Original Article

Leisure Questionnaire of People with Multiple Sclerosis

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ABSTRACT

Background: Leisure activities are an important part of life for people with multiple sclerosis (MS). Unfortunately, there are no proper assessment tools for evaluating the leisure activities of MS patients. The current research purposed to develop such a questionnaire and to determine its factor structure.
Methods: This psychometric study aimed to determine the factor structure of a questionnaire for evaluating the leisure activities of MS patients and was conducted in explanatory and confirmatory phases.
Results: The questionnaire was completed, and the data were entered in SPSS for the explanatory phase and using linear structural relations (LISREL) for the confirmatory phase. The lowest Eigenvalue was 1.01, which corresponds to the Kaiser criterion. The validity coefficients of the extracted factors are considerable. There is a very slight difference between the highest coefficient that is related to the third factor (0.846) and the lowest coefficient that is related to the fifth factor (0.799), indicating the number of factors was correctly determined. Confirmatory factor analysis illustrated that the goodness-of-fit (GFI) and the comparative fit index (CFI) indices were considerable (higher than 0.95), showing good fit of data. RMSEA was 0.024.
Conclusion: It can be concluded that the 5-factor structure (difficult, social, spiritual/religious, outdoor-physical, and cultural-artistic activities) of the multiple sclerosis leisure questionnaire with 50 items is confirmed.

Introduction

Studies assessing leisure time and determining its factor analysis have indicated that diversity and contradictory ideas exist among researchers in this regard. Various studies have resulted in different factor structures. For instance, Jopp and Hertzug identified 11 factors for leisure time: physical factors, games, handicrafts, watching TV, social-personal factors, social-public factors, growth factors, experiential activities, using technology, and taking a trip [1]. Cheung et al., however, developed the Leisure Participation Questionnaire (LPQ) that classified the leisure activities in four types: recreational (physical), cognitive, social, and productive

[2]. Thahlin placed the activities in 6 categories: culture-entertainment, productive-personal growth, outdoor-physical, recreation-expressive, friendship, and formal-group [3]. Other questionnaires, on the other hand, did not develop any classification of leisure activities [4-6].

Disagreement over the factors, dimensions, components, and factor analysis of leisure is not only influenced by different theoretical foundations and theories suggested for this concept, but also by social and cultural structures of the subjects. Through studying cultural differences regarding leisure over the past decades, the researchers concluded that different cultures disagree on the interpretation of this concept and its components [7]. These differences have been generalized to a difference in leisure, and various studies have been conducted on its different aspects. Nonetheless, a significant difference regarding leisure activities remains between developing

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and developed countries [8].

Cultural differences regarding leisure activities can also be found in the content of measurement tools. For example, Taylor's questionnaire, which examines leisure, includes snow skiing, diving, and boating [6], and Hellström's leisure questionnaire for the elderly includes activities such as picking raspberries, hunting, and fishing [9], which seem strange in some cultures like the Iranian culture. The current study aimed to develop a leisure questionnaire and determine its factor analysis for MS patients based on the Iranian culture.

Methods

The current psychometric study was conducted in two stages: (1) exploratory factor analysis, and (2) confirmatory factor analysis.

The statistical population of the study included MS patients in the city of Hamadan, from which the sample group for each stage of the research was selected. The inclusion criteria in all stages of the research comprised: neurologist's definitive diagnosis of MS, the ability to speak and communicate, and a willingness to participate in the project. The exclusion criteria consisted of the absence of any other disease associated with MS according to a neurologist and reluctance to continue participation in the project at any stage of implementation. The study was performed at the Hamadan MS Society in 2016.

a)Exploratory factor analysis: A sample group of 402 people was selected from the target population by the available sampling method. Sample size was determined due to the use of the exploratory factor analysis method. According to experts, a group of 400 samples is appropriate for factor analysis [10]. Practically, it is recommended to use a sample group at least 5 times higher than the number of variables included in the factor analysis, though one 10 times higher would be better [11].

b) Confirmatory factor analysis: To determine the factor analysis and the relationship between the components of leisure, 158 MS patients were selected in this stage. Table 1 shows the participants' characteristics in both stages of the research.

The tools used in this study was a leisure questionnaire developed in previous studies [12, 13]. After the research goals and methods were explained to the participants and written informed consent for all stages was obtained from them, the research was implemented. Questionnaires

were individually collected by referring to medical and rehabilitation centers and, if possible, by referring to the patients' residence with ethical considerations approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences (USWR. REC.1393.172).

Data were analyzed by SPSS and LISREL. The research questions were answered by the following statistical methods:

● The statistical properties of the groups and the questionnaire items were determined by the conventional descriptive statistics methods.

● The items on the leisure scale were analyzed by the classical psychometric model (such as degree of difficulty, correlation of each item with the total score, and variance). Keeping or removing an item was decided based on the parameters of the item and the item theory. The validity coefficients of the items in different groups were evaluated by the general formula of Cronbach's alpha coefficient (in classical theory) and the indicators of the validity of the item, person, and separation indicator (in the question-answer theory).

● Exploratory and confirmatory factor analyses (in classical theory) and residuals of the principal component analysis (in the theory of question-answer) were used to determine the one- or multidimensionality of the leisure activity.

● Exploratory factor analysis with maximum likelihood and second order confirmatory factor analysis were used to determine factor analysis of leisure.

● The validity coefficients of the questionnaires were estimated by calculating the internal consistency (Cronbach's alpha).

● Principal component analysis (PC) was used to assess the validity of the leisure scale and determine the number of factors used for leisure saturation.

● To examine the simple structure of the scale, the extracted factors were rotated using the oblique methods.

● The LISREL measurement model or confirmatory factor analysis was used to confirm the extracted factors and determine the factor analysis of the leisure scale.

Results

Exploratory Factor Analysis

The correlation coefficients of all items with the whole leisure questionnaire (the discriminating power

Table 1: Participants' characteristics

Variable	First Stage		Second Stage		Variable	First Stage		Second Stage	
	N	%	N	%		N	%	N	%
Gender					Marital Status				
Female	320	81	126	80	Single	86	22	31	20
Male	74	19	32	20	Married	281	71	116	73
Education					Divorced	22	6	7	5
Illiterate	17	4	8	5	Widowed	5	1	3	2
Less than High School Diploma	97	25	56	36	Job Status				
High School Graduate	134	34	47	30	Employed	60	15	21	14
Associate Degree	75	19	11	7	Unemployed	80	21	32	20
Graduate Degree	58	15	30	19	Retired	16	4	5	3
Postgraduate Degree	12	3	4	3	Housewife	210	53	90	57
					Student	28	7	9	6

of the items) are noticeable and statistically significant. In other words, all items have good discriminating power to measure leisure. Item 26 (woodworking, i.e., woodcarving or mosaic had the lowest correlation coefficient (0.11), and item 50 (attending woodworking training sessions in woodcarving, mosaic, and carpentry) and item 62 (walking in the street) had the highest correlation coefficient (0.56). Moreover, items 17 (sitting and talking with family members, M=3.09), 39 (watching TV, M=2.98), 5 (talking on the phone, M=2.89), and 54 (baking, M=2.87) had the highest mean. This indicates that these items have higher desirability than the other items for the sample group. On the other hand, items 51 (doing crosswords, M=1.03), 26 (woodworking, M=1.07), 22 (attending sewing classes, M=1.11), and 72 (literary arts such as writing and poetry) had the lowest mean, indicating low desirability for the sample group.

The initial statistical properties obtained using SPSS to ensure that the results were identical on the basis of different correlation matrices showed that the eigenvalues of 13 items were greater than 1. The percentage of overlap in variance for these 13 factors together accounted for approximately 62% of the total variance.

The lowest eigenvalue was 1.01, which corresponds to the Kaiser criterion [14]. To extract the scale factor, the principal component analysis method and the oblique rotation method (Oblimin) with a number of different factors were performed several times. Five factors were extracted from the factors with clear content.

Comparison of the 5-factor solution with the other solutions showed that fewer items should be removed from the scale set because of absent or weak factor loading and complexity (having significant loading on two or more factors at the same time).

As indicated in Table 2, five factors were extracted in exploratory factor analysis:

1. The first factor contains 16 items and is regarded as the factor of difficult activities. Item 71 in this factor was removed due to factor loadings in two factors.

2. The second factor is social with 12 items. Item 14 in this factor had the highest factor loading.

3. The items of the third factor are significantly related to spiritual/religious activities. In this factor, 8 items remained after factor analysis.

4. The fourth factor containing 9 items is related to outdoor-physical activities. Item 46 was removed due to a common area shared with item 1.

5. The fifth factor, i.e., the culture-entertainment factor, was described by 9 items.

Confirmatory Factor Analysis

The mean age of patients in this stage was 34 years with a standard deviation of 8 years and an age recognition range of 1 to 32 years. A total of 163 MS patients completed the questionnaire, and 158 questionnaires were found to be completely answered after data was collected and the confused, blank, and incomplete questionnaires were removed.

As explained earlier, the confirmatory factor analysis model was implemented by using the LISREL software package. All evaluated indices showed that the model has a good fit, and the value of chi-square is not statistically significant. The ratio of chi-square to the degree of freedom is 1.17 and conforms to the criteria proposed by Byrne [15] and Bentler [16]; they considered values less than 2 as good. The GFI and CFI indices were also considerable (higher than 0.95), showing good fit of data. Root mean square error of approximation (RMSEA) was 0.024; hence, it can be concluded that the degree of model approximation was not large in the community. Thus, it can be concluded that the 5-factor structure of leisure is experimentally confirmed, and in addition to the total score, a separate score is calculated and interpreted for each of the factors.

The findings illustrate that the coefficient for all items is higher than 0.3, indicating its acceptability. The highest coefficient was reported for items 30 (doing decorative activities) and 12 (training others in art), and the lowest coefficient was reported for item 45 (listening to music). All coefficients were statistically significant, as the t-property for all items was higher than 1.96.

Table 2: Component matrix of leisure questionnaire by explanatory factor analysis

Item	Factor one	Item	Factor two	Item	Factor three	Item	Factor four	Item	Factor five
23	0.671	14	0.621	33	0.771	62	0.645	6	0.731
29	0.669	78	0.605	24	0.732	56	0.616	13	0.696
21	0.610	5	0.590	8	0.731	46	0.600	30	0.651
68	0.583	9	0.590	16	0.709	64	0.523	12	0.636
73	0.498	17	0.523	70	0.664	65	0.496	32	0.602
71	0.490	2	0.520	57	0.590	59	0.482	66	0.584
43	0.489	44	0.500	79	0.579	38	0.468	54	0.502
77	0.484	31	0.480	74	0.445	52	0.414	47	0.467
10	0.483	27	0.438			71	0.490	11	0.429
20	0.479	41	0.435						
37	0.464	45	0.426						
35	0.454	19	0.415						
67	0.428								
55	0.422								
18	0.401								
64	0.412								
Eigenvalue	10.34		4.63		3.00		2.49		1.87
% Variance	19.89		8.90		5.78		4.79		3.59
α	0.844		0.819		0.846		0.802		0.799

Discussion

As stated above, factor validation (exploratory and confirmatory) of the questionnaire developed in this study resulted in the extraction of five factors: difficult, social, spiritual/ religious, outdoor, and cultural-artistic activities. The internal consistency coefficients confirmed the total score and factors (ranging from 0.799 to 0.846), the validity of the questionnaire, and its factors.

The first factor in exploratory factor analysis was called the factor of difficult activities. Difficult means those activities that most MS patients are less likely to be able to do, or lose their abilities to do, because of the progressive process of the disease. This factor includes activities such as swimming, exercising outdoors, exercising at home, cycling, working with a computer, playing computer games, and the like. Examining the items, it seems that physical inability in doing physical activities is included in this factor. The visual problems these patients have, which can affect their activities like working with a computer, may also hinder them in performing difficult activities.

Though previous studies have not considered this concept as specified in this study, the nature of this factor was found distinguished from other factors, as the structure and statistical properties of these activities showed that their frequency was extremely low in patients. This factor has not been considered in previous studies, because most findings were related to other diseases such as stroke [17], chronic fatigue syndrome [18], and rheumatoid arthritis [19]; in this sense, they differ from MS that is associated with progressive brain damage and starts mainly at a younger age.

The second factor, i.e., social factor, involved activities aimed at communicating with others, which include going to parties, going out with family, talking on the phone, etc. This factor has been of great importance in all resources of the present study, including texts and tools, interviews with patients, activity lists, and interviews with experts. It can be said that the social factor is of great consideration because of the importance the Iranian culture places on family structure and supporting other family members [20]. For example, an individual is supported by the family and lives with the family until s/he is married. Furthermore, Iranians' values and beliefs are influenced by the Islamic beliefs in which interpersonal relationships and helping others are greatly emphasized; therefore, this factor is very important in the Iranian culture [21].

MS patients are expected to spend some time with others. The factor of social status plays a key role in this regard [1, 2, 9, 22-25]. The results found in other studies on activities such as volunteering, going to the cinema, going to the restaurant, visiting friends and relatives and being visited by friends and relatives for Alzheimer's patients [26]; talking on the phone with friends, going out with friends, going to parties, attending social events, and engaging in political activities for normal people [1]; and being with family, meeting friends, talking on the phone, and speaking with family members and neighbors for patients with chronic conditions [18] were consistent with those found in this study.

The third factor was the spiritual/religious activities aimed at connecting with God, including reading the Quran, observing religious ceremonies, and going to the mosque. Though this factor was found absent in reviewing the literature, it was mentioned as a separate factor in interviews with experts and patients. The interviewees expressed the belief that the activities related to this factor affect their spiritual lives. For example, being in a religious ceremony may result in different reactions. Despite a willingness to do such activities, some were not likely to do them. This may be due to the practitioner's recommendation to do collective activities because of the positive mental effects such activities have on patients and the disease process. It seems that that religious factor that, in some studies, is restricted to church attendance only [17, 23] contains various activities in the Iranian culture, making it a distinct factor due to its positive impacts.

The fourth factor was outdoor activities including walking in the street, spending time in nature, parks, etc. This factor was called outdoor activities, because it requires the person to be out of the house. The same factor can be found in the literature in Tae Im Yi's instrument that was developed for stroke patients [17]. One type of leisure for these patients seems to be going out of the house. This has been observed more frequently in people with physical disabilities, such that people with severe physical disabilities have tried to spend time outdoors with the help of others. The inability to go outdoors can lead to increased depression as a common symptom in these patients, affecting their daily activities. Pendleton also considered activities such as cycling, mountaineering, and fishing as outdoor activities [27].

The fifth factor was identified as cultural/artistic activities. Most of these activities are performed only by women, especially housewives. This may be explained by the free time they have at home and being amused by doing such activities. It should be noted that fewer males participated in this study than females (Females comprised 80.7% of the population). Furthermore, it seems that the activities in this factor are influenced by the participants' culture and may differ from culture to culture; for example, making a handmade carpet. This factor was also mentioned as a cultural/artistic factor only in the study by Ti Im Yi [17]. The activities under the creativity factor in adolescents' fun profile [28] or under the handiwork factor in a study on adults' recreational activities [1] were similar to those activities under the cultural/artistic factor in the present study.

One of the limitations of the current study was the lack of an evaluation of the leisure scale in pre- and post-treatment conditions. Though the indices of scale psychometric properties were obtained based on desirable methods, it was not possible, due to the existing limitations, to implement the questionnaire as a pre-test for patients undergoing treatment in order to obtain the response index.

To generalize the application of this questionnaire and increase its validity, it is suggested that predictive validity methods be used and criteria determined for evaluating

leisure in appropriate method.

Conclusion

The findings of this study showed that the MS patients' leisure questionnaire with 52 items included the five factors of difficult activities, social, outdoor, artistic/cultural, and spiritual/religious activities in Iran. Moreover, various spiritual/religious activities performed in this country can cover a significant area of leisure for these patients. Therefore, these aspects of leisure should be of great consideration in conducting medical interventions on these patients to result in improved health and quality of life.

Acknowledgment

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References

1. Jopp DS, Hertzog C. Assessing adult leisure activities: an extension of a self-report activity questionnaire. Psychological assessment. 2010;22(1):108.
2. Cheung M, Ting W, Chan L, Ho K, Chan W. Leisure participation and health-related quality of life of community dwelling elders in Hong Kong. Asian J Gerontology and Geriatrics. 2009;4:15-23.
3. Silverstein M, Parker MG. Leisure activities and quality of life among the oldest old in Sweden. Research on aging. 2002;24(5):528-47.
4. Drummond AE, Parker C, Gladman JR, Logan P. Development and validation of the Nottingham Leisure Questionnaire (NLQ). Clinical rehabilitation. 2001;15(6):647-56.
5. Arab-Moghaddam N, Henderson KA, Sheikholeslami R. Women's leisure and constraints to participation: Iranian perspectives. Journal of leisure research. 2007;39(1):109.
6. Taylor HL, Jacobs Jr DR, Schucker B, Knudsen J, Leon AS, Debacker G. A questionnaire for the assessment of leisure time physical activities. Journal of chronic diseases. 1978;31(12):741-55.
7. Walker GJ, Deng J, Diser R. Culture, self-construal, and leisure theory and practice. Journal of leisure research. 2005;37(1):77-99.
8. Haase A, Steptoe A, Sallis JF, Wardle J. Leisure-time physical activity in university students from 23 countries: associations with health beliefs, risk awareness, and national economic development. Preventive Medicine. 2004;39(1):182-90.
9. Hellström A, Hellström P, Willman A, Fagerström C. Associations between sleep disturbances and leisure activities in late-life. Sleep Medicine. 2013;14:e151-e2.
10. Hooman HA. Multivariate data analysis in behavioral research: Parsa; 2011.
11. Habibi A. Practical Education of LISREL. 2 ed2012.
12. Hosseini SMS, Asgari A, Rassafiani M, Yazdani F, Mazdeh M. Leisure time activities of Iranian patients with multiple sclerosis: a qualitative study. Health Promotion Perspectives. 2016;6(1):47.
13. Hosseini SMS, Sarhady M, Nurani Gharaborghe S, Mazdeh M. Leisure of People With Multiple Sclerosis: A Content Analysis. Iranian Rehabilitation Journal. 2017;15(1):23-30.
14. Kaiser HF. On Cliff's formula, the Kaiser-Guttman rule, and the number of factors. Perceptual and Motor Skills. 1992;74(2):595-8.
15. Byrne BM. A primer of LISREL: Basic applications and programming for confirmatory factor analytic models: Springer Science & Business Media; 2012.
16. Bentler PM. Comparative fit indexes in structural models. Psychological bulletin. 1990;107(2):238.
17. Yi TI, Han JS, Lee KE, Ha SA. Participation in leisure activity and exercise of chronic stroke survivors using community-based rehabilitation services in seongnam city. Annals of rehabilitation medicine. 2015;39(2):234-42.
18. Khemthong S, Packer T, Passmore A, Dhaliwal S. Development of a Classification of Leisure Participation (CLP) Scale: Perceptions of leisure activities of women with and without chronic conditions. 2005.
19. Kautzmann LN. Identifying leisure interests: a self-assessment approach for adults with arthritis. Occupational Therapy in Health Care. 1984;1(2):45-52.
20. Javidan M, Dastmalchian A. Culture and leadership in Iran: The land of individual achievers, strong family ties, and powerful elite. The Academy of Management Executive. 2003;17(4):127-42.
21. Foroghi N. Leisure in Lifestyle and traditions. Kosar Journal. 2004;58.
22. Jalali Farahani M. Management of leisure and recreational sports. Tehran University Press; 2010.
23. Joudrey AD, Wallace JE. Leisure as a coping resource: A test of the job demand-control-support model. Human Relations. 2009;62(2):195-217.
24. Leung GTY, Fung AWT, Tam CWC, Lui VWC, Chiu HFK, Chan WM, et al. Examining the association between late-life leisure activity participation and global cognitive decline in community-dwelling elderly Chinese in Hong Kong. International journal of geriatric psychiatry. 2011;26(1):39-47.
25. Lin M-J. A Study on the Relationships of Service Quality and Satisfaction of Leisure Activities among the Retired Elderly in Caotun Town. International Conference on Gerontic Technology and Service Management2009.
26. Scarmeas N, Levy G, Tang M-X, Manly J, Stern Y. Influence of leisure activity on the incidence of Alzheimer's disease. Neurology. 2001;57(12):2236-42.
27. Pendleton H, Schultz-Krohn W, BCP S. Pedretti's Occupational Therapy. 6 ed: Elsevier; 2006.
28. Trottier AN, Brown GT, Hobson SJ, Miller W. Reliability and validity of the leisure satisfaction scale (LSS–short form) and the adolescent leisure interest profile (ALIP). Occupational Therapy International. 2002;9(2):131-44.