

The Mediating Role of Acceptance in the Relationship between Existential Fulfillment and Resilient Coping among Patients with Multiple Sclerosis

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Abstract

Introduction: Self-acceptance (approving one's self) potentially influenced by existential fulfillment (self-acceptance, self-actualization, and self-transcendence, which individuals pursue a purposeful life) may be linked to resilient coping (the cognitive and behavioral efforts individuals make to overcome internal and external challenges or to provide emotional relief, with the ability to withstand or quickly recover from difficult situations) in patients with Multiple Sclerosis (MS). This study aimed to examine the mediating role of acceptance in the relationship between existential fulfillment and resilient coping in patients with MS, which has never been done before and presents a lack of research in this subject. Furthermore, this research can provide psychotherapists with more accurate and real solutions to improve the quality of the life of people with MS.

Method: A correlational research design with structural equation modeling was used. The sample consisted of 210 MS patients from Yazd and Isfahan provinces, Iran, selected through convenience sampling in 2022. Participants completed the Acceptance and Action Questionnaire (AAQ-II), the Brief Resilient Coping Scale (BRCS), and the Existential Fulfillment Scale (EFS). Data were analyzed using structural equation modeling with SPSS-26 and AMOS-24 software.

Results: Findings indicated that existential fulfillment not only directly influences resilient coping in MS patients but also indirectly enhances it by increasing acceptance ($p < 0.01$). These results underscore the importance of fostering existential fulfillment and acceptance in therapeutic interventions aimed at improving resilience among individuals with MS, offering new insights for psychological support and care strategies in clinical settings.

Conclusion: Based on these results, acceptance plays a mediating role between existential fulfillment and resilient coping. This means it could be used to improve life conditions for people with MS. Such approaches could play a significant role in managing or improving the psychological impacts of MS.

Keywords: Acceptance and Commitment Therapy, Existential Psychology, Psychological Resilience, Multiple Sclerosis

Introduction

Multiple Sclerosis (MS), also known as multiple paralysis, is one of the most prevalent diseases affecting the central nervous system, resulting in the breakdown of the myelin sheath in the brain and spinal [1]. Extensive lesions in the brain and spinal cord due to MS lead to a broad spectrum of sensory, motor, cognitive, and neurological symptoms, including blurred vision, muscle weakness, fatigue, pain, dizziness, difficulty concentrating, intestinal and bladder dysfunction, and balance and coordination disturbances [2]. In recent years, the incidence of MS in Iran has increased significantly, and fortunately. Meanwhile, this rise in the prevalence of this disease has been met with greater attention and various diagnostic advancements [3]. There is an upward trend in both the incidence and prevalence

of MS globally [4]. For instance, compared to 24.26 per 100,000 in 2006, the prevalence soared to 44.53 per 100,000 in 2011. By 2021, the total prevalence in Iran reached 100 per 100,000, with the prevalence among women being two to three times higher than men, which has dramatically increased [5]. Living with MS challenges an individual's coping abilities due to the disease's diverse symptoms, unpredictable progression, and potential cumulative losses. Coping is defined as the cognitive and behavioral efforts individuals make to overcome internal and external challenges or to provide emotional relief [6]. The term resilience, is defined by the Oxford English Dictionary as "the ability to withstand or quickly recover from difficult situations" [7]. Resilience reflects an individual's ability to manage stressors that threaten mental health, and "resilient coping" specifically refers to the ability to maintain relatively stable and healthy levels of mental and physical functioning when facing highly adverse situations [8]. Unlike other stress management approaches, resilient coping emphasizes coping as a process, adapting to ever-changing demands [9].

This study hypothesizes that resilient coping in MS patients may be influenced by acceptance of the disease. The term "acceptance" means to receive willingly or approve. For chronic diseases like MS, where symptoms may persist or worsen, Acceptance and Commitment Therapy (ACT) can be a beneficial psychological intervention [10]. A pilot study involving MS patients showed that ACT significantly reduced depressive symptoms and improved quality of life [11]. Additionally, a systematic review found that mindfulness-based interventions, particularly those focusing on ACT, significantly reduced anxiety, depression, fatigue, and improved health-related quality of life, with benefits persisting at a six-month follow-up [12]. Chronic conditions like MS often require individuals to adapt in various aspects of life, accommodating new and challenging circumstances [13]. Acceptance involves confronting and facing the present moment—including symptoms—rather than avoiding it. This approach strengthens self-confidence in managing one's condition and fosters resilient coping. The primary goal of ACT is not merely symptom reduction but rather guiding patients toward a meaningful life [14].

In addition to acceptance, existential factors such as existential fulfillment may also relate to coping in MS patients. The primary components of existential fulfillment are self-acceptance, self-actualization, and self-transcendence [15]. Individuals pursue a purposeful life through these three concepts, which represent core attitudes for existential fulfillment and ways to address psychological conflicts arising from human limitations. Self-acceptance involves embracing one's own strengths and limitations. Rogers contrasts self-acceptance with behaviors driven by a desire for social approval, affection, and respect, where individuals try to "buy love" [16]. Unlike limitations imposed by others, intrinsic limitations arise from within. For example, while solitude imposed by others is not an inherent limitation, struggles with loneliness are. Self-actualization, on the other hand, entails recognizing and nurturing one's capacities for personal growth

in understanding and abilities. Self-transcendence involves recognizing and respecting realities beyond oneself, fostering meaningful relationships with them, feeling accountable, identifying with a larger whole, and distinguishing broader interests beyond personal gain [15]. Self-actualization, defined as "the desire to become more of who you truly are" and seen as "the pinnacle of human needs," was introduced by Viktor Frankl [17]. Existential fulfillment enables individuals to increase resilience in the face of challenges, such as disease, by embracing their limitations and expanding their capacities [15]. As mentioned, acceptance and existential fulfillment may be linked to resilient coping in MS patients, with self-acceptance potentially influenced by existential fulfillment. It is reasonable to consider that self-acceptance, as a component of existential fulfillment, may foster disease acceptance or what we term "acceptance and commitment" in MS patients. Through this process, acceptance could enhance resilient coping in individuals with MS by utilizing existential fulfillment as a mediating factor. The growing prevalence of MS underscores the importance of identifying factors that influence its progression, as well as improving rehabilitation resources. MS often creates a cycle of insecurity and confusion in many areas of a patient's life; the way forward involves resisting despair and developing flexible coping strategies. Based on the previous information, we face a lack of research regarding this topic, although it can play a significant role in improving people with MS's life through a psychological approach, considering the psychological aspects and impacts of MS. Given the lack of extensive studies examining resilient coping in relation to MS, this study aims to explore the relationship between existential fulfillment and resilient coping in MS patients, with acceptance acting as a mediating variable.

Method

The current study employed a correlational research design using Structural Equation Modeling (SEM). It was conducted cross-sectionally in 2022 among patients with MS residing in the Yazd and Isfahan provinces. Participants were members of local MS associations, and their diagnoses had been confirmed by qualified physicians based on clinical assessments and diagnostic tests. In SEM studies, a minimum sample size of 200 is recommended, with 300 considered optimal [18]. Due to limitations in accessing a larger patient pool, a total of 210 MS patients were selected through convenience sampling. Inclusion criteria required participants to be between 20 and 40 years of age and to have been diagnosed with MS for at least one year. Exclusion criteria included a self-reported history of mental illness or current use of psychiatric medications. Finally, the confidentiality of the information was strictly considered and informed consent was obtained from all subjects, due to the nature of this study.

After obtaining an ethical approval for the study, data collection was carried out through self-report questionnaires distributed either in person at MS association centers or electronically via secure online platforms, depending on participant preference and accessibility. Trained research

assistants provided instructions and support during questionnaire completion to ensure consistency and accuracy. Participants were informed about the purpose of the study, assured of the confidentiality of their responses, and asked to provide written or electronic informed consent prior to participation. Data collection was completed over a two-month period.

Although structural equation modeling typically requires a minimum of 200 participants, the sample size in this study was also verified using the Cochran formula for finite populations, confirming that 210 participants would provide sufficient statistical power for the analysis. The study was implemented by a trained research team affiliated with the host academic institution. Data collection took place at designated MS association centers located in the cities of Yazd and Isfahan, as well as online through secure links shared by association coordinators.

The tools used in this study were as follows:

Acceptance and Action Questionnaire-Second Version (AAQ-II):

This questionnaire consists of 10 items rated on a seven-point Likert scale [19], with scores ranging from "not at all" (1) to "always" (7), where higher scores indicate greater psychological flexibility [20]. The original version contained 32 items, which were reduced to 29 and then 16 items in subsequent versions, ultimately resulting in the 10-item version. The latest version shows improved validity and reliability over the original and is well-correlated with variables based on the theory of acceptance and commitment [20]. It has also demonstrated significant correlations with the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Depression, Anxiety, and Stress Scale (DASS), and the 12-item General Health Questionnaire (GHQ-12) ($p < 0.01$) [21]. Standardized internationally, the AAQ-II showed two factors with a Cronbach's alpha of 0.82 in a general population sample and 0.76 in a clinical sample in France. In Persian validation studies, the internal consistency and correlation coefficients were satisfactory across four groups, with values ranging from 0.71 to 0.89 [22].

Brief Resilient Coping Scale (BRCS): This scale measures adaptive coping tendencies in response to stress [23], focusing on individuals' willingness to effectively apply flexible, committed strategies to solve problems even in

challenging conditions. The BRCS includes four items rated on a five-point Likert scale from "1 = does not describe me" to "5 = describes me very well," yielding scores from 4 to 20. Low scores (4–13) indicate low resilience, scores between 14 and 16 indicate moderate resilience, and scores from 17 to 20 indicate high resilience. Higher scores reflect a flexible, optimistic, creative, and determined coping style, with a desire to transform challenges into manageable goals. Reliability testing using internal consistency yielded a Cronbach's alpha of 0.69, and confirmatory factor analysis indicated good validity [23].

Existential Fulfillment Scale (EFS): The EFS is a 15-item scale measuring three dimensions: "self-acceptance," "self-actualization," and "self-transcendence," rated on a five-point Likert scale from 0 ("not at all relevant to me") to 4 ("completely relevant to me"), with a maximum score of 20 per dimension [15]. In a study involving 812 students, the Cronbach's alpha for the subscales was 0.74, 0.71, and 0.88. The factorial structure of the EFS showed good validity, with internal consistency coefficients of 0.79, 0.76, and 0.82, respectively. Fit indices and parameter estimates confirmed good model fit, with standard regression coefficients for all aspects ranging from 0.50 to 0.92, suggesting overall good validity of this scale [24].

Data analysis involved both descriptive and inferential statistics. Descriptive statistics included mean and standard deviation calculations. Inferential analyses involved Pearson correlation coefficients and SEM to test the research hypotheses. Analyses were conducted using SPSS version 26 and AMOS version 24. Collinearity among independent variables within the SEM was assessed by examining the Variance Inflation Factor (VIF) and tolerance indices, which help determine the extent of multicollinearity among predictors.

Results

The age of participants ranged from 20 to 40 years, with an average age of 28.31 years ($SD = 5.001$). Among the respondents, 25.7% (54 individuals) were men and 74.3% (156 individuals) were women. Regarding marital status, 51.4% (108 individuals) were married, and 48.6% (102 individuals) were single. The duration of the disease among participants varied from 0 to 25 years, with an average of 7.55 years ($SD = 5.833$).

Table 1. Frequencies of Demographic Variables

Variable	Category	Frequency	Percentage (%)
Disease Severity	Primary Progressive	31	14.8
	Secondary Progressive	21	10.0
	Relapse Remitting	132	62.9
	Progressive Relapsing	26	12.4
Education Level	High School Diploma	56	26.7
	Post-Diploma / Bachelor's	108	51.4
	Master's Degree	25	11.9
	Doctorate	8	3.8
Employment Status	Freelance	40	19.0
	Unemployed	106	50.5
	Student	26	12.4
	Employed	38	18.1
Monthly Family Income (Per month)	Less than 120 \$	84	40.0
	120-240 \$	89	42.4
	250-500 \$	26	12.4
	More than 500 \$	11	5.2

Based on the research findings, the highest frequency of participants (62.9%) had a recurrent form of the disease that showed recovery, while the lowest frequency (10.0%) was observed in those with secondary progressive disease severity. Unemployment was the most common employment status among participants (50.5%), whereas students had the lowest frequency (12.4%). The most frequent family income range was 120-240 \$ per month (42.4%), while only 5.2% of participants reported a family income above 500 \$ per month.

Before analyzing the proposed model and testing the research hypotheses, the assumptions of structural equation modeling were assessed. The Kolmogorov-Smirnov test confirmed the normal distribution of data across the variables. Two indices, the Variance Inflation Factor (VIF) and Tolerance, were examined to assess multicollinearity among the independent variables, and both indices were within acceptable ranges, indicating no significant multicollinearity and thereby supporting this assumption. The bivariate correlations between the study variables were analyzed using the Pearson correlation test (Table 3).

The findings indicate a positive and significant relationship between existential fulfillment and

acceptance ($\beta = .66, p < 0.001$). Additionally, both existential fulfillment ($\beta = .30, p < 0.001$) and acceptance ($\beta = .47, p < 0.001$) show a positive and significant relationship with resilient coping. The model was examined using a covariance-oriented structural equation modeling approach, with estimates related to the overall fit indices of the model and main parameters presented in the following tables and Figure 1.

In this study, the indices χ^2/df , RMSEA, GFI, TLI, NFI, CFI, and IFI were used to assess the confirmatory factor analysis model. Although there is no fixed criterion for an acceptable χ^2/df index, a lower χ^2/df value suggests a better model fit, with values less than 3 considered favorable [18]. The RMSEA index, representing the root mean square error of approximation, evaluates the degree of error per degree of freedom, with values of 0.08 or below indicating a good fit and values of 0.10 or higher indicating a poor fit. For model acceptance, GFI, NFI, IFI, TLI, and CFI values should be 0.90 or higher. The data presented in Table 4 demonstrate that all indices met the recommended thresholds.

Table 2. Mean and Standard Deviation of Study Variables

Variable	Subscales	Minimum	Maximum	Mean	SD
Existential fulfillment	Self-Acceptance	0	20	9.22	4.32
	Self-Actualization	0	20	9.19	4.97
	Self-Transcendence	0	20	8.32	4.85
	Total Score	5	52	26.83	10.03
Acceptance	Acceptance of Emotional Experiences	5	49	24.54	11.67
	Control Over Life	3	21	11.53	4.78
	Total Score	9	70	36.07	22.15
Resilient Coping		4	20	13.55	4.10

Table 3. Correlation Matrix of study Variables

Variables	1	2	3
1. Existential fulfillment	1		
2. Acceptance	0.48*	1	
3. Resilient coping	0.38*	0.58*	1

Table 4: Model Fit Indices for the Structural Equation Model

Index	CMIN	DF	CMIN/DF	GFI	NFI	IFI	TLI	CFI	RMSEA
Value	17.922	7	2.56	0.97	0.96	0.98	0.95	0.98	0.08

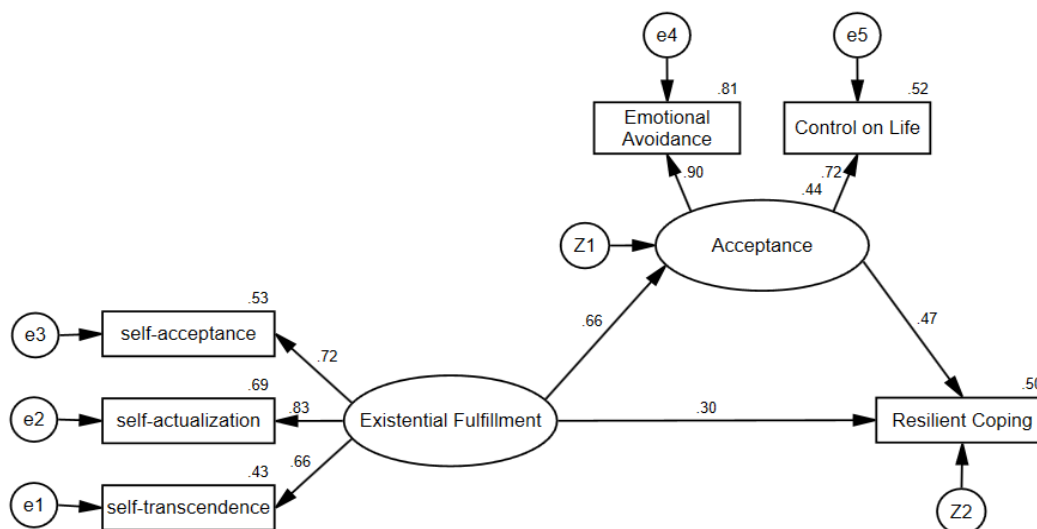


Figure 1. Path coefficients of the tested research model.

The structural equation model evaluation indicators fall within the desired range, indicating support for the hypothesized model based on the research data. In other words, the data fit the model well. To calculate the direct, indirect, and total effects of independent and mediating variables on the dependent variable, the self-management method in EMOS software was utilized, (Table 5). The findings show that the indirect path

coefficient from existential fulfillment to resilient coping is significant ($\beta=0.31$). This suggests that existential fulfillment is not only directly related to an increase in resilient coping among MS sufferers but also indirectly enhances resilient coping levels through increased acceptance. Thus, the mediating role of acceptance in the relationship between existential development and resilient coping in patients with MS is confirmed.

Table 5: Estimation of Direct and Indirect Effects of Independent and Mediating Variables on Resilient Coping

Independent Variable	Mediating Variable	Dependent Variable	Direct Estimate	P	Indirect Estimate	P	Total Estimate	P
Existential fulfillment	-	Acceptance	0.66	0.001	-	-	0.66	0.001
	-	Resilient Coping	0.29	0.019	-	-	0.61	0.001
	Acceptance	Resilient Coping	-	-	0.31	0.001	-	-
Acceptance	-	Resilient Coping	0.47	0.004	-	-	0.47	0.004

Discussion

The findings of this study indicate a direct relationship between existential fulfillment and acceptance, aligning indirectly with previous studies [25-30]. However, some differences were noted. For instance, a study on AIDS patients found that ACT improved disease acceptance, resulting in better coping, enhanced quality of life, and reduced depressive symptoms [25]. Similarly, another study confirmed that spiritual health and attention to existential dimensions positively impact the quality of life for MS patients [27].

In explaining this finding, it can be suggested that existential fulfillment, rooted in existential psychology, encompasses qualities such as self-acceptance, self-actualization, and self-improvement. These traits help individuals adopt basic attitudes that promote existential fulfillment and aid in managing psychological conflicts associated with human limitations [31]. A primary trait of individuals with high existential fulfillment is self-acceptance, allowing them to accept people, situations, and life experiences as they are. This acceptance fosters independence from others and external objects, bringing individuals closer to self-acceptance. Additionally, these individuals exhibit self-actualization, enabling them to perceive reality effectively, approach challenges with a problem-solving mindset, and seek optimal solutions. The final trait, self-transcendence, represents the essence of human existence and relates to one's spiritual dimension [15]. With these qualities, individuals with high existential fulfillment are more aware of illness-related challenges and more accepting of disease consequences. Supporting this, research has shown that MS patients with higher spiritual health enjoy a better quality of life, suggesting that they embrace disease-related hardships and use spiritual connections to cope. Therefore, it can be concluded that there is a direct relationship between existential fulfillment and acceptance in MS patients [28]. The findings of this study indicate a direct relationship between existential fulfillment and resilient coping. No specific prior research directly examining this relationship was found, though related studies suggest that spirituality-based treatments for chronic patients are

associated with overall quality of life and physical well-being. The mentioned study also noted significant correlations between depression, fatigue, emotional distress, and existential concerns [32]. Living with MS brings profound lifestyle changes, where individuals face not only physical challenges but also substantial emotional and psychological stress. This includes conditions like hopelessness, depression, cognitive impairments, mood swings, anxiety, and a sense of meaninglessness. Additionally, as the root cause of MS remains unknown, patients must navigate unpredictable symptoms and situations, often with limited control. In such circumstances, developing resilience and adaptability through existential fulfillment can help patients find meaning and purpose, enabling them to better cope with their condition.

Existential fulfillment promotes a purposeful, meaningful way of life [33] and involves finding order, coherence, and purpose in one's existence, striving for meaningful goals, and nurturing a sense of belonging. A person with high existential fulfillment has a clear life direction, pursues goals aligned with their purpose, finds satisfaction in past achievements, and is committed to creating a meaningful future [34]. These characteristics—self-acceptance, self-actualization, and self-improvement—help MS patients manage mental conflicts, accept their limitations, and foster personal growth. Through existential fulfillment, an individual with MS can view the illness as part of their life's limitations while focusing on creating positive conditions for themselves. This approach encourages resilience by fostering an understanding that life inherently involves hardship and challenges. Recognizing this enables a person to cultivate the resilience needed to handle difficult situations. Since resilient coping serves as a cognitive appraisal strategy for problem-solving in crises, it helps individuals adapt to adversity [23], manage crises effectively, and enhances their resilience over time. Consequently, it can be concluded that there is a direct relationship between existential fulfillment and resilient coping in patients with MS.

The findings of this study indicate a direct relationship between acceptance and resilient coping. This aligns

closely with previous studies [25, 29, 35], though some differences were observed. For instance, a study on AIDS patients found that ACT enhanced acceptance, leading to improved coping [25]. Another study demonstrated that acceptance-based and palliative interventions significantly bolstered mental resilience and quality of life [35]. To explain this finding, acceptance is considered a core component of ACT, which emphasizes mindfulness. For individuals with diseases like MS, ACT promotes self-awareness practices—such as self-observation and present-moment awareness—enabling them to accept the disease as part of life, which may reduce symptom severity [36]. Acceptance of one's current conditions, while simply observing thoughts and feelings, is associated with increased mental resilience [37]. ACT has also been shown to reduce stress in patients with MS [38]. Acceptance allows individuals to handle challenging mental experiences, manage thoughts and emotions in stressful situations, and reduce ineffective responses. With this skill, individuals can avoid attempting to control or eliminate distressing thoughts, instead fostering adaptive responses to these experiences [39]. Resilient coping, a cognitive skill for problem-solving under stress, aids in adapting to adversity and promotes self-efficacy, optimism, and self-reliance. Thus, individuals with strong resilient coping skills can effectively regulate and moderate the negative emotions stemming from their illness. In essence, acceptance enables people to build tolerance and resilience in the face of MS-related hardships, manage stress through self-awareness and mindfulness, and focus on responding rather than changing the circumstances. Together, these abilities enhance resilience, facilitate problem-solving, and strengthen cognitive control, all of which lead to improved resilient coping skills. Consequently, it can be confirmed that there is a direct relationship between acceptance and resilient coping in patients with MS.

The findings of this study indicate that acceptance mediates the relationship between existential evolution and resilient coping. No directly related research was found on this specific finding, highlighting the innovative aspect of this study. However, this result is indirectly consistent with previous studies [25, 26, 29]. Prior research has also shown that therapies based on acceptance and commitment help regulate emotions and enhance resilience, particularly among divorced women [29]. To explain this finding, it is worth noting that existential aspects of health are increasingly valued by the general public, and the benefits of meaning in life for mental and physical health are well documented. People who undergo existential evolution tend to have a strong sense of purpose and coherence in their lives. In contrast, those experiencing existential crises often feel hopeless and directionless, which can lead to depression, confusion, and even suicidal thoughts. Additionally, such crises are associated with increased anxiety, negative behaviors, and pessimism, while resilience, motivation, life satisfaction, hope, self-regulation, and self-awareness may decline [40].

Various factors—such as the loss of loved ones, divorce, and chronic illnesses—can lead to a diminished sense of meaning and trigger existential crises. MS is one such factor; due to its uncertain and limiting nature, it can profoundly impact patients' lives, often resulting in a loss of meaning and increased hopelessness. The disease's psychological effects, such as anxiety, depression, and mood swings, can further fuel feelings of fear, sadness, despair, and confusion. However, some people with MS manage to mitigate these psychological impacts by applying existential concepts like existential evolution. Through this process, individuals find meaning in their lives, work toward life goals, and pursue personal growth by accepting limitations and focusing on their capabilities. This mindset empowers them to confront life's challenges without succumbing to despair and isolation. Consequently, symptoms like negative thinking, low mood, and anxiety are reduced [25], enabling them to adapt more effectively to challenges associated with MS and cope with crises through resilient strategies. Furthermore, since self-acceptance is a core element of existential evolution, individuals who achieve this evolution can better tolerate disappointment and uncertainty and gain valuable experiences during critical times [41]. This characteristic fosters a sense of calm, self-compassion, and control over negative emotions. Acceptance also serves as a coping mechanism that improves quality of life, encouraging the use of available resources to meet goals and manage the situation. By choosing coping strategies like resilient coping, acceptance helps people to regulate negative emotions and guide themselves toward a meaningful, fulfilling life that aligns with their strengths [42]. Individuals with strong acceptance skills are also better equipped to reduce maladaptive coping strategies, anticipate emotional reactions, and balance negative emotions with a positive outlook, ultimately increasing resilience and promoting resilient coping. In conclusion, acceptance plays a mediating role in the relationship between existential evolution and resilient coping in patients with MS.

The authors have faced some limitations during this research, including lack of willingness in some people with MS and the effect of fatigue in the process of filling the questionnaires by them, potential response bias, etc. Obviously, there are some facts that should be considered in later studies such as preparing a wider range of samples and questionnaires and conducting a similar study using other psychological factors such as emotion regulation.

Conclusion

Overall, the findings of this study suggest that interventions grounded in existential theory, focusing on existential growth factors such as self-actualization and self-acceptance, and emphasizing acceptance and commitment, can enhance resilient coping in patients with MS by fostering greater acceptance. These interventions may play an important role in managing or improving the psychological consequences of the disease. Psychologists and mental health specialists, in

collaboration with the MS association, could implement necessary therapeutic interventions based on these results. By leveraging available resources, such as educational workshops, informational brochures, and virtual platforms, they can offer effective support alongside medical treatments for individuals with MS. Additionally, certain research limitations should be considered, including the non-cooperation of some participants, limited prior research, a lack of precise statistics, and possible inaccuracies in participant responses. To further validate these findings, it is recommended that future research employs experimental designs to test the effectiveness of interventions based on existential growth, acceptance, and commitment in improving coping mechanisms in MS patients.

Conflict of Interest

The authors declare no conflicts of interest.

Ethical Approval

Before the research started, its objectives were explained to the participants, and the secrecy of their information was ensured. They all filled out and signed the consent form to participate in the research. The Medical Ethics Committee of Yazd University also approved the research ethically (ID: IR.ARDAKAN.REC.1403.016).

Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work the authors used ChatGPT in order to improve English tone. After using this tool/service, the authors reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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