Supplementary Materials:

Psychometric testing of the British-English Workplace Activity Limitations Scale in four rheumatic and musculoskeletal conditions. Hammond A, Tennant A, Ching A, Parker J, Prior Y, Gignac M, Verstappen S, O'Brien R. Rheumatology Advances in Practice. 2023.

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Supplementary File S1: Linguistic validation, cross cultural adaptation, and content validity.

Method: Linguistic validation, cross-cultural adaptation, and content validity

The following procedures were used [1]:

Forward translation: two translators (a rheumatology researcher familiar with the WALS (AH), and a non-health professional (experienced teacher, including of English: JG) unfamiliar with the WALS) independently reviewed the WALS to identify words requiring changing into British English and use of Plain English (i.e., simplifying words and phrases).

Translation synthesis: the two translators discussed and agreed recommended changes.

Backward translation: was not required as the translation was into another form of English.

Expert committee review: The committee included: one translator (AH); three occupational therapists experienced in work and musculoskeletal conditions (YH, TW, RO'B); the WALS developer MG: Canadian-English speaker); experienced PROMS researchers (AT, AH, YP, SV) and two patient research partners (AP, SK). The committee discussed the synthesised translation, made additional recommendations, and agreed and approved the draft British English WALS. This process ensures semantic, idiomatic, experiential, and conceptual equivalence.

Field testing of the draft WALS and content validity: Cognitive debriefing interviews were used to investigate the WALS from people with RMD' perspectives [2]. PROM content validity should be assessed by experts, i.e., patient/ public representatives of the target populations [3]. At least 10 in each target group should be included [4]. Participants were mailed a paper questionnaire booklet, including the draft British English WALS, to complete at home, and asked to consider WALS ease of completion, item relevance and if anything important was missing. Within two weeks, they were interviewed, face-to-face or by telephone, about comprehensiveness (1 = not relevant; 5 = extremely relevant; and any missing items) and comprehensibility (instructions, content, layout). Findings were discussed with the expert committee, further changes made and the final British English WALS agreed. Content validity was further examined by linking the WALS to the Activities and Participation component of the International Classification of Functioning, Disability and Health (ICF) Core Set for Vocational Rehabilitation [5,6]. The Flesch-Kincaid Grade score was calculated using Microsoft Word to check readability was similar to the original WALS [7].

Results

Following forward translations and synthesis, the expert panel reviewed these and agreed the following changes: to have a root question “how much difficulty do you have…”, rather than each item starting with this; item 1 (travel) changing “subway” to “train” and including active travel (walking, cycling); item 2 (get around the workplace) changing “hallways” to “corridors” and adding “machinery” to include physical work settings; item 6 (work with hands) widening examples to include keyboard/touchscreen (as most jobs now involve computer usage), tools and operating machinery (to be inclusive of physical work) and adding smartphone to “hold a phone”; item 9 (managing hours of work) changing “schedule” to ”shifts,” as more commonly used in British English; and item 12 (concentration) changing “due to arthritis” to “condition”, as those with FM may not consider their diagnosis as arthritis.

Cognitive debriefing interviews were conducted with 48 participants (face-to-face n = 6; telephone n = 42) (Table 1), with results reviewed by the expert panel to determine any further changes in the WALS required. Most participants considered the WALS comprehensive, with items very or extremely relevant for their condition, with no significant differences between groups (Supplementary Table S2). Only six suggested additional items, although only by one each and so not included. These were: “driving for work”; “parking near work”; “opening door handles, bottles and jars”; “going to the [work] bathroom (turning door handles and taps)”; “dealing with co-workers and the public” and “having to explain myself [condition] to people.” Most (43/48) considered the WALS comprehensible, with instructions, content, and layout easy to understand. Only five stated these were “partly easy.” Of these, one recommended moving the “not applicable” column to the first response option, rather than last, which was changed. As only one person each raised the following issues, no changes were made: one participant (axSpA) misunderstood instructions, indicating all activities were “not applicable” as able to do them despite pain; and another participant (FM) reported taking several attempts to assimilate longer items (e.g., item 6). Three noted problems with the response options, with one each stating: the gap between “some” and “a lot” is too large and an intermediate option needed; frequency of difficulty rather than amount would be better; and preferring a focus on ability rather than difficulty. No problems were reported with the lack of time frame in the instructions.

The WALS was linked to 16 items in the ICF Core Set for Vocational Rehabilitation, indicating reasonable coverage, although it could potentially be linked to a further 14 items dependent on how a

person interprets item 11 (managing job demands) in relation to their job (Supplementary Table S3). The Flesch-Kincaid Grade Level score was 7.6, similar to the original WALS at 7.1, indicating a reading age of 11- to 13-year-olds [7].

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Supplementary File S2: **Workplace Activity Limitations Scale - British English.**

These questions ask you about activities related to your job. When you think about how much difficulty you have with these activities, think about doing them **WITHOUT** any help from another person or **WITHOUT** the help of a special gadget or piece of equipment.

Please tick: the most appropriate box; and tick if any difficulty is due to your musculoskeletal condition/ arthritis.

Tick *"Not applicable" only if the question describes something* ***not*** *part of your work.*

How much difficulty do you have:	*Not applicable*	*No difficulty*	*Some difficulty*	*A lot of difficulty*	*Unable to do*	*Difficulty unrelated to musculoskeletal condition/ arthritis*
1. Getting to and from work (e.g., train, bus, car, cycle, walk) and getting to and from work on time?	☐	☐	☐	☐	☐	Yes☐ No ☐
2. Getting around the workplace (e.g., stairs, corridors, furniture, machinery)?	☐	☐	☐	☐	☐	Yes☐ No ☐
3. Sitting for long periods of time at your job (e.g., more than 20 minutes)?	☐	☐	☐	☐	☐	Yes☐ No ☐
4. Standing for long periods of time at your job (e.g., more than 20 minutes)?	☐	☐	☐	☐	☐	Yes☐ No ☐
5. Lifting, carrying, or moving objects?	☐	☐	☐	☐	☐	Yes☐ No ☐

How much difficulty do you have:	*Not applicable*	*No difficulty*	*Some difficulty*	*A lot of difficulty*	*Unable to do*	*Difficulty unrelated to musculoskeletal condition/ arthritis*
6. Working with your hands (e.g., writing, using a keyboard/ touchscreen, grasping small objects/ tools, operating machinery, holding a phone/ smartphone)?	☐	☐	☐	☐	☐	Yes☐ No ☐
7. Crouching, bending, kneeling or working in awkward positions?	☐	☐	☐	☐	☐	Yes☐ No ☐
8. Reaching?	☐	☐	☐	☐	☐	Yes☐ No ☐
9. Managing the shifts or hours of work your job requires?	☐	☐	☐	☐	☐	Yes☐ No ☐
10. Managing the pace of work your job requires?	☐	☐	☐	☐	☐	Yes☐ No ☐
11. Meeting your current job demands?	☐	☐	☐	☐	☐	Yes☐ No ☐
12. Concentrating or keeping your mind on your work (because of your condition)?	☐	☐	☐	☐	☐	Yes☐ No ☐

Scoring instructions:
Items are scored: no difficulty = 0; some difficulty = 1; much difficulty = 2; unable to do = 3. Items are summed to form a 0-36 scale. High scores indicate greater work limitations. “Not applicable” items are scored as 0, as the activity does not therefore present difficulty for the person. “Difficulty unrelated to condition/ arthritis” is for information **only**, as the person is still experiencing work difficulties, whatever the cause. The WALS is considered a measure of presenteeism.
A Rasch transformation table is available to convert WALS raw scores to interval scores (Hammond et al, 2023).
A score of 0-6 indicates low work stability; 7 – 13 moderate work instability: and 14-36 high work instability.
Missing data: up to three items are allowed. Missing items are replaced by either the person’s overall median or mean WALS score, dependent on analysis approach.
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Supplementary File S3: Workplace Activity Limitations Scale: Rasch Analysis methods and results.

Method

Data was tested against the requirements of the Rasch Measurement model [1]. Briefly, these requirements include i) unidimensionality; ii) monotonicity; iii) homogeneity; iv) local independence and v) group invariance [2, 3]. Items added together to provide a score should satisfy all of these requirements. That is, they should i) measure one thing (domain/construct/trait; ii) the probability of a positive response to an item (or in the case of polytomous (i.e., two or more ordinal categories) items, the transition from one response category to the next) should increase with underlying ability, as should the total score [4], iii) the same hierarchical ordering of items should hold for each level (or grouping) of the score [5]; iv) items should be conditionally (on the score) independent of one another [6] and v) the response to items across different groups such as age or gender should, conditioned on the total score, be the same – referred to as (the absence of) Differential Item Functioning (DIF) [3].

Each requirement is tested. A t-test is used to determine if two separate groups of items deliver significantly different estimates, following the procedure given by Smith [7]. The hierarchical ordering of items across the scale is determined through a Chi-Square test of fit based on grouped scores. Monotonicity is evaluated through inspection of the item-category ordering. Conditional item dependence is determined though the correlation of residuals, where pair-wise correlations should not exceed 0.2 above the average residual [8]. Should clusters of locally dependent items be found, consideration is given to grouping these into 'super items' or testlets (simply adding them together to make one larger item, the latter based on a priori defined groups) to absorb the local dependency [9]. In the RUMM2030 software, this gives a bi-factor equivalent solution retaining a specified proportion of the variance. This "Explained Common Variance (ECV)" is reported, whereby a value less than 0.7 is indicative of requiring a multidimensional model, a value above 0.9 a unidimensional model, and the grey area in between, undetermined, requiring further evidence [10]**.** Consequently, a value of the ECV at 0.9 and above is considered acceptable in the current analysis. Where possible when two parallel forms are created from the pattern of local dependency in the item set, requires a latent correlation ≥ 0.9. This is consistent with the reliability required for individual use

[11-14]. Consequently, valid parallel forms would require both their latent correlation to be ≥0.9 and the ECV to be ≥0.9.

Group invariance (DIF) is tested through an analysis of variance (ANOVA) of residuals for age, gender, duration, education- and job skill- levels, and whether or not the patient is self-employed or employed, and full-time and part-time. Should DIF be identified it is tested by a comparison of person estimates from split and unsplit solutions to see if it is 'substantive' [14,15]. Where the difference is significant (a paired t-test), the result is reported as an effect size where a value higher than 0.1 is considered to represent substantive DIF [16]. If this is present, then the scale works in different ways for the contextual factor under consideration, and results are reported separately.

Given the requirements for fit, a hierarchical strategy was used to achieve fit to the model (**Supplementary Table S1**). With level 1 as the priority, all requirements listed above for fit to the model must be met. Should a Level 5 solution be unavailable, item deletion will be considered (Level 6). If this fails, then Level 7 will be utilised to test if the scale satisfies ordinal scaling; and if this fails then Level 8 indicates no valid ordinal scale. Data were fitted for the WALS scale within each condition.

Results

The initial fit of the WALS to the Rasch model showed multidimensionality, caused by clusters of locally independent items in both the upper and lower part of the scale. Consequently, fit of the WALS items to the Rasch model in those with RA, axSpA, OA and FM was at level 4 (i.e., local-dependency cluster based-parallel form: Table 3; Supplementary Table S1). The items most easily affirmed (i.e., the transition from no to some difficulty) were: 'Lifting, carrying, or moving objects' (RA); "Crouching, bending or kneeling" (axSpA, OA); and "Concentrating" (FM). The items most difficult to affirm (i.e., the transition from a lot of difficulty to unable to do) was: "Working with your hands" (RA, axSpA, OA and FM), particularly in FM, as the transition was five logits higher than the next threshold. No invariance (DIF) was observed in any condition. Local item dependency was observed necessitating the grouping of items into "super items." The dependencies were observed in the lower and upper part of the scale. For example, the items 'Managing the pace of work that your job requires' and 'Meeting your current job demands' had a residual correlation of 0.37 (RA), 0.36 (axSpA), 0.45 (OA) and 0.50 (FM), where values above 0.12 would be

considered indicative of local item dependency. It was this type of grouping that enabled the making of two parallel forms in each condition, which gave adequate fit to the model, so confirming construct (structural validity). In summary, the WALS satisfied the Rasch model requirements when implemented in a bi-actor equivalent solution. The amount of variance discarded was small, giving confidence that the scale was unidimensional (albeit with a slightly inflated reliability at the item level).

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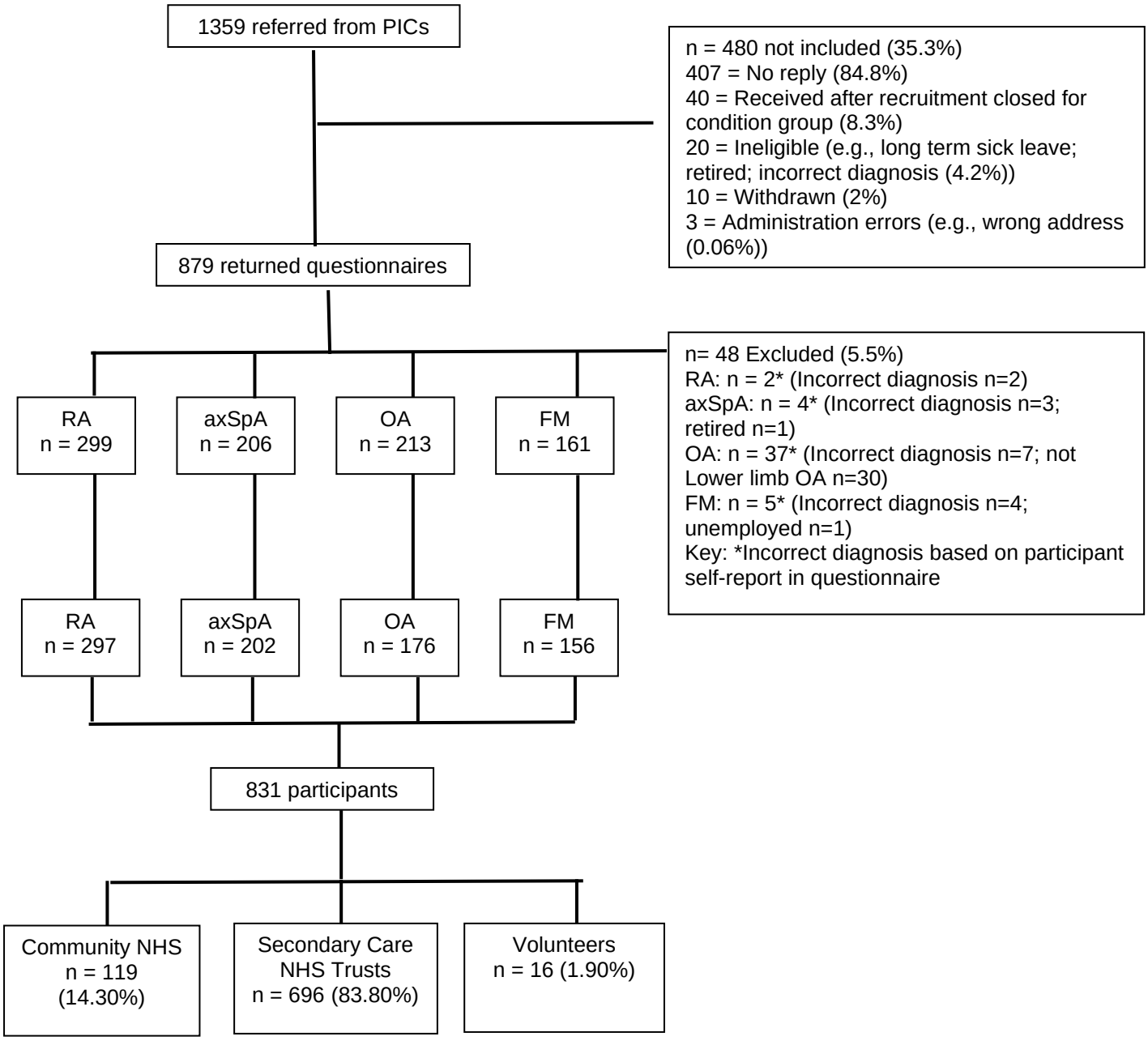
Supplementary Table S1: Hierarchical analytical structure for achieving ft of the Workplace Activity Limitations Scale to the Rasch model.

Level	Nature	Adjustments	Reporting		
			Chi-Square	ECV ≥0.9	Latent Correlation ≥0.9
1	Item-based	None	Interaction	No	No
2	Item-Based	Clusters for Local Item Dependency	Interaction	Yes	No
3	Domain-based	On existing sub-scales >2	Interaction	Yes	No
4	Parallel Form	On existing sub-scales <=2 or 2 LD patterns or conceptual groups	Conditional	Yes	Yes
5	Parallel Form	On alternative Items	Conditional	Yes	Yes
6	Item Deletion	On all original items	Interaction	No	No
		Repeat Levels 1-5			
7	Mokken Scaling	On items if Unidimensional. Loevinger's coefficient H ≥0.4-moderate	No	No	No
8	Fail	No valid ordinal scale	No	No	No

Key: ECV = Explained Common Variance. Interaction = Chi-Square Interaction fit statistic; Conditional = Conditional Chi-Square test of fit; Latent correlation is that between two items sets that are deemed to be parallel forms.

Supplementary Figure S1: Recruitment Flowchart Phase 2



Key: PICs – Patient Identification Centres; RA = rheumatoid arthritis; axSpA = axial spondyloarthritis; OA = osteoarthritis; FM = fibromyalgia.

Supplementary Table S2: **Phase 1: relevance of Workplace Activity Limitations Scale items (n = 48)**

Item no.	Item	RA n=12	axSpA n=10	OA n=13	FM n=13	Chi square	df	p
1	Get to/ from work	5.00 (4.00 – 5.00)	5.00 (5.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.50 – 5.00)	12.15	9	0.21
2	Get around work	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.50- 5.00)	4.24	6	0.64
3	Sit for long periods	5.00 (4.00 – 5.00)	5.00 (4.75 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.26	6	0.51
4	Stand for long periods	5.00 (4.00 – 5.00)	5.00 (3.75 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	10.14	9	0.34
5	Lift, carry, move objects	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	8.17	9	0.52
6	Work with hands	5.00 (4.00 – 5.00)	5.00 (4.75 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	9.65	9	0.38
7	Crouch, bend, kneel	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	7.48	9	0.59
8	Reach	5.00 (4.00 – 5.00)	5.00 (4.50 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	10.85	9	0.29
9	Manage hours of work	5.00 (4.00 – 5.00)	5.00 (4.75 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.50 – 5.00)	9.47	9	0.40
10	Manage pace of work	5.00 (4.00 – 5.00)	5.00 (5.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.00 – 5.00)	10.36	9	0.32
11	Manage job demands	5.00 (4.00 – 5.00)	5.00 (5.00 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.50 – 5.00)	11.99	9	0.21
12	Concentrate at work	5.00 (4.00 – 5.00)	5.00 (4.75 – 5.00)	5.00 (4.00 – 5.00)	5.00 (4.50 – 5.00)	7.92	9	0.54

Key: 1 = not at all relevant; 5 = extremely relevant. RA = rheumatoid arthritis; axSpA = axial spondyloarthritis; OA = osteoarthritis; FM = fibromyalgia.

No significant differences between groups.

Supplementary Table S3: Content validity of Workplace Activity Limitations Scale linked to the ICF Core Set for Vocational Rehabilitation (Activities and Participation domain).

		Work Activity Limitations Scale items											
ICF Vocational Rehabilitation Core Set Activities and Participation domain		1 To/ from work	2 Get around work	3 Sit	4 Stand	5 Lift, carry	6 Work with hands	7 Crouch, bend, kneel	8 Reach	9 Manage hours	10 Manage pace	11 Job demands	12 Concen -tration
1	d155 Acquiring skills												
2	d160 Focusing attention												
3	d163 Thinking												
4	d166 Reading												
5	d170 Writing												
6	d172 Calculating												
7	d175 Solving problems												
8	d177 Making decisions												
9	d210 Undertaking a single task												
10	d220 Undertaking multiple tasks												
11	d230 Carrying out daily routine												
12	d240 Handling stress and other psychological demands												
13	d310 Communicating with - receiving - spoken messages												
14	d315 Communicating with - receiving - nonverbal messages												
15	d350 Conversation												

16	d360 Using communication devices and techniques												
17	d410 Changing basic body position												
18	d415 Maintaining a body position												
19	d430 Lifting and carrying objects												
20	d440 Fine hand use												
21	d445 Hand and arm use												
22	d450 Walking												
23	d455 Moving around												
24	d465 Moving around using equipment												
25	d470 Using transportation												
26	d475 Driving												
27	d530 Toileting												
28	d540 Dressing												
29	d570 Looking after one's health												
30	d710 Basic interpersonal interactions												
31	d720 Complex interpersonal interactions												
32	d740 Formal relationships												
33	d820 School education												
34	d825 Vocational training												
35	d830 Higher education												

36	d840 Apprenticeship (work preparation												
37	d845 Acquiring, keeping, and terminating a job												
38	d850 Remunerative employment												
39	d855 Non-remunerative employment												
40	d870 Economic self-sufficiency												

Note: Item 11: “Meeting your current job demands” predominantly relates to Chapter 2: General Tasks and Demands” in the ICF, which states that “These items can be used in conjunction with more specific tasks or actions to identify the underlying features of the execution of tasks in different circumstances.” Codes shown in light grey may be relevant depending on the nature of the person’s job and how the respondent interprets this WALS item.

Supplementary Table S4: Frequency of "not applicable" and missing items in the Workplace Activity Limitations Scale.

WALS items	**RA (n=297)** **n (%)**		axSpA **(n=202)** **n (%)**		**OA (n=176)** **n (%)**		**FM (n=156)** **n (%)**	
	Not applicable	Missing	Not applicable	Missing	Not applicable	Missing	Not applicable	Missing
1. Get to/from work	22 (7.40)	2 (0.70)	9 (4.50)	2 (1.00)	10 (5.70)	0 (0)	7 (4.50)	0
2. Get around at work	17 (5.70)	3 (1.00)	6 (3.00)	2 (1.00)	6 (3.40)	0 (0(	9 (5.80)	0
3. Sit for long periods	47 (15.80)	1 (0.30)	21 (10.40)	2 (1.00)	19 (10.80)	0 (0)	18 (11.50)	0
4. Stand for long periods	57 (19.20)	1 (0.30)	23 (11.40)	2 (1.00)	17 (9.70)	2 (1.10)	20 (12.80)	0
5. Lift, carry, move objects	29 (9.80)	0 (0)	15 (7.40)	2 (1.00)	17 (9.70)	1 (0.60)	18 (11.50)	0
6. Work with hands	7 (2.40)	3 (1.00)	3 (1.50)	2 (1.00)	7 (4.00)	2 (1.10)	1 (0.60)	0
7. Crouch, bend, kneel	30 (10.10)	3 (1.00)	20 (9.90)	2 (1.00)	12 (6.80)	2 (1.10)	21 (13.50)	0
8. Reach	20 (6.70)	3 (1.00)	12 (5.90)	2 (1.00)	11 (6.30)	3 (1.70)	16 (10.30)	0
9. Manage hours of work	30 (10.10)	3 (1.00)	15 (7.40)	2 (1.00)	17 (9.70)	3 (1.70)	7 (4.50)	0
10. Manage pace of work	14 (4.70)	2 (0.70)	9 (4.50)	2 (1.00)	11 (6.30)	2 (1.10)	4 (2.60)	0
11. Meeting job demands	10 (3.40)	2 (0.70)	4 (2.00)	2 (1.00)	6 (3.40)	3 (1.70)	3 (1.90)	0
12. Concentrating at work	6 (2.00)	2 (0.70)	4 (2.00)	2 (1.00)	9 (5.10)	2 (1.10)	3 (1.90)	0

Key: WALS = Work Activity Limitations Scale; RA = rheumatoid arthritis; axSpA = axial spondyloarthritis; OA = osteoarthritis; FM = fibromyalgia

Supplementary Table S5. Raw score to interval scale transformation of the Workplace Activity Limitations Scale.

WALS Raw Score	WALS Interval Score
0	0
1	2.90
2	5.00
3	6.50
4	7.70
5	8.70
6	9.60
7	10.40
8	11.20
9	11.90
10	12.50
11	13.10
12	13.60
13	14.10
14	14.60
15	15.10
16	15.50
17	16.00
18	16.40
19	16.90
20	17.40
21	17.90
22	18.40
23	18.90
24	19.50
25	20.20
26	20.90
27	21.60
28	22.50
29	23.40
30	24.40
31	25.50
32	26.70
33	28.20
34	30.00
35	32.50
36	36.00

Key: WALS: Work Activity Limitations Scale

Supplementary Table S6: Calibration of the Workplace Activity Limitations Scale and Work Instability Scales on the Reference Metric.

Raw score	Reference	WALS	AS-WIS	RA-WIS
0	0.0	26.9	24.8	23.8
1	9.7	31.8	29.3	29.3
2	15.5	35.2	32.3	33.0
3	19.0	37.6	34.4	35.3
4	21.4	39.5	36.0	37.1
5	23.2	41.2	37.4	38.5
6	24.6	42.7	38.7	39.7
7	25.7	44.1	39.8	40.7
8	26.6	45.5	40.9	41.7
9	27.5	46.9	42.0	42.6
10	28.2	48.2	43.1	43.5
11	28.8	49.5	44.1	44.4
12	29.4	50.7	45.2	45.4
13	29.9	51.9	46.3	46.3
14	30.4	53.1	47.5	47.4
15	30.8	54.2	48.8	48.6
16	31.3	55.4	50.2	50.0
17	31.7	56.5	51.8	51.6
18	32.0	57.7	53.9	53.5
19	32.4	58.8	57.0	55.8
20	32.7	60.0	61.6	58.6
21	33.1	61.2		62.0
22	33.4	62.4		67.0
23	33.7	63.6		74.0
24	34.0	64.9		
25	34.2	66.2		
26	34.5	67.5		
27	34.8	68.9		
28	35.0	70.4		
29	35.3	71.9		
30	35.5	73.4		
31	35.8	75.1		
32	36.0	76.9		
33	36.3	78.9		
34	36.5	81.4		
35	36.7	85.0		
36	37.0	90.2		

37	37.2
38	37.4
39	37.6
40	37.8
41	38.0
42	38.2
43	38.4
44	38.7
45	38.9
46	39.1
47	39.3
48	39.5
49	39.6
50	39.8
51	40.0
52	40.2
53	40.4
54	40.6
55	40.8
56	41.0
57	41.2
58	41.4
59	41.5
60	41.7
61	41.9
62	42.1
63	42.3
64	42.4
65	42.6
66	42.8
67	43.0
68	43.2
69	43.3
70	43.5
71	43.7
72	43.8
73	44.0
74	44.2
75	44.4
76	44.5
77	44.7
78	44.9

79	45.0
80	45.2
81	45.4
82	45.5
83	45.7
84	45.9
85	46.0
86	46.2
87	46.3
88	46.5
89	46.7
90	46.8
91	47.0
92	47.2
93	47.3
94	47.5
95	47.7
96	47.8
97	48.0
98	48.1
99	48.3
100	48.4
101	48.6
102	48.8
103	48.9
104	49.1
105	49.2
106	49.4
107	49.5
108	49.7
109	49.9
110	50.0
111	50.2
112	50.3
113	50.5
114	50.6
115	50.8
116	51.0
117	51.1
118	51.3
119	51.4
120	51.6

121	51.8
122	51.9
123	52.1
124	52.3
125	52.4
126	52.6
127	52.8
128	52.9
129	53.1
130	53.3
131	53.5
132	53.6
133	53.8
134	54.0
135	54.2
136	54.4
137	54.6
138	54.7
139	54.9
140	55.1
141	55.3
142	55.5
143	55.7
144	55.9
145	56.1
146	56.3
147	56.6
148	56.8
149	57.0
150	57.2
151	57.4
152	57.7
153	57.9
154	58.2
155	58.4
156	58.7
157	58.9
158	59.2
159	59.5
160	59.7
161	60.0
162	60.3

163	60.6
164	61.0
165	61.3
166	61.6
167	62.0
168	62.4
169	62.7
170	63.1
171	63.6
172	64.0
173	64.5
174	65.0
175	65.5
176	66.1
177	66.7
178	67.3
179	68.0
180	68.7
181	69.4
182	70.2
183	71.1
184	72.0
185	73.0
186	74.0
187	75.2
188	76.4
189	77.7
190	79.3
191	81.1
192	83.4
193	86.5
194	91.6
195	100.0

Key: WALS = Work Activity Limitations Scale; WIS = Work Instability Scale; RA = rheumatoid arthritis; AS = ankylosing spondyloarthritis

Supplementary Table S7: Discriminant validity of the Workplace Activity Limitations Scale.

Perceived health status:	Very poor/ poor	Fair	Good/ very good	Kruskal-Wallis H	df	p
RA (n = 294)	15.00 (11.00 – 19.50) n=45	11.00 (8.00 – 14.00) n = 133	5.00 (3.00 – 8.00) n = 116	104.72	2	<0.001
axSpA (n=199)	12.00 (4.50 – 15.00) n = 21	9.00 (4.00 – 12.00) n = 78	4.00 (2.00 – 9.00) n = 100	24.47	3	<0.001
OA (n=173)	15.00 (12.00 – 18.50) n = 37	10.00 (6.00 – 13.00) n = 95	6.00 (3.00 – 8.50) n = 41	50.28	2	<0.001
FM (n=156)	1700. (15.00 -21.00) n = 83	14.00 (10.00 – 16.00) n = 63	11.45 (4.75 – 14.25) n = 10	30.94	2	<0.001

Key: RA = rheumatoid arthritis; axSpA = axial spondyloarthritis; OA = osteoarthritis; FM = fibromyalgia; WALS = Work Activity Limitations Scale
WALS: higher scores indicate greater work limitations.

Supplementary Table S8: Workplace Activity Limitations Scale item test-retest reliability (quadratic weighted kappa) in RA, axSpA, OA and FM.

WALS items	RA (n=136) [1]	axSpA (n=88) [1]	OA (n=78) [1]	FM (n=54) [1]
	n (%)	n (%)	n (%)	n (%)
1. Get to/from work	0.69	0.64	0.73	0.45
2. Get around at work	0.66	0.50	0.51	0.67
3. Sit for long periods	0.77	0.56	0.58	0.73
4. Stand for long periods	0.66	0.65	0.57	0.59
5. Lift, carry, move objects	0.60	0.57	0.66	0.63
6. Work with hands	0.61	0.68	0.75	0.56
7. Crouch, bend, kneel	0.67	0.57	0.59	0.52
8. Reach	0.69	0.55	0.61	0.49
9. Manage hours of work	0.55	0.51	0.44	0.61
10. Manage pace of work	0.64	0.50	0.55	0.47
11. Meeting job demands	0.68	0.68	0.69	0.60
12. Concentrating at work	0.68	0.73	0.64	0.49

Key: [1] Participants reporting" the same" health status at T1 and T2; RA = rheumatoid arthritis; axSpA = axial spondyloarthritis; OA = osteoarthritis; FM = fibromyalgia.