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Coping with Health Injuries and Problems: Psychometric Evaluation of an Iranian Scale for Behavioral Rehabilitation Strategies in Patients with Multiple Sclerosis

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Quantitative Study

Abstract

Background: The numerous psychophysical problems caused by multiple sclerosis (MS) decrease quality of life (QOL) and individual and social performance. Finding solutions to these problems and investigating them using reliable tools are crucial. This study was conducted with the aim to examine the psychometric properties of an Iranian scale for behavioral rehabilitation strategies in patients with MS.

Methods: A cross-sectional study with convenience sampling was conducted in 206 patients with MS at neurology clinics in Isfahan, Iran, in 2021-2022. The patients responded to the Coping with Health Injuries and Problems (CHIP) questionnaire. The content validity of the scale was assessed using Lawshe's content validity ratio (CVR) and content validity index (CVI), and exploratory factor analysis, and face and content validity and reliability were used to identify the factors in this population. SPSS software was used to analyze the collected data.

Results: The CVI and CVR were calculated for each item without eliminating or changing the items. The intra-class correlation coefficient (ICC) was calculated (ICC: 0.093 [95%CI: -0.539-0.65]; P = 0.39). The 5 factors of the model comprised palliative coping, instrumental coping, task-oriented coping, detachment coping, and cognitive avoidance coping. Saturation was reached with 26 items and 54% of the total variance was explained. With an acceptable Cronbach's alpha of 0.69, the CHIP scale can be used for Iranian patients with MS to determine their treatment plan. Palliative coping and instrumental coping were available in the original tool, and this study identified task-oriented coping, detachment coping, and cognitive avoidance coping.

Conclusion: This validation demonstrated the compatibility of the CHIP scale with the specific characteristics of Iranian patients with MS.

Keywords: Coping strategies; Psychometrics; Multiple sclerosis; Iran

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Introduction

Multiple sclerosis (MS) is a chronic, incurable, and debilitating disease, is mostly reported in high-income countries, is a female-predominant disease, and is mostly observed at the ages of 20-40 years (Ahadi, Delavar, & Rostami, 2014; Hyarat, Subih, Rayan, Salami, & Harb, 2019; Van Damme, Kindt, Crombez, Goubert, & Debruyne, 2019). The pathophysiology of MS is characterized by myelin loss and axonal damage (Ukueberuwa & Arnett, 2019). The patients experience symptoms such as physical weakness (Van Damme et al., 2019), muscle weakness and spasm, imbalance, vertigo, visual impairment, speech disorders (Dennison, Moss-Morris, Silber, Galea, & Chalder, 2010; Irvine, Davidson, Hoy, & Lowe-Strong, 2009), bladder and intestines disorders, sexual dysfunction, cognitive and emotional deficits (Dennison, Moss-Morris, Yardley, Kirby, & Chalder, 2013), pain, and fatigue (Dennison et al., 2010; Kos, Kerckhofs, Nagels, D'hooghe, & Ilsbroukx, 2008).

Research by the World Health Organization (WHO) also suggests a global prevalence of 30 per 100,000 (Walton et al. , 2020). The prevalence of MS in Iran is 15-30 per 10,000, Iran ranks first in the Middle East (Maleki, Hemmati Maslakpak, & Khalkhali, 2016). Experts have warned of 5000 new cases annually diagnosed with MS in Iran (Payamani, Nazari, Miri, Ghadirian Baharabchi, & Taghipour, 2016). According to numerical statistics, the prevalence of MS is 2-3 times higher in women than in men (Hyarat et al., 2019; Shahpouri, Barekatain, Tavakoli, Sanaei, & Shaygannejad, 2019). MS is the main or major cause of death in 50-70% of cases. Severe defects caused by progressive disability coupled with increased risk of infection raise the risk of death (Belbasis, Bellou, Evangelou, Ioannidis, & Tzoulaki, 2015; Leray, Moreau, Fromont, & Edan, 2016).

MS can profoundly affect different areas of life such as employment, housekeeping, social activities, family relationships, and marital life (Dennison, Yardley, Devereux, & Moss-Morris, 2011). The psychological consequences of MS include restlessness, weakness, fatigue, anxiety, depression, low self-esteem, sleep disorders, and concentration problems. These symptoms influence normal functioning, decrease quality of life (QOL) (Hyarat et al., 2019), cause a feeling of incompetence, and lower self-confidence in the patients. Emergence of this disease, especially at young ages, impairs the patients' confidence in their health and body. The patients may also perceive the unpredictable and unpleasant nature of the course of MS as an obstacle to their future plans (Payamani et al., 2016). In addition to decreased QOL, high levels of psychosocial problems such as psychological distress and communication problems have been reported in patients with MS (Dennison et al., 2011).

Physical, emotional and cognitive functions widely vary among the patients during their disease course (Wassem & Dudley, 2003). The patients should adopt coping strategies for a wide range of disabilities and adjust their lifestyle accordingly (Sevilla Guerra, 2013). In other words, coping strategies are required for tackling the new challenges that emerge with the disease progression (Wilski, Tomczak, Ferlak, Chmielewski, Luniewska, & Brola, (2021).

One may resort to behavioral and cognitive strategies defined as coping to adapt oneself to difficult situations and problems in life such as crises and diseases (Folkman, 2015). In the 1960s, Lazarus introduced and defined the concept of coping as "cognitive and behavioral efforts made to dominate, tolerate or decrease demands and their conflicts" (Biggs, Brough, & Drummond, 2017).

Coping with MS has been defined as either a process or coping strategies in their abstract form (Folkman, 2015). Coping has also been used to emphasize successful reactions to a situation or crisis (Bishop, 2005). According to Bishop (2005), coping with MS is a multidimensional concept that reflects the patient's response to psychosocial and functional changes.

Coping with chronic diseases such as MS has rarely been addressed in literature despite its importance. Selecting appropriate tools to identify behavioral processes, and thereby, modify the lifestyle of patients plays a key role in health psychology (Endler, Parker, & Summerfeldt, 1998). Non-specificity and major methodological limitations constitute the drawbacks of the instruments used thus far. Coping in MS patients has been poorly and ambiguously defined (Chen & Tang, 2005) and has rarely been investigated in Iran. Identifying methods for coping with the consequences of MS and numerous socio-individual problems facing the patients can help with their treatment. The present research was therefore conducted to translate the Coping with Health Injuries and Problems (CHIP) scale into Persian and validate its Persian version in patients with MS.

Methods

This cross-sectional, methodological study was performed in two phases, i.e., translation of the CHIP scale and its psychometric evaluation.

Translating the Coping with Health Injuries and Problems scale: The present study failed to obtain permission from the WHO for the forward-backward translation of this scale despite the great efforts made by the authors to contact this organization.

Two translators familiar with psycho-medical concepts independently translated the CHIP from English into Persian. The final translated version developed in collaboration with an expert panel was back-translated into English.

The content validity of the scale was assessed using Lawshe's content validity ratio (CVR) and content validity index (CVI), calculated through the methods previously discussed. No questions were omitted or changed. The obtained results demonstrated the content validity of the Persian version of the CHIP. The qualitative content validity was evaluated after implementing the comments of 10 experts, including psychologists, psychiatrists, and nurses. To determine the CVR, specialists rated each item as 1 (essential), 2 (useful but not essential), and 3 (not essential). The CVR was estimated at over 0.64 based on the formula proposed by Lawshe (1975). To evaluate the simplicity, relevancy, and clarity of the scale, the CVI was calculated as 3 or 4 on a scale ranging from 1 (irrelevant, simple, and clear) to 4 (very consistent, simple, and explicit). According to Polit and Beck (2006), a CVI of 0.9 was considered excellent and 0.8 acceptable.

Psychometric evaluation

Participants: The present study population comprised 206 patients with MS symptoms and behavioral problems referring to the neurology ward of outpatient clinics affiliated with Isfahan University of Medical Sciences, Isfahan, Iran, from November 2021 to January 2022. The inclusion criteria consisted of all types of MS based on the neurologist's diagnosis (i.e., clinically isolated syndrome, relapsing-remitting MS, primary-progressive MS, and secondary-progressive MS), and having the symptoms for at least 6 months. The exclusion criteria comprised unwillingness to participate in the study and severe physical and neurological problems that interfered with psychiatric treatments. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and the Helsinki Declaration.

After briefing all the participants on the study objectives and procedure, they were assured of their voluntary participation. The data were collected from November 2021 to January 2022. Convenience sampling was used to select the 206 participants.

Measurements: The CHIP was developed by Endler et al. (1998) as a self-report instrument to identify 4 basic dimensions of coping with physical health problems, i.e., palliative coping (items 2, 6, 10, 14, 18, 22, 26, and 30), instrumental coping (items 3, 7, 11, 15, 19, 23, 27, and 31), distraction coping (items 1, 5, 9, 13, 17, 21, 25, and 29), and emotional preoccupation coping (items 4, 8, 12, 16, 20, 24, 28, and 32). These items were scored on a Likert scale ranging from 1 to 5 (1: never, 2: low, 3: medium, 4: high, and 5: very high). Given the total score of 160 for the questionnaire, the dominant exposure strategy was identified based on the excellent score of the respondents. In general medical target groups, the internal alpha reliabilities of the distraction, palliative, instrumental, and emotional preoccupation coping subscales were 0.8 and 0.77, 0.78 and 0.78, 0.75 and 0.82, and 0.83 and 0.83 in men and women, respectively. The alpha coefficient, respectively, obtained as 0.81-0.84 and 0.78-0.82 for male and female adults was satisfactorily high (Endler et al., 1998).

Procedure: After providing the participants with an information packet outlining the nature and purpose of the study and receiving their consent, a research nurse and social worker, working in collaboration with the medical staff, completed the CHIP scale during 3 months for the same number of outpatients and inpatients. The patients were assured of receiving services as before in case of their unwillingness to participate.

Construct validity: As a statistical technique for merging data into a smaller set of variables and investigating the underlying theoretical structure of phenomena, exploratory and confirmatory factor analyses were performed in AMOS software (version 24; IBM Corp., Armonk, NY, USA) to evaluate the construct validity of the scale and determine the number of alpha extraction factors required for maximizing the generalizability factor (Distefano & Hess, 2005). In fact, the maximum likelihood exploratory factor analysis was performed using varimax rotation. The sample size was estimated using the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test. A KMO of 0.7-0.8 was considered good and 0.8-0.9 excellent. The factors that did not satisfy the factor eigenvalue of greater than 1 and the scree plot criterion were extracted. Items with a factor loading of at least 0.3 were considered appropriate. Horn's parallel analysis was also utilized to estimate the number of latent factors (Boelen, van den Hout, & van den Bout, 2008).

Reliability and content validity: The internal consistency of the Persian version of the CHIP was evaluated by calculating its Cronbach's alpha, which confirmed its internal consistency and reliability by exceeding 0.7 (George & Mallery, 2010). To evaluate the test-retest reliability of the scale, the intra-class correlation coefficient (ICC) was calculated for 10 participants in a pilot study with an interval of 14 days. In content validity testing, no questions were removed or added**.** The data analysis was conducted in SPSS software (version 23; IBM Corp., Armonk, NY, USA).

Results

Descriptive analysis: The 206 study participants were 22-55 years old and had a mean age of 34.8 ± 6.3 years. Women accounted for 65.7% (n = 138) of the population and men for 32.4% (n = 68).

Content validity: The CVI and CVR were calculated for each item without eliminating or changing the items (Lawshe, 1975).

Intra-class correlation coefficient: The ICC calculated for 10 participants, who were retested 14 days later, suggested the poor reliability of the questionnaire [ICC: 0.093 (95%CI: -0.539-0.65); P = 0.39].

Consistency: The total Cronbach's alpha obtained (α = 0.69) suggested the good fit of the questionnaire in the Iranian population. Table 1 confirms the internal consistency of the 4 subscales. The Cronbach's alpha calculated ranged from 0.38 for palliative coping to 0.62 for instrumental coping. Given that a Cronbach's alpha of over 0.7 confirms internal consistency (Hair, Black, Babin, & Anderson, 2010), the internal consistency of this questionnaire was acceptable.

Exploratory factor analysis: The KMO index and Bartlett's test of sphericity were used to evaluate the sample size adequacy before performing the exploratory factor analysis. The KMO was obtained as 0.89 in the one-factor and two-factor models, and the significant result of Bartlett's test of sphericity showed the need for performing factor analysis. Based on the varimax rotation, items 2-3, 6, 9, 11, and 18 were removed from the 5-factor model due to weak factor loading (Table 2).

Table 1. Cronbach's alpha, mean and standad deviation (SD) of item severity by total dimensions (n = 206)

Factor	Item	Mean ± SD	Cronbach's alpha if item deleted	Cronbach's alpha
Distraction coping	2. Staying in bed	2.133 ± 1.47153	0.69	0.52
	6. Resting when tired	3.5437 ± 1.34183	0.67	
	10. Sleeping	2.6359 ± 1.49094	0.66	
	14. Conserving energy	3.278 ± 1.08725	0.68	
	18. Staying warm	1.3333 ± 1.02514	0.69	
	22. Making the surroundings quiet	3.5743 ± 1.05893	0.68	
	26. Staying quiet	2.7756 ± 1.05179	0.68	
	30. Getting comfortable	3.5885 ± 1.3194	0.67	
Palliative coping	3. Acquiring more information	3.2670 ± 1.45889	0.67	0.38
	7. Seeking treatment quickly	4.6293 ± 0.86836	0.68	
	11. Focusing on getting better	3.0437 ± 1.35899	0.69	
	15. Learning more	3.7624 ± 4.83488	0.72	
	19. Complying with advice	2.9604 ± 1.37077	0.69	
	23. Following doctor's advice	4.1505 ± 1.12691	0.67	
	27. Taking medications on time	4.1535 ± 1.32380	0.70	
	31. Finding out about treatments	3.7718 ± 1.30342	0.68	
Instrumental coping	1. Thinking about better times	2.2624 ± 1.29886	0.67	0.62
	5. Being with others	2.8010 ± 1.54737	0.67	
	9. Daydreaming	3.2524 ± 1.50264	0.69	
	13. Enjoying attention from people	2.7707 ± 1.48559	0.67	
	17. Planning for the future	3.3932 ± 1.44349	0.69	
	21. Listening to music	3.6845 ± 0.93310	0.69	
	25. Inviting a company	2.6748 ± 1.59145	0.68	
	29. Having nice things around	2.1281 ± 1.33622	0.68	
Emotional preoccupation coping	4. Wondering "why me?"	2.8155 ± 1.68926	0.68	0.56
	8. Feeling angry	3.1268 ± 1.51900	0.67	
	12. Becoming frustrated	2.6456 ± 1.56973	0.67	
	16. Thinking about things I cannot do	2.6980 ± 1.63692	0.67	
	20. Fantasizing about being healthy	3.0101 ± 1.38516	0.70	
	24. Wishing it had not happened	3.3930 ± 1.60616	0.68	
	28. Thinking about vulnerability	3.4444 ± 1.15957	0.69	
	32. Worrying about my health	3.7476 ± 1.45648	0.67	

SD: Standard deviation

Table 2. Rotated component matrix (Extraction Method: Principal Component Analysis)

Item	Factors				
	1	2	3	4	5
Thinking about better times	0.725				
Wondering "why me?"	0.649				
Being with others		0.720			
Seeking treatment quickly				0.729	
Feeling angry	0.714				
Sleeping		0.509			
Becoming frustrated		0.585			
Enjoying attention from people		0.697			
Conserving energy				0.659	
Finding out about treatments		0.416			
Thinking about things I cannot do	0.578				
Planning for the future					0.428
Complying with advice	0.439				
Learning more			0.632		
Fantasizing about being healthy		0.439			
Listening to music					0.772
Making the surroundings quiet				0.774	
Following doctor's advice	0.610				
Getting comfortable			0.791		
Inviting company					0.771
Focusing on getting better				0.579	
Taking medications on time				0.669	
Worrying about my health			0.809		
Finding out about treatments	0.636				
Wishing it had not happened			-0.411		
Thinking about vulnerability	0.586				
Variance Explained	14%	24.5%	34.4%	44.3%	54%

Factor 1: Detachment coping, Factor 2: Cognitive avoidance coping, Factor 3: Task-oriented coping, Factor 4: Palliative coping, Factor 5: Instrumental coping

*Rotation Method: Varimax with Kaiser Normalization

Using the Scree Plot of factor analysis for the Iranian version Model of coping With Health Injuries and Problems "CHIP", he total variance explained was 54% (Figure 1).

The factor structure presented in table 2 significantly supports the factorial validity of the CHIP subscales. Factor 1 (detachment doping) accounting for 14% of the variance comprised 8 items with a loading of at least 0.43. "Sleeping" and "fantasizing about being healthy" with loadings of 0.43 and 0.50, respectively, were loaded on cognitive avoidance coping with 24.5% variance explained in factor 2.

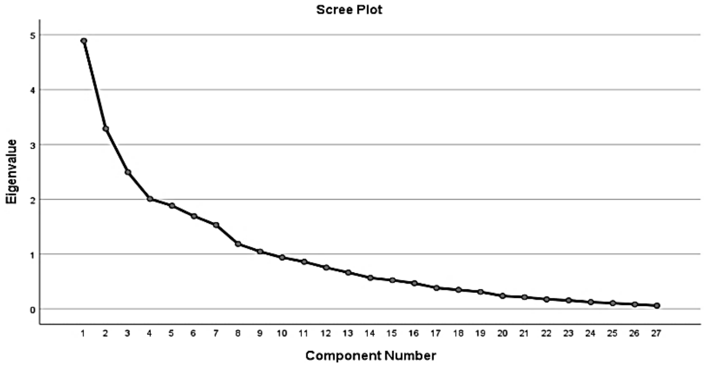

Figure 1. The scree plot of factor analysis for the Coping with Health

Injuries and Problems scale adapted to the Iranian culture

Factor 3 (task-oriented coping), with 34.4% variance explained and comprising “worrying about my health”, almost had the highest factor loading (i.e., 0.80) in all the factors. Factor 4 (palliative coping) accounting for 44.3% of variance included 8 items from the original palliative subscale.

Factor 5 (instrumental coping) accounting for an additional 54% of variance included all the items from the original instrumental coping subscale with a loading of at least 0.42.

Discussion

The purpose of this study was to investigate the psychometric properties of the CHIP questionnaire in patients with MS. Given the numerous psychophysical and economic changes in the lives of patients with chronic diseases, how they prepare for and deal with these conditions can affect their mental health. In chronic diseases such as MS, which require long-term treatments, using coping styles is associated with adaptation or non-adaptation to the disease and its problems (Costello, Kennedy, & Scanzillo, 2008). The present study findings suggested that the CHIP scale, with an acceptable Cronbach’s alpha of 0.69 in Iranian patients with MS, can help identify how these patients cope with their disease and determine their treatment plan. This information can be used to provide client-centered rehabilitation for patients with MS based on their responses. The Iranian patients, on the other hand, seemed to face challenges in effectively implementing the reliability of this tool. Cognitive deficits can interfere with the patient’s memory and increase the likelihood of problems in re-performing tasks (Costello et al., 2008).

In Canada, Endler et al. (1998) developed the original version of this scale with the 4 factors of distraction, palliative, instrumental, and emotional coping by recruiting a heterogeneous group of general medical patients and a homogeneous group of patients with lower back pain.

The multidimensional perspective of the present study tool with the 5 factors of palliative, instrumental, task-oriented, detachment, and cognitive avoidance coping more effectively explained the diversity of factors of coping with health problems in Iranian patients with MS; nevertheless, a conceptual overlap was observed among these factors (Endler et al., 1998). The different results obtained from the main model and the 5-factor model developed in this study showed the need for normalizing and confirming this tool in different populations and cultures.

In line with the tool developed in Canada in patients with chronic musculoskeletal pain, the present study instrument comprised 5 factors in Iranian patients with MS (Hadjistavropoulos, Asmundson, & Norton, 1999). In contrast, the variance explained in the present research was slightly higher. In line with the 6-factor French version applied to patients with chronic neurological disorders such as MS and Parkinson’s disease, this tool can help treatment staff and rehabilitation teams better understand the specific methods used by patients to cope with their disease. Moreover, factors such as cognitive avoidance and palliative coping are common between the present tool and the French version (Montel & Bungener, 2010).

Given that coping with chronic diseases is a dynamic time-varying process, time plays a key role in managing these conditions during their course. Gender and duration of MS also play a role in coping with this disease. The longer the history of MS is, the fewer the instrumental coping strategies used by the patients are;

nevertheless, research suggests no relationships between duration of MS and coping patterns (Ratsep, Kallasmaa, Pulver, & Gross-Paju, 2000).

The present study found cognitive avoidance to be used by the patients to cope with MS. Cognitive restructuring involves modifying the patient's thoughts and making them more accurate and beneficial. Correctly performing this technique can improve adherence to treatments in patients (Costello et al., 2008).

Despite the associations of detached/avoidant coping with childhood abuse and emotional neglect (Pust et al., 20211), research suggests that avoidance strategies are more frequently and easily used to cope with diseases in patients with lower disability levels (Holland et al., 2019).

Task-oriented coping is associated with better adaptation to chronic diseases. The cognitive reconstruction of a problem or making efforts to change the situation can optimally facilitate adaptation to the disease (van der Hiele et al., 2016). Given the chronic nature of MS, using palliative coping can significantly improve QOL and well-being in patients. Furthermore, raising awareness of the basic concerns and needs of patients in healthcare providers and physicians enables them to provide high-quality services tailored to the needs of patients, and thus, improves well-being and QOL in patients and decreases their need for hospitalization in ICUs (Dadsetan, Shahrbabaki, Mirzai, & Nouhi, 2021).

Limitations: This study recruited outpatients referring to neurology clinics in Isfahan. Investigating coping strategies in patients with severe MS in the hospital was impossible due to the high prevalence of COVID-19. In fact, disease exacerbation and hospitalization can change the coping strategy used. It is therefore recommended that further studies be conducted to include inpatients. Furthermore, the present findings should be interpreted by measuring the extent to which the individual coping mechanisms are used.

Conclusion

This validation demonstrated the compatibility of the CHIP scale with the specific characteristics of Iranian patients with MS. This instrument can be used by treatment and rehabilitation teams to identify methods for helping these patients cope with their disease. Improving the comprehension of coping strategies in these patients lays the foundations for designing specific preventive interventions based on behavioral rehabilitation, and therefore, helps them adapt to their disease.

Conflict of Interests

Authors have no conflict of interests.

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Ethical considerations and consent of participation**:** This study was approved by the Research Center for Social Determinants of Health at Semnan University of Medical Sciences IR.SEMUMS.REC.1400.203, and informed consent was obtained from all participants.

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