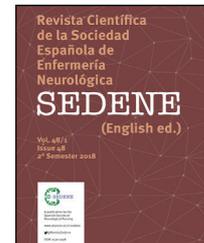




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## BRIEF ARTICLE

# Twelve item multiple sclerosis walking scale: analysis through nursing diagnoses<sup>☆</sup>

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### KEYWORDS

Multiple sclerosis;  
Fampridine;  
Altered gait;  
NANDA diagnoses;  
12-item multiple  
sclerosis walking  
scale

### Abstract

**Introduction:** Altered gait is one of the most common symptoms of multiple sclerosis. Fampridine is recommended to control this symptom. Its clinical benefits are assessed by timed and subjective tests, such as the 12-item MS walking scale (MSWS-12). Determining patients' responses using the MSWS-12 enables nurses to identify, evaluate and monitor NANDA diagnoses relating to mobility.

**Aim:** To analyse the effectiveness of the MSWS-12 in relation to NANDA diagnoses in monitoring subjects with MS who are responders to fampridine.

**Methods:** Observational, descriptive and retrospective study from October 2017 to September 2018 in Girona's Unitat de Neuroimmunologia i Esclerosi Múltiple Territorial. A total of 17 fampridine responders were included in the study. Variables: age, sex, EDSS and baseline MSWS-12 scores, at 15 days, and at 6 months.

**Results:** An increased total MSWS-12 score was observed between 15 days and 6 months of: impaired walking  $x = 1.9$  ( $p = .076$ ); impaired standing  $x = .2$  ( $p = .637$ ); fatigue  $x = .9$  ( $p = .209$ ); risk of falling  $x = .6$  ( $p = .270$ ).

**Conclusion:** Impaired walking and fatigue had a greater tendency to worsen over time. Risk of falling and impaired standing had a more stable score. The MSWS-12 in relation to NANDA diagnoses is a useful tool for nurses to monitor people with MS and altered gait.

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**PALABRAS CLAVE**

Esclerosis múltiple;  
Fampridina;  
Alteración de la  
marcha;  
Diagnósticos NANDA;  
Escala de movilidad  
de 12 ítems para  
esclerosis múltiple

**Escala de movilidad de 12 ítems para esclerosis múltiple: análisis mediante diagnósticos de enfermería****Resumen**

**Introducción:** La alteración de la marcha es uno de los síntomas más comunes en la esclerosis múltiple. Para controlar este síntoma se recomienda la prescripción fampridina. Sus beneficios clínicos se evalúan mediante pruebas cronometradas y pruebas subjetivas, como la escala de movilidad de 12 ítems para esclerosis múltiple (MSWS-12). Conocer la respuesta reportada por los pacientes mediante la MSWS-12 facilita a los profesionales de enfermería identificar, evaluar y monitorizar los diagnósticos NANDA relacionados con la movilidad.

**Objetivo:** Analizar la operatividad de la MSWS-12 relacionada con diagnósticos NANDA para el seguimiento de personas con EM respondedoras a fampridina.

**Métodos:** estudio observacional, descriptivo, retrospectivo desde octubre de 2017 a septiembre de 2018 en la Unitat de Neuroimmunologia i Esclerosi Múltiple Territorial de Girona. Se incluyeron un total de 17 sujetos respondedores a fampridina. Variables: edad, sexo, EDSS y la puntuación de los ítems de la MSWS-12 en los momentos basal, 15 días y 6 meses.

**Resultados:** Se observó un incremento de la puntuación total de la MSWS-12 entre los 15 días y los 6 meses de: deterioro de la ambulación  $x- = 1,9$  ( $p = 0,076$ ); deterioro de la bipedestación  $x- = 0,2$  ( $p = 0,637$ ); fatiga  $x- = 0,9$  ( $p = 0,209$ ); riesgo de caídas  $x- = 0,6$  ( $p = 0,270$ ).

**Conclusión:** El deterioro de la ambulación y la fatiga presentan una mayor tendencia al empeoramiento en el tiempo. El riesgo de caídas y el deterioro de la bipedestación presentan una puntuación más estable. La MSWS-12 relacionada con diagnósticos NANDA es una herramienta útil para enfermería en el seguimiento de personas con EM con alteración de la marcha.

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**Introduction**

Multiple sclerosis (MS) is a chronic, demyelinating, inflammatory, degenerative, immune-based disease which affects the central nervous system.<sup>1,2</sup> It has been estimated that MS affects 2.3 million people worldwide, with a mean prevalence of 33 cases per 100,000 inhabitants.<sup>3</sup> It is therefore considered to be the most common demyelinating disease and the primary cause of non-traumatic neurological disability in young adults between 20 and 40 years of age.

MS directly affects activity and quality of life: up to 90% of people diagnosed presented with altered gait. Difficulty in walking is perceived as highly disabling because it affects personal and social life, as well as their working environment.<sup>4-6</sup> To improve ambulation speed, the prescription of sustained-release fampridine at a dose of 10 mg/every 12 h is recommended. The clinical benefits of the treatment are assessed before and after starting it, objectively through chronometered tests such as the *Timed 25 Foot Walk Test* (T25FW) and subjectively using the *12-Item Multiple Sclerosis Walking Scale* (MSWS-12).<sup>7</sup>

The use of the MSWS-12 for assessment of response to treatment with fampridine is of the utmost interest in offering a comprehensive clinical approach. Awareness of the response reported by patients using this scale helps nursing professionals to identify, assess and monitor the NANDA<sup>8</sup> diagnosis relating to mobility, and consequently customise healthcare in accordance with the needs of each individual patient.

**Objectives**

To analyse the effectiveness of the MSWS-12 in relation to NANDA diagnoses (impaired walking, impaired standing, fatigue and risk of falling) in monitoring subjects with MS over time who are responders to fampridine.

**Method**

An observational, descriptive, retrospective study was conducted from October 2017 to September 2018 in the Unitat de Neuroimmunologia i Esclerosi Múltiple Territorial in Girona. A total of 17 subjects were included, corresponding to patient responders during the 6 months of treatment with sustained-release fampridine on a dose of 10 mg/every 12 h.

The variables collected at the beginning, after 15 days and 6 months were: age, sex, level of disability using the Kurtzke Expanded Disability Status Scale (neurological scale which gives a score from 0 to 10 correlated with increase in scoring to a higher level of disability)<sup>9</sup> and the evaluation of the MSWS-12 items.

The MSWS-12 is a self-administered scale where the patient is asked to what extent the MS has affected them in several aspects relating to their mobility during the last 2 weeks. The person must respond to each item with a score from 1 to 5, with 12 being the total minimum score (no affection) and 60 being the total maximum score (extreme affection).

**Table 1** Relationship between the ND and the MSWS-12 items.

ND domain	ND class	ND code	Definition	MSWS-12 items
N.º 4:	N.º 2: Activity and exercise	ND-88	Impaired ability to walk independently in the environment	Item 1: ability to walk
Activity and rest		Impairment in walking		Item 3: ability to climb up and downstairs Item 6: distance able to walk Item 10: walking slowed down Item 11: walk smoothly
		ND-238	Impaired ability to independently achieve and/or maintain an upright position of the body from feet to head	Item 4: standing when doing things more difficult
	N.º 3: Balance of energy	Impairment when standing ND-93	Overwhelming sustained sense of exhaustion and decreased capacity for mental and physical work	Item 5: balance when standing or walking Item 7: increased effort when walking
		Fatigue		Item 10: walking slowed down Item 12: concentration on walking
N.º 11: Safety and protection	N.º 2: Physical lesion	ND-155	Increased susceptibility to falling that may cause physical harm	Item 5: balance when standing or walking
		Risk for falls		Item 8: need to use support when walking indoors Item 9: need to use support when walking outdoors

**Table 2** Differences between day 15 and month 6 in the results obtained from the MSWS-12.

	Paired differences			
	Mean	Standard deviation	95% Difference confidence interval	
			Inferior	Superior
Impaired walking: 6 months-5 days	1.882	4.091	-.221	3.986
Fatigue: 6 months-15 days	.88235	2.78124	-.54763	2.31233
Risk for falls: 6 months-15 days	.58824	2.12305	-.50334	1.67981
Impaired standing: 6 months-15 days	.23529	2.01648	-.80148	1.27207

Continuous variables were expressed as a mean and the categorical variables as percentages. In both cases the corresponding confidence interval (CI) of 95% was also calculated. The evolution of the items using the student's *t*-test for the paired data were also evaluated. The significance level was established at  $p \leq .05$ . Statistical analyses was conducted with the SPSS® version 23 statistical package.

The relationship between the 12 items of the MSWS-12 and the NANDA nursing diagnoses were based on the

actual definition of the NANDA taxonomy (Table 1). Domain 4, class 2 and 3 for "impairment in walking" (ND-88 code) was selected, "impairment in standing" (ND-238 code) and "fatigue" (ND-93 code), and the domain 11, class 2 for "risk of falling" (ND-155-code). Of the 12 items making up the MSWS-12 item 2 was eliminated, which referred to a limited ability to run (none of the participants in the study could run and this was considered a variable which could lead to confusion).

## Results

Twelve women and 5 men, with an average age of 52.5 years of age participated (SD = 10.24) and one EDSS of 5.5 (SD = .69). The evolution of the ND between days 15 and 6 months of treatment showed an increase in the total score of: ND-88 1.9 (95% CI: -.221, 3.986)  $p = .076$ ; ND-238 .2 (95% CI: -.8, 1.3)  $p = .637$ ; ND-93 .9 (95% CI: -.6, 2.31)  $p = .209$ ; ND-155 .6 (95% CI: -.5, 1.7)  $p = .270$  (Table 2).

## Discussion

The observational study conducted by Hobart et al. in 2018<sup>9</sup> for evaluation of MSWS-12 in people with MS treated with fampridine compared with placebo, showed that there were significant improvements after 2 weeks of treatment administration and its benefits continued for 24 weeks. These results coincide with those obtained in this study from a jointed viewpoint, but they presented differences on studying them in a more grouped form, which meant that specific changes could be detected in the NANDA nursing diagnoses relating to walking (ND-88 and ND-93).

A nursing care plan based on analysis of the MSWS-12 items grouped according to the NANDA diagnoses facilitated the establishment of a specific methodology on the outcomes (NOC) and interventions (NIC) to provide better nursing care, as demonstrated by a study conducted by Akkus and Akdemir in 2012<sup>10</sup> relating to the MSQOL-54 quality of life scale.

## Conclusions

The results of the MSWS-12 indicate that impaired walking and fatigue had a greater tendency to worsen over time, and should therefore be the first NANDA diagnoses for nurses to consider. Risk of falling and impaired standing were NANDA diagnoses with a more stable score between 15 days and 6 months.

The MSWS-12 is a useful tool in nursing practice for monitoring people with MS with altered gait over time. However, a larger sample and longer length of monitoring would be encouraged, to compare the results obtained with the chronometered tests it (Timed 25-Foot Walk test, Timed Get Up and Go test and 2 min Timed Walk test).

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