Spanish adaptation and psychometric properties of the Sedentary Behaviour Questionnaire for fibromyalgia patients: the al-Andalus study

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ABSTRACT

Objectives. *Physical inactivity and sedentary behaviours are considered as risk factors for global mortality and primary contributors to the obesity epidemic. We assessed the psychometric properties and transcultural adaptation into Spanish of the Sedentary Behaviour Questionnaire in fibromyalgia patients.*

Methods. *The Spanish version of the Sedentary Behaviour Questionnaire (SBQ-S) was translated and cognitively pretested following cross-cultural adaptation guidelines. Test-retest reliability was evaluated in 114 fibromyalgia patients. Fifty-one participants wore a body monitoring device (SWA) for nine consecutive days and filled the SBQ-S twice (separated by a one-week interval). Measures of sedentary time assessed by the SBQ-S and the SWA were compared.*

Results. *Overall reliability of the SBQ-S scores was good. The intraclass correlation coefficients were excellent for the SBQ-S total scores (from 0.83 to 0.86), and varied from moderate to excellent for 10 of the 11 sedentary behaviours (from 0.52 to 0.96). There was no significant association between the SBQ-S and the SWA for the weekday, weekend, and total sedentary time (from r -0.06 to -0.03). Differences between the SBQ-S and the SWA increased as the hours per day of sedentary time increased (beta coefficients varied from -0.713 to -0.330, all p<0.02).*

Conclusion. *The SBQ-S developed in this study presents a good reliability and poor convergent validity when compared with the SWA in the Spanish fibromyalgia patients studied.*

Introduction

Fibromyalgia is a chronic non-inflammatory syndrome characterised by a diffuse bodily pain as tender points, sleep disorders, muscle stiffness, fatigue, cognitive disturbances, and mood disorders (1-4).

The prevalence of comorbidities among patients diagnosed with fibromyalgia is very high (5, 6). Recent findings have suggested an association between chronic widespread pain and increased mortality (7, 8). The increased mortality risk has been hypothesised to be related to a patient's lifestyle, including physical inactivity (8). Anecdotal evidence suggests that most fibromyalgia patients are sedentary (9) and less physically active than age- and sex-matched healthy controls (10). Physical inactivity and sedentary behaviour are considered as primary contributors to the obesity epidemic (11).

Sedentary behaviours are defined as those pursuits undertaken while awake that involve sitting or reclining and that result in low levels of energy expenditure, typically less than 1.5 metabolic equivalents (12). Time spent in sedentary behaviours in adults is associated with obesity (13, 14), incident type 2 diabetes (13), and increased risk of incident hypertension (15), conditions that are known to be more prevalent in fibromyalgia patients than in the general population (16, 17). Evidence from epidemiological (2, 18) and clinical studies (18, 19) suggests a link between fibromyalgia and obesity. There is an increasing interest in sedentary behaviours for understanding the mechanisms of obesity in general population (20). There is substantial evidence that sedentary behaviour is related to obesity and other health outcomes independent of physical activity (13, 21).

Extensive research has supported a link between physical activity and health in fibromyalgia patients (22, 23). Actually,

some physical activity questionnaires have been validated in fibromyalgia patients (24, 25). However, measuring sedentary behaviour as an absence of physical activity is inappropriate (12). Currently, there are no sedentary behaviour questionnaires available for fibromyalgia patients and the relationship between sedentary behaviour and health in fibromyalgia patients has not been appropriately addressed. The development of valid and reliable measures of sedentary behaviour for use with large samples of fibromyalgia patients is an important research priority. Consequently, the aim of this study was to evaluate the psychometric properties and transcultural adaptation of a sedentary behaviour questionnaire for Spanish-speaking patients with fibromyalgia.

Methods

Study population

We contacted a local association of fibromyalgia patients in Granada (Southern Spain), and an invitation to participate in the study was sent to all women aged 18–65 years old (n=650). One hundred and sixteen potentially eligible subjects responded and gave their written informed consent after receiving detailed information in a meeting about the study aims and procedures. The exclusion criteria included the inability to read and write in Spanish, no diagnosis of fibromyalgia according to the American College of Rheumatology classification criteria (1), severe trauma within the last six months, orthopaedic or musculoskeletal limitations that precluded ambulation. Additionally, subjects who were pregnant and who had severe dementia (Mini-Mental State Examination <10 points) were also excluded. One patient had less than 11 tender points and another patient did not complete the Mini-Mental State Examination. A total of 114 patients were finally included in the reliability analysis. A subsample of 59 patients wore a wearable body monitoring device but data were not valid in 8 patients. Finally, 51 patients were included in the convergent validity analysis. The research protocol was reviewed and approved by the Ethics Committee of the *Hospital Virgen de las Nieves* (Granada, Spain) and it was in accordance with the Declaration of Helsinki and the ethical standards in sports and exercise science research (26).

Procedures

Three measurement conditions, separated by an interval of 9 days, were performed during appointments that took place at the local association of patients with fibromyalgia of Granada. The participants were asked not to change their medications, habitual lifestyles, or undergo any treatments during the study period. During the first appointment, the sociodemographic and personal medical records of the fibromyalgia patients were registered; anthropometry was measured, and the fibromyalgia diagnosis was confirmed according to the American College of Rheumatology classification criteria (1). In addition, a body monitoring device was placed on the arm of each patient, and the Spanish version of the Mini-Mental State Examination (27), and the Sedentary Behaviour Questionnaire (SBQ-S) were administered and completed by each patient, and the time consumed to filling the SBQ-S was computed. During the second appointment, the SBQ-S was administered and completed by each patient and the time consumed was also computed. Two days later, at the third appointment, the body monitoring device was removed.

Instruments

– Sedentary behaviour measures

According to the recommendations of a recent review (28), we have selected two different sedentary behaviour instruments: a self-reported questionnaire and a body monitoring device.

The SBQ-S was adapted from the original version used in adults and has shown acceptable reliability and validity (29). It was designed to assess the amount of time spent doing 11 behaviours (watching television, sitting while eating, lying and resting, sitting while playing computer/video games, sitting while listening to music, sitting and talking on the phone, doing paperwork or office work, sitting and reading, playing a musical instrument, doing arts and crafts, sitting and driving/travelling in a car, bus, or train). The 11 items were completed separately for weekdays and weekend days. Response options were "none", "15 minutes or less", "30 minutes", "1 hour", "2 hours", "3 hours", "4 hours", "5 hours", or "6 hours or more". The time spent on each behaviour was converted into hours (eg, a response of 15 minutes was recorded as 0.25 hours). For the total scores of sedentary behaviour, hours per day for each item were summed separately for weekday and weekend days. To obtain weekly estimates, weekday hours were multiplied by 5 and weekend hours were multiplied by 2 and these were summed for total hours/week. For the summary variables of total hours/day spent in sedentary behaviours (weekday and weekend) and total sedentary hours/week, responses higher than 24 hours/day were truncated to 24 hours/day.

A SenseWear Pro3 Armband (SWA, BodyMedia Inc., Pittsburgh, PA, USA), a wearable body monitoring device was used to assess the sedentary behaviours that involve levels of energy expenditure less than 1.5 metabolic equivalents. Time spent being sedentary was expressed as total duration (hours/day). Sleeping time was removed from analysis. The monitor was worn for 9 days on the right arm over the triceps brachia muscle at the midpoint between the acromion and the olecranon processes. The monitor was carried over the whole day (24 hours), except during water-based activities such as bathing or swimming. A total of 7 days of recording was necessary to be included in the convergent validity analysis. Data obtained using the monitor were downloaded using software developed by the manufacturer (SenseWear Professional software version 6.1). This portable device has been successfully validated against doubly labelled water (30) and indirect calorimetry (31). It includes a 2-axis accelerometre for motion detection and additional sensors to measure energy expenditure by monitoring the heat flow from the body, skin temperature, and galvanic skin responses. The physiologic information gathered by the sensor array to-

gether with simple body measurements were processed using SenseWear algorithms to obtain accurate estimations of energy expenditure for all types of activity over the course of 9 days.

–Anthropometrical measures

Weight and height were measured following standard procedures with a scale (Inbody R20, Biospace, Gateshead, UK) and a stadiometer (Seca 780, Hamburg, Germany), respectively, and body mass index (weight in kg divided by m^2) was calculated.

– Cognitive measures

The Spanish version of the Mini-Mental State Examination (27) was used for screening cognitive function in all patients. Patients with a score <10 (out of 30) points were excluded, considering that they have severe dementia (32).

Study design

– Transcultural translation process

Figure 1 shows the adaptation process followed for the SBQ-S using direct and reverse translation, as prescribed by the scientific literature (33). The translators were asked to score the degree of difficulty of the translation (1=minimum; 10=maximum) and the degree of conceptual equivalence that they believed it bore to the original version (1=different; 10=equivalent). Both translations were systematically reviewed to determine the differences and to establish a first consensus version of the questionnaire.

The 4 bilingual translators established a consensus version of the final questionnaire. The investigation team in collaboration with all of the translators compared the reverse translation with the original version of the questionnaire in English. The consensus resulted in the second version of the questionnaire.

Subsequently, individual interviews were conducted for the fibromyalgia patients to evaluate their understanding of the questionnaire (cognitive debriefing), as described by previous studies (34, 35). This strategy evaluates the comprehensibility and feasibility of the instrument. The ratings of the results of the comprehension test by the research team resulted in the final version of the questionnaire (Appendix 1).

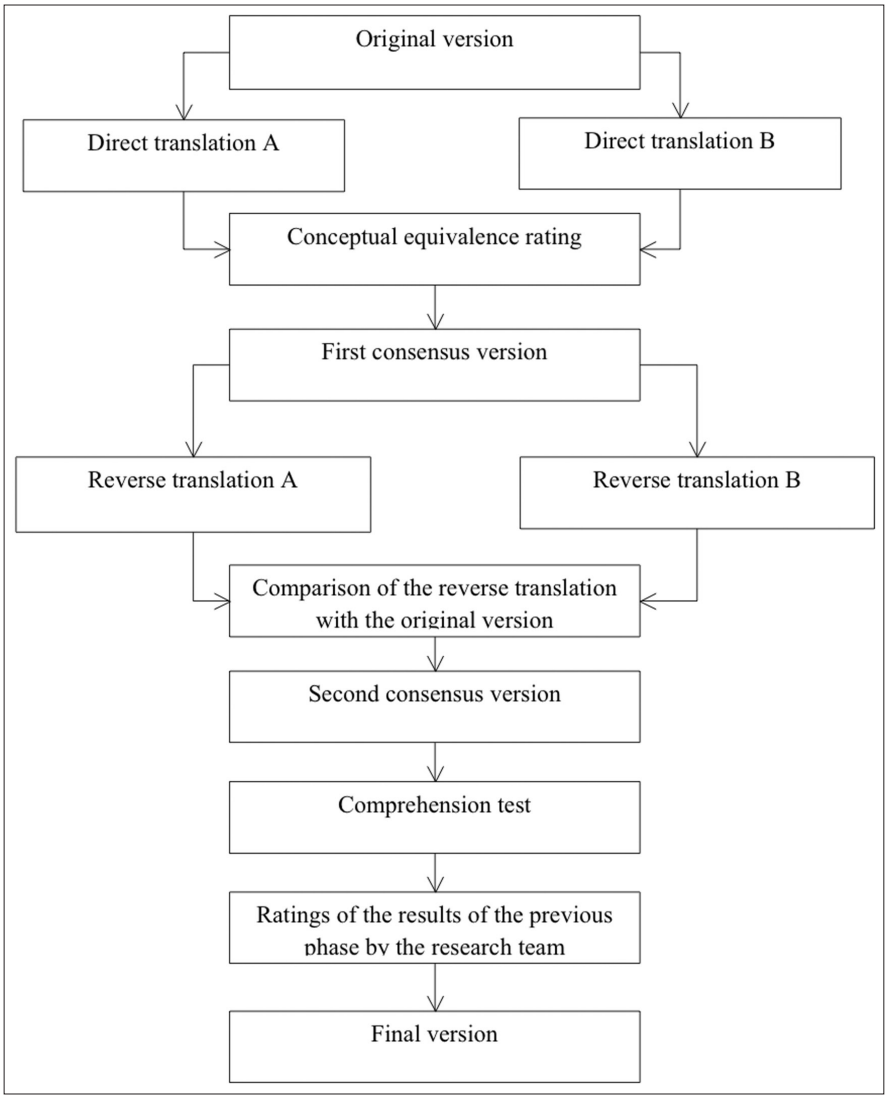

Fig. 1. Stages in the adaptation process of the Sedentary Behaviour Questionnaire to Spanish.

– Test-retest reliability

Test-retest reliability was evaluated for (1) the total sedentary time; (2) for the categories of total weekday, and total weekend sedentary time; and (3) for the total time of each of the 11 sedentary behaviours of the SBQ-S. All of the patients were asked to complete the SBQ-S twice (separated by a one-week interval).

– Convergent validity

The measure selected to evaluate convergent validity was the SWA. This tool has been analysed recently and was demonstrated to possess satisfactory psychometric properties in fibromyalgia patients (31), healthy (30) and other chronically ill clinical populations (36). The monitor was worn during 9 days, but we did not include the first and last day of recording to minimise the reactivity.

Statistical analyses

The test-retest reliability of the SBQ-S scores was assessed using the intraclass correlation coefficients with 95% confidence intervals (37), differences observed between the measurements (tests 1 and 2), standard deviations of the differences, intrapatient standard deviations, and standard error of the measurement (38). The following classification was used to interpret the intraclass correlation coefficient values: <0.50, 0.50–0.75, and >0.75 represented poor, moderate, and good reliability, respectively (39). Bland-Altman plots, including the 95% limits

Table I. Demographic and clinical characteristics of study population (n=114).

Variables	Median (25th–75th percentiles)
Tender point count, 1–18	18 (17–18)
Age, years	52 (46–57)
Body mass index, kg/m^2	26.8 (24.1–31.5)
Mini-Mental State Examination, 0–30	29 (26–29)
	n (%)
Gender (female/male)	108/6 (95/5)
Ethnicity (white)	114 (100)
Time since diagnosis	
≤5 years	56 (49)
>5 years	58 (51)
Highest education level	
No schooling	5 (4)
Elementary school	45 (40)
High school	35 (31)
College/university	28 (25)
Marital status	
Single	18 (16)
Married	85 (74)
Widowed	3 (3)
Divorced or separated	8 (7)
Occupational status	
Working	32 (36)
Unemployed	24 (28)
Retired	32 (36)

Values are the median (25th–75th percentiles) unless otherwise indicated.
Three missing data on diagnosis and body mass index, one missing data on highest education, 26 missing data on occupational status.

of agreement, were used to determine the agreement between the recorded values at the individual level (40). The association between the difference and the magnitude of each SBQ-S score (*i.e.* heteroscedasticity) was examined by regression analysis. Non-parametric tests were used because the variables were not normally distributed. The Wilcoxon signed-rank test was selected to analyse the systematic differences in the variables between the two measurements.

Bland-Altman plots (40), including the 95% limits of agreement, were used to determine the agreement between the objectively measured sedentary time (SWA) and the estimated sedentary time (SBQ-S). The mean and standard deviation of the differences between methods was calculated and tested for significance using a one-sample *t*-test of the differences against zero. The association between the difference and the magnitude of the measurement (*i.e.* heteroscedasticity) was examined by regression analysis. Linear correlations between variables were analysed according to the Spearman tests. The following classification was used to interpret the correlation values: correlations of <0.25, 0.25–0.50, 0.50–0.75, and >0.75 represented weak or no relationship, fair, moderate to good, and good to excellent relationship, respectively. Statistical analyses were performed using the SPSS package (version 18; SPSS Inc., Chicago, IL, USA) and the significance level was set at $p<0.05$.

Results

Sample characteristics

Table I summarises the demographic and clinical characteristics of the patients.

Transcultural translation process

During the process of direct and reverse translation, there were no problems and no item seemed to present any difficulty. The questionnaire was understandable and easy to translate. The sedentary behaviour questionnaire was adapted to our study population including the two new items of time spent eating and lying as indicators of sedentary behaviour. Items included were: *"¿Cuánto tiempo empleas comiendo sentado?"* and *"¿Cuánto tiempo empleas descansando tumbado?"*. In addition, we added some instructions at the beginning of the questionnaire to improve the understanding to the patients.

Patients' comprehension of the questionnaire (cognitive debriefing) was analysed in individual interviews with 12 women with fibromyalgia who ranged in age from 30 to 65 years and belonged to different educational levels (7 participants had an elementary school degree, 1 participant had a high school degree, and 4 participants had a university degree). Patients' comprehension disturbances were not observed, hence, the questionnaire did not require any

Table II. Test-retest reliability of the SBQ-S scores in fibromyalgia patients (n=114).

SBQ-S items and summary scores	Median (25th–75th percentiles) Test 1 (hours/day)	Median (25th–75th percentiles) Test 2 (hours/day)	Difference mean (SD) (hours/day)	Intrapatient SD (hours/day)	Intraclass correlation coefficient	95% confidence interval	Coefficient of repeatability (hours/day)	Standard error of the measurement (hours/day)
Watching TV	2.6 (1.6–3.6)	2.6 (1.6–3.3)	-0.05 (1.09)	0.39	0.82	0.74, 0.88	2.13	0.60
Sitting while eating	0.6 (0.5–1.0)	0.6 (0.5–1.0)	0.14 (0.86)	1.08	0.72	0.59, 0.81	1.70	0.42
Lying and resting	2.0 (0.9–3.0)	2.0 (0.6–3.0)	-0.01 (1.43)	0.07	0.74	0.62, 0.82	2.80	0.79
Playing computer games	0.0 (0.0–0.5)	0.0 (0.0–0.9)	0.03 (0.56)	0.22	0.93	0.89, 0.95	1.09	0.28
Sit listening to music	0.0 (0.0–0.5)	0.0 (0.0–0.3)	-0.10 (0.83)	0.79	0.55	0.36, 0.69	1.64	0.56
Sit talking on telephone	0.4 (0.3–1.0)	0.3 (0.3–0.9)	-0.09 (0.76)	0.68	0.84	0.77, 0.89	1.49	0.43
Office/paper work	0.0 (0.0–0.8)	0.0 (0.0–0.8)	-0.05 (0.62)	0.41	0.96	0.94, 0.97	1.22	0.31
Reading	0.5 (0.1–1.0)	0.5 (0.0–1.0)	0.04 (0.49)	0.28	0.90	0.86, 0.93	0.96	0.24
Play musical instrument	0.0 (0.0–0.0)	0.0 (0.0–0.0)	0.04 (0.35)	0.32	0.07	-0.35, 0.36	0.69	0.01
Arts and crafts	0.0 (0.0–0.4)	0.0 (0.0–0.5)	0.00 (0.62)	0.03	0.90	0.85, 0.93	1.22	0.33
Driving / travelling in vehicle	0.5 (0.2–1.0)	0.6 (0.3–1.3)*	0.07 (1.01)	0.57	0.52	0.31, 0.67	1.97	0.66
Total sedentary time	9.7 (7.2–12.5)	9.5 (6.7–12.6)	-0.03 (3.28)	0.64	0.86	0.79, 0.90	6.40	1.74
Total weekday time	9.4 (7.0–12.8)	9.3 (6.5–12.5)	-0.11 (3.78)	0.81	0.83	0.76, 0.88	7.37	2.05
Total weekend time	9.6 (6.5–12.6)	9.8 (7.3–12.8)	0.20 (3.39)	1.47	0.83	0.75, 0.88	6.62	1.89

Significant differences between tests 1 and 2 using Wilcoxon signed-rank test; *p=0.037.
SBQ-S: Spanish version of the Sedentary Behaviour Questionnaire; SD: standard deviation.

Table III. Comparison of sedentary time between SWA and SBQ-S in fibromyalgia patients (n=51).

Time interval	Sedentary time (hours/day)		Difference mean (SD) (hours/day)	*p*-value between methods	Correlation coefficients
	Estimated (SWA) median (25^{th}–75^{th} percentiles)	Self-reported (SBQ-S) median (25^{th}–75^{th} percentiles)			
Weekdays	10.4 (9.2–12.2)	9.3 (6.5–12.5)	0.25 (5.06)	0.564	-0.03
Weekend	10.1 (7.9–12.1)	9.8 (7.5–12.8)	-0.06 (4.77)	0.934	-0.06
Entire week	10.5 (8.8–11.9)	9.6 (6.7–11.6)	0.16 (4.65)	0.708	-0.06

Correlation coefficients were not significant using Spearman test ($p>0.05$).
The mean difference was not significantly different from zero using a one-sample *t*-test ($p>0.05$).
SWA: SenseWear Armband; SBQ-S: Spanish version of the Sedentary Behaviour Questionnaire; SD: standard deviation.

modification. The assessment of the questionnaire acceptance and formality showed that all the patients found the format comfortable and reported a sufficient comprehension of the items.

Test-retest reliability

The results of test-retest reliability for the SBQ-S scores are presented in Table II. The intraclass correlation coefficients were excellent for the weekday, weekend, and total sedentary time (0.83–0.86), and varied from moderate to excellent for the 11 sedentary behaviours (0.52–0.96), except for the item about time spent playing an instrument, which was poor (0.07). The standard errors of the measurement were satisfactory for all SBQ-S score assessed, varying from 0.0 to 2.1 hours/day. Mean differences between test and retest did not differ significantly from zero and were lower than the standard errors of the mean as well as the coefficient of repeatability was less than 2 standard deviations for all SBQ-S scores assessed.

Figure 2 shows the Bland-Altman plots and the limits of agreement for the weekday (7.3, -7.5 hours/day), weekend (6.8, -6.4 hours/day), and total sedentary time (6.4, -6.5 hours/day). There was no significant association between the difference and the magnitude of the test-retest SBQ-S measurements for the weekday, weekend, and total sedentary time (all $p>0.05$).

Convergent validity

The SBQ-S was validated in a subsample of 51 patients who had 7 valid days of registration using SWA. Mean registered time during waking time was ~17±2 hours/day. The SBQ-S slightly underestimated 2% the weekday and total sedentary time, and slightly overestimated 1% the weekend sedentary time, as compared with SWA method. The difference in weekday, weekend, and total sedentary time across the two methods was not significant ($p>0.05$). No significant association was observed between the SBQ-S and SWA measurements for the weekday, weekend, and total sedentary time (r from -0.06 to -0.03; $p>0.05$) (Table III). Figure 3

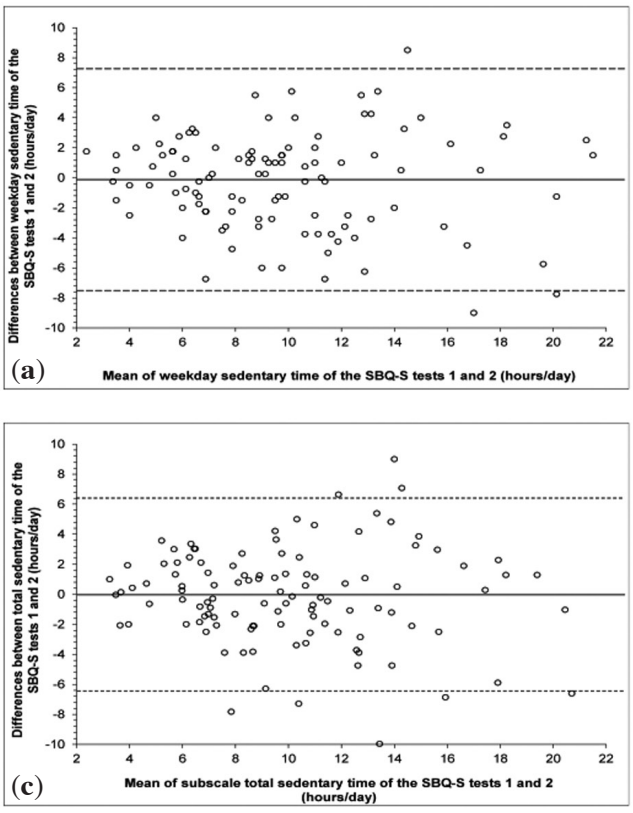

Fig. 2. Bland-Altman plots of the differences between tests 1 and 2 for the SBQ-S total scores: (**a**) weekday sedentary time, (**b**) weekend sedentary time, (**c**) total sedentary time. The means of the differences (solid lines) and limits of agreement (dashed lines) within ±1.96 standard deviations are shown.

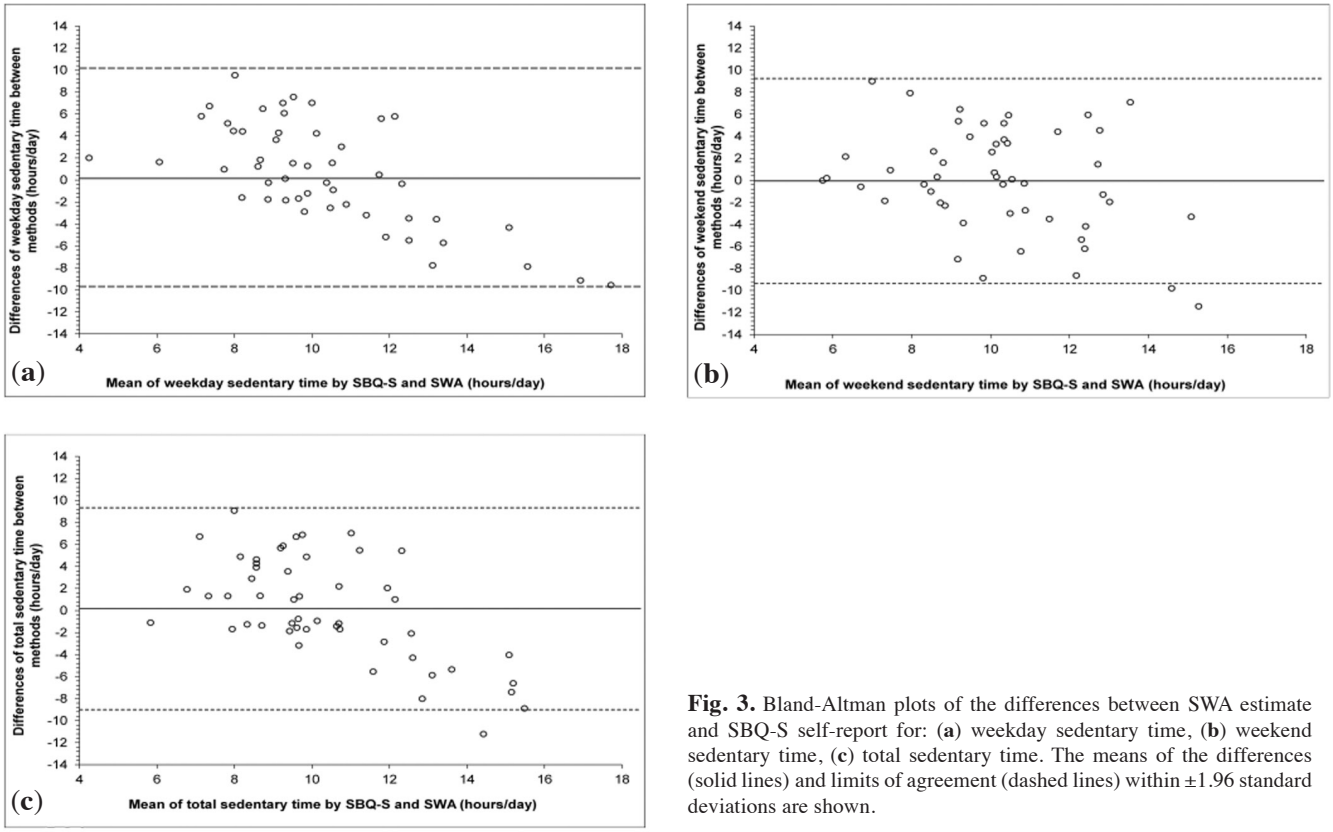

Fig. 3. Bland-Altman plots of the differences between SWA estimate and SBQ-S self-report for: (**a**) weekday sedentary time, (**b**) weekend sedentary time, (**c**) total sedentary time. The means of the differences (solid lines) and limits of agreement (dashed lines) within ±1.96 standard deviations are shown.

shows the Bland-Altman plots and the limits of agreement between the SBQ-S and SWA measurements for the weekday (10.2, -9.7 hours/day), weekend (9.3, -9.4 hours/day), and total sedentary time (9.3, -9.0 hours/day). There was a significant association between the difference and the magnitude of the SBQ-S and SWA measurements for the weekday, weekend, and total sedentary time (beta coefficients and *p*-values were -0.713, $p<0.001$; -0.330, $p=0.018$; and -0.629, $p<0.001$, respectively).

Operational qualities

The mean time required to complete the SBQ-S was 5' 18"±2' 48" per patient (range 1–15 minutes). None of the patients needed external help to complete the questionnaire.

Discussion

This is the first study to address the test-retest reliability and the convergent validity of a self-administered instrument for assessing sedentary behaviour in fibromyalgia patients, and the first study to adapt the English version of the Sedentary Behaviour Questionnaire into Spanish. The present study showed a transcultural adaptation conceptually equivalent to their original version as well as a good reliability, poor convergent validity, and satisfactory operational qualities for the SBQ-S in Spanish fibromyalgia patients.

During the adaptation of SBQ-S, no significant problems were encountered during the translation into Spanish or during evaluation of the conceptual equivalence of the items on the questionnaire. In general, the ability of the fibromyalgia patients to comprehend the questionnaire was good. Our results also showed that the patients readily accept the SBQ-S, since there were no missing values and all SBQ-S items were scored by the study population. The patients and researchers involved did not report significant problems understanding and interpreting the SBQ-S, obtaining a satisfactory execution and easy administration.

This study demonstrated that the SWA provides highly reproducible estimates of sedentary time during weekend and weekdays in fibromyalgia patients. Overall reliability of the SBQ-S items and total scores was acceptable. Test-retest reliability was similar for weekday and weekend sedentary behaviours, possibly because most of the patients (66%) were non-workers. Usually, weekend time use is more variable and time spent doing sedentary behaviours may naturally vary (29). The mean differences were low, the intraclass correlation coefficients were moderate to high, and similar than those determined in the original version (29). The standard errors of the mean provided a low index of error and the limits of agreement ranged from 6 to 7 hours/day for the SBQ-S total scores. Therefore, in our setting, a within-patient change in SBQ-S total score of at least 6 to 7 hours/day can be interpreted as a real change, exceeding measurement error. An examination of the Bland-Altman plots (Fig. 2), coefficients of repeatability, and heteroscedasticity suggested that the SBQ-S scores were repeatable, irrespective of the amount of reported time.

Certain types of sedentary behaviours, like playing musical instruments and listening to music, had lower test-retest reliability possibly due to low medians and restricted range. Stronger reliability was observed for sedentary behaviours

that tend to be done on a regular basis and for prolonged time periods, such as doing office work and television viewing time, than for activities occupying shorter blocks of time and a less regular pattern, such as travel or listen to music. This finding has already been reported (28). A possible explanation of lower reliability is that it may be a reflection of true variability of the behaviour, such as travelling, rather than the recall being unreliable.

The correlations between the SBQ-S and the SWA scores indicated a poor relationship between both instruments. This fact could suggest that the current self-report instrument fail to adequately capture sedentary behaviours in fibromyalgia patients. However, these results suggest that the use of both tools may therefore be appropriate to capture all aspects of sedentary behaviours. The validity of the SBQ-S appeared to be similar to the correlations reported in the original version for overweight adults (29). Other measures of sedentary time used in different populations have also shown only low to moderate correlations with accelerometre-derived sedentary time (41, 42). These instruments are not "gold standard" measures of sedentary time, having their own errors and biases (28). It is uncertain whether the low correlations in our study were caused by the nature of the survey question or type of referent measure. Because the SBQ-S contained multiple sedentary behaviours that may not be mutually exclusive (*i.e.* people can multitask), some patients reported doing more than 24 hours of sedentary behaviour in a day. It can also reflect the limited accuracy inherent in self-report measures. However, this was the case for only 3 patients in our sample. The reasons for these comparatively low correlations between the SBQ-S and the SWA scores in the Spanish patients are unclear and require further studies with additional indicators of validity.

Our findings also suggested poor agreement between the methods on the basis of the Bland-Altman plots (Fig. 3), and heteroscedasticity analysis. The wide limits of agreement (9.3 to -9.0 hours/day) showed large discrepancies between self-report and the SWA at the individual level, whereas mean difference was small (0.2 hours/day). This indicates that the SBQ-S has minimal bias overall, but can both substantially over- and under-estimate sedentary time compared with the SWA. According to the heteroscedasticity analysis the higher the sedentary time assessed by the SWA, the higher the difference between both methods. This may reflect over reporting, failure to recall time well or rounding up of time for the SBQ-S data.

The present study has several limitations, such as the absence of an age-matched healthy group to allow direct comparison or the absence of additional indicators of validity. The addition of log data would have allowed the period of television viewing time and other sedentary behaviours to be compared with the SWA data. Another limitation is that the currently used cross-sectional design does not provide any information on the sensitivity of the SBQ-S scores. It would be interesting to examine whether the SBQ-S scores are sensitive to change in future studies. Another limitation includes the use of a convenience sample of patients who were not necessarily representative of the larger population of community-dwelling individuals who have fibromyalgia. In addition, our sample size is relatively small to generalise the results. Future research will need to examine the measurement properties of sedentary-behaviour measures in more generalisable populations of fibromyalgia patients. Since little research has been published on the SBQ-S and SWA, further research is warranted before firm conclusions on the reliability, validity, and utility of these instruments can be made.

Conclusion

In conclusion, the present study showed that the SBQ-S developed during this study presents a good reliability for weekend, weekday, and total sedentary time, as well as a poor convergent validity when compared with the SWA in the Spanish fibromyalgia patients studied. This questionnaire is quick and easy to administer and interpret.

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Appendix 1:
Spanish version of the Sedentary Behaviour Questionnaire

Cuestionario de comportamiento sedentario

Nos gustaría obtener información sobre el promedio de tiempo en el que realizas actividad de tipo sedentaria. A continuación, encontrarás diversas cuestiones sobre hábitos sedentarios a realizar entre semana y en el fin de semana.

Debes tener en cuenta que algunos comportamientos pueden realizarse simultáneamente, como por ejemplo viajar e ir escuchando música, o bien, comer sentado y a la vez ver televisión. Por ese motivo, debes indicar únicamente el tiempo que dedicas a la actividad principal, sin incluir ese mismo tiempo a la actividad secundaria.

Selecciona el tiempo promedio que crees que dedicas a tales comportamientos.
Nosotros sumaremos después el número de horas totales.

DE LUNES A VIERNES

En un día típico **entre semana**, desde que te levantas hasta que te acuestas en la cama (por la noche):

1) ¿Cuánto tiempo empleas **viendo la televisión**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

2) ¿Cuánto tiempo empleas **comiendo sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

3) ¿Cuánto tiempo empleas **descansando tumbado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

4) ¿Cuánto tiempo empleas j**ugando al ordenador o con videojuegos sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

5) ¿Cuánto tiempo empleas **escuchando música sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

6) ¿Cuánto tiempo empleas **hablando con otras personas o por teléfono sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

7) ¿Cuánto tiempo empleas **haciendo "papeleo" o trabajo de oficina sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

8) ¿Cuánto tiempo empleas **leyendo sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

9) ¿Cuánto tiempo empleas **tocando un instrumento musical**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

10) ¿Cuánto tiempo empleas **haciendo trabajos de artesanía**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

11) ¿Cuánto tiempo empleas **conduciendo o montado en un coche, autobús o tren**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

FIN DE SEMANA

En un día típico del **fin de semana**, desde que te levantas hasta que te acuestas en la cama (por la noche):

1) ¿Cuánto tiempo empleas **viendo la televisión**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

2) ¿Cuánto tiempo empleas **comiendo sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

3) ¿Cuánto tiempo empleas **descansando tumbado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

4) ¿Cuánto tiempo empleas **jugando al ordenador o con videojuegos sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

5) ¿Cuánto tiempo empleas **escuchando música sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

6) ¿Cuánto tiempo empleas **hablando con otras personas o por teléfono sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

7) ¿Cuánto tiempo empleas **haciendo "papeleo" o trabajo de oficina sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

8) ¿Cuánto tiempo empleas **leyendo sentado**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

9) ¿Cuánto tiempo empleas **tocando un instrumento musical**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

10) ¿Cuánto tiempo empleas **haciendo trabajos de artesanía**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

11) ¿Cuánto tiempo empleas **conduciendo o montado en un coche, autobús o tren**?

Nada	15 min. o menos	30 min.	1 hora	2 horas	3 horas	4 horas	5 horas	6 horas o más

Appendix 1:
English version of the Sedentary Behaviour Questionnaire

We would like to obtain information about the amount of time devoted to sedentary behaviour. Below, you will find several questions about sedentary behaviours developed during weekday and weekend days.

You should be aware that some behaviours can be performed simultaneously, such as traveling and listening to music, or eat sitting and watching television. For this reason, you should only include the time you spend on the main activity, excluding the same time to the secondary activity.

Select the average time devoted to such behaviours, we will add after the number of total hours.

FROM MONDAY TO FRIDAY

On a typical **weekday**, from when you wake up in the morning until you go to bed at night:

1) How much time do you spend **watching television**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

2) How much time do you spend **sitting while eating**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

3) How much time do you spend **lying and resting**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

4) How much time do you spend **sitting while playing computer/video games**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

5) How much time do you spend **sitting while listening to music**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

6) How much time do you spend **sitting and talking on the phone**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

7) How much time do you spend **sitting and doing paperwork or office work**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

8) How much time do you spend **sitting and reading**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

9) How much time do you spend **playing a musical instrument**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

10) How much time do you spend **doing arts and crafts**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

11) How much time do you spend **sitting and driving/traveling in a motor vehicle**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

WEEKEND

On a typical **weekend day**, from when you wake up in the morning until you go to bed at night:

1) How much time do you spend **watching television**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

2) How much time do you spend **sitting while eating**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

3) How much time do you spend **lying and resting**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

4) How much time do you spend **sitting while playing computer/video games**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

5) How much time do you spend **sitting while listening to music**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

6) How much time do you spend **sitting and talking on the phone**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

7) How much time do you spend **sitting and doing paperwork or office work**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

8) How much time do you spend **sitting and reading**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

9) How much time do you spend **playing a musical instrument**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

10) How much time do you spend **doing arts and crafts**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more

11) How much time do you spend **sitting and driving/traveling in a motor vehicle**?

None	15 min. or less	30 min.	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours or more