Psychometric validation of the Arabic multiple sclerosis resiliency scale: Uncovering resilience factors in Lebanese MS patients for clinical and research advancements

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ABSTRACT

Background: Multiple sclerosis (MS) is an autoimmune demyelinating disease that involves the central nervous system (CNS). Individuals with Multiple Sclerosis (MS) may experience difficulty adapting to their diagnosis as the unpredictable nature of the disease can be challenging to cope with.
Methods: The purpose of this study is twofold. First, we have culturally adapted and analyzed the Arabic version of the Multiple Sclerosis Resiliency Scale (MSRS) psychometric properties. Second, we aimed to explore resilience in a sample of Lebanese patients with MS in the face of the chronic disease and financial hardship that Lebanon is going through to evaluate their strengths and struggles. The sample consisted of 306 participants aged between 18 and 79 diagnosed with MS for at least one year.
Results: After examining criterion validity, construct validity, internal consistency, and test-retest reliability, the Arabic version of the MSRS exhibited good psychometric properties. The study also revealed that resilience increases with age and lower disability scores. Additionally, individuals with higher resilience levels displayed lower levels of depression. The research revealed that MS patients have high resilience, mainly relying on cognitive and emotional strategies, social support from family and friends, MS peer support, and spirituality.
Conclusion: These findings highlight the importance of emotional coping strategies and social support in building resilience among MS patients.

1. Introduction

Multiple Sclerosis (MS) is a chronic inflammatory disease affecting the brain and the spinal cord. Lebanon, a small country in the Middle East, is a moderate to high-risk country for MS, with a prevalence of 62.91 cases per 100,000 persons in 2018 and an overall incidence of 8.36 cases per 100,000 persons [48]. According to the National Multiple Sclerosis Society [26], it can be difficult for persons with MS (PwMS) to adjust to the diagnosis due to the unpredictable nature of the disease.

Lebanese PwMS face two significant uncertainties; the unpredictable nature of their chronic illness and the instability of their daily life struggles in a country facing ongoing economic and political challenges. Lebanon has been facing a severe and escalating economic and financial crisis since 2019. The crisis has been further compounded by the COVID-19 pandemic and a major explosion at its port [49]. The country's healthcare sector is struggling with shortages of essential medicines such as MS disease-modifying therapies (DMTs) and medical supplies, and many healthcare workers have left the country [50]. The situation remains dire, with hyperinflation and ongoing political instability [10,37].

Resilience is the ability to bounce back from difficult experiences and adapt to adversities, trauma, tragedies, and threats [2]. It is a protective factor that improves MS patients' physical and mental health while contributing to healthy aging [19]. Resilience is associated with healthier lifestyle behaviors, more social support and financial security, and lower stress, depression, and anxiety symptoms [1,19,23,38]. It has also been shown to be associated with lower disability [11,31].

Several factors have been shown to affect resilience negatively or positively, namely depression [4,13,35,36,44], anxiety [13,36,44], and

personality traits [30,32]. Depression, anxiety, and neuroticism correlate negatively with resilience in PwMS [4,13,32,35]. On the other hand, Personality traits like extraversion, agreeableness, conscientiousness, and openness to experience contribute to positive resilience outcomes [30].

In Lebanon, Massouh [25] recently showed that PwMS had high levels of resilience, with 65% of the sample scoring moderately high to high on resilience. Moreover, 44% of the variability in resilience scores was predicted by depression, extraversion, and social support, showing that the higher the social support and extraversion, the lower the depression and higher the resilience. In this study [25], resilience was measured using the Resilience Scale [42] due to the unavailability at the time of a resilience scale that is specific for PwMS, such as the Multiple Sclerosis Resiliency Scale (MSRS) [12].

The purpose of this study was to evaluate the psychometric properties of the Arabic version of the MSRS among a sample of Lebanese PwMS and explore the factors associated with resilience in this sample. Establishing a valid psychometric measure and delineating the factors associated with resilience in PwMS will help healthcare providers identify protective and risk factors associated with resilience. This information would be valuable for healthcare providers of Arabic-speaking PwMS, as it will allow them to understand better how their patients cope with the disease, which could inform clinical practice.

2. Methods

This is a cross-sectional study on a sample of PwMS recruited from the Nehme and Therese Tohme Multiple Sclerosis Center at the American University of Beirut Medical Center (AUBMC).

2.1. Measures

Demographics: Data on patients' age, sex, diagnosis, treatment (disease-modifying therapy), disease duration, and EDSS were collected.

The *Multiple Sclerosis Resiliency Scale* (MSRS; [12]) aims to assess the level of resilience of PwMS based on five domains: (1) Emotional and Cognitive Strategies, (2) Physical Activity and Diet, (3) MS Peer Support, (4) Support from Family and Friends and (5) Spirituality. Patients are provided with statements and are asked to rate their level of agreement on a 4-point Likert scale with 1 = Strongly disagree and 4 = Strongly agree. The 25-item instrument has been shown to have good psychometric properties with high internal consistency in each of the five domains: Emotional and Cognitive Strategies ($\alpha = 0.92$), Physical Activity and Diet ($\alpha = 0.77$), MS Peer Support ($\alpha = 0.82$), Support from Family and Friends ($\alpha = 0.79$), and Spirituality ($\alpha = 0.91$) [12]. Permission to translate and use the Multiple Sclerosis Resiliency Scale (MSRS) was obtained from the author prior to the study.

The *Hopkins Symptoms Checklist* (HSCL-25; [8]) was used to evaluate depression and anxiety. The 25-item self-report scale was validated on a Lebanese sample [51] and currently consists of two factors, the first one evaluating anxiety (10 items) and the second evaluating depression (15 items). Patients were asked to state how frequently they are experiencing each symptom with 1 = Not at all and 4 = Extremely. The instrument was shown to have good psychometric properties with high internal consistency ($\alpha = 0.85$) [25].

The *Big-Five Personality Inventory* (BFI-10; [32]) evaluates five personality traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Patients are asked to rate their level of agreement on a 5-point Likert scale with 1 = Strongly disagree and 5 = Strongly agree. The BFI-10 was shown to have good psychometric properties, with $\alpha = 0.77$ for Extraversion, $\alpha = 0.70$ for Agreeableness, $\alpha = 0.78$ for Conscientiousness, $\alpha = 0.79$ for Neuroticism, and $\alpha = 0.76$ for Openness [34].

2.2. Procedure

To ensure equivalence of the translated MSRS, we first followed the World Health Organization's instrument translation approach [46]; the English version of MSRS was translated to Arabic by the first author, a bilingual healthcare professional. The translation was then reviewed by an expert panel consisting of the original translator and researchers with experience in instrument development and translation. The expert panel produced a finalized forward translation of the instrument. The Arabic MSRS was then back-translated to English, the original language, by an independent translator unfamiliar with the instrument. The two translators raised and discussed discrepancies between the forward and back translations for reconciliation [46].

The second step was to pilot test the finalized Arabic instrument on 10 Nehme and Therese Tohme Multiple Sclerosis Center healthcare professionals. Each of the 5 domains of the instrument was tested on 10 healthcare professionals, males and females, above 18 years, from different socioeconomic backgrounds. The pre-test involved cognitive interviewing, ensuring each question was understood, enquiring about ambiguous words, and asking participants to reformulate each question in their own words to ensure no significant cross-cultural variabilities.

A trained research assistant administered the final version of the Arabic MSRS, followed by the HSCL-25 and BFI-10, to a sample of 306 MS patients at the Nehme and Therese Tohme Multiple Sclerosis Center. After completing the interview, participants were given a list of tips the National Multiple Sclerosis Society provided to improve resilience in PwMS.

2.3. Data analysis

All data were analyzed using SPSS Statistics version 27.0 for Windows. Descriptive and inferential statistics were applied. Continuous variables are reported using means and standard deviations, while categorical variables are reported using frequencies and percentages. For inferential statistics, a *p*-value ≤ 0.05 was considered statistically significant.

To evaluate the psychometric properties of the MSRS, we first evaluated the association between the MSRS factors. Bivariate correlations were computed between the 5 resilience subscales.

Next, criterion and construct validity and reliability were evaluated. Internal consistency and test-retest reliability were evaluated for reliability. To evaluate criterion validity, a Pearson's correlation test was run to evaluate the relationship between resilience, depression, and anxiety. To evaluate construct validity, a Confirmatory Factor Analysis (CFA) was run on the total sample ($N = 306$) and the final version of the translated scale using the original (English version) 5-factor structure of the scale. Items were checked for normality and outliers before CFA was performed. In order to examine fit, the following goodness of fit measures were assessed: (1) Chi-square, (2) CMIN/DF, (3) CFI, and (4) RMSEA. Chi-square should not be statistically significant for adequate fit, CMIN/DF should be <3 for acceptable fit [18], CFI should be above 0.9 for acceptable fit [9] and above 0.95 for excellent fit [43], and RMSEA should be below 0.05 for reasonable fit [24]. Finally, Cronbach alphas were measured for internal consistency and test-retest reliability.

To explore the variables related to resilience, including age, sex, disability, disease duration, personality traits, depression, and anxiety, we used Pearson correlation coefficients, independent samples *t*-tests, one-way ANOVA, or their non-parametric alternatives as appropriate. Variables with a *p*-value <0.2 at the univariate level were entered into multivariable linear regression models to examine adjusted associations. Regression diagnostics were inspected for linearity, including collinearity and residual analysis.

3. Results

3.1. Participants

A total of 306 PwMS were enrolled and completed the data collection in this study. We followed the recommended rule for factor analysis, which consisted of ten subjects per scale item [28]. Participants were aged between 18 and 79 (M = 37.68; SD = 12.24), diagnosed with MS for at least one year following the revised McDonald MS diagnostic criteria, and had an Expanded Disability Status Scale (EDSS; [21]) score ranging between 0 and 6.5 (Table 1).

3.1.1. Psychometric properties of the MSRS

Our first objective was to examine the psychometric properties of the Arabic version of the Multiple Sclerosis Resiliency Scale (MSRS).

3.2. Validity

3.2.1. Criterion validity

Results showed an inverse relationship between resilience and both anxiety and depression. More specifically, there was a moderate and statistically significant inverse correlation between resilience and anxiety (r = −0.41) and depression (r = −0.61).

3.2.2. Construct validity

The Chi-square was statistically significant, showing that the model could be improved. However, the CMIN/DF met the prerequisites and was below 3. Moreover, the CFI and the RMSEA values approached the desired cut-off scores (Table 2).

Table 1
Patient characteristics.

	F	%	M	SD
Age			37.68	12.24
Sex				
Male	104	34		
Female	202	66		
MS type				
RRMS	242	79.1		
PPMS	12	3.9		
SPMS	41	13.4		
CIS	2	0.7		
Balóconcentric sclerosis	1	0.3		
Indeterminate	8	2.6		
Treatment				
Alemtuzumab	1	0.3		
Cladribine	9	2.9		
Dimethyl Fumarate	16	5.2		
Fingolimod	42	13.7		
HSCT	1	0.3		
Interferon Beta	24	7.8		
Mycophenolate	1	0.3		
Natalizumab	25	8.2		
Ocrelizumab	24	7.8		
Ofatumumab	2	0.7		
Peginterferon Beta	5	1.6		
Rituximab	123	40.2		
Teriflunomide	15	4.9		
No treatment	14	4.6		
Unknown	4	1.3		
Disease duration			8.16	6.76
EDSS			1.99	1.71

*RRMS: Relapsing Remitting MS, *PPMS:* Primary Progressive MS, *SPMS:* Secondary Progressive MS, *CIS*: Clinically Isolate Syndrome, *HSCT*: Hematopoietic Stem Cell Transplantation, *EDSS:* Expanded Disability Status Scale, *F*: Frequency, *M*: Mean, *SD*: Standard Deviation.

Table 2
Psychometric properties of the MSRS and other utilized measures.

MSRS CFA goodness of fit measures						
Model	Chi-Square	Df	*p* value	CMIN/DF	CFI	RMSEA
5-factor structure	591.89	265	0.00	2.23	0.89	0.06

Reliability and convergent validity	
Scales used	Cronbach's alpha
1) The Multiple Sclerosis Resiliency Scale (MSRS)	0.84
1a. Emotional and Cognitive Strategies	0.89
1b. Physical Activity and Diet	0.82
1c. MS Peer Support	0.94
1d. Support from Family and Friends	0.72
1e. Spirituality	0.77
2) The Hopkins Symptoms Checklist (HSCL-25)	0.91
2a. HSCL-Anxiety	
2b. HSCL-Depression	
3)The Big-Five Personality Inventory (BFI-10)	0.70

3.3. Reliability

3.3.1. Internal consistency

To evaluate reliability, we measured the internal consistency of the 5-factor structure. The total score showed good internal consistency with α = 0.84. Moreover, all of the subscales of Cronbach's alphas are above 0.7, indicating good internal consistency (Table 2).

3.3.2. Test-retest reliability

A test-retest was conducted on a smaller group of 50 individuals with MS within 3 weeks. The outcomes revealed excellent test-retest reliability with an Intraclass Correlation Coefficient (ICC) of 0.94 (95% CI: 0.90 to 0.96, F 17.55, df 49 and p < 0.000).

3.3.2.1. Resilience in MS patients. Participants had a high resilience score (M = 75.99; SD = 12.01), with no significant difference between males and females. More specifically, MS patients scored highest on Spirituality (M = 6.78; SD = 1.91) and Support from Family and Friends (M = 16.92; SD = 3.36), followed by Emotional and Cognitive Strategies (M = 40.30; SD = 8.58), Physical Activity and Diet (M = 7.70; SD = 3.02), and MS Peer Support (M = 4.32; SD = 2.40) (Table 3). To explore each domain's distinctiveness and individual subscales' impact on the overall score, we conducted a correlation analysis between the subscales and the total score (refer to Table 3). Our findings revealed that each subdomain possessed distinct qualities, with Emotional and Cognitive Strategies, Support from Family and Friends, and Physical Activity and Diet exhibiting a strong correlation with the total score. The total score of the MSRS was also inversely correlated with EDSS with r = −0.21; p-value <0.001, but no association was found between the total resilience score, age, or disease duration. Moreover, EDSS was associated with the Emotional and Cognitive Strategies (r = −0.17; p-value = 0.004) and the Physical Activity and Diet (r = −0.17; p-value = 0.004) subscales of the MSRS.

3.3.2.2. Anxiety and Depression in PwMS and association with resilience. Despite the high levels of resilience found in our sample, they scored high on the total HSCL score (M = 3.94; SD = 1.20). On average, the participants' anxiety score was M = 1.94 (SD = 0.64), while their depression score was M = 1.99 (SD = 0.65). Moreover, 8.2% of the participants (n = 24) expressed suicidal ideations. Having suicidal ideations was negatively correlated with resilience (r = −0.30, p < 0.01). We evaluated the characteristics of this sub-sample using one-way ANOVA with post-hoc Bonferroni tests. We utilized the HSCL question's categorization for suicidal thoughts, which rates the severity of

Table 3

MSRS total and subscales scores, and correlations between subscales and total scores.

Subscale	Mean	SD	Number of items	Plausible range	1	2	3	4	5	6
1) Emotional and Cognitive Strategies	40.30	8.58	13	0–52	1	0.21**	0.20	0.28**	0.11	0.87**
2) Physical Activity and Diet	7.70	3.02	3	0–12		1	0.11*	0.08	0.02	0.45**
3) MS Peer Support	4.32	2.40	2	0–8			1	0.15**	0.12*	0.31**
4) Support from Family and Friends	16.92	3.36	5	0–20				1	0.09	0.55**
5) Spirituality	6.78	1.91	2	0–8					1	0.30**
6) Total score	75.99	12.01	25	0–100						1

Note: $*p < 0.05$, $**p < 0.01$.

suicidal thoughts on a scale of 1 to 4, with 1 indicating non-suicidal thoughts and 4 indicating highly suicidal thoughts. Results showed that those who were not suicidal had significantly higher resilience scores (M = 77.39, SD = 11.09) than those who were a little suicidal (M = 63.33, SD = 14.25), quite a bit suicidal (M = 61.50, SD = 11.27), or highly suicidal (M = 63.37, SD = 12.64). Non-suicidal participants also had higher scores on the Emotional and Cognitive Strategies subscale of resilience (M = 41.37, SD = 7.85) compared to those who were a little suicidal (M = 31.42, SD = 10.37), quite a bit suicidal (M = 28.75, SD = 3.50), and highly suicidal (M = 29.37, SD = 10.29), and the difference was statistically significant. Non-suicidal participants also had significantly higher scores on the Support from Family and Friends subscale of resilience (M = 17.15, SD = 3.21) compared to those who were a little suicidal (M = 13.75, SD = 2.80). However, no significant difference was observed between those with suicidal ideation and those without in terms of Spirituality, MS Peer Support, and Physical Activity and Diet (Table 4).

As expected, depression scores significantly increased based on suicidality level. Non-suicidal individuals had significantly lower depression (M = 1.90, SD = 0.60) compared to those who were a little suicidal (M = 2.67, SD = 0.60) and those who were highly suicidal (M = 3.06, SD = 0.52) (Table 4).

3.3.2.3. Personality traits in PwMS and association with resilience. The participants received an average score of M = 7.05; SD = 2.09 for Agreeableness, M = 7.52; SD = 2.42 for Conscientiousness, M = 6.52; SD = 1.56 for Openness to Experience, M = 6.01; SD = 2.40 for Neuroticism, and M = 5.86; SD = 2.26 for Extraversion based on the BFI-10 personality assessment [32].

When evaluating the association between resilience and personality traits, resilience was positively correlated with Agreeableness ($r = 0.27$, $p = 0.004$), Conscientiousness ($r = 0.35$, $p < 0.001$), and Openness to Experience ($r = 0.26$, $p = 0.005$) personality traits and negatively correlated with Neuroticism ($r = -0.36$, $p < 0.001$) personality trait. The association between resilience and Extraversion was not statistically significant.

3.3.2.4. Predictors of resilience in PwMS. To investigate the correlation between resilience and anxiety/depression, along with other significant variables, a linear regression model was executed. The linear regression examined the relationship between resilience (Dependent Variable) and age, sex, EDSS, treatment (yes/no), anxiety, depression, and personality

traits (Independent Variables). The model accounted for 42.3% of the variance in resilience. The statistically significant predictors of resilience were age ($B = 0.21$, $p = 0.023$, 95% CI: 0.03, 0.40), EDSS ($B = -1.88$, $p = 0.006$, 95% CI: -3.20, -0.56), and depression ($B = -9.14$, $p < 0.001$, 95% CI: -13.80, -4.47). As age increases, so does resilience. Additionally, higher levels of resilience may be associated with lower levels of disability and depression. (Table 5).

4. Discussion

The Arabic MSRS showed good psychometric properties, assessed using criterion validity, internal consistency, and test-retest reliability. In terms of criterion validity, consistent with previous studies [4,13,25,35,36,44], depression and anxiety were found to be negatively associated with resilience measured using the MSRS. Moreover, the test-retest reliability score found in our sample was higher than that in Gromisch et al.'s recent study [14].

Regarding the translated MSRS construct validity, the CFA evaluated the original 5-factor structure and showed that the model could be improved. While some measures of goodness of fit met the prerequisites, others had values close to the desired cut-off scores. Although the MSRS showed good psychometric properties overall, further studies are needed to confirm the validity of the suggested 5-factor structure and to evaluate whether a new structure should be explored. This becomes especially important as previous studies evaluating the psychometric properties of the MSRS [12,14,16] have not yet explored construct validity. It is important to conduct additional studies to determine whether the 5-factor structure developed in the West for the MSRS applies to a diverse MS population, as this current study marks the first attempt to adapt and translate it into Arabic.

As for the second objective, our findings suggest that PwMS in Lebanon have high resilience (M = 75.99; SD = 12.01) despite the percentage of patients with suicidal ideation of 8.2%. This aligns closely with Massouh's [25] results, showing that MS patients have high resilience, with 8.1% of the sample expressing suicidal ideations. It is worth noting that these percentages of PwMS with suicidal thoughts are lower

Table 4

One-way analysis of variance in suicidality.

Variable	Df[1]	SS[2]	MS[3]	F
Resilience total score	3	4531.75	1510.58	**11.87****
Emotional and Cognitive Strategies	3	2725.57	908.52	**14.17****
Support from Family and Friends	3	149.96	49.99	**4.75***
Spirituality	3	10.49	3.50	0.98
MS Peer Support	3	2.12	0.71	0.12
Physical Activity and Diet	3	36.76	12.25	1.33
Depression	3	18.47	6.16	**17.03****

$*p < 0.01$; $**p < 0.001$.

Df: Degrees of freedom, *SS:* Sum of squares, *MS:* Mean squares, *F:* F-statistic.

Table 5

Predictors of resilience after checking for multi-collinearity.

Model 1	DV: MSRS Total Resilience		
	B	SE B	β
Age	0.21	0.09	**0.20***
Sex	−3.31	2.23	−0.12
EDSS	−1.88	0.66	**−0.25****
DMT(Y/N)	0.01	4.53	0.00
HSCL-Anxiety	3.36	2.23	0.17
HSCL-Depression	−9.14	2.35	**−0.47*****
Extraversion	−0.20	0.50	−0.04
Agreeableness	0.99	0.54	0.16
Conscientiousness	0.18	0.53	0.03
Neuroticism	−0.79	0.46	−0.15
Openness to Experience	1.56	0.84	0.17
R^2	0.423		
F	**7.80*****		

$*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

than the global rates and those reported in developed countries, which stand at 15% [20]. We contribute these lower levels to higher resilience. Resilience in times of crisis suggests that PwMS in Lebanon can overcome challenges and adapt to their difficulties. This becomes especially true since data collection occurred in 2022, a year characterized by psychosocial adversity and sociopolitical instability in Lebanon [52]. This shortage of medication, fuel, and other necessities does not seem to prevent MS patients from thriving in challenging times.

A key component of resilience was social support, emotional and cognitive strategies, and spirituality. Previous studies have shown that social support plays a protective role and improves resilience in MS patients [4,25]. Silverman et al. [35], through focus group discussions with MS patients, found that social connection was integral to patients' resilience.

Contrary to Hughes et al.'s [16] findings, our research suggests that spirituality significantly strengthens resilience. This inconsistency may be attributed to cultural factors, as Lebanon is a collectivistic society where social connections such as family and friends play an essential role, but also a religious and conservative culture [3] compared to the diversity and variations in cultures found in the United States of America [40] where the MSRS was developed and validated. This further highlights the importance of culturally adapting scales, especially considering the impact of language on worldviews [3], and the magnitude of factors contributing to resilience across cultures.

We found a negative association between MSRS total score and EDSS, mainly the emotional and cognitive strategies, physical activity, and diet. The inverse relationship between emotional and cognitive strategies and disability among PwMS has profound implications for disease management. A resilient person with stronger emotional coping strategies can positively influence their overall approach to their health and foster a proactive attitude toward treatment, encouraging individuals to adhere more consistently to prescribed therapies and lifestyle modifications [5,6]. Moreover, the cognitive strategies that enhance problem-solving and adaptive decision-making contribute to a more informed and empowered approach to disease management. The combination of emotional and cognitive resilience promotes a better understanding of treatment protocols and facilitates the incorporation of healthier habits into daily life.

Moreover, since physical activity and diet were found to be inversely correlated with EDSS, confirming previous studies [11,31], it becomes crucial to encourage MS patients to adopt a healthy lifestyle, as this can not only improve their resilience but potentially their level of disability. Our linear regression results confirm this association further by showing that having lower EDSS, lower depression, and higher age can increase one's likelihood of having higher resilience capacities.

Interestingly, despite the lack of MS associations in Lebanon and the difficulty for MS patients to quickly reach out to one another through support groups or other support, education, and wellness programs, our findings suggest that MS patients in Lebanon rely heavily on social support in order to cope with MS and that this significantly increases their resilience. Therefore, it may be necessary for healthcare providers working with PwMS to encourage their patients to reach out to family and friends in order to increase their well-being and ability to adapt to the adversities that may be caused by MS. Alternatively, healthcare providers may encourage patients to reach out to international MS societies in order to access support groups, activities, and chatrooms that are available online [27], until such resources become available in Lebanon.

5. Conclusion

To our knowledge, this study is the first to culturally adapt and examine the psychometric properties of the Arabic version of the MSRS, which showed good reliability and validity. Despite this study's novelty, it is not without limitations. The cross-sectional study design prevents us from generalizing the results, especially since data collection took place during a time of multiple crises in Lebanon on social, political, and economic levels. Hence, longitudinal studies with a larger sample are required to understand better the level of resilience of PwMS and how they generally cope with the disease. Finally, further studies are needed to confirm the validity of the 5-factor structure of the MSRS or explore a new structure. Since culturally specific factors may drive resilience, validating and culturally adapting the MSRS becomes especially important. It would allow healthcare providers working with MS patients to benefit from a reliable and valid tool that could inform their clinical practice. Future studies may also consider creating social support resources for MS patients and evaluating their impact.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used 'Grammarly' in order to edit and proofread. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

CRediT authorship contribution statement

Nour Yaktine: Writing – original draft, Formal analysis, Data curation, Conceptualization. **Souha Fares:** Supervision, Formal analysis. **Samia J. Khoury:** Writing – review & editing, Supervision, Project administration, Methodology. **Hala Darwish:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Conceptualization.

Declaration of Competing Interest

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