

## ⇒ Research Article



# The Effectiveness of Lazarus Multimodal Approach on Psychological Distress, Working Memory, and Anxiety in Patients With Multiple Sclerosis

Soha Shahlapour<sup>1</sup> , Mastooreh Sedaghat<sup>2\*</sup> , Sara Pashang<sup>3</sup> <sup>1</sup>Department of Health Psychology, Kish International Branch, Islamic Azad University, Kish Island, Iran<sup>2</sup>Department of Psychology, Semnan Branch, Islamic Azad University, Semnan, Iran<sup>3</sup>Assistant Professor, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran**Abstract**

**Background:** Multiple sclerosis (MS) is considered a chronic disease in which physical and mental disorders are common among these patients. This study aimed to evaluate the effectiveness of the Lazarus multimodal approach intervention on psychological distress, working memory, and anxiety in patients with MS.

**Methods:** A quasi-experimental research method with pre-test, post-test, and follow-up and a control group was used in this study. The statistical population of the study included the patients who were members of the "MS Patient Support Society" in Tehran who had been referred to this center during January and March 2017. The sample consisted of 32 people selected by the convenience sampling method from the members of the MS community. The data were obtained through the Kessler psychological distress scale (K10), the Wechsler's Working Memory Index, and the Beck Anxiety Inventory. The experimental group underwent the Lazarus multimodal approach in ten 90-minute sessions of two sessions per week for one and a half months. The control group received no intervention. The follow-up was performed three months after the post-test. The repeated measurement method and SPSS 22 were used to analyze the data.

**Results:** The findings showed that the Lazarus multimodal approach had a significant effect on decreasing anxiety ( $P < 0.001$ ), psychological distress ( $P < 0.001$ ), and increasing working memory ( $P < 0.001$ ).

**Conclusion:** It can be concluded that Lazarus' multimodal approach was effective on anxiety, psychological distress, and working memory and can be employed to reduce psychological problems in patients with MS.

**Keywords:** Memory, Multiple sclerosis, Anxiety disorders, Psychological distress

**\*Correspondence to**Mastooreh Sedaghat,  
Email: Sedaghat.m@  
semnaniau.ac.ir

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**Background**

Multiple sclerosis (MS) is regarded as a chronic disease in which physical and mental disorders are common among these patients. MS is a disease of the central nervous system and one of the most prevalent neurological diseases in humans and the most common disease leading to disability (1). The cause of the disease is not yet known, but it appears to be linked to autoimmune responses. A virus may stimulate the immune system and cause the body to produce antibodies that force the body to produce antibodies that mistakenly attack its elements (2). This disease is generally accompanied by personality and cognitive changes and psychology. In addition, psychological distress is a stimulus for the exacerbation and recurrence of the disease (3). Further, the psychological distress among these people is associated with biological changes (4). Additionally, psychological distress in these individuals is associated with poor problem-solving and dysfunctional coping, which can subsequently affect their physical condition of these individuals. For example, according to statistics, psychological distress has a prevalence of 50% in such people (5).

Psychological distress is considered an important determinant of the psychological and physical reactions to MS. It is the unpleasant mental states of depression, anxiety, and stress, which all have emotional and physiological symptoms. According to recent research, people with high psychological distress complain more about the disease's symptoms (5). Among the clinical symptoms affecting patients with MS, cognitive impairment is the most common symptom. Research has shown that 30-50% of patients with MS have mild cognitive impairments, and 20-30% of them have severe cognitive impairments. Memory, attention, processing speed, and executive function are often impaired by cognitive capacity, although other cognitive components such as selective attention, short-term memory, and implicit memory may be impaired as well (6).

Working memory is a concept that highly relies on environmental factors and a person's level of anxiety and is highly prone to damage. Therefore, this type of memory is sensitive in people with MS and can reduce performance (individual and social) in daily life and thus their quality of life (7), leading to their ability to work, drive, commit

to treatment, or maintain social connections. The most common cognitive complaint among patients with MS is memory impairment, which occurs in 40%-60% of cases. In such patients, the memory of a wide range of numbers is normal, but immediate recall with delayed information is impaired; memory impairment can affect both verbal and non-verbal information. Impaired working memory is considered one of the types of memory that occurs in people with MS (8). Working memory is a mental system that is tasked with temporarily storing and processing information to perform a range of complex cognitive tasks such as understanding, thinking, calculating, reasoning, and learning (9).

In our routine activities, we are constantly confronted with desires and goals affected by limited working memory capacity. Working memory is essential for acquiring automated skills that require mastery and processing information, new issues, or situations. Further, working memory is needed to retain irrelevant information, store new information, and recover information from long-term memory. Cognitive impairment in adults with MS is well established and directly affects the daily life activities and overall quality of life of the patient (9).

However, anxiety is considered the most common psychological disorder in patients with MS. It manifests itself in four different forms, including situational anxiety related to the frightening aspect of illness or treatment, illness-related anxiety, treatment-related anxiety, and exacerbation of pre-existing anxiety disorders such as phobias, panic attacks, generalized anxiety disorder, or obsessive-compulsive disorders. Likewise, anxiety is considered one of the most common causes of late-stage psychiatric counseling, which is associated with poor quality of life, increases insomnia, and decreases trust in physicians, leading to poor therapeutic unity (10). In various studies related to physical and psychological problem therapy in patients with MS, several interventions were suggested, including cognitive-behavioral therapy, stress management program, relaxation training, stress relief, insight supportive speech therapy, massage therapy, and symptomatic therapy and neurorehabilitation (11). However, considering the salient concept of the definition of the World Health Organization of health, the acceptance of the biopsychosocial concept of health and disease has created a fundamental assumption of composite health (12). Accordingly, the individual should be examined from all aspects and dimensions of the concept of health. Considering the problems that such patients have in various dimensions and the interaction between the symptoms of neuropsychological disorders in these patients, it is necessary to pay attention to these patients with a multimodal approach (13).

The Lazarus multimodal approach is considered one of the methods of psychotherapy that considers the dimensions of the definition of health. It has been successfully used in a wide range of disorders and

problems. Lazarus believes that human personality can be fully described by seven dimensions (behavior, emotion, sensory perception, imagery, cognition, interpersonal relationships, and cognitive pharmacology). Although these dimensions are separately described, they interact with each other, and each experience can be explained according to one dimension, which is related to other dimensions. If a change occurs in one dimension, it can affect other dimensions as well (14).

In a study on the effectiveness of the Lazarus multimodal approach on the status of widespread disability in patients with MS, Bahramkhani (15) found that this Approach affects the status of widespread disability in patients with MS. Additionally, in another study evaluating the use of the multimodal approach on anxiety and type of performance appraisal, Sotardi et al (16) concluded that this approach has a significant effect on anxiety and performance appraisal. Therefore, this study aimed to evaluate the effectiveness of the Lazarus multimodal approach on psychological distress, working memory, and anxiety in patients with MS.

## Methods

In this study, a quasi-experimental research method was used, along with pre-test, post-test, and follow-up and a control group. The statistical population was the patients who were members of the "MS Patient Support Society" in Tehran referred to this center during January and March 2018. The sample consisted of 32 members of the MS community who were selected using the convenience sampling method. Among the members of the community supporting MS patients whose names were selected from the statistics office of the society and screening among those wishing to participate in the project, the applicants filled out the beck anxiety questionnaire and if at least, had mild anxiety, were eligible to participate in the project and were enrolled in the sample group. Other criteria for entering the project were the age range of 20-50 years and the level of education above the diploma. On the other hand, the exclusion criteria included incomplete information and absence in more than two sessions. The ethical considerations were as follows:

All people received written research-related information and participated in the study based on their tendency. Individuals were assured that all information is confidential and used for research purposes. Moreover, the names and surnames of the participants were not registered to protect their privacy.

## *Kessler Psychological Distress Scale (K-10)*

This scale was developed by Kessler et al in the form of 10 questions (k-10), and six questions (k-6), in which the maximum score in k-10 and k-6 is equal to 40 and 24, respectively (17). Kessler et al found that this test's sensitivity is appropriate for most disorders compared to a comprehensive international diagnostic interview

for high-grade disorders and its sensitivity to individuals suffering from a disorder. The Cronbach's alpha validity coefficient for the overall score of this questionnaire was 0.71 (17). In the study conducted by Dadfar et al, the Cronbach's alpha coefficient was used to evaluate the general questionnaire's reliability, and the total Cronbach's reliability of the questionnaire was calculated as 0.85 (18).

### **Wechsler's Working Memory Index**

It is considered as one of the most common methods of assessing working memory and measures the memory width of figures and space. The digit span subscale consists of the forward and inverse digit spans. Each subscale has eight items, each of which includes two attempts. The subject gets a score of 1 or 0 for each correct and incorrect attempt, respectively. Therefore, the subject score in each subscale is between 0 and 14 and generally between 0 and 28. The spatial spacing subscale has straight (forward) and inverse spatial spacing. Each of these subscales consists of eight items, each of which has two attempts. To execute this subscale, a page is used on which ten cubes are installed. Numbers 1 to 10 are engraved on the next of the cubes facing the examiner (the subject does not see the numbers). The method of working in direct spatial spacing is that first, the examiner touches the cubes, and the subject should repeat the same action, namely, touch the cubes in the same order as the examiner touched; however, the subject should do the opposite of the examiner's action in the inverse spatial space, indicating that he touches the cubes from the end to the beginning. The subject gets a score of 1 for each correct attempt and a zero score for each incorrect attempt. Thus, the subject's score in each subscale is between 0 and 16 and in total, between 0 and 32. The internal reliability coefficient of Wechsler's working memory is extremely high and has a validity coefficient higher than 90 (19). In a study conducted by Nikravesh et al, Cronbach's alpha was 0.74 (20).

### **Beck's Anxiety Questionnaire**

It is a self-report questionnaire designed to measure the severity of anxiety in adolescents and adults. This questionnaire is a 21-item scale in which the subject chooses one of the four options that represent anxiety in each item (21). The results of the test indicated the validity of 0.072, reliability of 0.83, and internal stability with Cronbach's alpha of 0.92. In a one-week retest, Toosi et al estimated the reliability of Beck's Anxiety Inventory as 0.75. The content validity simultaneously examined the diagnostic and factor structure for this questionnaire and confirmed the high efficiency of this tool in measuring the severity of anxiety (22). In the study conducted by Ghasemian et al, Cronbach's alpha coefficient was used to evaluate the general questionnaire's reliability. The total reliability of the Cronbach questionnaire was calculated to be 0.85. The validity and reliability of the questionnaire

were examined in this study. In concurrent validity, the correlation coefficient between the mean of the first 20 questions and question 21 was 0.79. In investigating the content validity, the validity coefficient of all Beck Anxiety Questionnaire questions was calculated to be 0.88 (23).

The Lazarus multimodal approach was performed in ten 90-minute sessions of two sessions per week for one and a half months as a group under the Lazarus multimodal approach (24).

In this study, mean and standard deviation (SD) were used for descriptive statistics, and repeated measures analysis of variance (ANOVA) was also applied for the inferential analysis of the results. The above analyzes were performed by SPSS.22 software.

### **Results**

The participants in this research were in the age range of 29-54 years, and 43.56% and 56.44% of them were men and women, respectively. The mean ( $\pm$ SD) age of the experimental and control groups was 42.43 ( $\pm$ 8.02) and 40.86 ( $\pm$ 8.71), respectively ( $P>0.05$ ). Table 1 presents the mean and SD of demographic variables in the experimental and control groups.

Table 2 provides the mean and SD of psychological distress, working memory, and anxiety in the experimental and control groups. The condition of the homogeneity of variance-covariance matrices was correctly observed considering that the Box's M test was not significant for any of the research variables. The condition of the equality of intergroup variances was observed given the non-significance of any of Levene's test variables. The amount of the variance of the dependent variable was equal in all groups. Finally, examining the results of Mauchly's sphericity test showed that this test was significant for all variables; therefore, the assumption of the equality of variances within the subjects (sphericity assumption) was not observed (Mauchly's  $W=0.45$ ,  $P<0.001$ ). Hence, the Greenhouse-Geisser test was used to evaluate the univariate test results for intragroup effects and interactions.

The results of Table 3 indicate that the ANOVA is significant for the within-subject (time) and between-subject (group) factors for psychological distress, working memory, and anxiety. The findings revealed that the Lazarus multimodal approach had a significant effect on decreasing anxiety ( $P<0.001$ ), psychological distress ( $P<0.001$ ), and increasing working memory ( $P<0.001$ ).

### **Discussion**

This study sought to evaluate the effectiveness of the Lazarus multimodal approach on psychological distress, working memory, and anxiety in patients with MS. Based on the results, this approach had a significant influence on the above-mentioned parameters. The results of the present study are consistent with those of Bahramkhani (15), confirming the effectiveness of the

**Table 1.** Frequency Distribution and Comparison of the Demographic Characteristics of Research Units

Demographic Variables		Experimental	Control	P Value
Gender	Female	10 (62.5)	9 (56.2)	0.49
	Male	6 (37.5)	7 (43.8)	
Marital status	Single	2 (12.5)	3 (18.7)	0.82
	Married	14 (87.5)	13 (81.3)	
Age	20-30	5 (31.3)	7 (43.7)	0.27
	31-40	4 (25)	6 (37.5)	
	41-50	7 (43.7)	3 (18.8)	
Educational level	Under diploma	8 (50)	9 (56.2)	0.58
	Upper diploma	7 (43.7)	5 (31.3)	
	Undergraduate	1 (6.3)	2 (12.5)	

**Table 2.** Mean (SD) of Research Variables in Experimental and Control Groups

Variable	Group	Pre-test	Post-test	Follow-up
		Mean (SD)		
Psychological distress	Experimental	23.31 (1.19)	19.00 (1.46)	18.75 (1.48)
	Control	22.75 (1.23)	22.56 (1.09)	22.37 (1.31)
Working memory	Experimental	14.87 (2.68)	18.62 (2.57)	19.12 (2.75)
	Control	14.87 (3.11)	15.25 (2.86)	15.56 (2.82)
Anxiety	Experimental	33.31 (1.19)	28.68 (0.94)	28.31 (1.01)
	Control	32.75 (1.23)	32.62 (1.25)	32.31 (1.30)

Note. SD: Standard deviation.

**Table 3.** Analysis of Variance With Repeated Measures to Compare Variables in Experimental and Control Groups

Variables	Source of Effect	SS	df	MS	F	P Value	Eta Square
Psychological distress	Time	119.52	1.29	92.11	250.16	0.0001	0.89
	Time*group	92.14	1.29	71.01	192.86	0.0001	0.86
	Group	117.04	1	117.04	25.29	0.0001	0.45
Working memory	Time	112.14	2	56.07	379.08	0.0001	0.92
	Time*group	64.31	2	32.15	217.39	0.0001	0.87
	Group	128.34	1	128.34	5.49	0.026	0.15
Anxiety	Time	140.27	1.41	99.08	344.69	0.0001	0.92
	Time*group	109.52	1.41	77.36	269.13	0.0001	0.90
	Group	145.04	1	145.04	39.46	0.0001	0.56

Note. SS: Sums of squares; DF: degrees of freedom; MS: Mean squares; F: F-value.

Lazarus multimodal approach on the status of widespread disability in patients with MS.

Psychologists have developed methods for coping with anxiety by focusing on the individual's behavior and thought process. Those who use such methods have generally found them useful (25). Today, multimodal (integrated) therapies that combine different types of therapies, from stress relief to cognitive-behavioral techniques, have their effectiveness in reducing psychological distress. They have also proven to increase coping techniques and skills. This research finding represents that patients have been able to cope with psychological distress during the treatment period and have a more positive assessment and perception of the distress they experience in life (most importantly, MS). In other words, people under therapy

no longer underestimate their ability to cope with distress or underestimate it in dealing with a distressing event, or they do not overestimate the requirements of that event in coping with a distressing event (26).

Further, in explaining that the Lazarus multimodal approach affects the working memory of patients with MS, it is a comprehensive and holistic approach that is considered in the treatment process of all aspects of human personality. Therefore, in the treatment of patients with MS, it is illogical to simply consider the physiological aspect of the disease and use pure drug therapy. Thus, these patients' treatment should be considered, which was offered in the form of an eclectic treatment. As mentioned earlier, various symptoms are created in patients with MS due to the degeneration of the central nervous system,



depending on the injury's location. The MS-associated symptoms are divided into eight general areas according to the systems of action (i.e., pyramidal, cerebellar, brainstem, sensory, autonomic, visual, psychological, and miscellaneous). In each system, the degree of disability of the system is determined based on clinical evaluation, one of which is damaging the working memory (27). The disease symptoms occur due to the destruction of the nervous system's structure, thus it cannot be expected that psychological interventions cure or reduce such symptoms. However, it was found that psychological interventions effectively reduce minimal coping with the physical problems of physically ill patients (28).

Finally, the damaging cycle of anxiety and stress can be used to explain the Lazarus multimodal approach to the anxiety of patients with MS. According to this cycle, anxiety and distress, similar to other emotions, can have neuro-glandular, motor-muscular-visceral, and cognitive-cognitive levels. Anxiety, first, affects the glands and nerves when it is aroused in humans. Nerve and glandular arousal cause the involvement of the motor-musculoskeletal system, and if anxiety and distress continue, they affect the cognitive-consciousness level of the person (29). Assessing anxiety at such three levels is well possible. The movement of muscles in these three levels has a post-feedback state; in other words, when the neuro-glandular surface is stimulated, the level of neuro-glandular arousal increases due to the integrated action of the sympathetic nervous system, and it also evokes the second level in a circular motion. Accordingly, the third level is also stimulated, and, according to Jacobson, it takes on a spiral motion. Therefore, the level of anxiety and arousal causes arousal of the mentioned level, leading to more anxiety. In the treatment of anxiety, first, they enter with chemical and pharmaceutical interventions (endocrinology). They control anxiety with physical-behavioral interventions, and finally, change the movement of such a cycle with cognitive interventions (30).

Regarding research limitations, the results were restricted to patients with MS, and the controlled and experimental literature review related to the multimodal approach was limited. This study was performed only on the population of patients with MS in Tehran, and caution should be exercised in generalizing the results to other regions and cities. It is suggested that this research be performed on another sample group, and its results be evaluated and compared with those of this research. Furthermore, the therapies introduced in the present study should be compared with other psychological interventions. Finally, researchers in future research should consider the present study results as new research hypotheses. If this research is conducted in other cities, and the results are evaluated, it is suggested that this research be followed up after group training in the form of individual counseling.

## Conclusion

It can be concluded that the Lazarus' multimodal approach was effective on anxiety, psychological distress, and working memory and can be used to reduce psychological problems in patients with MS.

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## Authors' Contribution

Conceptualization: SS; Methodology: MS; Investigation: SP; Writing – Original Draft: SS; Writing – Review and Editing: All author; Funding Acquisition: All author; Resources: All author; Supervision: MS.

## Conflict of Interests

The authors declare that they have no conflict of interests.

## Ethical Approval

All ethical principles were considered in this research. The participants were informed about the purpose of the research and its stages. Informed consent was obtained from the subjects. They were also assured of the confidentiality of their information. Moreover, the subjects were free to withdraw from the study if desired. They were also informed that they would be provided with the results of the research.

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