Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972

JFH

Original research

Comparing the Effectiveness of Treatment based on Acceptance and Commitment and Reality Therapy on Adherence to Treatment in Women with Multiple sclerosis

Maryam Bagheri,[1] Farah Lotfi Kashani[*],[2] Mohammad Ismail Ebrahimi[3]

Abstract

Introduction: Education in the field of disease in people with chronic disease is a fundamental and important issue in achieving empowerment and optimal compliance of the patient, so this research aims to compare the effectiveness of treatment based on acceptance and commitment and reality therapy on compliance with treatment in women. He was diagnosed with multiple sclerosis.

Research Methods: This research was semi-experimental with a pre-test-post-test design and a 2-month follow-up with a control group. The research population consisted of all married women with multiple sclerosis in Hamadan city in 2023. From this number, 3 groups of 15 people were selected using available sampling method and were randomly divided into test groups and control groups, and were administered the Madanlo Chronic Disease Treatment Compliance Questionnaire in three pre-test-post-test sessions and followed up on the answers. they gave the subjects of the experimental group were treated with the approach of treatment based on acceptance and commitment and reality therapy, during 8 sessions, 1 session of 60 minutes per week, but no training was given to the control group. The data were statistically analyzed with SPSS software and using t-test of mixed analysis of variance and significant level of $p < 0.05$.

Results: The results showed that there is a significant difference between the average scores of the pre-test, post-test and follow-up treatment compliance in the three groups; And for the between-group factor, the F value calculated at a level smaller than 0.05 is not significant (Eta = 0.125, $P < 0.05$, $F = 2.990$) as a result, between the overall average of treatment adherence in the three experimental groups and There is no evidence of a significant difference.

Conclusion: According to the results of this research, it can be said that treatment based on acceptance and commitment and treatment based on reality therapy led to adherence to treatment in women.

Keywords: Acceptance and Commitment, Compliance with Treatment, Multiple Sclerosis, Reality Therapy

Citation: Bagheri M, Lotfi Kashani F, Ebrahimi ME. Comparing the Effectiveness of Treatment based on Acceptance and Commitment and Reality Therapy on Adherence to Treatment in Women with Multiple Sclerosis, Family and health, 2025; 14(4): 61-79

١- PhD student, Department of Health Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran. Email: drmaryambagheri1362@gmail.com

٢ - (**Corresponding author**): Associate Professor, Department of Psychology, Medical Branch, Islamic Azad University, Tehran, Iran, Email: lotfikasani@riau.ac.ir; phone number: 02122006660

٣ - Assistant Professor, Department of Psychology, Hamedan Branch, Islamic Azad University, Hamedan, Iran. Email: mse58_2007@yahoo.com

Received: 2024/10/3 **Accepted: 2024/11/21**

Introduction:

Multiple sclerosis is an autoimmune disease that affects the central nervous system and causes nerve damage, inflammation, and demyelination [1]. Worldwide, women are more affected than men, and in some regions, the number of multiple sclerosis cases in women is four times that of men [2]. The prevalence of multiple sclerosis usually occurs between the ages of 20 and 50 years, and the average age of diagnosis is about 32 years [3]. In Iran, according to studies, the prevalence of multiple sclerosis is increasing, and the disease rate in women is higher than in men [4]. The ratio of women to men with multiple sclerosis in Iran is about 3 to 1 [5]. This increase in prevalence may be due to various reasons including environmental, genetic and lifestyle changes [6]. Global information shows that the number of people with multiple sclerosis worldwide has increased from 2.3 million people in 2013 to 2.7 million people in 2020 and 2.9 million people in 2023 [7]. This increase may reflect improvements in diagnosis and access to health care, but it could also reflect a true increase in disease prevalence [8]. Overall, multiple sclerosis is a complex disease with multiple risk factors that affects women more and requires special attention in research, diagnosis and treatment [9].

This chronic neurological disease affects adults aged 20 to 50 years, and the average age of onset is the early fourth decade of life [10]. In this disease, the immune system of the affected person shows an inflammatory reaction against the nervous tissue and causes tissue demyelination. [11]. This disease can lead to various disorders such as depression and marital conflicts [12]. One of the missions of psychologists can be to help improve the quality of life and life satisfaction of these people through the reconstruction and improvement of variables related to mental and physical health of these people. Researches have shown the relationship between mental health and chronic and incurable diseases such as M. S is significant and the way of expressing emotions of people suffering from this disease is disturbed and has significant changes compared to the past [13]. They suffer from depression [14] and anxiety [15], which causes them to lose hope and optimism [16], reduces the resilience of these people [17] and their self-efficacy also suffers a significant drop [18]. Also, research indicates that psychological problems in people with multiple sclerosis are the main cause of disabilities, social harms and lowering the quality of life of these people [19]. In fact, the type of reaction of people to life events depends on the social, cultural, psychological and personality factors of people [20].

The quality of life related to health represents a kind of mental perception of the disease or its treatment. For this reason, patients with similar health status may not have the same quality of life due to individual differences related to expectations and coping strategies [21]. The components of multiple sclerosis, such as neurological disability, severity of complications, recovery status and duration of the disease can affect the levels of psychological adaptation and resilience of people with multiple sclerosis. Research has shown that psychological factors are often better predictors of individual differences in adjustment than disease factors. Unlike disease factors, psychological factors can be modified through psychological interventions [22]. Research shows a lot of mental suffering related to multiple sclerosis. Affected people need adaptation and coordination with the challenges of chronic disease, which is not an easy task and requires training [23].

Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972
JFH

It is obvious that adherence to treatment, which consists of any commitment to the implementation of medication orders, the implementation of expected health and lifestyle behaviors [24] can play a significant role in the treatment process of patients with multiple sclerosis. Banihashmi, Hatami, Hosni, Sahibi's research [25] shows that non-compliance with treatment can cause irreparable damage to many patients, especially patients with chronic disorders. Failure to comply with treatment can seriously harm the general health of people with chronic disorders. General health is the absence of physical symptoms, anxiety, and depression, as well as having an adequate level of social functions, which both acceptance and commitment therapy and reality therapy can increase by changing patients' behaviors [26].

Also, research shows that multiple sclerosis can disrupt the communication of affected people with others. For example, Saadat, Kalantari, Kajbaf and Hosseini-nejad [27] in their research titled Comparative study of psychological symptoms in multiple sclerosis patients and normal people showed that people with multiple sclerosis have higher scores in interpersonal sensitivity, hostility and more paranoia, all of which It can severely disrupt their relationships with their spouses and naturally it can lead to emotional divorce.

One of the treatments that can help improve these health-related variables is the treatment based on acceptance and commitment [28]. This therapy, which was founded by Steven Hayes and his colleagues, and by teaching mindfulness, accepting unchangeable things, clarifying values, and teaching intelligent planning to achieve desirable changes, tries to increase a person's ability and bring a rich, comprehensive and value-oriented life to people [29].

Acceptance and Commitment Therapy is the only psychological and experimental intervention in which acceptance and mindfulness strategies are used along with commitment and behavior change strategies to increase psychological flexibility [30]. Research shows that treatment based on acceptance and commitment by increasing psychological flexibility leads to better management of the person in dealing with chronic diseases [31] and can reduce stress in these patients [32] and is effective in improving the problems of patients with multiple sclerosis. [33]. This approach can also be effective in improving psychological adaptation in people with multiple sclerosis [34]. Finally, this treatment can improve psychological adjustment in people with multiple sclerosis [35] and increase self-efficacy and hope in these patient [36].

Among the treatments that are widely used today to reduce marital conflicts, there are third wave behavioral treatments, one of which is reality therapy. The reality therapy approach is one of the psychological treatments that emphasizes treatment through education. Choice theory was presented by Glaser in 1994 as a supplement to reality therapy theory. Glaser states that for scientific reasons, we choose all the behaviors we do, including the feeling of misery and misery. He believes that others cannot make us miserable or happy. All we receive from others is information. The information entered into our brain is processed there and then we decide what to do [37]. According to the choice theory, all the behavior that a person does are choices to satisfy their inner needs [love and belongingness, freedom, fun, power, survival] [38] This theory is against the psychology of external control, which believes that It creates that others can force us to behave and feel in a certain way. External control robs us of the freedom and personal agency we need. Believing in external control

and applying it harms all people, both the controller and the controlled [39]. This view teaches us that we have more self-control over our lives than we think, and often we unfortunately spend a lot of our energy trying to control others [40].

From Glaser's point of view, perhaps many chronic diseases are a kind of physiological creativity. According to him, any chronic patient who does not have a specific physical cause and medical treatment, his illness can be a creative but unintentional intervention of the body, in the trap of trying to satisfy his needs. Glaser believes that the common methods of treatment not only do not help the patient to regain control of his life, but also make his condition more difficult. During illness, by learning how to gain effective control over life through choice theory, the brain invents new reorganized behaviors that will dramatically change the illness process [41]. Researches have shown that this method, in addition to the effectiveness of changing behavior on the course of the disease, can affect the stress, anxiety and depression of people with multiple sclerosis [42]. According to the stated contents, the current research seeks to answer this question whether there is a difference between the effectiveness of treatment based on acceptance and commitment and reality therapy in a group manner on the compliance of women with multiple sclerosis.

This research aims to compare the effectiveness of treatment based on acceptance and commitment and reality therapy on compliance with treatment in women. He was diagnosed with multiple sclerosis.

Research Methods:

The research method was semi-experimental with a pre-test-post-test design and follow-up with a control group. The research population included all married women with multiple sclerosis in Hamadan city in 2023. Sample selection using available sampling and the number of samples based on similar studies, such as the research of Linehan and Dimf et al. [43], taking into account the effect size of 0.40, the confidence level of 0.95, the power of the test 0.80 and the dropout rate of 10 The percentage was calculated for each group of 15 people, which were randomly assigned to 15 people in the first experimental group [therapy based on acceptance and commitment], 15 people in the second experimental group [reality therapy] and 15 people in the control group and were divided into questionnaires.

They responded to the Medanlo treatment compliance questionnaire (2013) in 3 stages. Entry criteria include: 1. no bereavement in the last three months, 2. no mental disorders based on clinical interview and SCL90 questionnaire, and 3. the ability to do personal work and no involvement in vital organs that leads to organ failure, and the exclusion criteria from the study include Having more than two sessions of absenteeism, non-cooperation and not doing the specified assignments in the class, and unwillingness to continue participating in the research process.

The treatment group based on acceptance and commitment during 8 sessions 1 (session of 60 minutes per week) as a group based on the therapy protocol according to the method of Hayes et al. [44] and the experimental group of reality therapy based on the protocol of Glaser et al. [45] 8 sessions of 60 minutes were scheduled and the control group did not receive training.

Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972
JFH

The research tool was the chronic disease treatment compliance questionnaire: this questionnaire was designed and psychoanalyzed by Madanlo in 2012 for patients with chronic diseases [46] and has 40 items in the form of 7 subscales of diligence in treatment (9 items For example, I am responsible for my own health as much as the treatment team), willingness to participate in treatment (7 items, for example, when the symptoms of the disease become severe, I seek treatment) ability to adapt (7 items, for example, before doing anything, to I think about its effect on my disease) Integration of treatment with life (5 items, for example, if family participates in managing life affairs, I will not neglect my treatment], adherence to treatment) 4 items, for example, without control and supervision of the treatment team, treatment recommendations commitment to treatment (5 items, for example, during the recovery period or when the symptoms of the disease decrease, I will stop my treatment), hesitation in implementing the treatment (3 items, for example, by blaming and ordering and forbidding the treatment team to I don't follow their recommendations) and scoring is done using a 6-point Likert scale (from completely to not at all). Finally, the whole scale gets a score of 0-200. In this way, the higher the total score or the score of each subscale, the higher the compliance of the respondent, and by converting the score obtained from the questionnaire into a percentage and comparing it with the maximum and minimum scores, the questionnaire calculates and interprets the level of compliance with the treatment of patients becomes According to the level of adherence to the treatment of the patients, according to the percentage of points obtained (0-25% = poor, 26-49% = average, 50-74% = good and 75-100% = very good) it is possible to determine the adherence to the treatment In general or in each dimension of compliance, it was checked separately. In Madanlu's research [46], the average content validity index of the questionnaire is 0.91. The internal consistency of the questionnaire by calculating Cronbach's alpha is $\alpha = 0.921$. The reliability of the treatment adherence tool has been measured using the retest method, with a two-week interval, and its correlation coefficient has been reported as 0.875.

Acceptance and Commitment Therapy: In the present study, a therapy protocol was developed based on the method of Hayes and his colleagues in 2006 [44]. This program was implemented by the therapist in 1 session of 60 minutes every week for 8 weeks.

Table 1. Subjects of acceptance and commitment training sessions [44]

meetings	The content of the meetings
First session	Establishing a therapeutic relationship, concluding a therapeutic contract, psychological training
second session	Discussing experiences and evaluating them, efficiency as a measure, generating creative frustration
third session	Articulating control as a problem, introducing desire as another response, engaging in purposeful actions
fourth Session	The use of cognitive breakdown techniques, interfering with the functioning of problematic language chains, weakening one's alliance with thoughts and emotions

fifth meeting	Viewing self as context, undermining self-concept and self-expression as observer, showing separation between self, inner experiences, and behavior.
The sixth session	Application of mental techniques, patterning of leaving the mind, training to see inner experiences as a process
The seventh session	Introducing value, showing the dangers of focusing on results, discovering the practical values of life
The eighth session	Understanding the nature of desire and commitment, determining action patterns in accordance with values

Reality Therapy: In the present study, a therapeutic protocol was developed based on the method of Glaser et al.'s protocol [45]. This program was implemented by the therapist in 1 session of 60 minutes every week for 8 weeks.

Table 2. Description of the reality therapy package

meetings	The content of the meetings
First session	Introduction, determining group rules with the cooperation of members, examining the importance and role of communication skills, familiarizing group members with each other and establishing a relationship based on trust between members and communicating group rules.
second session	Teaching the concepts and theories of reality therapy, introducing how and why people behave, focusing on the members' awareness and knowledge of themselves and the way this knowledge affects the person and others, identifying strengths and weaknesses and trying to achieve a successful identity, helping Members to learn more about themselves and their basic needs (recognizing the 5 main human needs, listing the members' basic needs with their own efforts and checking the importance of meeting these needs)
third session	Getting feedback from the last meeting, asking for an explanation about the general view of the members related to their current employment and common life, and examining the reasons for the attitude of the group members about the current life situation. Examining people's goals for their lives and determining their purposefulness, introducing behavior and familiarizing members with the four components of general behavior: thinking, feeling, action and physiology, teaching decision-making skills and interpreting changes in thoughts, feelings, actions, physiological in time now.
fourth Session	Introducing and defining the four conflicts and forced behaviors, determining the level of access or failure of the group members to use the behavior and action in the present time in order to be employed and checking how their current behavior can help the members reach their goals and needs.
	Helping members to recognize their behavior and feelings in the present, showing less importance of the past compared to today's behaviors and emphasizing internal control compared to employment, introducing members to emotions such as anxiety and

Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972
JFH

fifth meeting	depression from the perspective of reality therapy and body skill training. Calmness in order to control and regulate emotions, to show the importance of planning to do things faster and better, to use time properly and to teach proper planning to achieve other goals in common life.
sixth session	Acquainting members with their responsibilities and helping them accept responsibilities and increase responsibility for their behavior choices and solutions that cause the tendency to despair and decrease happiness in employment. Introducing and explaining destructive and constructive behaviors in relationships and teaching how to live in the moment.
seventh session	Teaching the ten principles and concepts of the selection approach, accepting responsibilities for behavior, getting to know the issues of change and commitment, and doing even very little homework, based on increasing self-esteem, valuable self-concept until the next meeting, and getting a written commitment letter from the members in order to implement That and not making any excuses.
eighth session	Getting feedback from previous meetings, reviewing them and summarizing, reviewing and re-emphasizing to accept responsibility by members, helping people to use internal control, facing reality, making moral judgments about the rightness or wrongness of behavior, living in this the moment and ultimately the process of change that reduces anxiety and increases positive emotions.

The data were statistically analysed using analysis of covariance and a significance level of $P<0.05$ and using SPSS software version 23.

Findings:

In this research, 45 women with multiple sclerosis were examined in the acceptance and commitment-based treatment group (15 people), reality therapy (15 people), and the control group (15 people).

Table 3. Demographic characteristics of the two experimental and control groups (number 45)

Demographic variable		Experiment 1 (number: 15)	Experiment 2 (number: 15)	Experiment 3 (number: 15)	
job	employed	3 (20)	6 (40)	6 (40)	χ^2 (2)= 1.80 p= 0.407
	not working	12 (80)	9(60)	9(60)	
Education level	cycle	1 (7)	4(27)	0	χ^2 (6)= 14.849 p= 0.021
	diploma	8 (53)	6(40)	7(47)	
	post diploma	0	2(13)	6(40)	
	expert	6 (40)	3(20)	2(13)	
Duration of illness	1-9	9 (60)	11(73)	8(53)	χ^2 (2, 42)= 1.991 p= 0.149
	10-19	5 (33)	3(20)	6(40)	
	20-32	1 (7)	1(7)	1(7)	
age (years); (standard deviation) average		37.8 (7.7)	42.2 (8.4)	43.2 (7.4)	

According to the Chi-square test, no significant difference was observed between the three studied groups in terms of occupation, duration of illness, and according to the analysis of variance, there was no significant difference between the three studied groups in terms of age, and the three groups were homogeneous in terms of these variables (P>0.05).

Table 4. Mean and standard deviation of research variables in experimental group of treatment based on groups

group		Pretest		posttest		Follow up	
	variable	M	SD	M	SD	M	SD
Acceptance and commitment	Adherence to treatment	144.06	20.85	164.40	18.49	161.93	19.11
	Diligence in treatment	30.46	6.17	39.80	3.38	38.73	3.63
	Willingness to participate in treatment	24.86	6.85	32.23	3.08	31.66	3.13
	Adaptability	27.40	3.92	25.33	3.90	25.20	4.16
	Integrating therapy with life	18.93	4.25	18.40	3.58	18.80	3.23
	Adherence to treatment	16.53	3.52	17.40	4.32	17.40	2.69
	Commitment to treatment	17.26	5.88	18.06	5.83	17.93	5.93
	Reluctance to implement treatment	11.13	3.37	12.00	3.33	11.53	3.46
Reality therapy	Adherence to treatment	160.0	12.38	170.00	11.98	170.66	10.08
	Diligence in treatment	33.06	4.94	38.80	3.52	38.33	10.08
	Willingness to participate in treatment	28.40	5.56	30.53	5.73	32.46	3.17
	Adaptability	28.86	3.92	28.53	3.90	29.26	2.47
	Integrating therapy with life	17.86	4.62	18.20	5.77	18.26	3.86
	Adherence to treatment	17.13	4.32	18.20	2.14	18.13	5.78
	Commitment to treatment	20.93	3.89	21.00	4.95	20.26	2.09
	Reluctance to implement treatment	13.86	1.40	14.60	2.02	14.20	5.13
Control Group	Adherence to treatment	152.46	14.48	153.86	18.27	155.40	1.47
	Diligence in treatment	30.93	4.41	31.06	6.92	31.46	19.40
	Willingness to participate in treatment	25.86	5.93	25.26	5.49	26.33	7.48
	Adaptability	27.20	5.10	27.86	3.87	29.26	5.91
	Integrating therapy with life	19.60	3.08	20.60	3.04	19.32	3.86
	Adherence to treatment	17.53	2.47	17.46	2.53	17.6	2.57
	Commitment to treatment	18.93	5.10	19.53	4.68	19.23	2.53
	Reluctance to implement treatment	12.40	3.31	12.53	2.64	12.33	4.68

The results show that in the two experimental groups compared to the control group, compliance with treatment (interest in treatment, willingness to participate in treatment, ability to adapt, integration of

Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972
JFH

treatment with life, adherence to treatment, commitment to treatment, hesitation in implementing treatment) of women There has been a change in the post-test stage compared to the pre-test stage.

In order to investigate the significant difference between the mean scores of treatment compliance in the first experimental group (therapy based on acceptance and commitment), the second experimental group (reality therapy) and the control group in the pre-test, post-test and follow-up stages, using the mixed variance analysis method. (A within-subjects factor and a between-subjects factor) were used. The three stages of pre-test, post-test and follow-up were considered as within-subject factors and the grouping of subjects into three groups was considered as a between-subject factor. First, the assumption of sphericity was investigated with the Makhli test of sphericity for the within-group factor. The results are presented in table number 3.

Table 5: The results of Makhli's test to investigate the assumption of sphericity in the variable of adherence to treatment

In-group factor	Mochli's test	chi-square	df	Sig	Greenhouse Geisser
Time steps	0.408	36.735	2	0.001	0.628

The findings of the table show that the assumption of sphericity is not established ($\chi 2 = 0.0001$, P = 36.735). Therefore, the degree of freedom should be modified (an index called Epsilon Greenhouse Geisser should be used) and the summary of the mixed variance analysis results for intra-group and inter-group factors is presented in Table No. 4.

Table 6. Summary of mixed variance analysis results with within-group and between-group factors in the treatment compliance variable

Agents	Sources of change	sum of squares	df	mean square	F	probability value	Effect size	Statistical power
In-group factor	Time steps	3328.711	1.256	264.3109	27.292	< 0.0001	0.394	1
	interaction steps*group	1500.711	2.513	597.206	6.152	< 0.002	0.227	0.921
	error	5122.578	52.771	97.072				
intergroup factor	group	4178.311	2	208.1569	2.990	<0.061	0.125	0.550
	error	29341.289	29341.289	698.602				

The results of the table show that in relation to the intragroup factor, the F value calculated for the effect of the steps (pre-test, post-test and follow-up) is significant at a level smaller than 0.01 (Eta = 0.394, P < 0.01, P 292/ 27F=). As a result, there is a significant difference between the average scores of the pre-test, post-test and follow-up treatment compliance in the three groups; And for the intergroup factor, the F value calculated at a level smaller than 0.05 is not significant (Eta = 0.125, P < 0.05, F = 2.990) as a result, between the overall average of treatment compliance in the three experimental groups and There is no evidence of a significant difference. The results of the Bonferroni post hoc test (multiple comparisons) were calculated in order to investigate the difference between the means of the steps. The results can be seen in Table 5.

Table 7: Summary of the results of Bonferroni's post hoc test (multiple comparisons) in the treatment adherence variable

stages/groups		difference of means	standard error	probability value
stages	Pre-test - post-test	-10.578	1/955	< **0.0001**
	Pre-test - follow-up	-10.489	1.919	< **0.0001**
	Post-test - follow-up	0.089	0.792	**1.00**
groups	ACT- reality therapy	-10.089	5.527	**0.232**
	ACT - Control	2.889	5.572	**1.00**
	Reality therapy - control	12.978	5.572	**0.074**

Discussion and conclusion:

The present study was conducted with the aim of comparing the effectiveness of treatment based on acceptance and commitment and reality therapy on adherence to treatment in women with multiple sclerosis. Based on the results obtained from the present research, it was found that the effectiveness of treatment based on acceptance and commitment and reality therapy have an effect on adherence to treatment in women with multiple sclerosis over time. The results of the research findings with the results of the researches of Hakemabadi, Bigdali and Asghari Ebrahimabad [47], Shidaei, Aghdam et al. [48], Herman [49] and Marukovski et al. [50] regarding the effectiveness of therapy based on acceptance and commitment and reality therapy. It was consistent with treatment compliance.

Although the review of empirical research showed that similar research related to the effectiveness of these treatment methods in compliance with treatment is not available, and this can make it difficult to compare the results of the current research with previous findings in terms of alignment and non-alignment; However, the general studies conducted regarding these two treatment methods agreed on their effectiveness in the field of various mental disorders. This issue should be generalized more cautiously in relation to reality therapy. Because reality therapy is one of the newest efforts of therapists in the way of describing human beings, determining behavioural rules and how to achieve satisfaction, happiness and success, and research on this method of treatment is still in its initial stages [28, 29].

Paying attention to psychological approaches such as treatment based on acceptance and commitment and reality therapy in women with multiple sclerosis in dealing with psychological problems and disorders such as stress caused by death, improving the quality of life and increasing self-care behaviours, as well as the preparation of integrated psychological or psychological approaches. Medicines in the treatment of multiple sclerosis patients through increasing adherence to treatment and self-care behaviours in these people are among the things that are very important in the current society and even the future of the country. In explaining the findings of the research regarding the effectiveness of treatment based on acceptance and commitment on compliance with treatment, self-care behaviours in women with multiple sclerosis, it can be said: the main emphasis of this treatment is on reducing the intensity of the frequency of disturbing emotions and thoughts. Acceptance and commitment therapy emphasizes increasing behavioural efficacy in the presence of unpleasant thoughts and feelings, rather than directly trying to reduce the latter. In other words, the acceptance

Family and health Quarterly, vol14, Issue 4, Winter 2024, ISSN: 2322-3065
https://sanad.iau.ir/Journal/fhj/Article/1201972
JFH

and commitment therapy therapist does not try to change Joe's disturbing thoughts or reduce his unpleasant emotions [51].

The main assumption of acceptance and commitment therapy is that a significant part of psychological distress is a normal part of human experience. From the point of view of therapy based on acceptance and commitment and communication framework theory, the high prevalence of human resentment is not something strange. The communicative framework theory shows how the natural processes of language dramatically change human experience. These processes cause almost all aspects of human experience to be simply and repeatedly evaluated negatively. When human beings acquire the full and unique capacity to reflect on their existence, to think about its ultimate purpose, to compare it with mental ideals, to recognize personal defects, and to use these defects as evidence of worthlessness use, the distress capacity increases significantly. The relational framework theory assumes that this complete capability creates a capacity for experiential avoidance. Experiential avoidance means trying to avoid thoughts, feelings, memories, and these subtle but unpleasant experiences [43].

The human capacity for experiential avoidance is important for at least two reasons. First, many such behaviours either cause physical harm or aggravate the primary issues. Binge eating, substance abuse, overeating, and not exercising are often common examples of experiential avoidance that lead to physical harm. Behaviours such as procrastination and avoiding constructive conflict often make existing distress worse. In other words, many examples of experiential avoidance may provide short-term relief, but exacerbate our problems and distress in the long run. Second, many examples of experiential avoidance prevent a meaningful, purposeful, and passionate life. For example, if it is valuable for a person to have an intimate, compassionate and romantic relationship, and at the same time, he always withdraws from the person he is interested in, following unpleasant emotions, it is unlikely that he will create and maintain such a relationship [49]. These assumptions of communication frame theory/treatment based on acceptance and commitment imply a different view of human resentment. If increasing distress is a part of normal human life that is often impossible to avoid; And if frequent experiential avoidance often precipitates distress and reduces quality of life, then perhaps psychotherapy is required to help clients find ways to accept this distress, the distress that arises while living a meaningful, purposeful, and vigorous life. Therefore, the therapy based on acceptance and commitment does not ask the client to accept the content of his thoughts; rather, he wants to accept his thoughts as they are, not as his mind says [52].

Acceptance and commitment therapy is based on the hypothesis that psychological trauma is associated with efforts to control or avoid negative thoughts and emotions [49]. Acceptance and commitment emphasize changing the client's relationship with his inner experiences and his avoidances [44]. In this treatment, clinical problems are conceptualized in a format that consists of three basic problems, the basis of psychological problems, and includes problems related to awareness, avoiding internal experiences, and not performing important and valuable activities in one's life [51].

In connection with the explanation of the results obtained from the effectiveness of reality therapy on compliance with treatment and self-care behaviours on patients with multiple sclerosis, the purpose

of this treatment method should be mentioned. In this regard, Balk [53] says that the goal of reality therapy is to foster acceptance of responsibility in the individual and create a successful identity. A person should identify the behaviour that he is trying to correct, pay all his attention to it, and not make excuses to deny his responsibility. In this approach, the person tries to know the short-term and long-term goals of his life. Define them clearly. Evaluate the ways to achieve your goals. Among them, choose the methods that will lead to better results and experience a more positive feeling towards yourself.

Glaser [45], in relation to the effectiveness of reality therapy, emphasizes the empathic and supportive relationship in this way. An important factor is the desire of counsellors to invent their own special therapy style. Purity and feeling relaxed about one's style are important traits that enable therapists to perform their therapeutic task. In order to establish a good relationship between the therapist and the client, the therapist must have certain personal characteristics, such as intimacy, harmony, empathy, acceptance, interest, respect for the client, openness and welcoming to be challenged by others. Also, he stated that "the continuing goal of reality therapy is to create a relationship based on choice theory between the counsellors and the client. By experiencing a satisfying relationship, clients can learn how to correct the problematic relationship that brought them to the counsellor's session." Therefore, in many ways, the client- counsellor's relationship becomes a therapeutic factor for the client. The client- counsellors relationship is so important that it is believed that if the counsellors cannot communicate with the client, the first step in the counsellor’s process will not happen it is called friendship. This friendship is based on respect, limits and choices and includes several aspects or dimensions. Finally, the key point in the effectiveness of this therapy is that, based on new theories, in reality therapy, facing Reality, responsibility and evaluation about right and wrong counsellors are emphasized. A person is not only responsible for his actions, but also for his thoughts and feelings. A person is not a victim of his past and present, unless he wants to be [45].

Limitations of the study and delimitations: Time limit, follow-up of time continuity and long-term transfer of skills on performance improvement are among the limitations of this research. In addition, the findings of the research can be generalized to those women whose percentage of treatment comes, finally, that the sample group consisted only of patients with multiple sclerosis, therefore, the findings of this research can only be generalized to women. Application of research is; In order to investigate the effectiveness of this approach more accurately, it is suggested to use designs with control and random replacement in future researches and to consider different subgroups. The effectiveness of this approach should be compared with other approaches. A longer follow-up period should be considered, and the effectiveness of this approach in different diseases should be studied.

Conclusion: According to the results of this research, it can be said that therapy based on acceptance and commitment and therapy based on reality therapy led to the improvement of father-child relationship.

Acknowledgments: We are grateful to all those who helped us in the implementation of this research.

Competing Interests: The authors declared no conflict of interest.

Ethical Approval: The current research is taken from the doctoral thesis of the first author in the field of psychology and has been approved by the specialized research council with the code of ethics

IR.IAU.VARAMIN.REC.1401.067 of Islamic Azad University, Rudehen branch. The researchers of this study consider it necessary to thank all the participants who helped us in this research and made it possible to conduct the study.
Funding: This study was funded by Islamic Azad University of Rudehen.

Reference:

1. Walton C, King R, Rechtman L, Kaye W, Leray E, Marrie RA, Robertson N, La Rocca N, Uitdehaag B, van der Mei I, Wallin M, Helme A, Angood Napier C, Rijke N, Baneke P. Rising prevalence of multiple sclerosis worldwide: Insights from the Atlas of MS, third edition. Mult Scler. 2020 Dec; 26(14):1816-1821. doi: 10.1177/1352458520970841. Epub 2020 Nov 11. PMID: 33174475; PMCID: PMC7720355.
2. Yang JH, Rempe T, Whitmire N, Dunn-Pirio A, Graves JS. Therapeutic Advances in Multiple Sclerosis. Front Neurol. 2022 Jun 3;13:824926. doi: 10.3389/fneur.2022.824926. PMID: 35720070; PMCID: PMC9205455.
3. Kuhlmann T, Moccia M, Coetzee T, Cohen JA, Correale J, Graves J, Marrie RA, Montalban X, Yong VW, Thompson AJ, Reich DS; International Advisory Committee on Clinical Trials in Multiple Sclerosis. Multiple sclerosis progression: time for a new mechanism-driven framework. Lancet Neurol. 2023 Jan;22(1):78-88. doi: 10.1016/S1474-4422(22)00289-7. Epub 2022 Nov 18. PMID: 36410373; PMCID: PMC10463558.
4. Aghili M, Al Rasool T, Asghari A. The Effectiveness of Self-care Therapy on Psychic Restlessness and Tolerance of Emotional Distress in Women with Multiple Sclerosis. Family and Health. 2023; 12(4): 152-162. https://journal.astara.ir/article_703848.html?lang=en.
5. Jakimovski D, Bittner S, Zivadinov R, Morrow SA, Benedict RH, Zipp F, Weinstock-Guttman B. Multiple sclerosis. Lancet. 2024 Jan 13;403(10422):183-202. doi: 10.1016/S0140-6736(23)01473-3. Epub 2023 Nov 7. PMID: 37949093.
6. Haki M, Al-Biati HA, Al-Tameemi ZS, Ali IS, Al-Hussaniy HA. Review of multiple sclerosis: Epidemiology, etiology, pathophysiology, and treatment. Medicine (Baltimore). 2024 Feb 23;103(8):e37297. doi: 10.1097/MD.0000000000037297. PMID: 38394496; PMCID: PMC10883637.
7. Yamout B, Al-Jumah M, Sahraian MA, Almalik Y, Khaburi JA, Shalaby N, Aljarallah S, Bohlega S, Dahdaleh M, Almahdawi A, Khoury SJ, Koussa S, Slassi E, Daoudi S, Aref H, Mrabet S, Zeineddine M, Zakaria M, Inshasi J, Gouider R, Alroughani R. Consensus recommendations for diagnosis and treatment of Multiple Sclerosis: 2023 revision of the MENACTRIMS guidelines. Mult Scler Relat Disord. 2024 Mar;83:105435. doi: 10.1016/j.msard.2024.105435. Epub 2024 Jan 7. PMID: 38245998.
8. Wang Y, Wang J, Feng J. Multiple sclerosis and pregnancy: Pathogenesis, influencing factors, and treatment options. Autoimmun Rev. 2023 Nov;22(11):103449. doi: 10.1016/j.autrev.2023.103449. Epub 2023 Sep 21. PMID: 37741528.

9. Selmaj K, Cree BAC, Barnett M, Thompson A, Hartung HP. Multiple sclerosis: time for early treatment with high-efficacy drugs. J Neurol. 2024 Jan;271(1):105-115. doi: 10.1007/s00415-023-11969-8. Epub 2023 Oct 18. PMID: 37851189; PMCID: PMC10769939.
10. Castillo Villagrán D, Yeh EA. Pediatric Multiple Sclerosis: Changing the Trajectory of Progression. Curr Neurol Neurosci Rep. 2023 Nov;23(11):657-669. doi: 10.1007/s11910-023-01300-3. Epub 2023 Oct 4. PMID: 37792206.
11. Tavakoli Saleh SH, Esmail Ebrahimi M. Effectivenes of Acceptance- Commitment Therapy on the Resillience and Psycological Well-being of Female Patients with Multiple Sclerosis in Hamadan, Iran. Avicenna J Clin Med. 2021; 28(2): 126-133. doi: 10.52547/ ajcm.28.2.126.
12. Yoysefikia M, Khoshkonesh A, Falahzadeh H. The Effectiveness of Reality Therapy to Decrease the Marital Conflict and Despair in Women with Multiple Sclerosis. Armaghanj 2018; 23 (3): 364-377. URL: http://armaghanj.yums.ac.ir/article-1-1569-fa.html.
13. Woo MS, Engler JB, Friese MA. The neuropathobiology of multiple sclerosis. Nat Rev Neurosci. 2024 Jul;25(7):493-513. doi: 10.1038/s41583-024-00823-z. Epub 2024 May 24. PMID: 38789516.
14. Freedman MS, Gnanapavan S, Booth RA, Calabresi PA, Khalil M, Kuhle J, Lycke J, Olsson T; Consortium of Multiple Sclerosis Centers. Guidance for use of neurofilament light chain as a cerebrospinal fluid and blood biomarker in multiple sclerosis management. EBioMedicine. 2024 Mar;101:104970. doi: 10.1016/j.ebiom.2024.104970. Epub 2024 Feb 13. PMID: 38354532; PMCID: PMC10875256.
15. Maltby VE, Scott RJ, Giovannoni G, Hawkes CH, Levy M, Yeh EA, Lechner-Scott J. Where does multiple sclerosis come from? Mult Scler Relat Disord. 2024 May;85:105575. doi: 10.1016/j.msard.2024.105575. Epub 2024 Mar 23. PMID: 38574723.
16. Chataway J, Williams T, Li V, Marrie RA, Ontaneda D, Fox RJ. Clinical trials for progressive multiple sclerosis: progress, new lessons learned, and remaining challenges. Lancet Neurol. 2024 Mar;23(3):277-301. doi: 10.1016/S1474-4422(24)00027-9. PMID: 38365380.
17. Gill S, Agarwal M. Multiple Sclerosis Part 1: Essentials and the McDonald Criteria. Magn Reson Imaging Clin N Am. 2024 May;32(2):207-220. doi: 10.1016/j.mric.2023.11.002. Epub 2023 Dec 9. PMID: 38555137.
18. Mishra S, Bapuraj J, Srinivasan A. Multiple Sclerosis Part 2: Advanced Imaging and Emerging Techniques. Magn Reson Imaging Clin N Am. 2024 May;32(2):221-231. doi: 10.1016/j.mric.2024.01.002. Epub 2024 Feb 9. PMID: 38555138.
19. Carlson AK, Fox RJ. Pathophysiology, Diagnosis, Treatment and Emerging Neurotherapeutic Targets for Progressive Multiple Sclerosis: The Age of PIRA. Neurol Clin. 2024 Feb;42(1):39-54. doi: 10.1016/j.ncl.2023.07.002. Epub 2023 Aug 21. PMID: 37980122.
20. Alvarez E, Longbrake EE, Rammohan KW, Stankiewicz J, Hersh CM. Secondary hypogammaglobulinemia in patients with multiple sclerosis on anti-CD20 therapy: Pathogenesis, risk of infection, and disease management. Mult Scler Relat Disord. 2023 Nov;79:105009. doi: 10.1016/j.msard.2023.105009. Epub 2023 Sep 15. PMID: 37783194.

21. Bizri M, Koleilat R, Akiki N, Dergham R, Mihailescu AM, Bou-Fakhredin R, Musallam KM, Taher AT. Quality of life, mood disorders, and cognitive impairment in adults with β-thalassemia. Blood Rev. 2024 May;65:101181. doi: 10.1016/j.blre.2024.101181. Epub 2024 Feb 8. PMID: 38341336.
22. Wolf F, Nielsen J, Saliger J, Hennecken E, Kröber P, Eschweiler M, Folkerts AK, Karbe H, Zimmer P. Multimodal agility-based exercise training (MAT) versus strength and endurance training (SET) to improve multiple sclerosis-related fatigue and fatigability during inpatient rehabilitation: a randomized controlled pilot and feasibility study [ReFEx]. BMC Neurol. 2023 Oct 28;23(1):388. doi: 10.1186/s12883-023-03436-8. PMID: 37898772; PMCID: PMC10612282.
23. Hancock LM, Rao SM, Galioto R. Neuropsychological Manifestations of Multiple Sclerosis. Neurol Clin. 2024 Nov;42(4):835-847. doi: 10.1016/j.ncl.2024.05.010. Epub 2024 Jun 14. PMID: 39343478.
24. Van der Hoek LH, Rosenmöller BRAM, van de Rijt LJM, de Vries R, Aarab G, Lobbezoo F. Factors associated with treatment adherence to mandibular advancement devices: a scoping review. Sleep Breath. 2023 Dec;27(6):2527-2544. doi: 10.1007/s11325-023-02862-9. Epub 2023 Jun 29. PMID: 37386300; PMCID: PMC10656313.
25. Bani Hashemi, S., Hatami, M., Hasani, J., sahebi, A. Comparing Effectiveness of the Cognitive-behavioral Therapy, Reality Therapy, and Acceptance and Commitment Therapy on Quality of Life, General Health, and Coping Strategies of Chronic Patient's Caregivers. Journal of Clinical Psychology, 2020; 12(1): 63-76. doi: 10.22075/jcp.2020.18992.1757.
26. Gulma K. Enhancing public health programs with performance-based memorandum of understanding. J Public Health Policy. 2023 Dec;44(4):634-642. doi: 10.1057/s41271-023-00446-1. Epub 2023 Oct 27. PMID: 37891354.
27. Saadat S, Kalantari M, Kajbaf M B, Hosseininezhad M. A comparative study of health promoting behaviors in healthy individuals and patients with multiple sclerosis: An analytical study. Journal of Hayat 2019; 25 (2): 138-150. URL: http://hayat.tums.ac.ir/article-1-2944-fa.html.
28. Alzahrani AM, Hakami A, AlHadi A, Al-Maflehi N, Aljawadi MH, Alotaibi RM, Alzahrani MM, Alammari SA, Batais MA, Almigbal TH. The effectiveness of mindfulness training in improving medical students' stress, depression, and anxiety. PLoS One. 2023 Oct 31;18(10):e0293539. doi: 10.1371/journal.pone.0293539. PMID: 37906599; PMCID: PMC10617730.
29. Sanabria-Mazo JP, Giné-Vázquez I, Cristobal-Narváez P, Suso-Ribera C, García-Palacios A, McCracken LM, Hayes SC, Hofmann SG, Ciarrochi J, Luciano JV. Relationship between outcomes and processes in patients with chronic low back pain plus depressive symptoms: idiographic analyses within a randomized controlled trial. Psychother Res. 2024 Jul 30:1-16. doi: 10.1080/10503307.2024.2382429. Epub ahead of print. PMID: 39079014.

30. Jafskesh Moghadam A, Shahabizadeh F, Bahrainian A. Comparative Effectiveness of Mindfulness-based Psychotherapy versus Acceptance or Commitment Therapy on Stress Level in Dialysis Patients. J Adv Med Biomed Res 2016; 24 (107): 84-93. URL: http://journal.zums.ac.ir/article-1-3775-fa.html.
31. Zhang Y, Ding Y, Chen X, Li Y, Li J, Hu X. Effectiveness of acceptance and commitment therapy on psychological flexibility, fatigue, sleep disturbance, and quality of life of patients with cancer: A meta-analysis of randomized controlled trials. Worldviews Evid Based Nurs. 2023 Dec;20(6):582-592. doi: 10.1111/wvn.12652. Epub 2023 May 16. PMID: 37194163.
32. Levin ME, Krafft J, Twohig MP. An Overview of Research on Acceptance and Commitment Therapy. Psychiatr Clin North Am. 2024 Jun;47(2):419-431. doi: 10.1016/j.psc.2024.02.007. Epub 2024 Mar 21. PMID: 38724128.
33. Williams AJ, Botanov Y, Giovanetti AK, Perko VL, Sutherland CL, Youngren W, Sakaluk JK. A Metascientific Review of the Evidential Value of Acceptance and Commitment Therapy for Depression. Behav Ther. 2023 Nov;54(6):989-1005. doi: 10.1016/j.beth.2022.06.004. Epub 2022 Jun 26. PMID: 37863589.
34. Liu YE, Lv J, Sun FZ, Liang JJ, Zhang YY, Chen J, Jiang WJ. Effectiveness of group acceptance and commitment therapy in treating depression for acute stroke patients. Brain Behav. 2023 Dec;13(12):e3260. doi: 10.1002/brb3.3260. Epub 2023 Nov 8. PMID: 37938871; PMCID: PMC10726803.
35. Morris EMJ, Johns LC, Gaudiano BA. Acceptance and commitment therapy for psychosis: Current status, lingering questions and future directions. Psychol Psychother. 2024 Mar; 97(1): 41-58. doi: 10.1111/papt.12479. Epub 2023 Jun 26. PMID: 37357973.
36. Twohig MP, Seydavi M, Capel LK, Levin ME, Akbari M. Scoping Review of Acceptance and Commitment Therapy for Obsessive-Compulsive Disorder in Iran. J Cogn Psychother. 2024 Jul 11; 38(3): 211-226. doi: 10.1891/JCP-2023-0009. PMID: 38991742.
37. Kashif M, Albalwi AA, Zulfiqar A, Bashir K, Alharbi AA, Zaidi S. Effects of virtual reality versus motor imagery versus routine physical therapy in patients with Parkinson's disease: a randomized controlled trial. BMC Geriatr. 2024 Mar 5;24(1):229. doi: 10.1186/s12877-024-04845-1. PMID: 38443801; PMCID: PMC10916168.
38. Nègre F, Lemercier-Dugarin M, Kahn-Lewin C, Gomet R, Zerdazi EM, Zerhouni O, Romo L. Virtual reality efficiency as exposure therapy for alcohol use: A systematic literature review. Drug Alcohol Depend. 2023 Dec 1;253:111027. doi: 10.1016/j.drugalcdep.2023.111027. Epub 2023 Nov 15. PMID: 38006671.
39. Lattré T, Decramer A, Vanhaecke J, Van der Linden D, Goubau J. Immersive virtual reality in orthopedic hand therapy. Hand Surg Rehabil. 2024 Sep;43(4):101750. doi: 10.1016/j.hansur.2024.101750. Epub 2024 Jul 4. PMID: 38971226.
40. Rodríguez-Almagro D, Achalandabaso-Ochoa A, Ibáñez-Vera AJ, Góngora-Rodríguez J, Rodríguez-Huguet M. Effectiveness of Virtual Reality Therapy on Balance and Gait in the Elderly: A Systematic Review. Healthcare (Basel). 2024 Jan 9;12(2):158. doi: 10.3390/healthcare12020158. PMID: 38255047; PMCID: PMC10815791.

41. Tan YL, Chang VYX, Ang WHD, Ang WW, Lau Y. Virtual reality exposure therapy for social anxiety disorders: a meta-analysis and meta-regression of randomized controlled trials. Anxiety Stress Coping. 2024 Aug 20:1-20. doi: 10.1080/10615806.2024.2392195. Epub ahead of print. PMID: 39161295.
42. Baugher B, Szewczyk N, Liao J. Augmented reality cueing for freezing of gait: Reviewing an emerging therapy. Parkinsonism Relat Disord. 2023 Nov;116:105834. doi: 10.1016/j.parkreldis.2023.105834. Epub 2023 Sep 7. PMID: 37699779.
43. Dimeff LA, Linehan MM. Dialectical behavior therapy for substance abusers. Addict Sci Clin Pract. 2008 Jun;4(2):39-47. doi: 10.1151/ascp084239. PMID: 18497717; PMCID: PMC2797106.
44. Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: model, processes and outcomes. Behav Res Ther. 2006;44(1):1-25. doi: 10.1016/j.brat.2005.06.006. PMID: 16300724.
45. Glasser W, Zunin LM. Reality therapy. Curr Psychiatr Ther. 1972; 12: 58-61. PMID: 5032914.
46. Modanloo M. Development and psychometric tools adherence of treatment in patients with chronic (dissertation). Tehran: Iran University of Medical Sciences; 2013. (Persian)
47. Hokmabadi, M. E., Bigdeli, I., Asghari ebrahimabad, M. J., Asadi, J. Comparing the Effectiveness of Schema Therapy and Acceptance and Commitment Therapy on Personality Type D and Adherence to Treatment in Patients with Coronary Artery Disease. Journal of Clinical Psychology, 2020; 12(1): 25-36. doi: 10.22075/jcp.2020.12459.1217.
48. Sheydayi Aghdam Sh, Shamseddini lory S, Abassi S, Yosefi S, Abdollahi S, Moradi joo M. The effectiveness of treatment based on acceptance and commitment in reducing distress and inefficient attitudes in patients with MS. Journal of Thought & Behavior in Clinical Psychology. 2014; 9(34): 57-66. https://sanad.iau.ir/Journal/jtbcp/Article/1118339.
49. Herman J. Adherence revisited: The patient's choice. Orthopedic Nursing. 2024; 21(2): 79-82.
50. Morrison A, Wertheimer A.I. Complication of quantitative overviews of studies of adherence. Drug J, 2014; 38(2): 197-210. http://dx.doi.org/10.1177/009286150403800213.
51. Zhang T, Li X, Zhou X, Zhan L, Wu F, Huang Z, Sun Y, Feng Y, Du Q. Virtual Reality Therapy for the Management of Chronic Spinal Pain: Systematic Review and Meta-Analysis. JMIR Serious Games. 2024 Feb 12; 12:e50089. doi: 10.2196/50089. PMID: 38345832; PMCID: PMC10897798.
52. Landim SF, López R, Caris A, Castro C, Castillo RD, Avello D, Magnani Branco BH, Valdés-Badilla P, Carmine F, Sandoval C, Vásquez E. Effectiveness of Virtual Reality in Occupational Therapy for Post-Stroke Adults: A Systematic Review. J Clin Med. 2024 Aug 7; 13(16): 4615. doi: 10.3390/jcm13164615. PMID: 39200757; PMCID: PMC11354851.
53. Alashram AR. Combined robot-assisted therapy virtual reality for upper limb rehabilitation in stroke survivors: a systematic review of randomized controlled trials. Neurol Sci. 2024 Nov; 45(11): 5141-5155. doi: 10.1007/s10072-024-07628-z. Epub 2024 Jun 5. PMID: 38837113.