Research Paper: The Effects of Acceptance and Commitment Therapy on the Sense of Coherence, Locus of Control, and Posttraumatic Growth in Patients With Multiple Sclerosis

Jalal Younesi1 , Javad Kazemi1*, Mohammad Saeed Khanjani1 , Asghar Dadkhah1 , Akbar Biglarian2 , Banafsheh Ebrahimi Barmi3

1. Department of Counseling, Faculty of Counseling, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
2. Department of Statistics, Faculty of Statistics, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
3. Department of Rehabilitation Management, Faculty of Rehabilitation Management, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Objectives: This study aimed to determine the effects of Acceptance and Commitment Therapy (ACT) on the Sense of Coherence (SOC), Locus of Control (LoC), and Posttraumatic Growth (PTG) in patients with Multiple Sclerosis (MS). These factors were explored according to the prevalence of psychological problems in these patients.

Methods: This was a quasi-experimental study with a pre-test, post-test and a control group design. The study population included all patients with MS from Iran’s MS Association in Tehran City, Iran. The study sample included 30 patients (n=15/group) who were selected by purposive sampling technique and according to the study inclusion and exclusion criteria. The study participants were randomly assigned to the experimental and control groups. After obtaining necessary permissions and informed consent, a pre-test was initially performed. The instruments used in this study were the 29-item Antonovsky’s Sense of Coherence Scale; the 29-item Julian Rotter’s Locus of Control Scale, and the 21-item Tedeschi and Calhoun’s Posttraumatic Growth scale. Several studies supported the reliability and validity of these scales. The experimental group received 8 sessions (once a week, each session: 1.5 h) of group Acceptance and Commitment Therapy (ACT). However, the control group received no intervention. After the intervention, according to the instructions, the post-test was performed. Data analysis was conducted using SPSS V. 21. Multivariate Analysis of Covariance (MANCOVA) was performed to examine between-group differences data.

Results: The study findings indicated that ACT was effective on the SOC; however, it had no significant effect on the LoC and PTG (P=0.05).

Discussion: Participation in ACT sessions could enhance the SOC of patients with MS. Accordingly, it can be improved by accepting and enhancing these patients’ commitment to change through psychotherapy approach and increasing their SOC.

Keywords: Acceptance and Commitment Therapy (ACT), Multiple sclerosis, Sense of Coherence (SOC), Locus of control, Posttraumatic Growth (PTG)

ABSTRACT

Objectives: This study aimed to determine the effects of Acceptance and Commitment Therapy (ACT) on the Sense of Coherence (SOC), Locus of Control (LoC), and Posttraumatic Growth (PTG) in patients with Multiple Sclerosis (MS). These factors were explored according to the prevalence of psychological problems in these patients.

Methods: This was a quasi-experimental study with a pre-test, post-test and a control group design. The study population included all patients with MS from Iran’s MS Association in Tehran City, Iran. The study sample included 30 patients (n=15/group) who were selected by purposive sampling technique and according to the study inclusion and exclusion criteria. The study participants were randomly assigned to the experimental and control groups. After obtaining necessary permissions and informed consent, a pre-test was initially performed. The instruments used in this study were the 29-item Antonovsky’s Sense of Coherence Scale; the 29-item Julian Rotter’s Locus of Control Scale, and the 21-item Tedeschi and Calhoun’s Posttraumatic Growth scale. Several studies supported the reliability and validity of these scales. The experimental group received 8 sessions (once a week, each session: 1.5 h) of group Acceptance and Commitment Therapy (ACT). However, the control group received no intervention. After the intervention, according to the instructions, the post-test was performed. Data analysis was conducted using SPSS V. 21. Multivariate Analysis of Covariance (MANCOVA) was performed to examine between-group differences data.

Results: The study findings indicated that ACT was effective on the SOC; however, it had no significant effect on the LoC and PTG (P=0.05).

Discussion: Participation in ACT sessions could enhance the SOC of patients with MS. Accordingly, it can be improved by accepting and enhancing these patients’ commitment to change through psychotherapy approach and increasing their SOC.

* Corresponding Author:
Javad Kazemi, PhD.
Address: Department of Counseling, Faculty of Counseling, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
Tel: +98 (21) 22180061
E-mail: kazemi012@gmail.com
Highlights

- ACT can enhance the SOC of patients with MS.
- SOC contributes to the independence of patients with MS.
- SOC contributes to the enhanced psychological wellbeing of patients with MS.

Plain Language Summary

Patients with MS may be unable to prevent uncomfortable thoughts and emotions; however, they can modify their reaction to these thoughts and emotions through ACT. As a result, these thoughts and emotions become less annoying and harmful. Finally, patients with MS experience better emotions, which in turn, reinforces the SOC in them. The SOC provides the basis for personal independence, as the ultimate goal of rehabilitation.

1. Introduction

Multiple Sclerosis (MS) persists for a long time and affects one’s healthy functioning [1]. The prevalence of MS is 33 per one million individuals [2]. Researchers have identified various factors, including genetics, autoimmune mechanisms, and in particular viral infections in this respect [3]. No definitive cure is discovered for MS. However, the rehabilitation teams are working to improve these patients’ lives. In addition to physical rehabilitation, it is necessary to pay attention to psychological rehabilitation in patients with MS [4].

An aspect requiring psychological rehabilitation in patients with MS is difficulty in the Sense of Coherence (SOC). An SOC is defined as a general orientation, a deepening, enduring, and dynamic sense of confidence in life events; they are understandable, structured, and explainable; there exist resources to cope with them, and all these events are meaningful and deserve consideration [5]. By disrupting the psychological SOC, patients somehow lose their dominance over daily living activities. Accordingly, they feel influenced by external (rather than internal) characteristics, a concept recognized as the Locus of Control (LoC) [6].

If individuals with chronic illness achieve an SOC, which has an internal LoC, they will foster a sort of meaning beyond the illness; a meaning that will stimulate growth after being affected by the disease, i.e. called Posttraumatic Growth (PTG). This factor leads to growth in psychological components. PTG is a component of positive alternations, characterized by the experience of traumatic and unpleasant events with a return to a higher level of pre-traumatic function [7].

An approach that appears to contribute to the rehabilitation of patients with MS is Acceptance and Commitment Therapy (ACT). In other words, the treatment process is based on acceptance, commitment, and preventing avoidance behaviors. This principle seeks to teach patients to abandon the idea of suppressing anxiety; dissociate themselves from disturbing thoughts; and possibly allows the patients [8] to experience unpleasant emotions rather than avoiding them. Furthermore, some unpleasant emotions develop in patients with MS due to the unclear prognosis of the disease; avoidance behaviors in experiencing those emotions cause achieving decreased coherence [9]. By disrupting the SOC, one is drawn to the external LoC, and subsequently, the odds of PTG is reduced.

The purpose of ACT is to create flexibility. Moreover, flexible individuals experience a high SOC. Besides, in healthy individuals, a high SOC is associated with internal LoC. The more internal the LoC, the higher it is associated with PTG. However, for those with chronic illnesses, this matter remains unclear, especially in patients with MS whose prognosis is ambiguous. There exist a concurrent fear of aggravated illness and the hope of recovery. These thoughts may affect SOC, LoC, and PTG. This issue must be clarified for patients with MS. ACT addresses thought’s context; however, other interventions focus on thought’s content. Working on content is more difficult and time-consuming. This is especially true for individuals with chronic illnesses, like MS. However, ACT works faster, changes the context of thought as well as the reactions of patients to their thoughts and emotions.

Therefore, the current study aimed to determine the effects of ACT on the SOC, LoC, and PTG in patients with MS.
with MS. These factors were explored according to the prevalence of psychological problems in these patients.

2. Methods

This was a quasi-experimental study with a pre-test, post-test, and a control group design. The study population comprised patients with MS referring to Iran’s MS Association in Tehran, City, Iran, from November 2018 to December 2018. Of 69 patients with MS, 30 were randomly selected by purposive sampling method. Accordingly, the study subjects were divided into the experimental and control groups (n=15/group). The following tools were used to collect the necessary data:

1) Antonovsky’s 29-item SOC scale [10]: It consists of the subscales of comprehensibility, manageability, and meaningfulness. The questionnaire’s scoring is based on a Likert-type scale; each question has 7 items, ranging from one to 7. Generally, the minimum and maximum obtainable scores are 29 and 203, respectively. The scores 29-58 indicate low coherence, 58-116 demonstrate moderate coherence, and the scores >116 reflect high coherence. A study explored the validity and reliability of the 29-item questionnaire concerning the data obtained from 20 countries, and the following results were obtained. In 26 studies using the 29-item questionnaire, Cronbach’s alpha coefficient for internal consistency was equal to 0.82-0.95. The correlation obtained from the test-retest method indicated a significant stability of 0.54 within two years. Ericsson and Lindstrom performed a systematic review on 458 articles and 13 doctoral dissertations; they concluded that the questionnaires of the Sense of Coherence (29-item & 13-item versions) were valid and reliable. In Iran, Alipour et al. obtained a Cronbach’s alpha coefficient of 0.96 for the same. Besides, the construct validity of this questionnaire was calculated as 76% [11].

2) Julian Rotter’s 29-item LoC scale [12]: It consists of two options of A and B, scored as one and zero, respectively. Of the 29 questions, questions 1, 8, 14, 19, 24, and 28 are filler items and receive no score. Of the remaining 23 questions, a score of >9 presents an external LoC, and a score of <9 suggests an internal LoC. Cronbach’s alpha coefficient for this scale was obtained as 0.87. Moreover, the reliability coefficient of the split-half method was reported to be 0.84 [13]. Jafri et al. approved the validity of the tool as per experts’ opinions and obtained a Cronbach’s alpha coefficient of 0.87 for it [14].

3) The Tedeschi and Calhoun’s 21-item PTG scale [15] is responded on a 5-point Likert-type scale, i.e. the score ‘zero’ indicates strongly disagree, and the score 4 reflects strongly agree. It comprises 5 subscales of relationship with others, new facilities, personal power, spiritual change, and the value of life. Its Cronbach’s alpha coefficient was measured as 0.90. Besides, the same value for each subscale ranged from 0.67 to 0.85 [13]. In Iran, Mahmoodi et al. obtained a Cronbach’s alpha coefficient of 0.92 for it, and the construct validity of this questionnaire was computed as 68.98% [16].

The study inclusion criteria included the age of 20-55 years, educational level of at least high-school diploma, residing in Tehran, and the period past the disease onset to be ≥1-5 years. Furthermore, patients with the following MS types were studied: Primary Progressive MS (PPMS); Secondary Progressive MS (SPMS), and 3-Progressive-Relapsing MS (PRMS). Among the study groups, the patients with Expanded Disability Status Scale (EDSS) scores of 4-5 were selected.

The exclusion criteria included having RRMS, substance or alcohol abuse, undergoing another psychological treatment concurrently, >2 absenteeism sessions, and presenting cognitive problems, according to the Mini-Mental State Exam (MMSE).

The treatment was conducted based on Twohig’s ACT protocol [17]; according to which, 8 weekly sessions (1.5 hours) were held at the MS Community Rehabilitation Clinic in Tehran. The content of the treatment sessions is summarized in Table 1.

Accordingly, the first pre-test was performed. Then, the experimental group was treated with 8 weekly sessions of ACT, each lasting 1.5 hours. However, the control group received no treatment during this period. After the treatment sessions, the post-test was administered.

The PTG questionnaire was completed at the post-test (three months after the end of the sessions); according to the research nature and the experts’ opinions, PTG does not form immediately and may occur after the treatment [15].

Finally, the obtained data were analyzed in SPSS. The Mean±SD indices in the descriptive part and Multivariate Analysis of Covariance (MANCOVA), in the inferential part, were used. The Chi-squared test was applied to investigate the differences between the demographic characteristics of the experimental and control groups. This research was registered under the Code IRCT20180710040411N1.
3. Results

The present study evaluated the effects of ACT on the SOC, LoC, and PTG in patients with MS (n=15/ experimental & control groups). Besides, MANCOVA assumptions are reported in Table 2 and Table 3.

Table 2 presents that the distribution of the studied variables in the sample was normal. This is because the Z-values were not significant at P<0.05.

Table 3 illustrates that the error variance of the variables in the study groups was homogeneous. This is because the F-value was not significant at P<0.05.

Table 4 highlights that the Chi-squared test value was not significant in any of the demographic variables. In other words, there was no significant difference in the demographic variables between the study groups.

According to Table 5, the mean changes of all 3 variables were negligible in the control group; however, in the experimental group, the mean change in the variable of SOC was significant and reached from 68.14 in the pre-test to 153.92 in the post-test. Furthermore, the LoC and PTG demonstrated no significant mean score changes. The MANCOVA was used to compare the experimental and control groups in terms of SOC, LoC, and PTG scores (Table 6).

4. Discussion

The obtained results suggested that ACT increased the SOC in patients with MS; however, no significant changes were found in the LoC and PTG. In explaining these findings, it can be stated that individuals with strong SOC are more flexible in stressful events [18]. Therefore, the presented ACT possibly improved the flexibility of the study participants; accordingly, their SOC has increased.

ACT might have created an emotionally-accepting experience of emotion-regulation in the explored patients, i.e. changed the SOC in them. On the other hand, Antonovsky believed that unexpected and uncontrollable experiences and uncertain situations weaken the SOC [19].

It may be assumed that patients with MS include these experiences. Besides, the intervention group, regardless of the particular acquired skills, may have experienced reduced levels of emotion (uncontrollable & unexpected). This might have been resulted from receiving ACT; consequently, the SOC has raised. Higher scores on the SOC have led to the adaptation to chronic diseases.

<table>
<thead>
<tr>
<th>Session</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introducing and communicating with group members; explaining the general rules of the sessions; distributing the questionnaires.</td>
</tr>
<tr>
<td>2</td>
<td>Discussing and evaluating MS-related experiences as well as the metaphor of ‘someone in the well’; creating creative despair.</td>
</tr>
<tr>
<td>3</td>
<td>Explaining ‘control’ as a problem to control the destructive effects of MS, as well as the metaphor of ‘a ball in the pool’; concerning controlling behaviors; assigning home tasks.</td>
</tr>
<tr>
<td>4</td>
<td>Reviewing behavioral tasks and commitment; introducing the fault; applying cognitive fault techniques; discussing the ‘lemon slice’ metaphor; performing the technique of separation between self and thoughts; assigning the home task of identifying the extent of knowing oneself identical with the thoughts related to MS.</td>
</tr>
<tr>
<td>5</td>
<td>Reviewing behavioral tasks and commitment; blaming oneself as the origin of MS as a problem separate from self, while considering oneself as an observer; practicing separation between oneself, MS, internal experiences, and behavior.</td>
</tr>
<tr>
<td>6</td>
<td>Applying mindfulness techniques; discussing conflicts between experience and mind; mind modeling; training inner experiences as a process; practicing mindfulness techniques by eating raisins.</td>
</tr>
<tr>
<td>7</td>
<td>Introducing the concept of value; discovering the practical values of life before, during, and after MS development.</td>
</tr>
<tr>
<td>8</td>
<td>Understanding the nature of desire and commitment; determining patterns of practice corresponding with the intrinsic values discovered with MS disease and the action based on them; post-test summation and implementation.</td>
</tr>
</tbody>
</table>
Moreover, some studies have supported it as a protective factor against the intolerable pain requirements for that disease [20, 21]. Some studies reported that the SOC, as a mediator variable, leads to adaptive strategies for coping with stress in patients with MS [5].

Mindfulness and ACT provide greater psychological adjustment for coping with trauma [21, 22]. Individuals with disabilities experience decreased cohesion due to the effects of physical limitations and the lack of control over their lives. Besides, in critical situations, their SOC is severely impaired, leading to further inappropriate behaviors and vulnerability [23]. The ultimate goal of ACT, in addition to flexibility, is a psychological adaptation to conditions (sometimes unchangeable), caused by illness. Therefore, this problem could explain the improved SOC in this study.

Additionally, there was a significant relationship between individual differences in the SOC and selecting a healthy lifestyle [24]. The effects of lifestyle interventions have been demonstrated on the SOC in individuals with mental health issues [25]; in other words, ACT is more of a lifestyle than a therapeutic approach. Therefore, ACT, using techniques, such as mindfulness and cognitive defusion, have modified the lifestyle of the investigated patients with MS. As a result, the relationship between lifestyle and cohesion has significantly changed in them.

According to other studies, a high SOC has accepted its limitations and, consequently, weakened the stigma associated with MS disease [26]. The present study focused on ACT in terms of accepting emotions due to the limitations associated with the disease; therefore, it seems to reduce the effects of MS stigma, leading to the increased SOC.

<table>
<thead>
<tr>
<th>Index</th>
<th>SOC</th>
<th>LoC</th>
<th>PTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>0.287</td>
<td>0.247</td>
<td>0.226</td>
</tr>
<tr>
<td>P</td>
<td>0.003</td>
<td>0.003</td>
<td>0.005</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index</th>
<th>SOC</th>
<th>LoC</th>
<th>PTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>0.274</td>
<td>0.254</td>
<td>0.243</td>
</tr>
<tr>
<td>P</td>
<td>0.003</td>
<td>0.011</td>
<td>0.002</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC</td>
<td>0.22</td>
<td>1</td>
<td>27</td>
<td>0.64</td>
</tr>
<tr>
<td>LoC</td>
<td>2.11</td>
<td>1</td>
<td>27</td>
<td>0.15</td>
</tr>
<tr>
<td>PTG</td>
<td>0.62</td>
<td>1</td>
<td>27</td>
<td>0.43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>-</th>
<th>Education</th>
<th>Age</th>
<th>Gender</th>
<th>Marital Status</th>
<th>Job</th>
<th>The Extent of Lesion</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>χ²</td>
<td>2</td>
<td>5.42</td>
<td>0</td>
<td>0.14</td>
<td>3.37</td>
<td>0</td>
<td>2.21</td>
</tr>
<tr>
<td>P</td>
<td>0.73</td>
<td>0.14</td>
<td>1</td>
<td>7.0</td>
<td>0.06</td>
<td>1</td>
<td>033</td>
</tr>
</tbody>
</table>
No study has directly examined the effects of ACT on SOC. However, some research has employed other interventions, including Adlerian hope-therapy and lifestyle. The relevant results indicated a significant increase in the SOC among women with motor disabilities. Furthermore, mindfulness intervention was reported to positively influence SOC in patients with asthma [27]. Another study suggested that cognitive-behavioral happiness training intervention was effective on the SOC in patients with type 2 diabetes [28]. Therefore, the present study results were in line with those of the investigations mentioned above in terms of their effect on increasing the SOC.

The LoC is sometimes altered due to the removal of the external source factor [29]; there is an external agent in these patients and perhaps accepting this agent, rather than removing or altering the external factor, has failed to make a significant difference in the LoC scores. However, as a result of the treatment, not the method of the treatment and the therapeutic target, the LoC changes may also occur over time. There was also a relationship between the internal LoC and the problem-focused coping style [30].

ACT mainly focuses on the acceptance of emotions. A great body of literature revealed the effects of ACT on emotion regulation in different patients [31, 32]. However, this intervention was unable to significantly change the LoC in the explored patients. Moreover, some studies have reported that 88% of patients with S have an LoC, i.e. either modest or time-consuming, depending on the state of the disease. Such conditions probably change as soon as the disease achieves a stable mode. Increasing the source of external control is associated with the exacerbation of MS symptoms [33].

Contrary to the current study findings, demonstrating no significant difference in the mean LoC scores, another study indicated that ACT failed to decrease the sever-

### Table 5. Descriptive indices in the SOC, LoC, and PTG before and after the intervention

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test, Post-test</td>
<td>Pre-test, Post-test</td>
</tr>
<tr>
<td>SOC</td>
<td>66.72±83.24</td>
<td>53.73±23.20</td>
</tr>
<tr>
<td>LoC</td>
<td>93.14±75.4</td>
<td>80.13±78.3</td>
</tr>
<tr>
<td>PTG</td>
<td>53.23±83.6</td>
<td>86.19±96.5</td>
</tr>
</tbody>
</table>

### Table 6. MANCOVA results to examine between-group differences in post-intervention research variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source of Variance Index</th>
<th>Sum of Squares</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
<th>Eta Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC</td>
<td>Pre-test</td>
<td>663.36</td>
<td>1</td>
<td>663.36</td>
<td>075.0</td>
<td>786.0</td>
<td>003.0</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>681.40509</td>
<td>1</td>
<td>641.40509</td>
<td>067.83</td>
<td>05.0</td>
<td>791.0</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>819.10728</td>
<td>22</td>
<td>674.487</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LoC</td>
<td>Pre-test</td>
<td>130.11</td>
<td>1</td>
<td>130.11</td>
<td>573.0</td>
<td>457.0</td>
<td>025.0</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>273.43</td>
<td>1</td>
<td>273.43</td>
<td>22.2</td>
<td>150.0</td>
<td>092.0</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>030.427</td>
<td>22</td>
<td>410.19</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PTG</td>
<td>Pre-test</td>
<td>164.0</td>
<td>1</td>
<td>164.0</td>
<td>003.0</td>
<td>957.0</td>
<td>005.0</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>80.129</td>
<td>1</td>
<td>80.129</td>
<td>33.2</td>
<td>141.0</td>
<td>096.0</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>85.1225</td>
<td>22</td>
<td>708.55</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The main purpose of rehabilitation is to implement various rehabilitation sciences to identify, enhance, and apply the patient’s remaining abilities in autonomy. The feeling of low cohesion reduces the patient’s focus on these goals and leads to dependence and inactivity. Therefore, therapists can assist the patients to feel better regarding the chronicity of MS. ACT seems to be appropriate for achieving these goals, and it has been effective in increasing the SOC in patients with MS.

5. Conclusion

The main purpose of rehabilitation is to implement various rehabilitation sciences to identify, enhance, and apply the patient’s remaining abilities in autonomy. The feeling of low cohesion reduces the patient’s focus on these goals and leads to dependence and inactivity. Therefore, therapists can assist the patients to feel better regarding the chronicity of MS. ACT seems to be appropriate for achieving these goals, and it has been effective in increasing the SOC in patients with MS.

Ethical Considerations

Compliance with ethical guidelines

To comply with ethical considerations, an informed consent form was obtained from all study patients before conducting the study. Besides, we observed the principle of confidentiality and information secrecy. This study was approved by the Research Ethics Committee of the University of Social Welfare and Rehabilitation Sciences (Code: IR.USWR.REC.1397.019).

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Authors’ contributions

Conceptualization: Jalal Younesi; Methodology: Asghar Dadkhah; Data collection: Banafsheh Ebrahimi Barmi; Data analysis: Akbar Biglarian, and Supervision: Mohammad Saeed Khanjani.

Conflict of interest

The authors declared no conflicts of interest.

Acknowledgments

We are extremely grateful to the staff of the University of Social Welfare and Rehabilitation Sciences. We also thank Iran’s MS Association officials and all patients with MS for participating in this study.

References


This Page Intentionally Left Blank