SUPPLEMENTARY MATERIALS

Work participation in patients with axial spondyloarthritis: High prevalence of negative workplace experiences and long-term work impairment

Uta Kiltz, Kirsten Hoeper, Ludwig Hammel, Sebastian Lieb, Andreas Hähle, Dirk Meyer-Olson

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Supplementary Table 1. List of study investigators at each participating site

Site No.	Investigator and other important participants	Position / Role	Site address	Patients enrolled
1	Prof. Dr. med. Dirk Meyer-Olson	Principal Investigator	Medizinische Hochschule Hannover, Hannover, 30625 Germany m&i Fachklinik Bad Pyrmont/MVZ Weserbergland, Bad Pyrmont, 31812 Germany	134
	Christiane Bartels	Study Nurse		
	Elif Sensu	Study Nurse		
	Nadine Lowald	Study Nurse		
	Katharina Falke	Study Nurse		
2	PD Dr. med. Uta Kiltz	Principal Investigator	Rheumazentrum Ruhrgebiet, Herne, 44649 Germany Ruhr Universität, Bochum, 44801 Germany	102
	Dr. med. Ioana Andreica	Sub-Investigator		
	Styliani Tsiami	Sub-Investigator		
	Doris Morzeck	Study Nurse		
	Dagmar Krinitzki	Study Nurse		
	Gordana Brnos	Study Nurse		
3	Prof. Dr. med. Torsten Witte	Principal Investigator	Medizinische Hochschule Hannover, Hannover, 30625 Germany	26
	Dr. med. Elke Riechers	Sub-Investigator		
	Alexandra Röhl	Study Nurse		
	Gudrun Melke	Study Nurse		
4	Prof. Dr. med. Monika Reuss-Borst	Principal Investigator	Bad Bocklet, 97708 Germany	9
5	Dr. med. Gabriele Lorenz	Principal Investigator	Chemnitz, 09130 Germany	45
	Claudia Richter	Study Nurse		
6	Dr. med. Florian Haas	Principal Investigator	Tübingen, 72072 Germany	79
	Katja Backes	Study Nurse		
7	Dr. Ilka Schwarze	Principal Investigator	Leipzig, 04129 Germany	90
	Melanie Faust	Study Nurse		
8	Dr. med. Peter Kästner	Principal Investigator	Erfurt, 99096 Germany	3
	Dr. Karsten Brose	Sub-Investigator		
	Cornelia Gehlhaas	Study Nurse		
	Daniela Freuße-Stöber	Study Nurse		
9	Dr. med. Christina Eisterhues	Principal Investigator	Braunschweig, 38100 Germany	7
	Corinna Ebeling	Study Nurse		
10	Dr. med. Silke Zinke	Principal Investigator	Berlin, 13055 Germany	41
	Kristina Lunkowitz	Study Nurse		
11	Dr. med. Thomas Kupka	Principal Investigator	Altenburg, 04600 Germany	24
	Jessica Hübner	Study Nurse		
12	Prof. Dr. med. Herbert Kellner	Principal Investigator	München, 80639 Germany	154
	Ruta Tautkute	Study Nurse		
13	Dr. med. Thilo Klopsch	Principal Investigator	Neubrandenburg, 17033 Germany	82
	Caroline Martin	Study Nurse		
14	PD Dr. med. Hans-Eckhard Langer	Principal Investigator	Düsseldorf, 40217 Germany	1
	Rebekka Gabernig	Study Nurse		
	Janine Altena	Study Nurse		

Supplementary Table 2. Characteristics of the Full Study Population (n=770) concerning family status, health insurance, diagnosis, and medication.

Characteristic	Statistic
Family status	
In a committed relationship (married / living together), % (n)	67.7 (521)
Have children, % (n)	65.5 (504)
Number of children (n=504) (%):	
1	39.1
2	46.2
3	12.1
4	2.2
5	0.4
HLA-B27 positive children (n=504), % (n)	9.7 (49)
Not specified	48.4 (244)
How many (n=504), n (%)	
1	83.7 (42)
2	12.2 (6)
3	4.1 (2)
Health insurance	
Type of health insurance (multiple answers possible), % (n)	
Statutory	95.1 (732)
Have ever been privately insured and decided to switch to statutory health insurance because of their axSpA condition (n=732), % (n)	1.1 (8)
Private	4.9 (38)
Have ever considered switching to statutory health insurance to have lower health insurance costs in old age (n=38), % (n)	29.0 (11)
Have a private supplementary insurance, % (n)	18.6 (143)
Are afraid of being excluded from private supplementary insurance because of their axSpA condition (n=143), % (n)	15.4 (22)
Claim benefits from long-term care insurance due to their axSpA condition, % (n)	1.3 (10)
Degree of care (degrees 1 to 5 where 0 is the lowest and 5 the highest) (n=10), % (n)	
Degree 1	30.0 (3)
Degree 2	60.0 (6)
Degree 3	10.0 (1)
Degree 4	0.0 (0)
Degree 5	0.0 (0)
Diagnosis	
axSpA diagnosis by rheumatologist, % (n)	77.7 (598)
axSpA diagnosis by another physician, % (n)	
Orthopedist	12.6 (97)
General practitioner	5.2 (40)
Ophthalmologist	0.9 (7)
Gastroenterologist	0.3 (2)
Dermatologist	0.0 (0)
Other specialised physician	3.4 (26)
Feel well educated about their axSpA condition, % (n))	88.7 (683)
Informed their private environment about their disease, % (n)	95.1 (732)
Informed their professional environment about their disease, % (n)	73.5 (566)

Biologic treatment	
Taken NSAIDs, % (n)	
Currently	22.2 (171)
Currently and previously	29.0 (223)
Previously	38.6 (297)
Never	10.3 (79)
Taken DMARDs, % (n)	
Currently	10.5 (81)
Currently and previously	4.3 (33)
Previously	27.9 (215)
Never	57.3 (441)
Taken biologics, % (n)	
Currently	35.3 (272)
Currently and previously	16.1 (124)
Previously	8.8 (68)
Taken biologics, % (n)	
Never	39.7 (306)
PROs	
BASDAI extreme values (≥8 for at least three of the first five questions), % (n)	11.0 (85)

AxSpA, axial spondyloarthritis; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; DMARDs, disease-modifying anti-rheumatic drugs; NSAIDs, non-steroidal anti-inflammatory drugs; PRO, patient-reported outcome; SD, standard deviation

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37 **Supplementary Table 3. Univariate and multivariate logistic regression with WP as target**

38 **variable (unimpaired n=377) of the ≤47 years age sub-group**

Predictors	**Impaired WP (n=215)**	**Unimpaired WP (n=162)**	**β_j [constant β_0]**	**OR**	**95% CI**	**$\chi 2$***	**p-value**
Univariate logistic regression							
General demographic characterization							
Age (years), mean ± SD	36.7 ± 6.9	37.0 ± 6.4	0.007 [-0.531]	1.007	0.976 – 1.038	0.19	0.667
BMI, mean ± SD	27.5 ± 14.0	26.1 ± 4.5	-0.016 [0.137]	0.984	0.957 – 1.012	1.73	0.268
Male, % (n)	57.7 (124)	73.5 (119)	0.709 [-0.750]	2.031	1.306 – 3.158	10.21	0.002
University education, % (n)	23.7 (51)	37.7 (61)	0.664 [-0.485]	1.942	1.242 – 3.037	8.54	0.004
In a committed relationship, % (n)	60.9 (131)	58.6 (95)	-0.095 [-0.226]	0.909	0.600 – 1.378	0.20	0.654
Work characterization							
Full time employment, % (n)	62.8 (135)	85.2 (138)	1.226 [-1.204]	3.407	2.038 – 5.698	24.37	<0.001

Short-term absenteeism (WPAI-axSpA), mean ± SD	0.2 ± 0.3	0.0 ± 0.0					
Short-term presenteeism (WPAI-axSpA), mean ± SD	0.5 ± 0.2	0.1 ± 0.1					
Clinical characterization							
Disease duration (years)	9.0 ± 9.0	10.5 ± 9.2	0.017 [-0.452]	1.018	0.995 – 1.041	2.32	0.131
Biologic treatment, % (n)	47.0 (101)	58.6 (95)	0.470 [-0.532]	1.600	1.060 – 2.416	5.05	0.025
PROs							
ASAS-HI, mean ± SD	7.8 ± 3.4	3.4 ± 3.0	-0.413 [1.956]	0.662	0.607 – 0.722	138.82	<0.001
BASDAI, mean ± SD	4.7 ± 2.0	2.0 ± 1.2	-0.852 [2.424]	0.427	0.360 – 0.506	171.05	<0.001
BASDAI ≥4, % (n)	63.7 (137)	9.9 (16)	-2.774 [0.627]	0.062	0.035 – 0.112	123.083	<0.001
BASDAI Fatigue, mean ± SD	5.8 ± 2.3	2.8 ± 2.1	-0.567 [2.102]	0.567	0.505 – 0.638	135.65	<0.001
BASDAI Duration morning stiffness, mean ± SD	3.5 ± 2.5	1.6 ± 1.8	-0.461 [0.793]	0.631	0.553 – 0.719	68.76	<0.001
BASFI, mean ± SD	3.7 ± 2.3	1.2 ± 1.4	-0.766 [1.359]	0.465	0.391 – 0.552	137.64	<0.001
Multivariate logistic regression							
Constant			2.885				
ASAS-HI			-0.178	0.837	0.745 – 0.940		0.003
BASDAI			-0.513	0.599	0.406 – 0.883		0.010
BASDAI ≥4			0.027	1.028	0.368 – 2.867		0.959
BASDAI Fatigue			-0.067	0.936	0.773 – 1.133		0.494
BASDAI Duration morning stiffness			0.034	1.035	0.866 – 1.236		0.706
BASFI			-0.175	0.839	0.662 – 1.064		0.148
Full model					192.54		**<.001**

BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; βj, regression coefficient; ASAS-HI, Assessment of SpondyloArthritis International Society-Health Index; BMI, body mass index; CI, confidence interval; df, degrees of freedom; n, number of patients; OR, odds ratio calculated as exp(β_j); SD, standard deviation; WP, work participation; χ2, Chi-squared statistic

*For univariate models df=1; for the multivariate full model df=14

Supplementary Table 4. Univariate and multivariate logistic regression with WP as target variable (unimpaired n=318) of the >47 years age sub-group

Predictors	Impaired WP (n=238)	Unimpaired WP (n=80)	β_j [constant β_0]	OR	95% CI	$\chi 2^*$	p-value
Univariate logistic regression							
General demographic characterization							
Age (years), mean ± SD	55.6 ± 4.6	54.5 ± 5.1	-0.055 [1.926]	0.947	0.894 – 1.002	3.72	0.060
BMI, mean ± SD	29.4 ± 14.0	28.8 ± 9.6	-0.004 [-0.974]	0.996	0.974 – 1.018	0.14	0.723
Male, % (n)	51.3 (122)	73.8 (59)	0.983 [-1.709]	2.671	1.527 – 4.673	12.84	< 0.001
University education, % (n)	22.3 (53)	72.5 (58)	0.281 [-1.160]	1.324	0.743 – 2.360	0.89	0.341
In a committed relationship, % (n)	75.2 (179)	80.0 (64)	0.276 [-1.305]	1.318	0.708 – 2.455	0.78	0.384
Work characterization							
Full time employment, % (n)	50.8 (121)	80.0 (64)	1.353 [-1.990]	3.868	2.114 – 7.075	22.37	<0.001
Short-term absenteeism (WPAI-axSpA), mean ± SD	0.2 ± 0.3	0.0 ± 0.0					
Short-term presenteeism (WPAI-axSpA), mean ± SD	0.5 ± 0.2	0.1 ± 0.1					
Clinical characterization							
Disease duration (years)	16.1 ± 12.2	16.7 ± 10.9	0.004 [-1.162]	1.004	0.983 – 1.026	0.16	0.687
Biologic treatment, % (n)	54.2 (129)	50.0 (40)	-0.168 [-1.002]	0.845	0.509 – 1.403	0.42	0.515
ASAS-HI, mean ± SD	8.2 ± 3.2	4.3 ± 3.0	-0.408 [1.420]	0.665	0.597 – 0.740	82.13	<0.001
BASDAI, mean ± SD	4.9 ± 1.8	2.3 ± 1.6	-0.953 [2.231]	0.386	0.306 – 0.486	115.89	< 0.001
BASDAI ≥4, % (n)	66.8 (159)	16.3 (13)	-2.339 [-0.165]	0.096	0.050 – 0.185	65.19	<0.001
BASDAI Fatigue, mean ± SD	5.8 ± 2.0	2.9 ± 2.0	-0.691 [1.857]	0.501	0.423 – 0.594	102.28	<0.001
BASDAI Duration morning stiffness, mean ± SD	3.5 ± 2.4	1.7 ± 1.7	-0.502 [0.135]	0.605	0.506 – 0.724	45.13	<0.001
BASFI, mean ± SD	4.8 ± 2.2	2.2 ± 1.6	-0.650 [1.092]	0.522	0.439 – 0.621	84.15	<0.001

Multivariate logistic regression				
Constant	3.432			
ASAS-HI	-0.122	0.885	0.772 – 1.015	0.081
BASDAI	-0.691	0.501	0.305 – 0.824	**0.006**
BASDAI ≥4	1.049	2.856	0.866 – 9.418	0.085
BASDAI Fatigue	-0.172	0.842	0.641 – 1.104	0.214
BASDAI Duration morning stiffness	-0.096	0.909	0.738 – 1.120	0.369
BASFI	-0.227	0.797	0.628 – 1.011	0.061
Full model			133.81	**<.001**

βj, regression coefficient; ASAS-HI, Assessment of SpondyloArthritis International Society-Health Index; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; BMI, body mass index; CI, confidence interval; df, degrees of freedom; n, number of patients; OR, odds ratio calculated as exp(β_j); WP, work participation; $\chi 2$, Chi-squared statistic
*For univariate models df=1; for the multivariate full model df=14

Supplementary Table 5. Impact of axSpA on the ability to work and participation in vocational reintegration and rehabilitation programs in the WP Study Population (n=695).

Characteristic	Statistic
Impact of axSpA at work / the ability to work	
Have ever been "slowed down" professionally by their axSpA / have had a change of plans due to their axSpA, % (n)	
Has already happened frequently	8.6 (60)
Has already happened	33.2 (231)
Has never happened	27.6 (192)
The vocational situation has even improved to due axSpA	1.0 (7)
Does not apply	29.5 (205)
Have ever been treated differently from colleagues at work because of their axSpA, % (n)	25.6 (178)
Not specified	8.2 (57)
Feel that their axSpA has an impact on the amount of their salary (e.g., raises), % (n)	
Already once	5.0 (35)
Already more often	4.3 (30)
Not specified	11.2 (78)
Vocational reintegration and rehabilitation programs	
Have previously participated in vocational reintegration programs (n=679, excluding patients not employed for other reasons than their axSpA condition), % (n)	22.8 (155)
Duration of taking part (n=155), mean ± SD	11.8 ± 14.5
Duration in weeks, % (n)	
1-2	8.4 (13)
3-5	33.5 (52)
6-9	29.0 (45)

≥ 10	29.0 (45)
Have ever made use of an vocational rehabilitation program in the company (e.g., a retraining measure), % (n)	10.2 (71)
Did not know	4.5 (31)
Times using the vocational rehabilitation program (n=71), % (n)	
1	67.6 (48)
2	23.9 (17)
3	2.8 (2)
4	2.8 (2)
5	1.4 (1)
6	1.4 (1)
Time since the last vocational rehabilitation program in years (n=71), % (n)	
< 1 year	18.3 (13)
1-4 years	31.0 (22)
5-9 years	9.9 (7)
≥ 10 years	40.8 (29)
The vocational rehabilitation program was initiated by … (n=71) (multiple answers possible), % (n)	
… patients themselves	33.8 (24)
… employment agency	31.0 (22)
… pension insurance	29.6 (21)
… rheumatologist	21.1 (15)
… general practitioner	18.3 (13)
… other specialised physician	8.5 (6)
… orthopedist	4.2 (3)
… health insurance	4.2 (3)
… company/ vocational physician	0.0 (0)
… unknown	4.2 (3)
Had to change employers because of their axSpA condition, % (n)	14.1 (98)
Not specified	4.5 (31)
Due to their condition, occurred … (multiple answers possible), % (n)	
… a reorganisation of the workplace by the employer or the pension insurance	18.0 (125)
… an in-company transfer to a new position	5.8 (40)
… a retraining measure by the employment agency	4.2 (29)
… a retraining measure by the pension insurance	2.7 (19)
… an in-company retraining to a new position	1.6 (11)
… a retraining measure in an vocational promotion center	1.6 (11)
Neither of the above.	71.7 (498)

AxSpA, axial spondyloarthritis; n, number of patients; SD, standard deviation; WP, work participation

Supplementary Table 6. Pearson correlation, VIF, and CI to verify model assumptions of independence of the explanatory variables.

	Age	BMI	Male	University education	In a committed relationship	Disease duration	ASAS-HI	BASDAI	BASDAI ≥ 4	BASFI	BASDAI fatigue	BASDAI Duration morning stiffness	Biologic treatment	Full time employment
Age	-	0.083	0.043	−0.034	0.238	0.395	0.164	0.116	0.101	0.312	0.050	0.083	0.003	−0.308
BMI	0.083	-	−0.022	−0.024	0.018	0.000	0.055	0.029	0.035	0.059	0.005	0.024	0.064	−0.023
Male	0.043	−0.022	-	−0.078	0.010	−0.097	0.223	0.186	0.192	0.094	0.216	0.003	0.007	−0.289
University education	−0.034	−0.024	−0.008	-	0.008	0.047	−0.144	−0.134	−0.139	−0.158	−0.091	−0.101	−0.112	0.061
In a commited relationship	0.238	0.018	0.010	0.008	-	0.027	0.036	0.010	0.17	0.022	−0.006	0.036	−0.012	−0.073
Disease duration	0.395	0.000	−0.097	0.047	0.027	-	0.042	−0.016	−0.043	0.141	−0.030	0.016	−0.103	−0.094
ASAS-HI	0.164	0.055	0.223	−0.144	0.036	0.042	-	0.681	0,559	0.705	0.655	0.426	−0.029	−0.260
BASDAI	0.116	0.029	0.186	−0.134	0.010	−0.016	0.681	-	0.839	0.752	0.847	0.641	0.043	−0.182
BASDAI ≥ 4									-					
BASFI	0.312	0.059	0.094	−0.158	0.022	0.141	0.705	0.752	0.644	-	0.649	0.539	−0.017	−0.278
BASDAI fatigue	0.050	0.005	0.216	−0.091	−0.006	−0.030	0.655	0.847	0.721	0.649	-	0.458	−0.004	−0.163
BASDAI duration morning stiffness	0.083	0.024	0.003	−0.101	0.036	0.016	0.426	0.641	0.507	0.539	0.458	-	−0.012	−0.082
Biologic treatment	0.003	0.064	0.007	−0.112	−0.012	−0.103	−0.029	0.043	−0.074	−0.017	−0.004	−0.012	-	0.000
Full time employment	−0.308	−0.023	−0.289	0.061	−0.073	−0.094	−0.260	−0.182	−0.150	−0.278	−0.163	−0.082	0.000	-
VIF*	1.370	1.026	1.352	1.053	1.143	1.202	2.416	7.733	3.359	2.941	3.842	1.738	1.069	1.257
CI*	2.989	4.127	4.146	5.099	5.533	6.024	6.610	7.602	8.951	10.163	11.451	13.884	20.329	24.593

ASAS-HI, Assessment of SpondyloArthritis International Society-Health Index; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; BMI, Body Mass Index; VIF, Variance inflation factor; CI, condition index

* VIFs >10 and CIs >30 suggest multicollinearity.

Supplementary Table 7. Model quality for variables of the univariate logistic regression (n=695).

Predictors	−2 log likelihood*	R^2_N	R^2_{CS}	Classification table (%)		
				Correct prediction by WP		Overall prediction
				Unimpaired WP	Impaired WP	
General demographic characterisation						
Age	878.523	0.040	0.030	2.9	97.6	64.6
BMI	895.346	0.010	0.004	0.0	100.0	65.2
Male	873.102	0.050	0.040	0.0	100.0	65.2
University education	888.291	0.020	0.010	0.0	100.0	65.2
In a committed relationship	897.860	0.001	0.001	0.0	100.0	65.2
Work characterisation						
Full time employment	843.709	0.100	0.080	0.0	100.0	65.2
Clinical characterisation						
Disease duration	898.337	0.000	0.000	0.0	100.0	65.2
Biologic treatment	897.801	0.001	0.001	0.0	100.0	65.2
PROs						
ASAS-HI	659.746	0.40	0.29	64.5	84.8	77.7
BASDAI	593.077	0.49	0.36	71.9	88.1	82.4
BASDAI ≥4	699.911	0.34	0.25	91.0	57.57	73.2
BASDAI Fatigue	650.685	0.41	0.3	71.1	83.4	79.1
BASDAI Duration morning stiffness	777.644	0.22	0.16	63.2	78.1	72.9
BASFI	652.971	0.41	0.30	66.1	84.1	77.8

ASAS-HI, Assessment of SpondyloArthritis International Society-Health Index; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; BMI, body mass index; df, degrees of freedom; n, number of patients; R^2_{cs}, Cox & Snell pseudo R^2; R^2_N, Nagelkerke pseudo R^2

* Null model: 898.393

Supplementary Table 8. Post-hoc Games-Howell-Test for PROs by different types of WP impairment (corresponding to Supplementary Figure 1).

Work impairment*		**p-value by PRO†**				
		BASDAI	Fatigue‡	Duration morning stiffness‡	BASFI	ASAS-HI
Absenteeism	Disability pension	0.259	0.263	0.391	**<0.001**	**<0.001**
Absenteeism	No employment	0.900	0.900	0.900	0.181	0.787
Absenteeism	Presenteeism	0.253	0.751	0.900	0.189	0.313
Absenteeism	Unimpaired WP	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Disability pension	No employment	0.417	0.257	0.779	**0.012**	0.141
Disability pension	Presenteeism	**0.004**	**0.020**	0.163	**<0.001**	**<0.001**
Disability pension	Unimpaired WP	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
No employment	Presenteeism	0.586	0.900	0.702	**0.003**	0.088
No employment	Unimpaired WP	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Presenteeism	Unimpaired WP	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**

ASAS-HI, Assessment of SpondyloArthritis International Society-Health Index; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; PRO, patient-reported outcome; WP, work participation

* Absenteeism and presenteeism were evaluated in the short-term (through the WPAI-axSpA). Patients grouped under presenteeism as work impairment displayed presenteeism but no absenteeism, whereas patients displaying absenteeism were grouped under absenteeism independently of whether their showed presenteeism.

† Significant differences are indicated in bold. See Supplementary Figure 2 for a visual illustration of the group differences.

‡ Fatigue and duration morning stiffness as measured via the BASDAI.

Supplementary figure legends

Supplementary Figure **1.** Disease duration (years) in the WP Study Population. (A) Disease duration and percentage frequency of disability pension and patients not working (B) disease duration and percentage frequency of absenteeism and presenteeism.

Supplementary Figure 2. Work hours lost in the last 7 days as measured by the WPAI-axSpA among all workers (n=590) in the WP Study Population. The majority of patients reported not having lost any work hours in the past week.

Supplementary Figure 3. Relationship between presenteeism and absenteeism, and presenteeism and impairment of daily activities in the WP Study Population. Scatterplots indicate that there was no relationship between **(A)** presenteeism and absenteeism, however, a positive relationship between **(B)** presenteeism and impairment of daily activities. The size of the dots depicts the relative number of patients represented.

Supplementary Figure 4. PROs by different types of WP impairment in the WP Study Population. Illustration of differences in the PROS **(A)** BASDAI, **(B)** BASDAI Fatigue, **(C)** BASDAI Duration morning stiffness, **(D)** BASFI, and **(E)** ASAS-HI by different types of work impairment. Patients with unimpaired WP had significantly lower disease activity (including less fatigue and duration morning stiffness), as well as better global functioning and physical function across all patients with WP impairment; significances of differences between groups are shown in Supplementary Table 6.