Description of musculoskeletal disorders and occupational exposure from a field pilot study of large population-based cohort (CONSTANCES)

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Description of Musculoskeletal Disorders and Occupational Exposure From a Field Pilot Study of Large Population-Based Cohort (CONSTANCES)

To the Editor:

Musculoskeletal disorders (MSDs) have become one of the most significant and costly health problems in the working population. Information about the prevalence of MSDs available in the literature, mainly coming from specific company-based studies, may suffer from a lack of comparability because of the variability of the population.[1–4] Because the relative importance of each risk factor for MSDs varies according to work environments,[5] these studies should be extrapolated to the entire working population with caution.[6] Furthermore, besides the occupational setting potentially leading to overrating or underrating of MSD or exposure, depending on the potential benefit or risk to social status of the workers, these studies have problems in observing workers, especially those with temporary jobs.

The "Cohorte des consultants des Centres d'examens de santé" (CONSTANCES) project was designed to set up a large population-based longitudinal cohort designed as an "open epidemiologic laboratory" accessible to the epidemiologic research community with the aim of contributing to the development of epidemiologic research and to provide useful public health information. In conclusion, the cohort was composed of a random sample of adults aged 18 to 69 years at inception, and inclusion took place in Health Screening Centers (HSCs).[7] We hypothesize that the information provided by cohort participants that will be included in HSCs will also provide information about participants usually not observed in studies about occupational settings, such as unemployed population or temporary workers.

We made use of the data collected during the pilot phase of the project to describe the prevalence of MSDs and exposure to the risk factors. In view of setting up of the full CONSTANCES cohort, we checked whether their prevalence is similar to that in other large MSD studies. We also detailed the main characteristics of the participants, their exposure, and complaints to verify that HSCs and CONSTANCES could provide an interesting setting for studies about temporary workers and the unemployed population.

The study sample was taken from the field pilot study of CONSTANCES. It took place in seven of the participating HSCs throughout France, from May 2009 to May 2010 for a 4- to 5-month period in each center. It was designed to include 3500 participants (women and men in almost equal numbers), and the preliminary analysis of the data showed that this sample was close to the general adult population in France regarding sex, age, and socioeconomic status.[7] Most of the variables used in the field pilot study were taken from self-administered questionnaires. In the present study, we used the following: sociodemographic characteristics (sex, age, social position, educational and income levels, and employment status); and occupational factors (current occupational exposure to biomechanical hazards) that were collected based on the Saltsa consensus and the French MSD surveillance system.[8,9] Specific scales for MSD based on the Nordic questionnaire were filled out.[2,10,11] Presence of symptoms lasting at least 30 days during the past 12 months by site was also considered.

For unemployed population, only not retired participants and those with previous jobs were considered and compared with the working sample. In the working population, associations between type of contract and social position with sociodemographic characteristics, work exposure, and MSDs were described.

The sample included 3471 participants; 1643 men and 1829 women. Among them, 113 (3.2%) never worked, 443 (1.7%) reported to be retired, 328 (9.4%) had no job, and 2587 (74.5%) were working at the time of the study. The 328 participants (112 men and 216 women) who reported to be unemployed (not retired, but had never worked) were older (50 to 60 years) (men: 38.4% vs 26.7%; women: 32.4% vs 25.4%; $P < 0.05$) and more often blue-collar workers (men: 31.1% vs 22.2%; women: 8.3% vs 4.8%, respectively) compared with the working population. Unemployed men had significantly more shoulder persistent pain than working men (22.6% vs 12.3%) and unemployed women had more hand, elbow, back, and knee pain (22.3%, 13.6%, 36.1%, and 26.0% vs 15.0%, 8.8%, 25.9%, and 18.8%, respectively) than working women. When the information was collected ($n = 180$), unemployed people reported to be seeking a job (53.9%, $n = 97$), have voluntarily resigned from their jobs (26.7%, $n = 48$), or have a health problem (19.4%, $n = 35$).

Table 1 shows the prevalence of occupational exposure and persistent musculoskeletal pain in men and women according to social position and employment status. In men and women, there was a clear gradient between social position and prevalence of occupational exposure to physical effort, squatting position, working with arms up, or screwing with hand. In men, the prevalence of persistent back and knee pain increased with social position (not significant for other sites). In women, there is a clear gradient in the prevalence of pain with the social position for all sites except the neck. Very few women reported temporary jobs. In men and women, occupational exposures were strongly associated with employment status. Although very few men reported temporary jobs, they seemed to report more persistent musculoskeletal pain (significant only for elbows).

Finally, we considered whether the field pilot study gave a fair description of MSDs and biomechanical exposure in a large sample of the general population. Limitations came from the design of the pilot study and its inclusion criteria. The study had a cross-sectional design based on a large and nontargeted population. Nevertheless, we found the globally expected levels of exposure and pain. The first results regarding temporary workers and unemployed populations clearly open a way for more research on these usually hard-to-reach populations in occupational studies.[12–15] The high prevalence of MSDs in our sample of temporary workers and participants who had to stop working is promising for future research within the large longitudinal CONSTANCES cohort.

CONCLUSIONS

This field pilot study showed valid results about MSDs with interesting information for particular populations of usually

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TABLE 1. Description of Exposure and Locations of Persistent Pain According to Actual Social Position and Type of Contract Among Men and Women

	Actual Social Position									Type of Contract								
	Executives		Intermediate Professions		Employees		Craftsmen/ Blue-Collar Workers			Permanent		Fixed-Term		Others		Interim		
	n	%	*n*	%	*n*	%	*n*	%	*P*	*n*	%	*n*	%	*n*	%	*n*	%	*P*
Men																		
No. participants	437		272		229		268			1071		50		31		19		
Age at inclusion, y (mean, SD)	43.7 (9.8)		43.6 (9.2)		40.2 (10.5)		43.1 (9.9)			43.2 (9.6)		40.0 (12.6)		40.6 (11.3)		40.0 (10.3)		
Intense physical effort	14	3.3	31	11.7	43	19.7	82	32.4	<0.001	149	14.0	8	16.3	10	31.3	7	36.8	0.006
Squatting position	12	2.8	47	17.8	50	22.7	119	46.9	<0.001	202	18.9	7	13.7	12	37.5	10	52.6	<0.001
Working arms up	12	2.8	21	7.9	31	14.2	74	29.0	<0.001	119	11.2	9	17.6	5	15.6	5	27.8	0.02
Flex the elbows	76	18.1	47	17.9	32	14.7	39	15.5	0.82	171	16.2	6	12.0	7	21.9	6	35.3	0.002
Screwing the hand	5	1.2	38	14.5	12	5.6	123	49.2	<0.001	156	14.8	7	14.6	9	28.1	8	47.1	0.001
Elbows	31	8.2	24	10.4	13	7.2	23	10.6	0.61	78	8.8	4	9.5	0	0.0	5	27.8	0.01
Shoulders	45	11.6	33	13.7	19	9.8	32	13.9	0.75	119	12.8	1	2.3	1	3.2	3	16.7	0.14
Back	78	19.7	55	21.7	42	20.3	75	31.0	0.01	217	22.3	10	21.3	9	29.0	8	42.1	0.30
Knees	61	15.3	41	16.9	35	17.2	58	24.7	0.04	168	17.6	6	13.3	8	25.8	3	17.6	0.35
Hands	30	8.1	24	10.2	14	7.6	26	11.6	0.66	80	9.0	4	9.3	4	12.9	3	15.8	0.74
Neck	39	10.0	29	11.6	17	8.4	28	12.1	0.80	104	11.0	4	8.7	3	9.7	2	11.1	0.97
Women																		
No. participants	262		316		675		64			1050		110		89		10		
Age at inclusion, y (mean, SD)	41.7 (9.3)		42.4 (10.0)		41.6 (10.6)		42.2 (9.9)			42.6 (9.5)		36.6 (11.2)		42.4 (12.1)		36.0 (8.5)		
Intense physical effort	17	6.7	54	17.9	114	18.0	23	39.7	<0.001	164	15.7	19	18.1	20	23.3	3	33.3	0.007
Squatting position	25	9.8	71	23.4	220	34.8	21	36.8	<0.001	263	25.1	30	29.1	37	42.1	2	22.2	0.001
Working arms up	14	5.5	25	8.3	93	14.7	22	37.3	<0.001	126	12.0	11	10.5	14	16.1	2	22.2	0.12
Flex the elbows	65	25.8	54	17.8	165	26.2	18	30.0	0.07	267	25.6	12	11.3	12	14.0	5	55.6	<0.001
Screwing the hand	5	2.0	21	7.0	39	6.3	10	17.0	<0.001	56	5.4	10	10.1	7	8.1	1	11.1	0.19
Elbows	9	3.9	20	7.6	60	10.6	10	18.5	0.005	84	9.6	6	6.5	6	8.0	0	0.0	0.71
Shoulders	31	13.0	54	19.9	111	18.8	19	35.2	0.003	183	19.9	16	16.7	12	15.6	0	0.0	0.43
Back	41	17.0	70	24.5	183	30.0	19	33.9	0.005	250	26.5	21	20.8	23	28.8	1	10.0	0.42
Knees	28	12.3	52	18.8	122	20.6	15	25.9	0.02	177	19.5	16	17.0	16	20.0	2	20.0	0.56
Hands	25	10.6	43	15.5	91	15.8	14	25.0	0.03	145	16.0	13	14.4	10	13.0	0	0.0	0.40
Neck	40	16.7	62	21.0	131	21.3	12	21.1	0.61	207	21.6	20	19.2	14	17.7	1	10.0	0.66

unreached participants. The limited sample will be extended and would give additional material for studying these populations.

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Safe Lifting and Apparently Conflicting Evidence: Increase Understanding for Making Progress in Prevention of Musculoskeletal Disorders

To the Editor:

We would like to compliment Restrepo[1] and Gucer[2] and their colleagues on taking up the challenge of evaluating the use of safe lifting practices, including the use of mechanical lifts both from the perspective of the caregivers and the residents. This is of major importance because we seem to make slow progress in preventing musculoskeletal disorders in health care staff and that is not for a want of trying.[3] One important reason for this slow progress might be that we rely too much on the implementation of seemingly effective interventions. Both authors state firmly in their articles that evidence is available that the use of powered mechanical lifts prevent the onset of work-related musculoskeletal disorders or in their own words, "Several intervention studies have since shown that using mechanical lifts to assist frail patients clearly decreased worker injury from MSDs [musculoskeletal disorders]"[1] and "Evidence linking the use of powered mechanical lifting in LTC [long-term care] facilities to reduced caregiver injuries has been accumulating,"[2] referring to primary scientific articles and general reports. In contrast to this statement about effectiveness, a *Cochrane Review* article that was recently updated concluded that manual material handling advice and training with or without assistive devices does not prevent back pain or back pain–related disability when compared with no intervention or alternative interventions.[4,5] There is neither evidence available from randomized controlled trials nor controlled prospective studies for the effectiveness of manual material handling advice and training or manual material handling assistive devices for treating back pain. Remarkably, this review is not discussed nor referenced in the two articles.[1,2] Given this apparently conflicting evidence, we would like to invite both authors to address why, in their opinion, the present intervention of safe lifting practices, including the use of mechanical lifts, differs from the interventions discussed in the *Cochrane Review*. In this way, we can learn and increase our understanding of why some interventions work and others do not.

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Response: Safe Lifting

To the Editor:

Lift-related musculoskeletal disorders among caregivers in long-term care facilities were the subject of our reports. Therefore, we focused our literature search on studies that spoke directly to this population. These studies examined the impact of safe lifting programs and powered mechanical lift use on caregiver injuries. Cohort studies of caregiver injury and cost outcomes found that a comprehensive safe lifting program in the context of adequate numbers of lifts reduced injuries and costs (see, eg, Refs.[1–3]). A cross-sectional study found that the provision of powered mechanical lifts reduced caregiver injuries and costs but training had equivocal impact.[4]

Given the specificities of our interest, our literature review did not include the excellent Cochrane review on back pain,[5] authored by Verbeek and colleagues, because it included a broad range of industries and examined diverse training programs with a wide range of assistive devices available to workers. It also excluded studies that bore directly on our area of interest (see Refs. 1 to 4) if they did not meet the Cochrane review's criteria for inclusion (randomized controlled trials or cohort studies with contemporary controls).

Verbeek et al[5] found specific training actions alone or with assistive devices to be ineffective in reducing back pain. We found that a comprehensive safe lifting program did reduce lift-related injuries. Although our results stand in contrast to the Cochrane review findings, these are consistent with the findings of other safe lift intervention studies referenced earlier.

Our differences may be due to the potentially material difference in the outcome variables—back pain versus something that results in a workers' compensation claim. It has been reported that over time lower back pain affects almost a third of the US population, that the cause of most pain due to lower back issues cannot be clearly identified, and that most "correct" on their own in a matter of a few weeks although they are likely to reoccur.[6,7] Also, our outcome variables were limited to lift-related injuries. This increases our chances of finding an effect of efforts specifically targeted to reduce lift-related injuries.

Finally, our differences in findings may be because our predictor was a comprehensive measure of safe lifting, while the Cochran review included studies that measured different training actions. A multifactorial approach rather than a focus solely on training may be necessary to effect change. In our Safe Lift Index, we include not only measures of caregiver training but also assessment of the degree to which the facility considers safe lifting (ie, use of powered mechanical lifts) to be important and reinforces its use. Our Safe Lift Index was designed to assess the comprehensiveness of the safe lift policy. We think that the more comprehensive and the less piecemeal is the policy, the better its chance to succeed, at least in the specific setting of long-term care that we studied.

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