

Cultural adaptation, translation and validation of the Spanish version of Past-day Adults' Sedentary Time

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Abstract

Background

To better understand sedentary behaviour and favour international comparisons, more evidence from different countries are needed. However, there are a few tools available in Spanish to measure sedentary behaviour. This study aimed to culturally adapt, translate and validate the Past-day Adults' Sedentary Time (PAST) questionnaire in Chilean adults compared with the ActivPAL (AP).

Method:

101 workers wore an AP for one week and were asked to respond to the Spanish version of the PAST twice on different visits at a 7-day interval. The PAST assesses sedentary behaviour in several domains, including working time, during the previous day. Reliability was assessed with the intraclass correlation coefficient (ICC). Correlations and Bland-Altman methods were used to determine accuracy properties of the PAST compared with the AP.

Results

77 participants provided valid data (51.0% male; age = 39.0 ± 12.39 years). The PAST showed moderate reliability (ICC = 0.63). For the total time in sedentary behavior per day, the PAST showed no correlation ($r = 0.21$, $p = 0.07$) and a mean bias of 54.9 min/day (LoA 95%: -484.3, 594.2 min/day) with the AP. For the total time in SB at work, the PAST showed moderate reliability (ICC = 0.40), weak correlation ($r = 0.37$, $p < 0.002$), and mean bias was 33.8 min/day (LoA 95%: -285.7, 353.3 min/day).

Conclusions

The PAST performed better when estimating sedentary behaviour during working hours compared with the whole day. In this setting, accuracy properties were comparable with other self-report tools.

Background

The effects of being insufficiently active and the need to implement public policies to fight this health issue have been widely endorsed by the evidence of recent decades.[1] Research around the world reports that at least 50% of daily activities during the waking hours are performed while sitting among the adult population.[2, 3] Sedentary behaviour (SB) is defined by activities with an energy expenditure < 1.5 metabolic equivalents when seated, reclined or lying down while awake.[4, 5] Some studies indicate that the time spent in SB is detrimental to health since it has been associated with biological disease markers, [3, 6, 7] and mental health outcomes,[8] among others. Nevertheless, some deleterious effects on health could be reversed if people become physically active.[9–11]

Given the growing body of evidence about SB, efforts are underway to design and improve measuring tools to gain a better picture of this behaviour in society.[12–14] In the last decade there has been increasing use of objective instruments, such as accelerometers, to measure physical activity (PA) and SB, as they provide totals of accumulated time at different intensities of PA and its distribution over time. [15–17] Yet despite their numerous advantages, these devices do not report contextual information about behaviour.[15] Self-reporting methods can complement the objective measurement methods or provide a better alternative when the cost of implementation is an issue.[18, 19] Therefore, the use of self-reporting instruments that can, in addition to contributing the total time, provide information on the different domains is necessary to be able to produce more specific contextual information for decision-making.

Among the self-reporting methods, questionnaires are the most common way to assess SB in population studies.[20] However, information about valid and specific self-reporting instruments in Spanish to measure SB is limited.[15] There are some valid instruments used globally to measure PA levels, such as the International Physical Activity Questionnaire (IPAQ) and the Global Physical Activity Questionnaire (GPAQ), which have been used in some studies to determine SB.[15] Still, they do not provide contextual information because they only include one question about the total time in a typical day. Also, the simple question about SB on the GPAQ in Spanish has reported a low validity compared to accelerometers.[21, 22]

Some questionnaires base their responses on the participant's memory of activities in the last week, last day, or last weekend.[23, 24] Clark et al. (2013) developed and validated the instrument called the *Past-day Adults' Sedentary Time* (PAST) questionnaire.[24] The PAST asks for recall of the last day to obtain the total hours in SB in 7 contexts or domains (work, transportation, television, computers/Internet/video games, reading, pastimes, other purposes). With this format, the PAST has reported greater accuracy than the usual methods that incorporate the concept of a "typical day".[24, 25]

Given the importance of considering SB an aspect to be measured in population studies, the validation of an instrument in Spanish that contributes contextual information and total SB times is necessary. For this reason, the general aim of this study was to assess the reliability and validity of the 7-item PAST instrument in a population of workers.

Methods

The translation, adaptation, and validation of the PAST questionnaire included a cross-sectional study. The study population was recruited through printed news, telephone calls, and mailings to workplaces in Temuco, Chile. Individuals over 18 years were included, with the only exclusion criterion being the use of a wheelchair. The sample included participants from different sectors: public transport, schools, childcare, healthcare, higher education, sales and administration, and others. The participants from the study stages signed an informed consent that was approved by the Ethics Committee of the Universidad de La Frontera, Temuco, Chile.

The participants were visited twice in their place of work. The first visit was arranged to collect sociodemographic characteristics (age, weight (Seca 803, Germany), height (Seca 213, Germany), educational level, occupation, and self-perceived health), answer the PAST questionnaire and deliver an ActivPAL 3™_μ accelerometer (AP, Pal Technologies Ltd., UK) (T1).

PAST

The PAST questionnaire was developed by Clark et al. to provide contextual information about SB by domains.[24] This instrument has seven items and can be applied in approximately 20 minutes. The seven domains of SB are work, transportation, television, computers/Internet/video games, reading, pastimes, other purposes. The PAST has demonstrated moderate to good validity in Australian adult population (range = 0.57–0.78).[24, 25] It has also reported an average difference in total SB of 5–25 minutes per day vs an accelerometer (0.8–5.2%),[24, 25] which is less than other methods (4–5 hours). [21, 26]

Cultural and linguistic adaptation of the questionnaire

The PAST questionnaire (Online supplement) was adapted culturally and translated from English to Spanish according to standardised criteria.[27] Stage 1 of translation from English to Spanish was done by an informed translator (t1) and one not informed (t2). Then in a meeting (stage 2) versions t1 and t2 were synthesised, and any discrepancies resolved. This new version was back-translated to English (stage 3) from Spanish by native English translators (bt1 and bt2). The group of investigators reviewed the translation to English (bt1 and bt2) and compared these results to the synthesis in Spanish (t1 and t2) to develop a preliminary version (Stage 4). This version was tested (stage 5) in a small sample of adults selected by convenience (n = 40), but not included in the sample for the validation process. General observations of the participants from the test were made for the review, analysis, and final design of the version in Spanish (stage 6). Regarding the cultural adaptation, examples in some of the questions were added to clarify to what they referred, without altering the understandability of the items. As a result, we included the following examples or clarifications at the end of the questions for some domains: 1) Item 4, Transport: *"if you cycle for transportation, do not include that time either. If your job includes sitting in a vehicle, do not include that time (e.g., taxi driver)."*; 2) Item 5, Watching television: *"Only include the time when this was your main activity (e.g., if you watched TV and used your computer or ate, report only one)."*; and 3) Item 7, Reading: *"Remember, do not include reading time that has been part of any previously reported."* For more details, the final version of the Spanish version of the PAST is included as an online supplement.

Reliability and validity

To assess the reliability of the PAST, the participants responded to the questionnaire during the first visit (T1), and a second visit (T2) that was completed a week later. The concurrent validity of the PAST was tested versus the measurement from the AP. Each participant received oral and written instructions on the use of the AP for the following seven days. Still, they were asked to perform their usual activities during

the week of monitoring. The participants were also asked to complete a diary of accelerometer use and hours of sleep for the following seven days, where they detailed their work schedules. The reference instrument for the validation was the AP accelerometer. The AP accelerometer is small ($23.5 \times 43 \times 5$ mm) and light (10 gr). This device presents minimal differences with direct observation (0.1–2.8%).^[13, 28] Also, it is more sensitive to changes than other objective measuring instruments, like the ActiGraph GT3X.^[29, 30] The device was sealed with a latex protector and adhered to the participant's front inner right thigh with a transparent and hypoallergenic tape (Tegaderm™ Roll, 3MTM) to provide a waterproof barrier. This allows its continuous 24-hour use for seven days without needing to remove it for activities like showering or sleeping, for example.

After a week, the second visit was made, where the participant's AP was removed, completed the PAST, and they were asked if they had difficulties or discomfort using the accelerometer (T2). Also, the participants were asked to report their most preferred instrument between the PAST and AP to measure SB in a future study.

Accelerometer data reduction

The APs were started up and downloaded with ActivPal™ Professional Software, v7.2.32 Research Edition (Pal Technologies Ltd., UK). The data were extracted from the AP events file, which includes continuous intervals in seconds of activity, for subsequent integration with the participant's diary. A semiautomatic filter was used to extract the time of use and the hours in which the participant was awake.^[31] To be considered valid, the participant's data had to include at least 10 hours of daily use for five days of the week.^[32–34] Average times were calculated for seated/lying (i.e., SB), standing, stepping, and total transitions from sitting to standing for an average day, the previous day, and at work. Also, relative estimates for time spent in SB at work were calculated for both the AP and PAST. To be able to compare the data reported with the PAST, the SB time of the previous day was used.

Statistical analysis

To describe the study sample, measures of central tendency were used for continuous variables and percentages for the categorical variables. Comparisons of continuous variables between sexes were performed with T-test or Mann–Whitney U test, while categorical variables were compared with chi-square and proportion tests. Test-retest reliability of the PAST instrument was assessed by comparing the results obtained in T1 and T2 with the intraclass correlation coefficient (ICC). The criteria for ICC values classification were: <0.50 as poor, 0.50 – <0.75 as moderate, 0.75 – <0.90 as good, and ≥ 0.90 was considered as excellent.^[35] The concurrent validity between the PAST questionnaire and the AP was evaluated with correlations (Pearson's or Spearman's based on distribution) and the Bland-Altman method to estimate mean bias and limits of agreement (LoA).^[36] The criteria to evaluate the correlation between sitting time estimated by the PAST and the reference were: 0.00 – 0.19 as very weak, 0.20 – 0.39 as weak, 0.40 – 0.59 as moderate, 0.60 – 0.79 as strong, and 0.80 – 1.0 as very strong.^[37] Paired T-test and Wilcoxon signed-rank test were used to compare total SB estimates between the PAST and AP.

The Kappa method was used to determine the agreement between tertiles, quartiles, and quintiles of SB as classified by the PAST and the AP. The following criteria were used to assess the agreement: 0.01–0.20 as none to poor, 0.21–0.40 as low, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement.[38] All the calculations were done with a 95% confidence level. All data cleaning and analysis were done with Stata, version 15 (StataCorp. College Station, TX, USA).

Results

One hundred one participants were recruited for the study, of which 11 did not complete the seven days of follow-up (lost AP: 1, forgot to use AP: 9, skin irritation: 1). Finally, 77 adults (41 men; age = 38.5 ± 1.36 years; 67.7% overweight/obese) had valid data to complete the analyses since only participants who provided data corresponding to workdays were included (Table 1). Of all the participants with valid data, 20.2% reported itchy skin, 6.7% reported irritation, and 3.4% reported discomfort when using the AP. No differences were found as the most preferred instrument between the PAST (50.7%) and AP (49.3%, $p = 0.493$) by the participants.

Table 1
Sample characteristics

Variable	Total (n = 77)	Men (n = 41)	Women (n = 36)	p
Age (average, SD) years	38.5 1.36	38.9 1.85	38.1 2.03	0.78
Nutritional status (%)				
Underweight	1.1	-	2.3	< 0.001
Normal	31.1	10.9	52.3	
Overweight	44.4	56.5	31.8	
Obese	23.3	32.6	13.6	
Marital status (% married/de facto)	40.0	52.2	27.3	0.016
Educational level (%)				
Complete secondary education	18.9	30.4	6.8	0.017
University degree	50.0	43.5	56.8	
Graduate studies	31.1	26.1	36.4	
Occupation (%)				
Administration	10.4	17.0	2.8	< 0.001
Education	50.6	34.2	69.4	
Health	16.9	9.8	25.0	
Transportation (driver)	9.1	17.0	0.0	
Others	13.0	22.0	2.8	
Self-perceived health (%)				
Poor	16.7	17.4	15.9	0.675
Good	52.2	47.8	56.8	
Very good/Excellent	31.1	34.8	27.3	

Table 2 shows the device-measured movement behaviours in the sample of Chilean working adults. The total average time in SB measured with the AP was 553.7 ± 128.63 min/day with men accumulating more time in SB than women (588.8 vs 513.7 min/day, $p = 0.01$). On average, men were more sedentary than women (305.2 min/day vs 229.3 min/day, $p = 0.01$) during working hours. Standing time was larger in women than men on both an average day and the previous measured day. More details are shown in Table 2.

Table 2
Device-measured movement behaviors in the sample of Chilean working adults.

Variable	Total (n = 77)	Men (n = 41)	Women (n = 36)	p
Device-measured movement behaviours on an average day				
Waking time (average, SD) min/day	979.0 78.50	988.8 75.33	967.9 81.60	0.248
Sedentary time (average, SD) min/day	553.7 128.63	588.8 133.85	513.7 111.18	0.01
Standing time (average, SD) min/day	299.8 83.95	274.6 78.69	328.4 81.50	0.004
Stepping time (average, SD) min/day	125.6 44.39	125.4 52.97	125.9 32.75	0.960
Transitions to standing (average, SD)	74.5 27.96	71.4 30.31	78.0 24.97	0.301
Device-measured movement behaviour on an average workday				
Working time (mean, SD) min/day	524.8 118.21	550.1 138.20	495.9 83.08	0.044
Sedentary time (mean, SD) min/day	269.7 136.39	305.2 155.87	229.3 97.31	0.014
Standing time (mean, SD) min/day	186.1 74.64	172.7 75.46	201.5 71.67	0.092
Stepping time (mean, SD) min/day	73.8 37.73	74.8 42.95	72.6 31.31	0.799
Transitions to standing (mean, SD)	38.3 18.82	38.0 20.80	38.7 16.57	0.861
Device-measured movement behaviours on the previous day				
Waking time (average, SD) min/day	1023.7 118.80	1026.6 77.82	1020.4 154.0	0.823

Variable	Total (n = 77)	Men (n = 41)	Women (n = 36)	p
Sedentary time (average, SD) min/day	590.9 189.14	625.6 196.51	551.3 174.70	0.086
Standing time (average, SD) min/day	310.1 127.23	281.4 133.69	342.7 112.56	0.034
Stepping time (average, SD) min/day	122.7 60.07	119.5 72.30	126.4 42.83	0.618
Transitions to standing (average, SD)	76.4 33.29	73.2 38.37	79.9 26.45	0.378
Device-measured movement behaviours on the previous day at work				
Working time (mean, SD) min/day	532.3 120.62	559.4 137.4	497.0 84.20	0.032
Sedentary time (mean, SD) min/day	285.3 165.96	316.6 191.16	245.8 119.07	0.076
Standing time (mean, SD) min/day	208.6 126.94	187.5 114.31	233.2 137.90	0.119
Stepping time (mean, SD) min/day	68.5 41.86	68.6 48.84	68.4 31.35	0.985
Transitions to standing (mean, SD)	40.9 25.52	41.7 27.67	39.8 22.83	0.763

When using the PAST questionnaire (Table 3), the average time in SB was 645.8±238.31 min/day. The activities adding up more sedentary time, aside from work, were watching television (96.1 ± 73.56 min/day) and using a computer or electronic devices (79.7 ± 89.10 min/day). No differences were observed between men and women in any of the domains evaluated by the PAST.

Table 3

Time spent in sedentary behaviours as measured with the Spanish version of Past-day Adults' Sedentary Time (PAST) questionnaire in Chilean working adults.

PAST questionnaire Domains	Total (n = 77)	Men (n = 41)	Women (n = 36)	p
Total time (mean, SD) min/day	645.8 (238.31)	653.9 (260.62)	636.6 (213.37)	0.75
Work (mean, SD) min/day	303.5 (186.82)	336.3 (215.77)	266.1 (140.99)	0.10
Transportation (mean, SD) min/day	56.2 (55.32)	47.4 (49.03)	66.2 (60.88)	0.14
Television (mean, SD) min/day	96.1 (73.56)	95.5 (80.35)	96.8 (66.11)	0.94
Computer/electronic device (mean, SD) min/day	79.7 (89.10)	78.4 (99.72)	81.1 (76.60)	0.90
Reading (mean, SD) min/day	35.7 (54.45)	31.6 (55.28)	40.4 (53.88)	0.48
Pastimes (mean, SD) min/day	16.1 (35.21)	9.3 (27.87)	23.9 (41.08)	0.07
Others (mean, SD) min/day	58.5 (56.40)	55.4 (56.74)	62.1 (56.59)	0.60
Abbreviations: PAST: Past-day Adults' Sedentary Time; SB: sedentary behavior; SD: standard deviation				

The SB estimates derived from both the PAST and the AP showed no differences for the total time per day, and at work, including its per cent contribution from SB to the whole day (Table 4). The PAST questionnaire showed moderate reliability for estimating total SB in the total sample (Table 4), while the reliability in men was good and excellent in women. The reliability was moderate when assessing time spent sedentary at work.

Table 4

Accuracy properties of the Past-day Adults' Sedentary Time (PAST) questionnaire for measuring sedentary behavior in a sample of Chilean working adults with the AP as reference standard.

	Total (n = 77)		Men (n = 41)		Women (n = 36)	
	Estimate (CI 95%)	<i>p</i>	Estimate (CI 95%)	<i>p</i>	Estimate (CI 95%)	<i>p</i>
Sedentary behavior						
Total SB (mean, min/day)	645.8	<i>0.106</i>	653.9	<i>0.521</i>	636.6	<i>0.079</i>
PAST	(591.7- 699.9)		(571.6- 736.2)		(564.4- 708.8)	
AP	590.9		625.6		551.3	
	(548.0- 633.8)		(563.6- 687.7)		(492.2- 610.4)	
SB at work (mean, min/day)	318.4	<i>0.129</i>	349.7	<i>0.395</i>	279.0	<i>0.147</i>
PAST	(274.9- 361.9)		(280.9- 418.6)		(231.9- 326.2)	
AP	285.3		316.6		245.8	
	(245.7- 324.8)		(254.7- 378.6)		(202.1- 289.5)	
SB percentage from work (% per day)	48.8	<i>0.428</i>	52.8	<i>0.219</i>	43.8	<i>0.891</i>
PAST	(43.5- 54.0)		(45.0-60.5)		(37.0- 50.6)	
AP	46.8		48.3		44.9	
	(42.0-51.6)		(41.9- 54.8)		(37.3- 52.4)	
PAST test-retest reliability						
Total SB (ICC, CI 95%)	0.63	<i>< 0.011</i>	0.80	<i>0.017</i>	0.90	<i>0.017</i>
	(0.35- 0.92)		(0.57- 1.04)		(0.74- 1.05)	
SB at work (ICC, CI 95%)	0.40	<i>< 0.001</i>	0.32	<i>0.075</i>	0.28	<i>0.104</i>
	(0.13- 0.68)		(0.00-0.73)		(0.00- 0.72)	
Concurrent validity						
Abbreviations: AP: ActivPAL; ICC: intraclass correlation; PAST: Past-day Adults' Sedentary Time; SB: sedentary behavior						

	Total (n = 77)		Men (n = 41)		Women (n = 36)	
Total SB (rho, CI 95%)	0.21 (0.00-0.41)	<i>0.07</i>	0.19 (-0.12-0.50)	<i>0.24</i>	0.27 (-0.05-0.59)	<i>0.11</i>
SB at work (rho, CI 95%)	0.37 (0.14-0.60)	<i>0.002</i>	0.35 (0.04-0.66)	<i>0.028</i>	0.35 (-0.03-0.73)	<i>0.054</i>
SB percentage from work (rho, CI 95%)	0.32 (0.06-0.58)	<i>0.007</i>	0.36 (0.01-0.70)	<i>0.025</i>	0.25 (-0.08-0.58)	<i>0.179</i>
Agreement (kappa)						
Total SB	0.08	<i>0.149</i>	-0.03	<i>0.590</i>	0.20	<i>0.048</i>
Tertiles	0.01	<i>0.424</i>	0.05	<i>0.300</i>	0.09	<i>0.704</i>
Quartiles	0.06	<i>0.434</i>	0.02	<i>0.375</i>	0.08	<i>0.533</i>
Quintiles						
SB at work	0.22	<i>0.003</i>	0.20	<i>0.031</i>	0.20	<i>0.045</i>
Tertiles	0.19	<i>0.002</i>	0.21	<i>0.012</i>	0.13	<i>0.099</i>
Quartiles	0.14	<i>0.007</i>	0.17	<i>0.012</i>	0.08	<i>0.187</i>
Quintiles						
SB percentage from work	0.08	<i>0.174</i>	0.11	<i>0.171</i>	0.03	<i>0.401</i>
Tertiles	0.05	<i>0.244</i>	0.04	<i>0.333</i>	0.05	<i>0.318</i>
Quartiles	0.07	<i>0.116</i>	0.11	<i>0.076</i>	0.05	<i>0.290</i>
Quintiles						
Abbreviations: AP: ActivPAL; ICC: intraclass correlation; PAST: Past-day Adults' Sedentary Time; SB: sedentary behavior						

The PAST showed a non-significant correlation with AP for the total SB (Table 4), with an average bias of about 1 hour with the AP (Fig. 1). The women presented a mean bias of almost one hour more than that observed in the men (85.3 vs 28.8 min/day). The agreement between the PAST and AP to classify the mean sedentary time into tertiles, quartiles, and quintiles was not significant (Table 4).

Overall, the PAST showed a weak correlation with the AP for the total sedentary time at work. The mean bias between the PAST and AP was about half an hour per day for SB during working hours, with similar differences for men and women (Fig. 1). The agreement between the PAST and AP to classify the time

spent in SB during working hours was poor to low when tertiles, quartiles and quintiles were used (Table 4).

When comparing percentages of work time spent sedentary between the PAST and AP, a weak correlation was observed (Table 4). The average bias was 2.0% per day between the PAST and the AP (Fig. 2). No agreement was found to classify the proportion of time spent in SB at work into percentile categories between the PAST and AP (Table 4).

Discussion

Overall, the total device-measured sedentary time corresponded to 56.6% of the day in the entire sample (men: 59.5%, women: 53.1%), while at work, the participants were sitting for almost half of the time each day. The recorded daily time in SB measured objectively was comparable to other studies conducted on a Chilean adult population.[21, 39] The reliability of the PAST questionnaire was moderate, and its validity was weak compared with the AP to estimate SB, but only during working hours.

The reliability of the PAST showed similar results to those reported previously with the English version in Australian adult and university populations.[24, 25] However, our findings on the concurrent validity of the PAST were dissimilar to those reported previously in Australia, since, in those studies, the validity was moderate to substantial.[24, 25] These differences may be due to our research included adults with various occupations and physical activity requirements compared to the Australian participants, which had patients with cancer and people in a university context.[24, 25] Apart from comparing between sexes, we explored different grouping options using both occupations and latent class analysis based on the movement behaviours as measured with the AP, but no improvements were found in the accuracy properties of the instrument.

The mean bias between the PAST and AP for total SB (54.9 min/day) was considerably lower than the observed with the single question of the GPAQ assessed in Chilean population (-293.9 min/day).[21] Our findings are in line with a recent meta-analysis in which multi-item questionnaires showed smaller mean differences (-10.93 min/day, 95% CI: -51.13, 29.28) with accelerometers compared with single-item instruments (-159.56 min/day, 95% CI: -189.69, -129.44).[15] Although the mean bias was almost an hour, the limits of agreement between the PAST and AP were wide (\pm 9hrs), indicating that the estimations on the individual level are very limited. These large differences might be because some study participants over or under-reported some sedentary activities without a clear pattern, as found in several studies from a meta-analysis.[15] For example, some people may have reported time on the computer for recreational or work activities separately, while others may have included that as part of the estimation only at work. During the data collection, efforts were made orally to avoid these confusions, as well as in the written instructions. Still, each participant was free to report the times that they estimated.

The PAST questionnaire performed better when it was assessed in the work context, as shown in other studies.[15] The concurrent validity of the PAST was weak ($r = 0.37$, $p < 0.002$) for both when measuring time in SB at work and comparing the proportion of their workday spent in SB ($r = 0.32$, $p = 0.007$). The

use of percentages could be a complementary approach to explore in the future as the current and previous studies have shown no differences between overall recall estimates based on proportions and those derived from devices.[15] Following this principle, it has been suggested that a visual analogue scale could be used to measure the proportion of the day spent sitting as it has shown higher precision and data loss when compared with other tools.[14] The slightly better performance of the PAST in work context could be explained due to the time in SB during the workday being less variable between days, unlike free time activities, which were also observed in the initial validation of the PAST.[24]

Self-report measures are valuable tools as they provide contextual information that could be very difficult to register with accelerometers or other devices.[20] Also, when comparing prospective studies that have been used self-reported and device-measured SB, the direction of the associations with outcomes, such as mortality, are consistent.[40] Although the self-reports performance is usually poor to moderate compared with devices,[15] these methods will remain as relevant tools as more interest has been placed into differentiating the influence of different sedentary domains or activities on outcomes, such as mental health.[8, 41, 42] Due to the lower cost of self-reports compared with accelerometers or inclinometers, these instruments play an important, and sometimes unique, role to conduct studies in settings where resources are limited, or research is incipient, like in Chile. Therefore, this study fills an important gap to better understand sedentary behaviours in a Latin American context.

This study was the first to validate the PAST questionnaire in Spanish. Although the recruitment was not probabilistic, it managed to include participants from various work environments and with a wide age range. This improves the external validity of the findings reported in this study about a working adult population. Although 101 participants were recruited, only 77 were included in the analyses, mainly for not using the accelerometer. Nevertheless, there were no differences in the demographic characteristics between those included and not included in the study. This instrument only evaluates the SB from the last day, which could limit its use to estimate common SB that could be more variable, particularly in free time.[43] Although the PAST assesses SB in different domains, apart from the whole day, we were able to explore only the time spent sedentary at work. This remains an issue in the field due to the difficulty of assessing SB in different contexts,[14] so the use of cameras or logs as reference standards may be useful tools to fill this gap.

Conclusions

The PAST questionnaire showed moderate reliability, no correlation with the AP to estimate SB from the last day. Slightly better results were obtained to evaluate both absolute and relative estimates of SB at work. Overall, sedentary time showed no difference between the PAST and the AP on an average day and at work, but the individual variability of the differences was wide. The PAST may be used with caution when estimating SB individually, but offers comparable mean group estimates with the AP.

Abbreviations

AP
ActivPAL
ICC
intraclass correlation
IPAQ
International Physical Activity Questionnaire
GPAQ
Global Physical Activity Questionnaire
PA
physical activity
PAST
Past-day Adults' Sedentary Time
SB
sedentary behaviour

Declarations

Ethics approval and consent to participate

The study was approved by the Scientific Ethics Committee of the Universidad de La Frontera (n 103/2014). All participants provided written consent to participate.

Consent for publication

Not applicable

Availability of data and materials

Data can be shared based on specific requests.

Competing interests

The investigators declare they have no conflicts of interest.

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Authors' contributions

NAF and PMF conceptualised the manuscript, NAF analysed the data. NAF, PMF and DCP drafted, critically reviewed the manuscript. NAF, PMF and DCP have approved the final version and are responsible for this manuscript.

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Figures

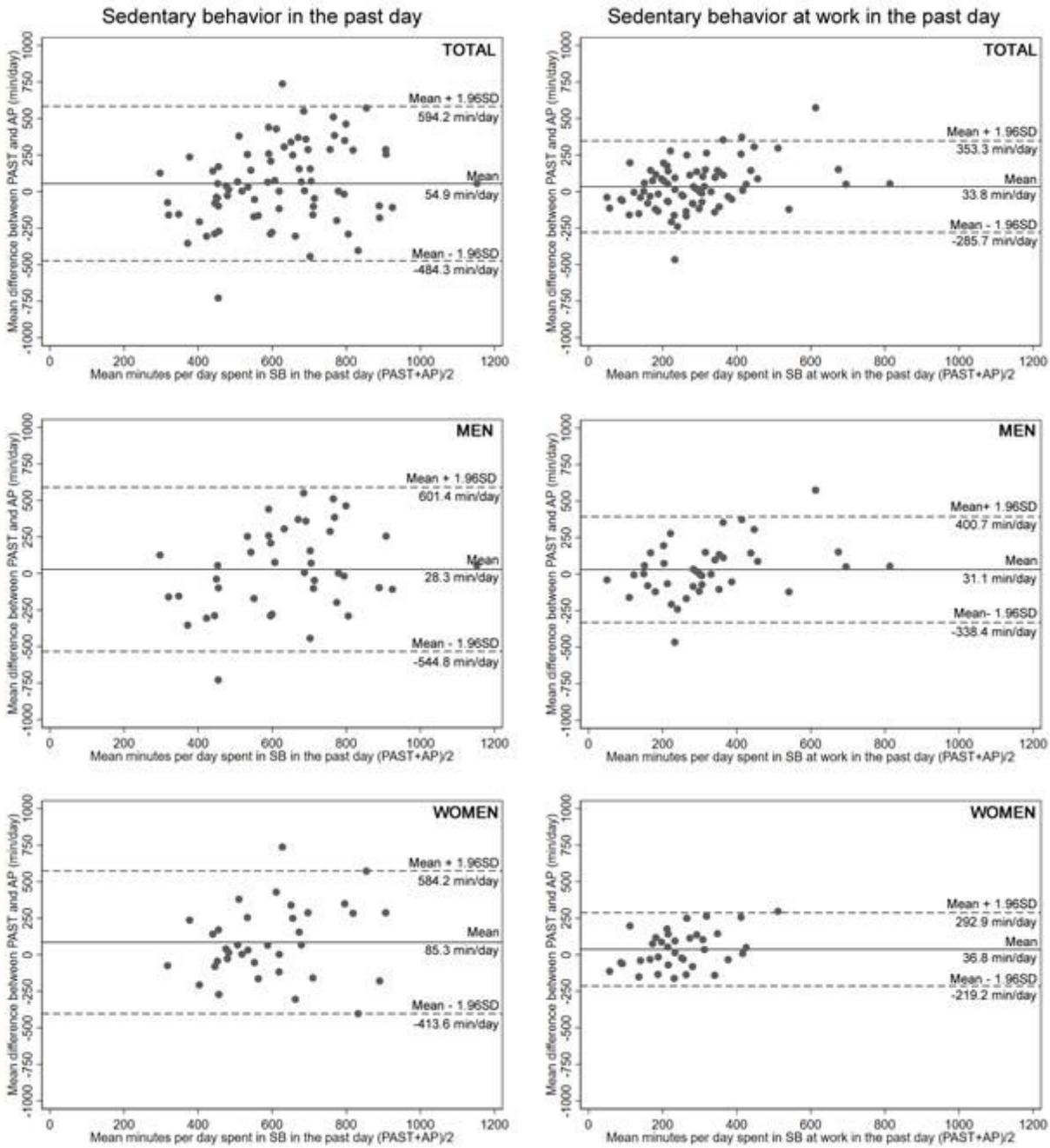


Figure 1

Bland-Altman difference plot for time in sedentary behaviors between PAST and AP. The solid lines represent the mean differences and the dotted lines represent the agreement limits. Abbreviations: AP: ActivPAL; PAST: Past-day Adults' Sedentary Time questionnaire; SB: sedentary behaviour; SD: standard deviation

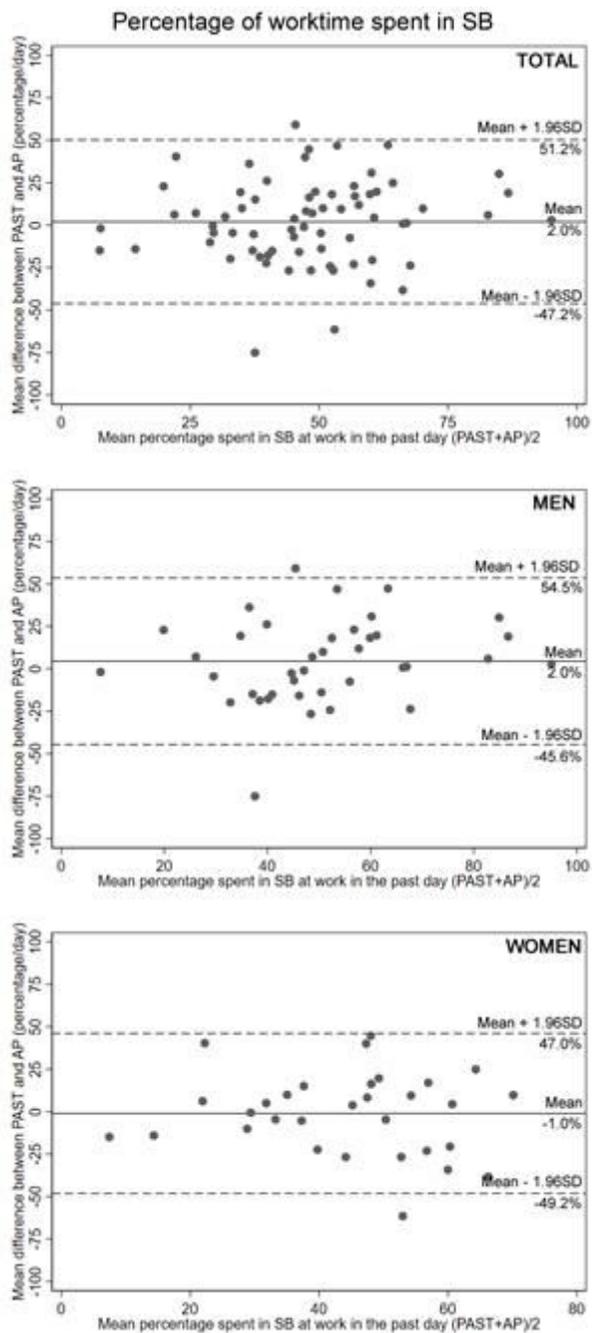


Figure 2

Bland-Altman difference plot for the percentage of worktime spent in sedentary behaviors between PAST and AP. The solid lines represent the mean differences and the dotted lines represent the agreement limits. Abbreviations: AP: ActivPAL; PAST: Past-day Adults' Sedentary Time questionnaire; SB: sedentary behaviour; SD: standard deviation

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