

Text A - Questions in questionnaire

Psychosocial factors – full description.

The current study assessed decision control, fair and empowering leadership and social climate using items taken from the General Nordic Questionnaire for Psychological and Social Factors at work (QPS_{Nordic}) (32), a validated instrument for research and tool for employers to monitor and improve working conditions (32, 33). For each of the four subjects a mean was calculated based on the responses.

Participants were asked for decision control at work through the five questions: 1) *If there are alternative methods for doing your work, can you choose which method to use?* 2) *Can you influence the amount of work assigned to you?* 3) *Can you influence decisions concerning the persons you will need to collaborate with?* 4) *Can you decide when to be in contact with clients?* 5) *Can you influence decisions that are important for your work?* Response alternatives (1-5) were *very seldom or never, rather seldom, sometimes, rather often* and *very often or always*.

Three questions investigated empowering leadership: 1) *Does your immediate superior encourage you to participate in important decisions?* 2) *Does your immediate superior encourage you to speak up, when you have different opinions?* 3) *Does your immediate superior help you to develop your skills?* Response alternatives (1-5) were *very seldom or never, rather seldom, sometimes, rather often* and *very often or always*.

For fair leadership we used the three questions: 1) *Does your immediate superior distribute the work fairly and impartially?* 2) *Does your immediate superior treat the workers fairly and equally?* 3) *Is the relationship between you and your immediate superior a source of stress to you?* Response alternatives (1-5) were *very seldom or never, rather seldom, sometimes, rather often* and *very often or always*.

We asked for social climate in participants work unit through three questions: *What is the climate like in your work unit?* Items asked for were: 1) *Encouraging and supportive*, 2) *Distrustful and suspicious*, 3) *Relaxed and comfortable*. Response alternatives (1-5) were *very little or not at all, rather little, somewhat, rather much* and *very much*.

Table A. Linear mixed model on $\geq 30^\circ$ and $\geq 60^\circ$ forward bending exposure at work (percentage) and average low back pain during follow-up (Design 1).

	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>			<u>Model 4</u>			<u>Model 5</u>		
	Observations = 291/141/150			Observations = 285/140/145			Observations = 284/139/145			Observations = 281/138/143			Observations = 281/138/143		
	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value
$\geq 30^\circ$															
Total	-0.530	-2.248,1.189	0.546	-0.832	-2.602,0.937	0.357	-0.817	-2.600,0.966	0.369	-0.793	-2.533,0.947	0.372	-1.432	-3.144,0.280	0.101
Construction	-2.180	-4.293,-0.067	0.043	-2.417	-4.599,-0.235	0.030	-2.373	-4.581,-0.166	0.035	-2.376	-4.447,-0.306	0.025	-2.580	-4.691,-0.468	0.017
Healthcare	1.643	-1.062,4.348	0.234	1.540	-1.386,4.466	0.302	1.547	-1.334,4.428	0.292	1.625	-1.375,4.625	0.288	0.332	-2.729,3.394	0.831
$\geq 60^\circ$															
Total	0.393	-3.496,4.281	0.843	0.103	-4.005,4.212	0.961	0.369	-3.834,4.572	0.863	0.508	-3.660,4.676	0.811	-3.904	-8.589,0.780	0.102
Construction	-1.033	-5.346,3.280	0.639	-1.835	-6.429,2.760	0.434	-1.365	-6.062,3.332	0.569	-3.055	-7.728,1.617	0.200	-5.237	-10.593,0.118	0.055
Healthcare	8.106	-1.556,17.768	0.100	8.263	-2.123,18.645	0.119	0.817	-2.064,18.414	0.118	8.115	-2.337,18.567	0.128	-1.136	-13.961,11.691	0.862

Observations: total observations included in linear mixed models for total/construction/health care; P-values ≤ 0.05 in bold

Dependent variable: average pain intensity from 6 months to 24 months follow-up (T2, T3, T4, T5)

Independent variables:

Model 1: Forward bending at work (percentage of work day)

Model 2: As model 1 + Age, Gender, Smoking, BMI

Model 3: As model 2 + Heavy lifting

Model 4: As model 3 + Social climate, Decision control, Fair leadership, Empowering leadership

Model 5: As model 4 + Objectively measured sitting at work (percentage of work day).

Table B. Linear mixed model with exposure to forward bending $\geq 30^\circ$ at work (percentage) and change in low back pain during follow-up (Design 2).

		<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>			<u>Model 4</u>			<u>Model 5</u>																	
		Observations = 407/197/210						Observations = 399/196/203						Observations = 398/195/203						Observations = 393/194/199						Observations = 393/194/199					
		Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value												
Total	T2	0.809	-1.186,2.804	0.427	0.822	-1.177,2.822	0.420	0.781	-1.219,2.781	0.444	0.750	-1.239,2.739	0.460	0.654	-1.325,2.633	0.517															
	T3	0.631	-1.498,2.760	0.561	0.599	-1.532,2.729	0.582	0.541	-1.591,2.674	0.619	0.561	-1.556,2.678	0.603	0.436	-1.671,2.543	0.685															
	T4	1.557	-0.504,3.618	0.139	1.350	-0.763,3.463	0.210	1.299	-0.815,3.413	0.229	1.286	-0.814,3.386	0.230	1.166	-0.924,3.256	0.274															
	T5	0.720	-1.587,3.026	0.541	0.727	-1.580,3.034	0.537	0.738	-1.569,3.045	0.531	0.732	-1.558,3.022	0.531	0.560	-1.719,2.839	0.630															
Construction	T2	-1.776	-4.381,0.870	0.190	-1.859	-4.419,0.701	0.155	-2.026	-4.554,0.502	0.116	-1.941	-4.480,0.599	0.134	-1.982	-4.519,0.545	0.126															
	T3	-1.797	-4.602,1.008	0.209	-1.995	-4.730,0.740	0.153	-2.157	-4.857,0.543	0.117	-1.980	-4.699,0.740	0.154	-1.990	-4.703,0.725	0.151															
	T4	-0.119	-2.767,2.529	0.930	-0.877	-3.506,1.752	0.513	-1.083	-3.680,1.515	0.414	-1.034	-3.641,1.573	0.437	-1.077	-3.681,1.528	0.418															
	T5	0.118	-3.007,3.243	0.941	0.248	-2.832,3.327	0.875	0.415	-2.624,3.454	0.789	0.450	-2.603,3.503	0.773	0.406	-2.644,3.455	0.794															
Healthcare	T2	4.266	1.203,7.204	0.004	4.416	1.429,7.403	0.004	4.492	1.498,7.485	0.003	4.442	1.476,7.408	0.003	4.296	1.348,7.244	0.004															
	T3	3.960	0.818,7.101	0.014	4.023	0.837,7.209	0.013	4.224	1.025,7.424	0.010	4.210	1.040,7.380	0.009	3.889	0.734,7.045	0.016															
	T4	4.077	0.948,7.206	0.011	4.499	1.203,7.794	0.007	4.591	1.289,7.892	0.006	4.545	1.285,7.804	0.006	4.330	1.088,7.572	0.009															
	T5	2.259	-1.056,5.573	0.182	2.264	-1.089,5.618	0.186	2.245	-1.114,5.603	0.190	2.224	-1.070,5.556	0.185	1.964	-1.331,5.260	0.243															

T2: 6 months, T3: 12 months, T4: 18 months, T5: 24 months; Observations: total observations included in models for total/construction/healthcare; P-values ≤ 0.05 in bold.

Dependent variable: Change in pain between T1 and TX. Independent variables:

Model 1: Forward bending at work (percentage of work day)

Model 2: As model 1 + Age, Gender, Smoking, BMI

Model 3: As model 2 + Heavy lifting

Model 4: As model 3 + Social climate, Decision control, Fair leadership, Empowering leadership

Model 5: As model 4 + Objectively measured sitting at work (percentage of work day).

Table C. Linear mixed model with exposure to forward bending $\geq 60^\circ$ at work (percentage) and change in low back pain during follow-up (Design 2).

		<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>			<u>Model 4</u>			<u>Model 5</u>		
		Observations = 407/197/210			Observations = 399/196/203			Observations = 398/195/203			Observations = 393/194/199			Observations = 393/194/199		
		Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value	Coef.	95% CI	P-value
Total	T2	-1.631	-6.214,2.952	0.485	-1.439	-6.025,3.148	0.539	-1.577	-6.164,3.009	0.732	-1.492	-6.085,3.102	0.524	-1.723	-6.301,2.854	0.461
	T3	-0.580	-5.289,4.129	0.809	-0.444	-5.166,4.278	0.854	-0.751	-5.508,4.007	0.769	-0.601	-5.358,4.156	0.804	-1.043	-5.789,3.702	0.667
	T4	1.624	-3.003,6.252	0.491	1.381	-3.281,6.044	0.562	1.041	-3.669,5.751	0.399	0.924	-3.789,5.637	0.701	0.501	-4.200,5.202	0.835
	T5	2.174	-2.977,7.324	0.408	2.448	-2.710,7.605	0.352	2.346	-2.820,7.512	0.094	2.412	-2.803,7.626	0.365	2.225	-2.970,7.419	0.401
	Construction	T2	-3.583	-8.866,1.700	0.184	-3.714	-8.877,1.450	0.159	-4.129	-9.235,0.978	0.113	-4.308	-9.464,0.848	0.101	-4.381	-9.529,0.766
	T3	-3.155	-8.599,2.290	0.256	-3.537	-8.858,1.785	0.193	-4.253	-9.543,1.037	0.115	-4.018	-9.334,1.298	0.139	-4.109	-9.416,1.199	0.129
	T4	0.467	-4.867,5.801	0.864	-0.660	-5.922,4.603	0.806	-1.614	-6.880,3.652	0.548	-1.797	-7.100,3.506	0.507	-1.955	-7.255,3.344	0.470
	T5	0.457	-5.451,6.366	0.879	0.572	-5.230,6.373	0.847	0.341	-5.386,6.067	0.907	0.597	-5.156,6.350	0.839	0.573	-5.167,6.314	0.845
Healthcare	T2	6.717	-3.599,17.032	0.202	7.562	-2.932,18.056	0.158	7.984	-2.538,18.505	0.137	8.139	-2.754,19.032	0.143	7.358	-3.491,18.206	0.184
	T3	8.851	-2.062,19.763	0.112	10.237	-1.111,21.584	0.077	11.307	-0.123,22.737	0.053	10.935	-0.950,22.821	0.071	9.454	-2.416,21.323	0.119
	T4	4.370	-6.501,15.241	0.431	5.147	-6.335,16.629	0.380	5.715	-5.796,17.227	0.330	5.354	-6.520,17.228	0.377	4.244	-7.593,16.082	0.482
	T5	6.726	-5.511,18.963	0.281	6.551	-5.940,19.041	0.304	6.363	-6.145,18.871	0.319	6.408	-6.780,19.596	0.341	5.311	-7.827,18.449	0.428

T2: 6 months, T3: 12 months, T4: 18 months, T5: 24 months; Observations: total observations included in models for total/construction/healthcare

Dependent variable: Change in pain between T1 and TX. Independent variables:

Model 1: Forward bending at work (percentage of work day)

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