.51; p < 0.000) and interest (Partial Eta² = 0.564; F = 36.79; p < 0.000). In order to clarify the nature of the differences among the groups, the Tukey multiple comparison test was used, the results of which are displayed in Table 5.

Table 5. Tukey's Post Hoc Test Results for Three Groups in Terms of Meta-Emotions Scores in Pre-Test, Post-Test and Follow-up Stage

Variable	Stage	Group	Group mean differences	
			Meta-cognitive therapy group	Control group
Anger	Pretest	Compassion therapy	-0.15	0.20
		Meta-cognitive therapy	-	0.35
	Posttest	Compassion therapy	0.30	-2.60*
		Meta-cognitive therapy	-	-2.90*
	Follow-up Stage	Compassion therapy	0.10	-2.65*
		Meta-cognitive therapy	-	-2.75*
Shame	Pretest	Compassion therapy	-0.95	-1.45
		Meta-cognitive therapy	-	-1.50
	Posttest	Compassion therapy	-0.70*	-5.25*
		Meta-cognitive therapy	-	-4.55*
	Follow-up Stage	Compassion therapy	-0.30*	-4.70*
		Meta-cognitive therapy	-	-4.40*
Anger control	Pretest	Compassion therapy	-0.15	-1.55
		Meta-cognitive therapy	-	-1.4
	Posttest	Compassion therapy	0.20	-5.35*
		Meta-cognitive therapy	-	-5.15*
	Follow-up Stage	Compassion therapy	-0.20	-5.55*
		Meta-cognitive therapy	-	-5.35*
Suppression	Pretest	Compassion therapy	1.00	-1.5
		Meta-cognitive therapy	-	-1.15
	Posttest	Compassion therapy	2.00	-2.30*
		Meta-cognitive therapy	-	-4.30*
	Follow-up Stage	Compassion therapy	1.60	-2.30*
		Meta-cognitive therapy	-	-3.80*
Compassion	Pretest	Compassion therapy	1.75	0.85
		Meta-cognitive therapy	-	1.9
	Posttest	Compassion therapy	-1.50	4.95*
		Meta-cognitive therapy	-	5.45*
	Follow-up Stage	Compassion therapy	0.75	4.80*
		Meta-cognitive therapy	-	5.55*
Interest	Pretest	Compassion therapy	1.90	1.45
		Meta-cognitive therapy	-	1.45
	Posttest	Compassion therapy	1.00	4.50*
		Meta-cognitive therapy	-	4.25*
	Follow-up Stage	Compassion therapy	0.75	4.50*
		Meta-cognitive therapy	-	4.25*

* P<0.05 and ** p<0.01

As Table 5 demonstrates, there is no significant difference in the pretest mean scores of meta-emotion dimensions in the three groups of compassion-based therapy, meta-cognitive therapy and control. Nevertheless, in the post-test and follow-up stages, the mean scores of anger, shame, anger control and suppression in the compassion-based therapy and meta-cognitive therapy groups have significantly decreased compared to the control group. On the contrary, the mean scores of interest and compassion in the

experimental group have increased significantly. In other words, therapeutic interventions including compassion-based and meta-cognitive therapies have been effective in reducing the scores of anger, shame, anger control and suppression, and in increasing those of interest and compassion. For a clearer picture of the nature of the differences at different time intervals, Bonferroni's post hoc test was used, the results of which are presented in Table 6.

Table 6. Bonferroni's Post Hoc Test Results for Scores of Meta-Emotion Dimensions during Pre-Test, Post-Test and Follow-Up Phases for Each Group

Variable	Group	Stage	Mean differences for each stage	
			Posttest	Follow-up
Anger	Meta-cognitive	Pretest	3.15*	3.05*
		Posttest	-	-0.10
	Compassion	Pretest	2.70*	2.80*
		Posttest		0.10
	Control	Pretest	-0.10	-0.05
		Posttest		0.05
Shame	Meta-cognitive	Pretest	2.95*	3.10*
		Posttest		0.150
	Compassion	Pretest	2.70*	2.45*
		Posttest		-0.25
	Control	Pretest	-0.10	0.20
		Posttest		0.30
Anger control	Meta-cognitive	Pretest	2.90*	2.95*
		Posttest		0.05
	Compassion	Pretest	2.95*	3*
		Posttest		0.05
	Control	Pretest	0.15	0.01
		Posttest		-0.15
Suppression	Meta-cognitive	Pretest	2.65*	2.20*
		Posttest		-0.45
	Compassion	Pretest	1.65*	1.60*
		Posttest		-0.05
	Control	Pretest	-0.50	-0.45
		Posttest		0.05
Compassion	Meta-cognitive	Pretest	-2.65*	2.60*
		Posttest		0.05
	Compassion	Pretest	-4.90*	-5.60*
		Posttest		-0.70
	Control	Pretest	-0.10	0.05
		Posttest		0.15
Interest	Meta-cognitive	Pretest	-3.05*	-2.85*
		Posttest		0.20
	Compassion	Pretest	-10.25*	-0.5*
		Posttest		0.9
	Control	Pretest	-0.05	-0.05
		Posttest		0.01

* P<0.05 and ** p<0.01

As Table 6 displays, the mean scores during post-test and follow-up stage for anger, shame, anger control and suppression in the meta-cognitive therapy and compassion-based therapy groups have decreased compared to pre-test. Additionally, the mean scores of compassion and interest have increased during post-test and follow-up stage in the intervention groups. However, no significant difference was observed in the mean scores of the dimensions of meta-emotion in the control group during the pre-test, post-test and follow-up stage.

Discussion

The present study was carried out with the purpose of comparing the effectiveness of compassion therapy and meta-cognitive therapy on the level of nurses' meta-emotion. The results of the mixed analysis of variance revealed the significant impact of the time factor on nurses' meta-emotions. In other words, all the dimensions of meta-emotion (except for compassion

and interest) reduced in nurses from pre-test to follow-up. Moreover, the interaction effect of time and group also indicated a significant difference among the three groups (meta-cognitive therapy group, compassion-based therapy group and control group) in terms of anger scores, shame, anger control, suppression, compassion and interest. That is, compassion therapy and meta-cognitive therapy were effective in reducing the scores of anger, shame, anger control and suppression, and in increasing those of interest and compassion.

The impact of compassion therapy was also more than that of meta-cognitive therapy in terms of a reduction in shame; however, the impact of the interventions was not significant in the other dimensions of meta-emotions. This finding is consistent with that of [Ghasemi et al. \(2019\)](#) who reported that compassion therapy is a suitable treatment option for the improvement of the skills of mindfulness, cognitive regulation of emotion and readiness to experience

shame and guilt in people with depression and anxiety disorders. The finding is also consistent with the study of other psychotherapists and counselors who have a growing interest in compassion treatment to reduce emotional disorders such as depression and anxiety (Finlay-Jones, 2017). The finding is also similar to that of Shenaar-Golan et al. (2022) who treated their emotional disorders by increasing compassion in parents who had children with behavioral problems.

Regarding the effectiveness of compassion therapy in regulating the level of meta-emotion, it can be said that nurses who are weak and ineffective in terms of meta-emotion use a negative inner voice more often and are more self-critical. Since one of the treatment techniques in compassion-based therapy is training a compassionate mind, in this therapy more work is done on nurses' tone of voice (which is inefficient in meta-emotions) and attempt is made to strengthen their positive and compassionate inner tone and voice so that they may gain security. In fact, in this technique, nurses are equipped with skills for regulating their mood and emotion by performing and repeating exercises such as soothing rhythm breathing. In other words, by expanding the relief system and regulating the threat system, the compassionate mind creates emotional balance in nurses and makes them efficient in terms of meta-emotions. Also, based on Neff's theory (2022), teaching the skills of self-compassion to themselves and others, in nursing, causes some effective abilities such as a reasonable perception of themselves, emotional balance in stressful situations (COVID-19 outbreak season), and finally tolerant and patient nurses. Also, based on the truth, that negative and unpleasant emotions are the inherent features of all human beings, makes them be kind to themselves and their negative emotions, and manage their emotions effectively and properly.

Moreover, the results of the present study revealed that meta-cognitive therapy is effective in reducing negative meta-emotions and enhancing positive meta-emotions. Such findings are consistent with those of Wells et al. (2021) who reported meta-cognitive therapy as effective in reducing emotional disorders and increasing the mental health in adolescents with cancer (Fisher et al., 2019). Likewise, the finding of the present study is in line with that of McPhillips, et al. (2019) who, having compared the impact of CBT and meta-cognitive therapy in treating emotional disorders in patients with heart diseases, reported meta-cognitive therapy to be both more cost-effective and effective compared to CBT. Among other studies with similar findings, we may refer to the research carried out by Mansueto et al. (2022) who found a significant direct effect of meta-cognitive beliefs on emotional failure, with meta-cognitive beliefs reducing the level of emotional failure. With respect to the impact of meta-cognitive therapy on the correction and adjustment of nurses' meta-emotions, based on the associative network model it can be said that meta-cognition is a

multifaceted concept that includes knowledge, processes and strategies evaluating, monitoring or controlling cognition. In fact, the concept of meta-cognition refers to our knowledge of our own cognitive processes and of how to use them optimally to achieve learning goals. In other words, it refers to the information that a person has about their cognitive system. With the growth and expansion of the cognitive system in humans, a set of meta-cognitive and supervisory processes is also formed. These meta-cognitive skills act as awareness-raising skills, and help individuals gain knowledge about their emotions, become competent in managing their emotions, and also succeed in correcting and adjusting their meta-emotion. In other explanation, based on the theory of Wells (2021), in the intervention of metacognitive therapy, the main goal was to correct the view and attention of nurses towards unpleasant emotions and feelings, in other words, they tried to make them perceive their kind feelings and emotions in a different way; It means that they should consider themselves apart from other problems, especially negative thoughts, in order to evaluate their emotions and feelings better. This issue accomplished by the help of teaching techniques, such as attention training and detached mindfulness and free association technique, identifying negative thoughts and feelings, emotional recital; which led to the strengthening of positive meta-emotions and weakening of negative meta-emotions in nurses.

The current research had some limitations. The first limitation was the self-assessment questionnaires for the collect date; likewise extracting detailed information with questionnaires was impossible. Future researchers may need to use both interview and observation. Second, all treatment sessions were carried out by one therapist. Future researchers may need to use the help of an assistant therapist to prevent the main therapist's excessive fatigue. Third, since the sample in this study comprised only nurses in a certain location, generalization of the findings to other groups might be impossible. In the current study, due to time constraints, the follow-up stage was carried out one month after the treatment, which is a relatively short interval for the investigation of the long-term effects of therapeutic interventions. Therefore, it is necessary to conduct researches that can take into account the long-term effects of the mentioned interventions.

Conclusion

The results of this study demonstrated that compassion therapy and meta-cognitive therapy play a role in correcting and modulating nurses' meta-emotion and can be used to increase nurses' efficiency in regulating and managing emotion. Therefore, in order to increase positive meta-emotion and reduce negative meta-emotion, it might be necessary to hold educational workshops for nurses.

Conflict of interest

The authors state that there is no conflict of interest in this study.

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