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AM J ALZHEIMERS DIS OTHER DEMEN published online 2 July 2013
DOI: 10.1177/1533317513494454

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What is This?
French Validation of the Revised Algase Wandering Scale for Long-Term Care

Elodie Martin, BA¹, Nathalia Biessy-Dalbe, BA¹, Jean-Michel Albaret, PhD¹,² and Dona L. Algase, PhD³

Abstract

Objectives: The aim of this study was to create a French equivalent of the revised Algase wandering scale for long-term care (RAWS-LTC). Methods: The RAWS-LTC French version (F-RAWS-LTC), Mini-Mental State Examination, and Neuropsychiatric Inventory were administered to a sample of 100 institutionalized patients from 12 specialized homes. Results: The mean of the overall F-RAWS-LTC was 2.32 (standard deviation [SD] = 0.74, range 1-4), and the mean of each subscale was 2.48 for persistent walking, 1.62 for eloping behavior, and 2.30 for spatial disorientation. The correlation between the overall F-RAWS-LTC and each subscale was between 0.73 (for Spatial Disorientation) and 0.87 (for Persistent Walking). The correlation between the degree of behavioral disturbances and the overall F-RAWS-LTC is 0.42, and the correlation with the cognitive impairment is 0.50. Differences between the wanderers and nonwanderers are significant for the overall F-RAWS-LTC and for all the subscales. Discussion: Data demonstrate the statistical validity of the F-RAWS-LTC.

Keywords
dementia, Alzheimer’s disease, agitated behavior, assessment, wandering scale

Introduction

In recent years, numerous studies about patient management have addressed behavioral disorders in patients with dementia (PWDs).¹ At the same time, the 2008 to 2012 Alzheimer’s plan was developed by the French government to finance research, promote earlier diagnosis of the disease, and provide better care for patients and their family, caregivers, and nursing home staff. In this context, a closer look is given to behavioral problems within the disorder, their assessment, and on pharmacological and nonpharmacological interventions.²,³ This emphasizes the need to validate tools intended to assess behavioral changes for PWDs living in institutions and to adapt care projects.

Among the disorders that occur during Alzheimer’s disease (AD), wandering is frequently mentioned by caregivers as a source of anxiety and exhaustion.⁴ This activity has beneficial effects, wandering maintains a physical activity so have benefits to muscle trophicity and motor autonomy. Arguably, it stimulates appetite, and, like other physical activities in dementia, it could reduce sleep disorders and comorbidities, including infections.⁵ Wandering can also have adverse effects on the patient. First, the risk of falling is multiplied. Second, incessant walking may provoke extreme fatigue. Furthermore among those who wander, daily care may be compromised (washing, dressing, and nursing procedures) as well as mealtimes (inability to sit). The patient is also at risk of dehydration. This behavior can also be an issue of discord because of intrusions into the private rooms of other patients.⁵ From the perspective of the staff member, a wanderer requires higher vigilance and can cause higher levels of stress and/or anxiety.⁶ The “burden” is considered to be more important when the patient walks; indeed wandering is rated as the most important stressor for the nursing staff.⁷

Wandering behavior occurs in 17.4% of PWD.⁸ In their literature review, Lai and Arthur⁹ have reported an occurrence varying from 38% to 63% in PWDs. In the French cohort REAL.FR,¹⁰ among 571 PWDs living at home, the frequency of wandering is estimated to be 12.2%. The differences appear to be explained by the definition criteria for wandering.⁵ Variance exists due to the following considerations: inpatient or outpatient, restricting wandering to aimlessly locomotion, or also including wheelchair mobility (vs walking).

In this study, we refer to the definition proposed by Algase and Nelson⁴ “wandering is a syndrome of dementia-related locomotion behavior having a frequent, repetitive, temporally disordered nature and/or spatially-disoriented nature that is manifested in lapping, random, and/or pacing patterns, some of which are associated with eloping, eloping attempts, or getting lost unless accompanied.”

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To date in France, instruments to measure wandering are limited. Direct observation or recording can provide some information on the behavior, type of pattern movement, and frequency and distance traveled but are rarely used, as it is very time consuming. The assessment of behavioral disorders is primarily based on the Cohen-Mansfield Agitation Inventory15 or the Neuropsychiatric Inventory (NPI)13 which allows to evaluate the frequency, intensity, and impact of behavioral disorders on the environment. However, wandering is one criterion among various motor disturbances found in various disorders, such as gestural stereotypies, perseveration behaviors, and handling objects. The scale does not evaluate wandering specifically.

In their integrative literature review, Lai and Arthur9 note that only 3 scales have been reported, and the Algase wandering scale is considered as a valid research instrument. The revised Algase wandering scale for long term care (RAWS-LTC) was created by Algase et al14 to estimate the degree of wandering behavior in PWD in long-term care settings. This version was derived from a longer version of the Algase wandering scale.15 The RAWS-LTC contains 3 subscales, including persistent walking, spatial disorientation, and eloping behavior, validated across earlier versions. It has 19 items whose values range from 1 to 4, a high score meaning a more wandering. The scores are computed by averaging the ratings for all items for every subscale and all the scales. Scores computed as item averages allow for comparison of subscale scores of unequal length. A valid rating is needed on 75% of the items to compute a useable score. This same computation rule applies to the overall RAWS-LTC scale score as well. It is completed by the nursing staff. The respondent should have provided care to the PWDs over several recent shifts. This criterion ensures that the respondents have had the opportunity to observe the wandering behavior. Their answers should reflect their observations of the patients during the preceding week. The scale can be completed independently or by having it read to the caregivers by another individual. It can be administered in 10 minutes. Psychometric properties are supported by Cronbach’s α for the RAWS-LTC (.93 for the overall scale,.94 for persistent walking,.87 for eloping behaviors, and .88 for spatial disorientation). Mean scale scores (and standard deviation [SD]) for nonwanderers are as follows: 1.61 (0.23) for the overall scale, 1.91 (0.44) for persistent walking, 1.18 (0.20) for eloping behavior, and 1.50 (0.50) for spatial disorientation. Mean scale scores (and SD) for problematic wanderers are as follows: 2.72 (0.36) for the overall scale, 3.28 (0.39) for persistent walking, 2.19 (0.67) for eloping behavior and 2.69 (0.54) for spatial disorientation.16

The purpose of this research was to adapt this instrument to a French population while maintaining the meaning and intent of the original tool.

Method

Establishing Equivalence

Content Equivalence. Considering cultural proximity, we have translated the scale without changing the items proposed in the original version. All items are simple to understand and are appropriate to French culture.

The RAWS-LTC is calibrated in patients living in a nursing home with 100 beds or more and in assisted-living facilities. Like in the United States, a French nursing home is an institution providing full-time nursing care, assistance during daily activities, paramedical care, such as physiotherapy and psychomotor/occupational therapy, psychosocial and personal care, and room and meal. A residential home is an institution providing living conditions adjusted to the needs of residents who usually require no other specific nursing care and only some assistance for some basic activities of daily living, (dressing, mobility, and meals).17 In France, 6% of the seniors live in institutions (nursing home or residential home), this value is 6.5% in the United States.17

Semantic Equivalence. We used back translation in order to transform the scale. The aim of this procedure is to achieve a version that is conceptually equivalent in the target culture.18 The original English version of the RAWS-LTC was first translated into French by two professionals specialized in gerontology and knowledgeable about the wandering behavior of PWDs. This version was then pilot tested with patients. Second, this version was translated by an independent bilingual person from French back into English. Third, a comparison of the back-translation with the original text was performed by Dr Algase to check the accuracy end fidelity of the original translation.

Technical Equivalence. In this study, a paper-and-pencil format was used to administer the F-RAWS-LTC to staff members of PWDs having wandering behavior. In order to ensure that the questionnaire was completed precisely, we imposed an additional criterion that the scale is to be completed in the presence of a psychomotor therapist and a nursing member, because it is necessary to obtain a comprehensive assessment of the phenomenon.

Design and Sample

Data were collected with a nonprobability sampling strategy using structured format face-to-face interviews. On a population of 767 institutionalized patients living in 12 specialized homes for elderly people from 5 French departments (Haute Garonne, Gers, Tarn, Rhône and Gard), we selected 50 wanderers and 50 nonwanderers matched for sex and dementia diagnosis. These nursing homes were comparable in their architectural and staffing features and enabled resident’s similar freedom to move independently around the grounds (narrowly out of their rooms) but did not allow the patient to leave the grounds without access to a code. Inclusion criteria were (1) being older than 65 years of age; (2) having been diagnosed with dementia according to the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition, Text Revision; DSM IV-TR) criteria19; (3) having a Mini-Mental State Examination (MMSE) score less than 26 of 30; and (4) being capable of independent walking. The 2 groups (wanderers and nonwanderers) are determined by the 20th item of RAWS-LTC: “resident is a
wanderer”; in response to this item, caregivers can answer (1) definitely not, (2) at times, (3) yes but it is not a problem, and (4) yes and it is a problem. The first answer qualifies the patient as a nonwanderer, and the remaining 3 choices qualify the patients as wanderers.

**Description of the Sample**

The age of PWDs ranged from 65 to 95 years with a mean of 84 years (SD = 6.27). In each group (wanderers and nonwanderers), there were 39 women and 11 men; this sex ratio reflects a representative sample of inpatient membership.20

The mean MMSE cognitive level score of PWDs was 8.30 (SD = 7.22) with a range of 0 to 25.

All PWDs were diagnosed by gerontologists or neurologists as having Alzheimer dementia, multiple infarct dementia, mixed type dementia, dementia with Lewy bodies, or frontal dementia (see Table 1 for diagnosis repartition) using DSM-IV-TR criteria and recommendations.21

**Instruments and Procedures**

Cognitive functioning was assessed by the MMSE.22 This short measure of global cognitive function has been widely used in clinical evaluation. It consists of 6-weighted items with a maximum score of 30. Lower scores indicate greater cognitive impairment in PWDs.

To evaluate behavioral and psychological symptoms, we used the French version of the Neuropsychiatric Inventory Version Caregiver Team (NPI-ES). The NPI-ES is frequently used to assess behavioral disturbances. The frequency and the severity of 10 behavioral disturbances (including motor disturbances) occurring in PWDs were rated by the staff members on a scale of 12 points for each item. A lower score indicates fewer behavioral symptoms. To calculate the score of the motor disturbances subtest, we used the frequency (rated as 1—rarely to 4—very often) and the severity scores (rated as 1—mild to 3—severe). A frequency × severity score greater than 2 for each item is pathological. For the total score, we used the sum of frequency × severity obtained for each of the 10 items.

Wandering behavior was measured by the RAWS-LTC French version (F-RAWS-LTC).

**Data Analysis**

Data were treated and analyzed using the SPSS software version 21.

An analysis of variance (ANOVA) was used to compare the 2 groups on age, overall MMSE and spatial orientation score, and overall NPI-ES and aberrant motor behavior subscale score.

Then, we used 3 methods to assess criterion and construct validity: (1) ANOVA to examine the difference between wanderers and nonwanderers on the overall F-RAWS-LTC, 3 subscale scores, and MMSE and NPI scores; (2) correlation between MMSE and F-RAWS-LTC and between NPI-ES and F-RAW-LTC. Finally, internal consistency of the F-RAWS-LTC was assessed by the correlation between the overall F-RAW-LTC and the 3 subscale scores and by Cronbach’s α for overall scale and subscales. The statistical significant level retained was a P value < .05.

**Results**

A preliminary analysis (sex × groups) was conducted on all the variables and showed no significant differences according to sex. Further analysis was performed using the only group variable.

**Age**

There was significant difference between wanderers (mean [M] = 85.82) and nonwanderers (M = 82.46) on age, F1,98 = 7.65, P < .01.

**The MMSE and NPI-ES Scores**

Nonwanderers, as shown in Table 2, presented higher MMSE score (M = 5.44; SD = 5.90) than wanderers (M = 11.16; SD = 7.33); moreover, spatial orientation score is higher in nonwanderers (M = 1.52; SD = 1.78) than wanderers (M = 0.58; SD = 1.07). Nonwanderers presented lower NPI score (M = 19.32; SD = 17.65) than wanderers (M = 31.14; SD = 18.52); moreover, motor disturbances score is lower in nonwanderers (M = 2.06; SD = 3.69) than wanderers (M = 7.06; SD = 4.56).

We observed significant difference in the MMSE score F1,98 = 18.47, P < .01 and in the NPI score F1,98 = 10.68, P < .01. Significant differences were also observed in the subscores: spatial orientation of MMSE F1,98 = 10.28, P < .01, and motor disturbances of NPI F1,98 = 36.34, P < .01.

Further, Cohen’s effect size value for MMSE (d = .86) suggested high practical significance.

Cohen’s effect size value for NPI (d = .65) suggested moderate significance.

**Construct Validity**

The overall score of the F-RAWS-LTC, as shown in Table 2, was significantly higher in wanderers than in nonwanderers, F1,98 = 156.99, P < .01, and for each subscale score: persistent walking F1,98 = 168.24, P < .01, eloping behavior F1,98 = 97.48, P < .01, spatial disorientation F1,98 = 22.46, P < .01.

The correlation between the overall F-RAWS-LTC score and the overall MMSE score was r = −.50 (P < .01). We also

| Table 1. Diagnosis Repartition Depending on Whether Wandering is Present or Not. |
|-----------------|---------------|---------------|
| Dementia        | Wanderers     | Nonwanderers  |
| Alzheimer dementia | 39            | 36            |
| Dementia with Lewy bodies | 1             | 5             |
| Frontal dementia | 2             | 2             |
| Multiple infarct dementia | 1           | 2             |
| Mixed type dementia | 2            | 0             |

Wandering had a significant impact on the cognitive evaluation.
noted a significant correlation between the overall F-RAWS-LTC score and the subscale spatial orientation (MMSE) score ($r = -0.36; P < 0.01$).

There was a significant but weak correlation between the overall NPI-ES score and the overall F-RAWS-LTC score ($r = 0.42; P < 0.01$). The correlation was better between the overall F-RAWS-LTC score and the motor disturbance subscale score (NPI-ES; $r = 0.64; P < 0.01$).

**Internal Consistency**

Each subscale was correlated with the overall F-RAWS-LTC score (from $r = 0.73$ to $r = 0.87; P < 0.01$; cf Table 3). Correlations between the subscales demonstrated moderate to high significant relationships ranging from $r = 0.31$ (spatial disorientation and persistent walking) to $r = 0.73$ (eloping behavior and persistent walking; $P < 0.01$).

The overall scale had a Cronbach's $\alpha$ of 0.92. Across sub-scales, Cronbach’s $\alpha$ was 0.94 for persistent walking (n = 100), 0.74 for eloping behavior (n = 80), and 0.89 for spatial disorientation (n = 99).

**Discussion**

**General Characteristics of the Studied Population**

In this study, wanderers were predominantly female (77%) with an overall mean age of 82.7 years (77 to 95 years). This is explained by the predominance of female patients among nursing home residents. We do not find a gender effect on wandering, like other studies. However, Klein et al. found a gender effect on wandering for men (odds ratio = 1.97 for men vs women $P = 0.034$).

In our study, wandering patients were significantly younger than nonwanderers. We did not take into account the disease duration. Klein et al. showed that wandering behavior increases with the duration of the disease; however in their study, Algase and Song showed that age was significantly negatively correlated with the revised Algase wandering scale (RAWS). In the nursing home, residents manifesting physically nonaggressive behaviors, including wandering, tended to be younger than other residents. Our results are consistent with the latter study.

**Cognitive Impairment and Behavioral Disorders**

This study was conducted to validate an instrument dedicated to wandering behavior on a French population sample. We chose to validate the RAWS-LTC rather than RAWS, because it combines the 3 most significant factors and confirms the conceptual dimensions used to structure the instrument: persistent walking (frequency), eloping behavior (boundary transgressions), and spatial disorientation (navigational deficits). These 3 subscales have good reliability and validity as dimensions of wandering, so it can be useful for differentiating wanderers from nonwanderers. They can also detect increasing levels of wandering behavior. The other items (routinized walking and shadowing) are not sufficiently sensitive to differentiate wanderers from other PWDs.

Our results show significant differences between wanderers and nonwanderers on cognitive impairment and behavioral disorders. The average MMSE score of wanderers corresponds to severe dementia. However, wandering occurs in patients at all levels of cognitive impairment, but frequency increases with...
cognitive impairment. In our sample, the range of the MMSE score extends from 0 to 19 (moderate to severe dementia), in accordance with Algase and Song’s study25 in which the MMSE score ranges from 0 to 23. The increased frequency of wandering according to cognitive impairment is reflected in a negative correlation between overall F-RAWS-LTC score and the MMSE score. Cognitive level is lower in the wanderer group which is consistent with data in the literature.9,24-28 For example, Algase and Song25 found a similar significant correlation between the MMSE score and the wandering subscale (r = -.62, P < .01).

Among cognitive deficits present in dementia, spatial disorientation plays an important role in wandering.11,29 This explains the significant correlation between the spatial orientation subscale of the MMSE score and the F-RAWS-LTC score in our study.

Similarly, the NPI-ES scores were very heterogeneous in our wandering population (range = 3-80). But behavioral disorders were significantly more frequent in the wanderer group, with a significant correlation between the NPI-ES score and the overall F-RAWS-LTC score. Similarly, Klein et al8 indicate that wandering behavior is associated with moderate to severe depression, delusions, hallucinations, and sleep disorder.

Psychometric Properties of F-RAWS-LTC

The F-RAWS-LTC has high internal consistency (α = .92), which is highly significant and interesting for use in research.30 This result is consistent with those of Algase et al study15 (α = .93). Scores (and SD) for wanderers and non-wanderers are also very similar in both the studies.

For convergent validity, the moderately significant correlation between the aberrant motor behavior subscale of the NPI-ES score and the F-RAWS-LTC score allows us to consider that we are partially measuring a common phenomenon, but the NPI-ES subscale also contains repetitive and endless activities. Heterogeneity is observed among the 3 subscales, eloping behavior is less important (1.62) than persistent walking (2.50) and spatial disorientation (2.32). In 2010, the Médéric Foundation survey observed that 88% of French nursing homes reported having felt the need to put in devices limiting the freedom of patients with AD to come and go (in most cases to fight against the risk of eloping).31 A code to access the institution or a specific unit is the system most frequently used (65%). This may explain why attempts to elope are less frequently observed by caregivers.

Limitations

There are several limitations to our study such as the lack of data concerning the disease duration and the nature of cognitive impairment, particularly executive and attentional functions that could be important factors in wandering.32 First, the MMSE was used to screen the cognitive level, but it is not sufficient to provide a complete and precise profile of weaknesses of PWDs; in addition, this test is susceptible to many issues such as education and sociocultural effects. Second, the small sample size does not permit to distinguish the impact of different forms of dementia. A further study will be interesting to address this issue.

In conclusion, these results show that the F-RAWS-LTC can be used as a valid measure of wandering in French PWDs. This instrument enables to describe and quantify wandering behavior in long-stay care settings.

This tool could be used in clinical situations and in future research, particularly in a test–retest design to measure the long-term effects of psychomotor interventions on wandering and the effects on environmental management.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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