

Comparison of the Effectiveness of Self-care Education and Process Emotion Regulation in the Mitigation of Depression Symptoms among the Caregivers of Older Adults with Dementia

Shabnam Moadab Kazerouni¹, Mohammad Hatami^{2*}, Rostam Seifaddini³

1. Department of Health Psychology, UAE Branch, Islamic Azad University, Dubai, United Arab Emirates

2. Department of Psychology, Faculty of Education and Psychology, Kharazmi University, Tehran, Iran

3. Department of Neurology, University of Medical Sciences, Kerman, Iran

* **Corresponding author:** Mohammad Hatami, Department of Psychology, Faculty of Education and Psychology, Kharazmi University, Tehran, Iran. Email: Hatami@khu.ac.ir

Received 2023 November 11; Accepted 2024 February 06.

Abstract

Background: The long-term, demanding nature of caring for dementia patients leaves a detrimental impact on carers' physical and emotional well-being.

Objectives: The present study aimed to compare the effectiveness of self-care education and process emotion regulation in the mitigation of depression symptoms among the caregivers of older adults with dementia.

Methods: This quasi-experimental study was conducted based on a pre-test-post-test design and a four-month follow-up period with a control group. The statistical population consisted of all caregivers who cared for dementia patients in their homes or institutions and were referred to Dr. Rostam Seifaddini's center in Kerman in 2021. The statistical sample consisted of 45 people who were selected via convenience sampling. Thereafter, 15 subjects were randomly assigned to the control group, and 30 cases were allocated to two experimental groups. The experimental group received self-care training and process emotion regulation interventions in eight 45-minute sessions once a week. Data were collected using the Beck Depression Inventory (1961) and analyzed in SPSS software (version 26) using repeated measures analysis of variance.

Results: The results demonstrated that self-care education and emotion process regulation training were effective in depression and quality of life among the caregivers of older adults with dementia ($P < 0.01$). The findings also pointed out that there was no significant difference between the effectiveness of the two interventions (self-care education and emotion process regulation training) in reducing depression symptoms among the caregivers of older adults with dementia.

Conclusion: It can be concluded that self-care and emotion regulation training are effective in the mitigation of depression symptoms in caregivers.

Keywords: Caregivers, Depression, Dementia, Emotional regulation, Self-care

1. Background

The elderly population is increasing in all countries for multiple reasons, including a sharp decline in mortality rates due to advances in medical science, health, and education, thereby increasing life expectancy and longevity (1). Aging is associated with various biological, psychological, and social aspects (2). The prevalence of chronic and debilitating diseases in this age group is very high, making aging a challenging period for individuals and families (3). Therefore, devoting special attention to the quality of life of older adults and their caregivers is a critical priority that is more crucial than ever and should be considered in all plans developed for older people.

Dementia, which is a chronic disease affecting older adults, is a chronic, progressive, and irreversible neurological disorder characterized by deficits in cognitive function, including impairments in memory and cognition, aphasia, executive dysfunction, communication deficits, and changes in mood, personality, and judgment (4, 5). As the disease progresses, patients need the help of family members due to limitations, as well as the need for emotional support and tools to carry out their activities (6). Caring for people with chronic diseases

builds up great tension among caregivers and families of patients.

Patient's biological, social, and psychological demands outstrip the needs of caregivers. Therefore, the effects of chronic diseases not only disrupt patients' lives but also affect caregivers (7), exposing them to negative physical, psychological, and social consequences, such as impaired immune function, sleep disturbance, fatigue, difficulty in communicating, burden of care, as well as high levels of anxiety and stress. Since caregivers often place lower value on their health, they experience less safety and more risks to their health (8).

Depression is one of the major depressive disorders with a high prevalence (9). Almost everyone experiences at least mild depression at some time in their life (10). The meaning of depression varies across individuals and can be either a symptom or a diagnosable disorder. By definition, depression is a disorder with sufficient durability and specific symptoms that affect one's functioning and cause distress (11). The fifth edition of the Diagnostic and Statistical Manual lists depression as a mood disorder (12). Depressive disorders are states of sadness, fear, and emotional response to an actual or imminent threat.

In some cases, depression develops in childhood and persists if left untreated (13). The symptoms of depression occur at different levels (14). Mood disorders usually have an early onset over time, are relatively stable, and may persist for years (15). Self-care is the practice in which each person uses their knowledge, skills, and ability as a resource to take care of their health independently (16). Self-care is a measure people take to provide, maintain, and promote their health; nonetheless, sometimes, it extends to children, family, and friends (17). Self-care is an active, practical process driven by the patient and essential for preventing short- and long-term complications (18). Studies have pointed out that observing self-care activities and improving the quality of life among patients with chronic disease and their families contribute significantly to mitigating treatment costs (19).

Research suggests that emotions play a vital role in shaping behavior, aiding decision-making, helping people remember significant experiences, and promoting social relationships. While emotions are helpful, they can also be destructive. Inappropriate emotional reactions can lead to various forms of psychological trauma, social problems, and even physical illness (20).

2. Objectives

In light of the aforementioned issues, the present study aimed to assess the effectiveness of self-care education and emotion process regulation in the mitigation of depression among the caregivers of older adults with dementia.

3. Methods

This quasi-experimental study was conducted based on a pre-test-post-test design and a four-month follow-up period with a control group. The statistical population consisted of all caregivers (aged 35-55) who cared for dementia patients in their homes or institutions and were referred to Dr. Rostam Seifaldini's center in Kerman in 2021. The statistical sample consisted of 45 people who were selected via the convenience sampling. Thereafter, 15 subjects were randomly assigned to the control group, and 30 cases were allocated to two experimental groups. The research sample size was estimated to be 45 based on previous studies considering the maximum standard deviation of 10 and $\alpha=0.05$ and test power of 95%. The inclusion criteria entailed 1. the absence of any known physical-mental illness in the caregiver, 2. lack of care for patients with other chronic conditions, 3. minimum degree in education, 4. absence of any severe crisis or stressful events, such as the death of loved ones, divorce, illness, or migration, during the last three months, and 5. willingness to participate in the research project. On the other hand, the exclusion

criteria were as follows: 1. absence from more than two sessions, 3. unwillingness to continue attending meetings, 4. older adult's death during the study, 4. acute and chronic physical and mental illnesses known to inhibit the care of older adults, 5. active use of substances, such as psychotropic drugs, and 6. assignment of older adults to long-term care centers during the study.

Beck Depression Inventory: The Beck Depression Inventory was developed by Beck et al. in 1961. The Likert scale is used to rate the degree of depression in 21 items on this questionnaire. The psychometric qualities of this scale demonstrated strong internal consistency, as measured by Cronbach's alpha, which ranged from 0.80-0.90. This questionnaire has strong reliability, as detected by the retest reliability of 0.75 after two weeks and the three-year reliability of 0.71. The results illustrated that the factor load of each question was higher than 0.40 (21). Moreover, the correlation coefficient of the Beck depression inventory, perceived stress scale, and Zonk anxiety scale were obtained at 0.66, 0.44, and 0.67, respectively. This study confirmed the reliability of this scale, rendering a Cronbach's alpha coefficient of 0.89 (22).

Self-care Education

In this study, self-care training sessions were conducted in eight 45-minute sessions based on the educational and therapeutic package of Khosravi Larijani et al. (23). The summary of the meetings are presented in [Table 1](#).

Table 1. Self-care training sessions

Session	Content
First	A brief explanation of the goals of the intervention and the benefits of self-care that were on the agenda of the intervention, talking about their previous visits to the treatment centers for their reasons and treatment, communicating professionally with teenagers
Second	Describing the program and testing the self-care model
Third	Providing necessary information related to patients' body image by using educational aids and reviewing the information provided by asking participants questions
Fourth	Applying motivational techniques, such as open-ended questions and reflective listening, a reflection of desired and achievable behaviors, summarizing and providing feedback, negotiating realistic and achievable goals to differentiate educational materials and behavioral skills presented
Fifth	Behavioral skills training to implement therapeutic recommendations by using educational aid tools and reviewing the skills presented by asking the participants
Sixth	Designing several questions to measure the learning, answering the vague and desired points of the subjects and thanking them, and asking for participation in the next meeting and doing the homework
Seventh	Reviewing the submitted contents, subject evaluation, and appreciation
Eighth	A brief explanation of the objectives of the intervention and the benefits of self-care that were on the agenda of the intervention, talking to patients about their previous visits to the treatment centers for reasons and their treatment, communicating professionally with teenagers, describing the program, running the post-test, and setting the time for the follow-up test

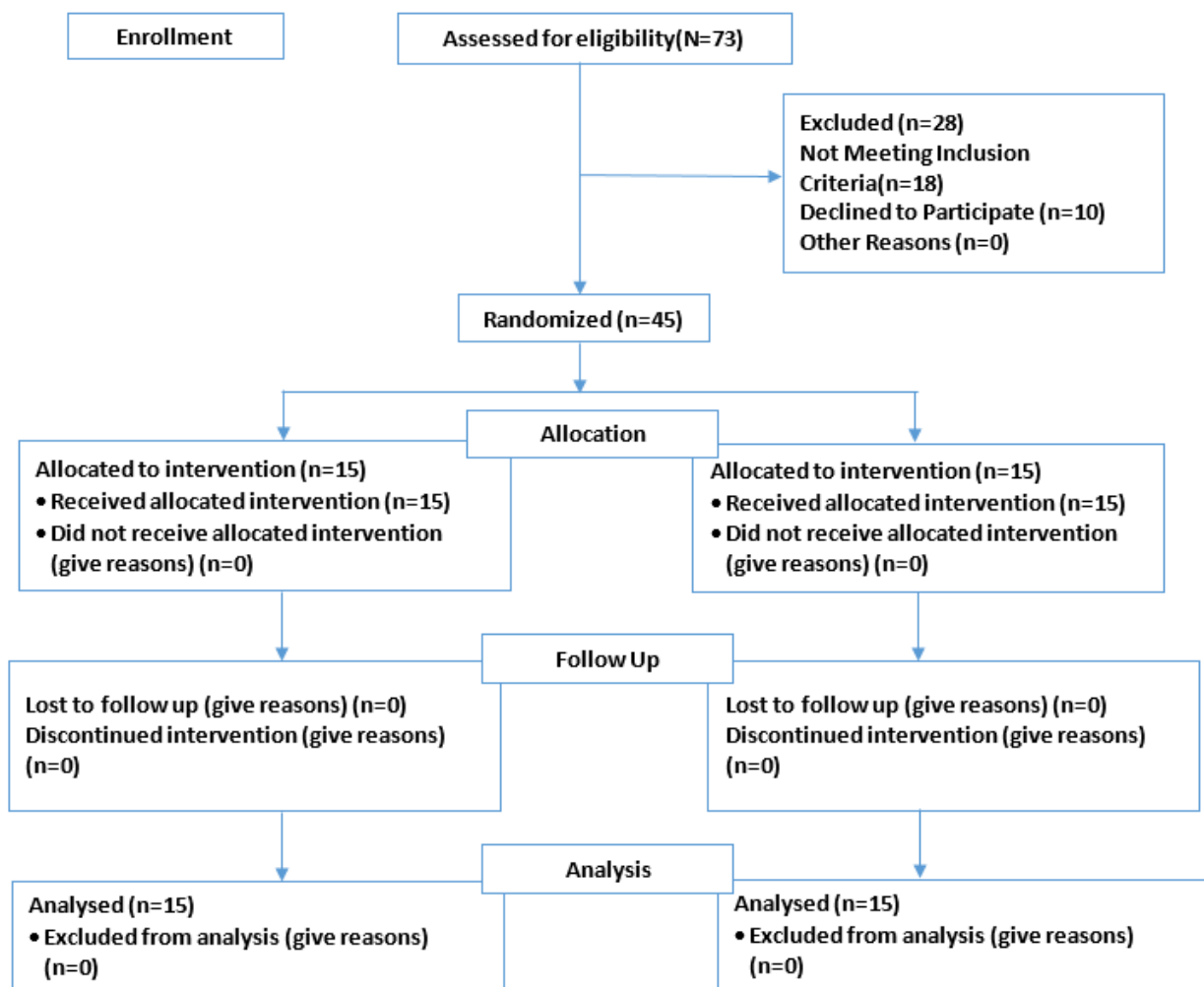
Emotion Process Regulation Training

This study conducted emotional process regulation training in eight 45-minute sessions based

on Gross's (24) therapeutic/educational package. The summary of the meetings are presented in [Table 2](#).

Table 2. Emotion Regulation Sessions

Session	Content
First	1. Getting to know each other, communicating with members, and starting a mutual relationship between the leader of the group psychologist and the members; expressing the primary and sub-objectives of the group; the members' discussion about the sub-and collective goals, the logic and the stages of intervention, as well as the framework and rules of the company
Second	Situation selection, emotional training, and a daily diary of emotional states
Third	Assessing the level of emotional vulnerability and emotional skills of members, including three parts: self-assessment to identify their emotional experiences, self-assessment to determine the extent of their emotional exposure, self-assessment to identify self-regulatory strategies, and the form of rating the rate of emotional vulnerability in different situations.
Fourth	Making changes in the emotionally triggering situation; listing individual, social, and relational goals; examining one's relationship with those around them; identifying personal and interpersonal situations that need to be improved; developing a list of positive activities; and teaching the skills required to solve interpersonal problems
Fifth	Teaching attention-shifting skills, reviewing previous session assignments, switching skills, attention, evaluation, and response
Sixth	Changing cognitive assessments; reviewing homework in the previous session; the role of mind (mental processing and a set of thoughts, beliefs, and memories) in generating, maintaining, increasing, and decreasing emotional response; identifying false assessments and their effects on emotional states; completing the wrong assessment list; identifying these assessments and their emotional consequences; and practicing open strategy- assessment
Seventh	Changing the behavioral and physiological consequences of emotion; reviewing the tasks of the previous session, exposure, evaluation, and skill training; applying emotional expression skills and modulating response when engaging in emotional experiences; creating physical relaxation through relaxation training using Jacobson's method
Eighth	Re-evaluating and planning for the application of training; reporting on how the previous session assignments were performed; applying skills in the real world of a practical plan by members; qualitative evaluation of the whole program in writing; implementing post-test and time for follow-up test

**Figure 1. Flowchart consort**

The flowchart consort are presented in [Figure 1](#). Regarding ethical considerations, participation in the study was entirely voluntary. Moreover, before the commencement of the project, participants were familiar with the specifications of the plan and its regulations. The attitudes and beliefs of the people were respected. The experimental and control group members were allowed to leave the study at any stage. In addition, if the control group members were interested, they could receive the intervention carried out for the experimental group in the same treatment sessions after the completion of the project. All documents, questionnaires, and confidential records were only available to the executors. Informed written consent was obtained from all volunteers. Data were analyzed in SPSS software (version 26) using repeated measure analysis of variance and the Bonferroni test.

4. Results

The mean age scores of subjects in the self-care

education, emotional regulation, and control groups were reported as 4.4 ± 5.26 , 42.2 ± 4.61 , and 43.4 ± 6.18 , respectively. There was no significant difference between the three groups in terms of age. The results of the descriptive findings of the research are presented in [Table 3](#) in three stages of the research in three groups.

Table 3. Mean and standard deviation of depression symptoms by group and time of measurement

Group	Pre-test		Post-test		Follow-up	
	M	SD	M	SD	M	SD
Self-care	49.8	4.05	38.6	3.63	39.5	3.66
Education						
Emotional	48.6	3.35	36.2	4.26	37.0	4.31
Regulation						
Control	50.3	4.32	50.1	4.25	50.4	4.37

The normality of data was evaluated using the Shapiro-Wilk test, and the results demonstrated that the data were normal. The results of multivariate analysis of variance are displayed in [Table 4](#).

Table 4. Results of Multivariate Analysis of Variance (MANOVA) in the studied groups

Variables	Test	Value	F	Df1	Df2	P-value	Eta2
Depression symptoms	Pillai's effect	0.71	34.3	2	27	0.001	0.71
	Wilks Lambda	0.28	34.3	2	27	0.001	0.71
	The Hotelling Effect	2.54	34.3	2	27	0.001	0.71
	Roy's Largest Root	2.54	34.3	2	27	0.001	0.71

As illustrated in [Table 4](#), the Wilks Lambda index is significant at 0.01 (Wilks Lambda= .282; $F=34.3$; $P=0.001$; 0.718) when the effect of pre-tests is controlled. Put differently, it might be argued that at

least one variable significantly differs between the experimental and control groups. Refer to [Table 5](#) in the following step to ascertain which component(s) is the difference:

Table 5. Summary of simple variance analysis of effects in group and out-group

Source of change		SS	Df	MS	F	P-value	Eta
Between Subjects	Group	2092.8	1	2092.8	44.5	0.001	0.61
	Error	1315.6	28	46.9			
Within Subjects	Time	728.8	1.06	685.1	145.3	0.001	0.83
	Time*Group	716.8	1.06	673.8	143.0		
	Error	140.3	29.7	4.71			

The results pinpointed a significant difference between the intervention and control groups in at least two stages of depression. In the following study,

the observed differences in the groups used the Bonferroni post hoc test, the results of which are demonstrated in [Table 6](#).

Table 6. Bonferroni test to compare three groups of depression

Variables	Group		Mean Diff.	P-value
Depression symptoms	Pre-test	Self-Care	Emotion Regulation	1.20
		Self-Care	Control	-0.46
		Emotion Regulation	Control	1.66
	Post-test	Self-Care	Emotion Regulation	2.40
		Self-Care	Control	-11.4
		Emotion Regulation	Control	-13.8
	Follow-up	Self-Care	Emotion Regulation	2.46
		Self-Care	Control	-10.9
		Emotion Regulation	Control	-13.4

According to [Table 5](#), the pre-test results for depression among the three groups in the Bonferroni test indicate no significant difference in any of the variables between the intervention and control

groups in the post-test. The post-test and follow-up research variables exhibit no discernible difference in the efficacy of emotion process regulation training and self-care instruction.

5. Discussion

The current study aimed to compare the effectiveness of self-care education and emotion regulation in depression symptoms among the caregivers of older adults with dementia. The results suggested that self-care training is effective in reducing depression symptoms among these caregivers. This finding is in accordance with the results of the studies by Ivoine et al. (25), Huang et al. (26), Jang et al. (27), Kim et al. (28), Dacherty-Skippen et al. (29), Jiang et al. (30), and Devarajoo et al. (31). In explaining this finding, it can be argued that self-care behaviors include cognition in thoughts and attention to the dimensions above. Just as the guardian should guard individuals' entry and exit, self-care behaviors are also the guardian of the psyche (32).

The effect of self-care on improving health outcomes and reducing burdens has been proven in several studies. The same studies have suggested that simply producing educational content for patients and implementing training courses for them will not lead to self-care (33). Most of these studies have highlighted that patients' self-care function formation and promotion requires systematic educational and supportive interventions to improve their knowledge, skills, and confidence in managing their health problems (34). In addition to academic and supportive interventions, joint targeting of health outcomes, regular monitoring and evaluation of health status, identifying progress and problems, and helping patients address issues are integral parts of this systematic approach (35).

The results evidenced that emotion regulation training is effective in the mitigation of depression in older adults with dementia. This finding is in agreement with the studies performed by Kazemi Rezaei et al. (36) entitled "Effectiveness of Emotion Regulation Training Based on Dialectical Behavior Therapy on Cognitive Emotion Regulation and Quality of Life of Patients," Esmaili Shad et al. (37) entitled "Investigating the Effect of Emotion Regulation Training on Spiritual Intelligence, Health Worry and Psychological Distress in Women with Depression," Borjali et al. (38) entitled "Effectiveness of Training Process Emotion Regulation Strategies on Mental Health," Azimi (2018) "entitled Effectiveness of Training Emotion Process Regulation Strategies on General Health Problems", and Bahadori et al. (39) entitled "Investigating the Effectiveness of Emotion Regulation Skills Training on Emotion Regulation Strategies."

In the present study, it can be stated that emotion through cognition is inseparable from human life and helps people manage or regulate their feelings and emotions when faced with stressful or threatening events, master them, and not drown in emotion.

Cognitive emotion regulation strategies are among the reactions that determine how to accept or cope with stressful situations and adverse events (40). Moreover, it can be argued that executive actions on coherent use of cognitive processes have led older adults to solve problems, plan, act, regulate, and monitor their emotions. Therefore, emotional regulation training has reduced depression in older adults. For Beck, negative beliefs and attitudes about oneself are central to mood changes. On the other hand, changes in different parts of cognitive system function, such as memory, attention, and consciousness, cause mood changes. Therefore, the role of emotion regulation in coping with stressful life events cannot be ignored (41).

In another explanation, it can be stated that emotion regulation helps the ability to understand, modulate, and experience emotions. Moreover, it increases the probability of effective coping with stressful situations through the capacity to tolerate negative emotions and experience more positive emotions (31). Emotional regulation enables the person to use an adaptive and constructive behavioral and psychological style to deal with negative emotions, reducing psychological damage and increasing strength. It can provide a better adaptation to difficulties and strengthen resilience. In general, impaired emotion regulation underlies numerous psychological disorders and traumas (35).

Individuals who are unable to identify and know about emotional issues, perception, processing, and proper management in stressful situations appear in such cases with a state of fragility and weakness and lose their resilience. One of the effects of emotion regulation training is increasing the ability of the person to monitor and manage their emotions. This process can help improve variables, such as depression and resilience, since self-control and self-regulation strengthen these two variables (38). On the other hand, according to the findings of several studies, difficulties in emotion regulation in the form of inability to identify and express emotions are the basis of the pathology of multiple psychological disorders and symptoms, such as anxiety and depression, helplessness, hopelessness, and low life satisfaction, leading to an increase in depression.

Furthermore, emotion regulation training increases the ability to identify, evaluate, and differentiate positive and negative emotions from physical, behavioral, and mental dimensions. This in turn, develops the ability to manage emotions and have greater self-awareness of negative emotions by accepting and moderating them, enhancing the experience of positive emotions (29). Experiencing positive emotions expands people's knowledge and effective behavior; moreover, the presence of pleasant feelings, as well as the benefits of optimal thought and action, can help the individual deal constructively with difficult situations and maintain

resilience and self-efficacy by increasing continuous individual and social efficiency (33).

The results demonstrated no significant difference between the effectiveness of self-care education and emotion process regulation training in reducing depression in older adults with type 2 diabetes. No research has compared the effectiveness of these two treatments in the reduction of depression. Nonetheless, the lack of difference between the two above-mentioned interventions in reducing depression in older people with diabetes can be ascribed to the fact that one of the essential parts of self-care education is understanding the adaptive nature of emotions and increasing emotional awareness (42), which also happens in the process of emotion regulation training. The difference between the effectiveness of the two interventions in reducing depression is justified. It can be concluded that both self-care and emotional regulation skills training can improve the mental health of individuals by informing people about their positive and negative emotions and accepting and coping with them effectively. Both interventions emphasize exercises and skills associated with increasing adaptive strategies and reducing less adaptive ones. Skills learned in both interventions by considering short-term and long-term goals, performing enjoyable activities daily, and exercises to deal with anger, guilt, and fear could empower the intervention group to foster a healthier life, accept life change, and increase the ability to regulate emotion and reduce depression.

This research used a questionnaire for data collection, and the responses were evaluated based on self-reporting. The answers depend on the individual's honesty and self-evaluation since this method has inherent limitations, such as distraction, inaccuracy, error of judgment, and misinterpretation of instructions, which can affect the research results. Due to the experimental nature of the study and the limited sample size for more precise control of disturbing variables, the small sample size is one of the main limitations of this research, which limits the generalization of results to larger groups. Lack of general management of the sample in the interval between pre-test, post-test, and follow-up, as well as possible investigations due to the sensitivity caused in the sample group, will limit and reduce the generalization strength of the test results. Difficulties and limitations in coordination in groups to participate in the intervention were another limitation of this research.

It is suggested that other studies be carried out in this area and in different nursing homes to increase the generalization power of results by providing comparability. Considering that this study was conducted on caregivers of older adults with dementia, it is recommended to assess the effect of these interventions on other groups of patients with

chronic pain and specific diseases, as well as different age groups. It is suggested that the effects of these interventions on genders be investigated in future research. It is recommended that the study be retested on more prominent groups to assess the validity of these therapeutic interventions. It is suggested that in future studies, the effect of more therapeutic methods be compared and the therapeutic effect be assessed in the more extended follow-up period.

Considering the effectiveness of self-care training in the psychological constructs of caregivers of older adults with dementia, it is recommended that health psychologists and clinical psychologists dominant in this treatment be employed for team collaboration to promote health and increase the quality of life among the caregivers of these individuals. The results of this study indicated that recognition of psychological problems of older adults with dementia and their caregivers in particular and all chronic patients in general, as well as improving their quality of life, requires the Ministry of Health to pay serious attention to treatment programs at the level of hospitals.

6. Conclusion

As evidenced by the obtained results, it can be concluded that self-care and emotion regulation training are effective in the mitigation of depression symptoms among caregivers. Both treatments can be employed to reduce psychological problems and depression in patients with dementia.

Acknowledgments

The researchers would like to thank all the teachers and students who participated in the study.

Conflicts of interest

The authors of the article declared no conflict of interest.

References

1. Amani, M., Movadi, M. The Effectiveness of Emotional Regulation Skills Training on Emotional Regulation Strategies and Quality of Life in Family Head Females. *Quarterly Journal of Woman and Society*, 2018; 9(34): 1-18.
2. Azimi M. Effectiveness of Process Emotion Regulation Strategies in Cognitive Emotion Regulation Strategies and General Health Problems among Adolescent Girls with Addicted Parents. *etiadpajohi* 2019; 12 (49) :189-208
3. Baker FA, Lee YE, Sousa TV, Stretton-Smith PA, Tamplin J, Sveinsdottir V, Geretsegger M, Wake JD, Assmus J, Gold C. Clinical effectiveness of music interventions for dementia and depression in elderly care (MIDDEL): Australian cohort of an international pragmatic cluster-randomised controlled trial. *The Lancet Healthy Longevity*. 2022 Mar 1;3(3):e153-65.
4. Basso JC, McHale A, Ende V, Oberlin DJ, Suzuki WA. Brief, daily meditation enhances attention, memory, mood, and emotional regulation in non-experienced meditators. *Behavioural brain*

- research. 2019 Jan 1;356:208-20.
5. Cece V, Guillet-Descas E, Nicaise V, Lienhart N, Martinet G. Longitudinal trajectories of emotions among young athletes involving in intense training centres: Do emotional intelligence and emotional regulation matter?. *Psychology of Sport and Exercise*. 2019 Jul 1;43:128-36.
 6. Charlton RA, McQuaid GA, Wallace GL. Social support and links to quality of life among middle-aged and older autistic adults. *Autism*. 2023 Jan;27(1):92-104.
 7. Chen G, Chen P, Gong J, Jia Y, Zhong S, Chen F, Wang J, Luo Z, Qi Z, Huang L, Wang Y. Shared and specific patterns of dynamic functional connectivity variability of striato-cortical circuitry in unmedicated bipolar and major depressive disorders. *Psychological Medicine*. 2022 Mar;52(4):747-56.
 8. Chen TY, Kao CW, Cheng SM, Liu CY. Factors influencing self-care among patients with primary hypertension: path analysis of mediating roles of self-efficacy and depressive symptoms. *European Journal of Cardiovascular Nursing*. 2023 Jan 13;zvad011.
 9. Lu F, Wong CK, Tse ET, Ng AP, Li L, Lam JS, Bedford L, Fong DY, Ip P, Lam CL. The Impact of a Health Empowerment Program on Self-Care Enablement and Mental Health among Low-Income Families: Evidence from a 5 Year Cohort Study in Hong Kong. *International Journal of Environmental Research and Public Health*. 2023 Mar 15;20(6):5168.
 10. Matcham F, Lightley D, Siddi S, Lamers F, White KM, Annas P, de Girolamo G, Difrancesco S, Haro JM, Horsfall M, Ivan A. Remote Assessment of Disease and Relapse in Major Depressive Disorder (RADAR-MDD): recruitment, retention, and data availability in a longitudinal remote measurement study. *BMC psychiatry*. 2022 Feb 21;22(1):136.
 11. Kim J, You SY. What perception do families have of person-centered care for patients with dementia in nursing homes?. *NPG Neurologie-Psychiatrie-Gériatrie*. 2022 Aug 1;22(130):237-44.
 12. Drigas A, Mitsea E, Skianis C. Subliminal Training Techniques for Cognitive, Emotional and Behavioral Balance. *The Role of Emerging Technologies*. *Technium Soc. Sci. J.*. 2022;33:164.
 13. Esmaeilshad B. The Effectiveness of Self-Care Training on Quality of Life, Self-Care Behaviors and Blood Sugar in Elderly Without Self-Care Behaviors. *Aging Psychology*. 2020; 6(1), 1-11.
 14. Fisher PM, Ozenne B, Ganz M, Frokjaer VG, Dam VN, Penninx BW, Sankar A, Miskowiak K, Jensen PS, Knudsen GM, Jorgensen MB. Emotional faces processing in major depressive disorder and prediction of antidepressant treatment response: A NeuroPharm study. *Journal of Psychopharmacology*. 2022 May;36(5):626-36.
 15. García Márquez MF, Rivera Reyes MF, Parrado Corredor F. Neurological foundations of mindfulness and its influence with the loneliness feeling in elderly. 2022;3(2):11-23.
 16. Gehlawat M, Thumati G, Gundala S. Role of diabetes self-management education in improving self-care behavior among adult type 2 diabetes: A systematic review and meta-analysis. *MRIMS Journal of Health Sciences*. 2023 Jan 1;11(1):9-16.
 17. Gross JJ. Emotion regulation: Current status and future prospects. *Psychological inquiry*. 2015 Jan 2;26(1):1-26.
 18. Hazzan AA, Dauenhauer J, Follansbee P, Hazzan JO, Allen K, Omobepade I. Family caregiver quality of life and the care provided to older people living with dementia: Qualitative analyses of caregiver interviews. *BMC geriatrics*. 2022 Dec;22(1):1-1.
 19. Hermanns N, Ehrmann D, Shapira A, Kulzer B, Schmitt A, Laffel L. Coordination of glucose monitoring, self-care behaviour and mental health: achieving precision monitoring in diabetes. *Diabetologia*. 2022 Nov;65(11):1883-94.
 20. Isik E, Fredland NM. Orem's self-care deficit nursing theory to improve children's self-care: An integrative review. *The Journal of School Nursing*. 2023 Feb;39(1):6-17.
 21. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical psychology review*. 1988 Jan 1;8(1):77-100.
 22. Borjali M, Naserinia S. The Effectiveness of Emotion Regulation Strategies Training on Mental Health, Self-compassion and Craving in The Addicts. *Counseling Culture and Psychotherapy*. 2019; 10(40), 133-154.
 23. Khosravi Iarjani M, Bahjati F, Choobforoush Zade A. The Effectiveness of The Intervention Based on Informational-Motivational and Behavioral Skills (IMB)Self-Care Model on Quality of Life in Students with Diabetes. *Journal of Research in Psychological Health*. 2019; 13 (2):45-63
 24. Jung SE, Kim S, Bishop A, Hermann J. Poor nutritional status among low-income older adults: examining the interconnection between self-care capacity, food insecurity, and depression. *Journal of the Academy of Nutrition and Dietetics*. 2019 Oct 1;119(10):1687-94.
 25. Iovino P, Nolan A, De Maria M, Ausili D, Matarese M, Vellone E, Riegel B. The influence of social support on self-care is mediated by self-efficacy and depression in chronic illness: key findings from the 'SODALITY'observational study. *Aging & Mental Health*. 2023 Apr 3;27(4):820-8.
 26. Huang Z, Liu T, Chair SY. Effectiveness of nurse-led self-care interventions on self-care behaviors, self-efficacy, depression and illness perceptions in people with heart failure: a systematic review and meta-analysis. *International Journal of Nursing Studies*. 2022 Aug 1;132:104255.
 27. Jang I. The effects of emotional regulation between clinical practice stress and nursing professionalism in nursing students. *Journal of the Korean Data and Information Science Society*. 2016;27(3):749-61.
 28. Kim B, Kim J. Influence of uncertainty, depression, and social support on self-care compliance in hemodialysis patients. *Therapeutics and Clinical Risk Management*. 2019 Oct 22:1243-51.
 29. Docherty-Skippen SM, Hansen A, Engel J. Teaching and assessment strategies for nursing self-care competencies in Ontario's nursing education programs. *Nurse Education in Practice*. 2019 Mar 1;36:108-13.
 30. Jiang Y, Shorey S, Seah B, Chan WX, San Tam WW, Wang W. The effectiveness of psychological interventions on self-care, psychological and health outcomes in patients with chronic heart failure—A systematic review and meta-analysis. *International Journal of Nursing Studies*. 2018 Feb 1;78:16-25.
 31. Devarajooch C, Chinna K. Depression, distress and self-efficacy: The impact on diabetes self-care practices. *PloS one*. 2017 Mar 31;12(3):e0175096.
 32. Lewis S, Willis K, Bismark M, Smallwood N. A time for self-care? Frontline health workers' strategies for managing mental health during the COVID-19 pandemic. *SSM-Mental health*. 2022 Dec 1;2:100053.
 33. Miller ST, Akohoue SA, Murry VM, Tabatabai M, Wilus D, Foxx A. SISTER (Sisters inspiring sisters to engage in relevant diabetes self-care) diabetes study: Protocol for diabetes medical nutrition therapy randomized clinical trial among African American women. *Contemporary Clinical Trials*. 2023 Feb 1;125:107052.
 34. Pallavicini F, Ferrari A, Mantovani F. Video games for well-being: A systematic review on the application of computer games for cognitive and emotional training in the adult population. *Frontiers in psychology*. 2018 Nov 7;9:2127.
 35. Puig Llobet M, Sánchez Ortega M, Lluch-Canut M, Moreno-Arroyo M, Hidalgo Blanco MA, Roldán-Merino J. Positive mental health and self-care in patients with chronic physical health problems: Implications for evidence-based practice. *Worldviews on Evidence-Based Nursing*. 2020 Aug;17(4):293-300.
 36. Qin K, Lei D, Pinaya WH, Pan N, Li W, Zhu Z, Sweeney JA, Mechelli A, Gong Q. Using graph convolutional network to characterize individuals with major depressive disorder across multiple imaging sites. *EBioMedicine*. 2022 Apr 1;78.
 37. Vigo D, Haro JM, Hwang I, Aguilar-Gaxiola S, Alonso G, Bruffaerts R, Caldas-de-Almeida JM, de Girolamo G, Florescu S, Gureje O. Toward measuring effective treatment coverage: critical bottlenecks in quality-and user-adjusted coverage for major depressive disorder. *Psychological medicine*. 2022 Jul;52(10):1948-58.
 38. Waldron DA, Coyle C, Kramer J. Aging on the autism spectrum: Self-care practices and reported impact on well-being. *Journal*

- of Autism and Developmental Disorders. 2022 Aug;52(8):3512-22.
39. Weiss A, Beloosesky Y, Gingold-Belfer R, Leibovici-Weissman Y, Levy Y, Mulla F, Issa N, Boltin D, Koren-Morag N, Meyerovitch J, Sharon E. Association of anemia with dementia and cognitive decline among community-dwelling elderly. *Gerontology*. 2022 Dec 1;68(12):1375-83.
40. Wyatt JP, Ampadu GG. Reclaiming self-care: self-care as a social justice tool for Black wellness. *Community mental health journal*. 2022 Feb 1:1-9.
41. Zhang F, Rao S, Cao H, Zhang X, Wang Q, Xu Y, Sun J, Wang C, Chen J, Xu X, Zhang N. Genetic evidence suggests posttraumatic stress disorder as a subtype of major depressive disorder. *The Journal of clinical investigation*. 2022 Feb 8;132(3).
42. Kazemi Rezaei SV, Kakabraee K, Hosseini SS. The effectiveness of emotion regulation skill training based on dialectical behavioral therapy on cognitive emotion regulation and quality of life of patients with Cardiovascular Diseases. *Journal of Arak University of Medical Sciences*. 2019 Sep 10;22(4):98-111.