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Comparing the effectiveness of mindfulness training with schema therapy on self- referential thinking and cognitive fusion among female nurses

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Original Article

Abstract

BACKGROUND: Nurses are a powerful force in the health care system and play an important role in the development, improvement, and promotion of care. Therefore, this research was conducted to compare the effectiveness of mindfulness programs with schema therapy on cognitive fusion and referential thinking in female nurses.

METHODS: The research was semi-experimental with a pretest-posttest design and follow-up with a control group. The statistical population of the research included all the female nurses of Imam Khomeini Hospital in Tehran, Iran, in 2021, from September to November, from whom 60 nurses were selected by convenience sampling method and replaced in three groups of 20 people, taking into account the entry criteria. Research tools included the Cognitive Fusion Questionnaire (CFQ) and Repetitive Thinking Questionnaire (RTQ). The intervention program was implemented for each of the experimental groups during 8 weekly sessions (1 hour). But the control group did not receive these programs. To analyze data, repeated measures analysis of variance (ANOVA) and SPSS software were used.

RESULTS: In addition to the effect of time and group, the interaction effect of group × time for referential thinking (η^2 = 0.327, P = 0.001, F = 12.41) and cognitive fusion (η^2 = 0.263, P = 0.001, F = 9.11) was significant. This finding indicates that the implementation of mindfulness-based therapy and schema therapy has affected the variables of referential thinking and cognitive fusion in nurses.

CONCLUSION: Based on the findings of the current research, it is recommended to use schema therapy programs as well as mindfulness programs as effective psychological methods to improve referential thinking and cognitive fusion of the staff working in the field of treatment, especially nursing personnel.

KEYWORDS: Mindfulness; Schema Therapy; Self-Referential; Cognitive; Female Nurses; Burnout; COVID-19

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Introduction

From the beginning of the coronavirus disease 2019 (COVID-19) epidemic, healthcare workers (HCWs) around the world have experienced excessive work, increasing health risks in the absence of clear guidelines, and reorganizing their activities. These factors cause a lack of control, exhaustion, anxiety, depression symptoms, and reduced energy investment in the professional field.[1] Nurses have reported mental health concerns during the pandemic,[2] often linked to the perceived threat of virus transmission in the healthcare setting.[3] The

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work pressure of this group often increases to such an extent that it reduces their satisfaction, commitment, and attachment to their profession and even life, and also it results in leaving the service or job burnout in them.[4]

In one study, about half of the frontline nurses reported moderate to high burnout, with emotional exhaustion at 60.5%, depersonalization at 42.3%, and lack of personal accomplishment at 60.6%.[5] Zhang et al. demonstrated that 78.5% and 92.5% of nurses showed mild levels of emotional exhaustion and depersonalization, respectively, while participants experienced a severe lack of personal accomplishment.[6] Wang et al. indicated that 27.7% of the medical staff experienced depression, and 32.3% of them felt stressed. Specifically, correlation analyses showed correlations between mental fatigue, psychological inflexibility, cognitive fusion, and negative emotions among nurses. Furthermore, in Wang et al.'s study, psychological inflexibility and cognitive fusion mediated negative emotions among nurses as a result of mental fatigue, and psychological inflexibility and cognitive fusion also played a statistically significant role as chain mediators.[7]

According to reverse mediation research, stigma, depression, anxiety, and quality of life can affect cognitive fusion.[8] Faustino et al. have found that the concept of fusion of thought and action has a wide range of disorders that directly and indirectly modify the social functioning of people, including their family life and social communication health.[9] Psychological inflexibility and cognitive fusion, as important diagnostic criteria for mental health, predict negative emotions.[10] Referential thinking is an uncontrollable, repetitive, continuous, and detailed cognitive activity that focuses on the negative aspects of oneself and the world.[11] Marchand has suggested that research on self-referential thinking has increased, which may be associated with several mood and anxiety spectrum disorders.[12] The study of Wang et al. recommended that negative effects came from impairment of cognitive functioning, and interventions using acceptance and commitment therapy for mental fatigue and negative emotions were more effective since both psychological inflexibility and cognitive fusion were important components of the therapy.[7] Cookson et al.'s study recommended that interventions designed to reduce cognitive fusion might be useful for this group.[8]

Therefore, according to the role of nurses in providing the physical health of society, the need for interventions to reduce the reverse effects of job burnout and increase the psychological capacity of this group is very effective. One of these interventions is mindfulness, which means conscious and non-judgmental attention to internal and external variable phenomena, and for the first time, Kabat-Zinn et al.[13] introduced mindfulness-based interventions that include stress reduction based on mindfulness, increase stress management, and improve mental health.[14] However, studies show the positive effects of mindfulness-based interventions on increasing happiness and job satisfaction, reducing anxiety and stress,[14] improving the cognitive functions of nurses, and reducing negative thoughts.[15, 17]

Another therapy that has a lot in common with mindfulness is Young schema therapy. Because both mindfulness-based therapy and Young schema therapy are based on cognitive principles that focus on managing dangerous situations and associated psychological disorders.[18] Shahmoradi et al. provided its effectiveness on maladaptive schemas and general health in patients.[19] Piri et al. demonstrated its effectiveness on the symptoms of borderline personality disorder of patients with substance abuse.[20] Moreover, Dehganisoltani and Rezainasab revealed that schema therapy was effective on metacognitive beliefs, thought-action fusion, and rumination in women with generalized anxiety disorder

(GAD).[20] Bamber and McMahon believe that dysfunction in the job field is the reproduction of maladaptive behavior that originates from the underlying maladaptive schema in the context of the work situation, and any specific job dysfunction can be matched with the underlying maladaptive schema.[20]

Because prior research neglects the role of cognitive fusion and referential thinking in female nurses besides job burnout, this investigation aimed to compare the effectiveness of mindfulness and schema therapies in promoting referential thinking, job burnout, and cognitive fusion in the nursing community. Therefore, this research was conducted to compare the effectiveness of mindfulness programs with schema therapy on cognitive fusion and referential thinking in female nurses.

Methods

This semi-experimental study was conducted with a pretest-posttest design and a control group with a 2-month follow-up phase. The statistical population of the research included all the female nurses of Imam Khomeini Hospital in Tehran, Iran, from September to November the year 2021.

The authors calculated the sample size based on the study of Javidnasab et al.[21] According to G*Power software (β = 0.05, and α = 0.05), the sample size was estimated for each group to be 15 people with the convenience sampling method, but to avoid the loss of external validity and the possibility of dropout in the sample, 20 people were considered in each group.

Sampling was done in such a way that the researcher was present at Imam Khomeini Hospital, where she was also one employee. Figure 1 show the flow diagram of the study.

Then, research tools [Cognitive Fusion Questionnaire (CFQ) and Self-Referential Thinking Questionnaire (RTQ)] were distributed among the volunteer nurses applying for participation in the research, and according to the gained scores in the research tools, 60 nurses were selected and randomly divided into three equal groups of 20 people. The randomization of people was based on odd (experimental groups) and even (control group) numbers. After obtaining ethical consent, the first experimental group underwent mindfulness training for 8 sessions of 60 minutes according to the Kabat-Zinn et al. protocol,[13] and the second experimental group underwent schema therapy for 8 sessions of 60 minutes according to the protocol of Young et al.[18]

During this period, the control group did not receive any training in mindfulness and schema therapy and remained on the waiting list (in such a way that after the post-test sessions, the people of the control group also underwent schema and mindfulness therapy to comply with ethical considerations).

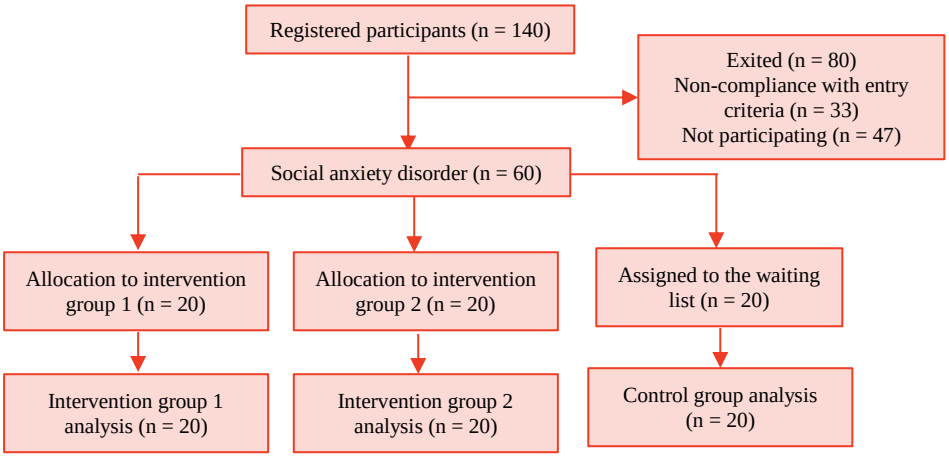

Figure 1. Flow diagram of the study

After the completion of the intervention sessions of all three groups, a post-test and a follow-up period were conducted 2 months later. The content of the intervention sessions is presented in tables 1 and 2.

The criteria for including in the research were: female gender, informed consent to take part in the investigation, ability to take part in intervention sessions, the age range of 25 to 35 years, having job burnout based on a burnout questionnaire, having at least one year of experience in the nursing staff (term of employment), having a bachelor's degree and above, official employment as a nursing staff (job status), and having a night shift in the work schedule. The criteria for excluding from the research were lack of motivation to take part in the investigation, simultaneous participation in educational-therapeutic programs in mental health, inability to take part in intervention sessions, absence of more than one therapy session, suffering from each of the chronic diseases and the use of specific medicines related to the illness, and working in two jobs at the same time (education and nursing). Besides descriptive statistics, the researchers performed data analysis with repeated measures analysis of variance (ANOVA). Before the interpretation, the assumptions of ANOVA for variables of self-referential thinking (Mauchly's sphericity = 0.33, F = 10.62, P = 0.850; Box's M = 0.81, P = 0.642, η^2 = 0.994) and cognitive fusion (Mauchly's sphericity = 0.909, F = 0.092, P = 0.92; Box's M = 12.08, P = 0.525, η^2 = 4.78) were evaluated and confirmed. The researchers used SPSS software (version 24, IBM Corporation, Armonk, NY, USA) for all tests at a significance level of 0.05.

CFQ: This questionnaire was developed in 2014 by Gillanders et al.[22] and has 12 questions with 2 factors of fusion (questions 3, 4, 5, 6, 7, 8, 10, 11, and 12) and fault (questions 1, 2, and 9); scoring is done on a 7-point Likert scale in such a way that 7 is assigned to "always" and 1 point to "never". The range of scores on the questionnaire will be between 7 and 49, and higher scores indicate more cognitive fusion. The validity of this questionnaire has been confirmed by its creators in research and clinical work. They also reported Cronbach's alpha coefficient of the questionnaire as 0.93 and the retest reliability coefficient as 0.80 after 4 weeks.[22] Moreover, in the study of Javidnasab et al.,[21] Cronbach's alpha coefficient of the questionnaire was calculated as 0.80. In the present study, Cronbach's alpha coefficient of the whole instrument was 0.79.

RTQ: This questionnaire is a 15-item self-report instrument prepared by Ehring, et al.[23]

Table 1. Summary of the content of Kabat-Zinn et al.13 mindfulness training sessions

Session	Contents
First	Introducing members, expressing goals and adjusting expectations, explanations about variables
Second	Performing yoga stretching exercises, discussing the experience of home exercises and ways to remove obstacles, body scanning meditation and talking about the meditation experience, and distributing pamphlets
Third	Doing stretching yoga, discussing the experience of home exercises and ways to remove obstacles, body scanning meditation, talking about the experience of meditation, distributing pamphlets
Fourth	Mindful yoga practice, mindful sitting with awareness of emotions and thoughts, discussion regarding mindful attitude, distribution of pamphlets
Fifth	Performing body scan meditation, checking the awareness of unpleasant events and emotions, thoughts, and body sensations along with it, practicing 3-minute breathing space, and distributing pamphlets
Sixth	Conducting a mindful sitting, checking the awareness of pleasant events and the accompanying emotions, thoughts, and bodily sensations, practicing the 3-minute breathing space, and distributing pamphlets
Seventh	Practicing mindful yoga, doing mountain meditation, repeating exercises from previous sessions, distributing pamphlets
Eighth	Practicing body checks, reviewing the program, discussing the programs, and summarizing the entire program

Table 2. Summary of the contents of Young et al.[18] sessions

Session	Contents
First	Acquaintance and relationship building, expressing the importance and purpose of schema therapy and clients' problems as schema therapy
Second	Confirming or rejecting the schemas based on current and past life evidence, discussing the aspect of the existing schema with a healthy schema
Third	Teaching cognitive techniques such as schema validity test and evaluation of advantages and disadvantages of coping styles
Fourth	Training to strengthen the concept of a healthy adult in the subject's mind, identifying their unsatisfied needs, and providing solutions to release blocked emotions
Fifth	Teaching healthy communication and imaginary conversation, teaching experimental techniques (mental imaging of problematic situations and facing the most problematic ones)
Sixth	Relationship therapy training, relationships with important people in life and role-playing, doing homework related to new behavioral patterns
Seventh	Investigating the advantages and disadvantages of healthy and unhealthy behaviors and providing solutions to overcome obstacles to changing behavior
Eighth	Reviewing the contents of the previous sessions and practicing the learning solutions

This questionnaire includes three subscales of the main features of referential thinking with questions 1, 2, 3, 6, 7, 8, 11, 12, and 13, perceived failure with questions 4, 9, and 14, and conquering mental capacity with questions 5, 10, and 15 and a general score of referential thinking. Subjects indicate their agreement or disagreement with each of the statements on a 5-point Likert scale of never = 0, rarely = 1, sometimes = 2, often = 3, and always = 4. The range of scores is between 0 and 60, and a higher score means more negative referential thinking or repeated negative thoughts. Cronbach's alpha coefficient was 0.95 for the whole test and 0.94 for the subscales of the main characteristics of referential thinking, 0.83 for perceived inefficiency, and 0.86 for capturing mental capacity, and for the reliability of the test-retest method for the whole test.[23] The internal consistency of the RTQ was obtained by Cronbach's alpha method for the whole test as 0.79 and for the subscales as 0.78, 0.71, and 0.69, respectively.[19]

Cronbach's alpha was used to check the reliability of the questionnaire, and the total coefficient of the questions was 0.71. This study has the code of ethics (IR.IAU.K.REC.1401.026) from the Islamic Azad University, Karaj Branch, Karaj, Iran.

Results

In the present study, 54 female nurses ended the study in three groups of mindfulness-based therapy (n = 18 people), schema therapy (n = 17 people), and control (n = 19 people). The mean and standard deviation (SD) of the participants' age in the three groups were 32.28 ± 4.58, 33.65 ± 4.87, and 33.63 ± 4.56, respectively. The mean and SD of the work experience of the participants in the two experimental groups were 6.00 ± 1.74 years and 6.94 ± 1.88 years, and 6.84 ± 10 in the control group.

Table 3 shows that in the two experimental groups, the mean scores of referential thinking and cognitive fusion decreased in the post-test and follow-up stages. On the other hand, no similar changes were observed in the mentioned stages in the control group. As table 3 shows, the Shapiro-Wilk index related to any of the two dependent variables was not significant in three groups and three stages of implementation. This article shows the normal distribution of data for the two variables of referential thinking and cognitive fusion.

According to the results, the effect of implementing independent variables on referential thinking (Wilks's lambda = 0.517, η^2 = 0.281, P = 0.001, F = 9.78) and cognitive fusion (Wilks's lambda = 0.643, η^2 = 0.198, P = 0.001, F = 6.18) was significant.

Table 3. Mean and standard deviation (SD) and Shapiro-Wilk values of variables in the three stages

Variable	Group	Mean ± SD			Shapiro-Wilk values			P		
		Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up
Self-referential thinking	Mindfulness training	37.78 ± 6.59	23.50 ± 5.09	25.83 ± 5.54	0.969	0.946	0.980	0.781	0.367	0.955
	Schema therapy	37.35 ± 7.42	20.94 ± 4.67	20.35 ± 4.31	0.933	0.964	0.957	0.241	0.704	0.582
	Control	34.11 ± 6.98	33.42 ± 6.63	32.95 ± 5.53	0.945	0.952	0.944	0.330	0.431	0.312
Cognitive fusion	Mindfulness training	41.44 ± 8.07	32.67 ± 6.15	31.33 ± 5.64	0.961	0.969	0.918	0.616	0.770	0.121
	Schema therapy	40.47 ± 8.04	26.59 ± 5.37	26.60 ± 4.32	0.914	0.964	0.973	0.118	0.716	0.871
	Control	39.53 ± 6.82	40.26 ± 7.66	41.89 ± 7.48	0.968	0.970	0.964	0.729	0.767	0.643

SD: Standard deviation

Moreover, results showed that in addition to the effect of time and the effect of group, the interaction effect of group × time for referential thinking (η^2 = 0.327, P = 0.001, F = 12.41) and cognitive fusion (η^2 = 0.263, P = 0.001, F = 9.11) was significant. This finding indicates that the implementation of mindfulness-based therapy and schema therapy has affected the variables of referential thinking and cognitive fusion in nurses.

The results of Bonferroni's test comparing the effect of time in table 4 showed that the difference in the mean scores of referential thinking and cognitive fusion in the pretest-posttest and pretest-follow-up stages was statistically significant, but the mean difference of those scores in the posttest-follow-up stages was insignificant.

Besides, the results of Bonferroni's test comparing the effects of the groups in table 4 showed that compared to the control group, the difference in the mean of referential thinking and cognitive fusion in the two treatment groups based on mindfulness and schema therapy was significant. Thus, the mean of referential thinking and cognitive fusion in both experimental groups has decreased compared to the control group.

Finally, the results of Bonferroni's post-hoc test in table 4 showed that the difference in the effect of two treatment methods based on mindfulness and schema therapy on cognitive fusion was significant (P = 0.011), so that schema therapy compared to therapy based on mindfulness has reduced cognitive fusion in nurses. Therefore, it can be said that schema therapy is a more effective method to reduce cognitive fusion in female nurses compared to mindfulness-based therapy.

Discussion

The present study aimed to determine whether mindfulness and schema therapy were effective in referential thinking and cognitive fusion in nurses. The results showed that the difference in the mean scores of referential thinking and cognitive fusion in the pretest-posttest and pretest-follow-up stages were statistically significant. In addition, compared to the control group, the difference in the mean of cognitive fusion and referential thinking in the two treatment groups based on mindfulness and schema therapy was significant; therefore, nurses have a reduced cognitive fusion in post-test and follow-up. Schema therapy is a more effective method to reduce cognitive fusion in female nurses compared to mindfulness-based therapy. Since less research has been done on cognitive fusion and referential thinking, no study was found comparing the effectiveness of two approaches on the mentioned variables. Therefore, the alignment and non-alignment of these findings with the results of the past research are not clear. This study has referenced previous studies to evaluate the effectiveness of mindfulness-based therapy (MBS) on different variables.

Table 4. Bonferroni's post-hoc test results for referential thinking and cognitive fusion

Variables	Times	Mean difference	Standard error	P
Self-referential thinking	Posttest-Pretest	10.45	1.17	0.001
	Pretest-follow-up	10.03	1.13	0.001
	Posttest-follow-up	-0.42	1.09	> 0.999
Cognitive fusion	Posttest- Pretest	7.31	1.33	0.001
	Pretest-follow-up	7.39	1.42	0.001
	Posttest-follow-up	0.08	1.08	> 0.999
	ST-MT	2.82	1.21	0.071
Self-referential thinking	MT-control	-4.45	1.18	0.001
	ST-control	-7.28	1.19	0.001
Cognitive fusion	ST-MT	4.11	1.35	0.011
	MT-control	-5.41	1.32	0.001
	ST-control	-9.52	1.34	0.001

ST: Schema therapy; MT: Mindfulness therapy

A very large literature supports the effectiveness of mindfulness programs on several psychological outcomes.[14-18] A review of a population of healthcare professionals, for example, found that mindfulness-based programs were an efficient intervention that could enhance healthcare professionals' psychological functioning.[16] Researchers have demonstrated that mindfulness programs can be effective in increasing the psychological well-being of different populations including people with cancer, people with multiple sclerosis (MS),[24] school teachers' self-reported personality traits as well as stress and burnout levels, mental health promotion in adults in nonclinical settings, and in reducing stress in the workplace.[24] Mindfulness interventions target aberrant self-referential thinking, and neuroimaging studies indicate that mindfulness practices impact both the structure and function of cortical midline structures (CMS). Thus, these interventions likely exert benefits, at least in part, by modulating CMS functions associated with both self-referential thinking and emotional regulation.[12] Objective awareness allows one to interpret thoughts as "just thoughts" and prevents experiencing irrational negative thinking as fact. There is compelling evidence that mindfulness impacts default mode network (DMN) neural processes. Modification of this network likely plays a significant role in the objectification of the experience of automatic thoughts.[25]

Shahmoradi et al. showed that there was a difference between maladaptive schemas and general health between both treatment groups and the control group. Despite this, there was no significant difference between the two groups in terms of therapies.[19] Furthermore, Valian et al. discovered that the mean score of mental health differed significantly between the control group and the mindfulness experimental group. Furthermore, there was a significant difference between the effectiveness of schema therapy and acceptance and commitment therapy at the end of the treatment and in a one-month follow-up.[26] Compared to other groups, schema therapy was more effective at reducing symptoms of borderline personality disorder.[20] The effects of group schema therapy on women include reduced metacognitive beliefs, the intertwining of thought and action, and rumination. Schema therapy is an appropriate method to modify the dimensions of metacognitive beliefs, thought-action mixing, and rumination in women with generalized disorder.[21] In explaining the more effective therapeutic schema on cognitive fusion, we can say that the therapeutic schema cause changes in cognitive, emotional, and behavioral fields. As a result, the therapeutic schema can increase the individual's power of differentiation by separating healthy and unhealthy behaviors from each other. Therefore, it seems logical that the therapeutic schema is more effective in cognitive fusion.[19-21]

Limitations of the current research include sampling restrictions, as this study only studied nursing personnel in Tehran. Besides, only the questionnaire is used in this study. For this reason, prejudice may be created in the information obtained. In addition, the non-random selection of individuals was another limitation of this research. Holding workshops on schema therapy and identifying incompatible schemas by activating their factors can improve nurses' cognitive fusion. Researchers should conduct future research as an experimental study (complete experiment) to gain more reliable results regarding the effectiveness of the two treatment methods implemented, to interfere with disturbing variables more effectively. A follow-up phase of two months was considered necessary because of COVID-19 disease epidemic and the difficulty of coordinating with nurses. Based on this, it is recommended to investigate the continuity and permanence of mindfulness

intervention and schema therapy on nurses.

Conclusion

Based on the findings of the current research, it is recommended to use schema therapy programs as well as mindfulness programs as effective psychological methods to improve referential thinking and cognitive fusion of the staff working in the field of treatment, especially nursing personnel.

Conflict of Interests

Authors have no conflict of interests.

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