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Comparison between a self-reported job exposure matrix (JEM CONSTANCES) to an expertise-based job exposure matrix (MADE) for biomechanical exposures

ALEXIS DESCATHA, MD[*],

Univ Angers, CHU Angers, Univ Rennes, Inserm, EHESP, Irset (Institut de recherche en santé, environnement et travail) - UMR_S 1085, F-49000 Angers, France; Occupational Health Unit U1168 UMS011, Paris Hospital, Versailles University, Poincaré site, F92380 Garches, France

BRADLEY A. EVANOFF, MD,

Division of General Medical Sciences, Washington University School of Medicine in St. Louis, St Louis, USA

JOHAN H. ANDERSEN, MD,

Occupational Medicine, University Research Clinic, Herning, Denmark

MATTHEW BACA, MSc,

Division of General Medical Sciences, Washington University School of Medicine in St. Louis, St Louis, USA

SKYE BUCKNER-PETTY, MPH,

Division of General Medical Sciences, Washington University School of Medicine in St. Louis, St Louis, USA

MARC FADEL, MD [resident],

Occupational Health Unit U1168 UMS011, Paris Hospital, Versailles University, Poincaré site, F92380 Garches, France

LAURE NGABIRANO, MPH,

Univ Angers, Univ Rennes, Inserm, EHESP, Irset (Institut de recherche en santé, environnement et travail) - UMR_S 1085, F-49000 Angers, France; U1168, Inserm, Villejuif, France

YVES ROQUELAURE, MD,

Univ Angers, CHU Angers, Univ Rennes, Inserm, EHESP, Irset (Institut de recherche en santé, environnement et travail) - UMR_S 1085, F-49000 Angers,

ANN MARIE DALE, PhD

Division of General Medical Sciences, Washington University School of Medicine in St. Louis, St Louis, USA

[*]Corresponding author: alexis.descatha@inserm.fr Tel: + 33147107764 Fax + 33147107768.

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All authors have participated significantly.

Sir

Job exposure matrices are becoming more and more widely used,(1) including use for estimation of biomechanical exposures.(2) In the context of providing exposure data available for international research, an international team created an employment exposure matrix from the first available data from the Constances cohort, called “JEM Constances”.(3) As part of ongoing efforts to compare different JEMs,(4) we compared similar exposure variables from JEM Constances to those assigned in a JEM used for public health purposes in the same country, the French “MADE” (“*Matrice Associant Difficultés physiques au travail et Emploi*”, French for “difficult physical conditions and job matrix”).(5,6) We studied the correlation and the agreement of exposure estimates for different job titles between these two matrices.

Briefly, the Constances cohort created a JEM based on self-reported exposures to 27 different biomechanical factors at the level of the job, using the French “PCS 2003” national job codes.(3) The MADE matrix coded 17 different exposures using consensus estimates from occupational health experts, using the same PCS codes.(5) The relevant variables were crossed to obtain Spearman correlation coefficients for JEM Constances and MADE, using the PCS2003 code as a unit and using the subject by applying the two matrices on available data on Constances cohort. Three categories for variables of both JEM Constances and MADE were also obtained based on the tertiles of the distribution using Constances cohort. Thus, a calculation of a Kappa agreement was also performed with similar units.

The results on the selected variables are fairly good (Table 1) except for exposures to the neck and to work in cold environment (<10°C), where some coefficients were lower than 0.5.

These results confirm that a matrix based on a self-reported assessment exposure matrix and one based on expert estimates of exposure provide similar overall results. Although the statistical analyses were simple, using only an overall evaluation of correlation and agreement between the two approaches, the demonstration of broadly similar results using two different exposure methods may aid the comparison of studies using different exposure methods.

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Table 1.

Correlation and agreement between JEM-Constances (Self-report assessed in Constances Cohort) and MADE (expert based matrix)

Variables JEM Constances	Variables MADE	Spearman Rhos, job code as units	Spearman Rhos, subject as unit	Kappas, job code as unit	Kappas, subject as unit
Physical intensity	*Effort*	0.84	0.69	0.79	0.66
	Very heavy lifting	0.80	0.68	0.75	0.67
	Static strength	0.87	0.84	0.82	0.83
	Heavy lifting	0.85	0.79	0.82	0.78
	Dynamic strength	0.85	0.78	0.81	0.77
Working with repetition	*Repetition*	0.73	0.73	0.66	0.73
Kneeling or squatting	*Kneeling or squatting*	0.72	0.63	0.65	0.55
	Very heavy lifting	0.72	0.63	0.65	0.55
	Heavy lifting	0.78	0.75	0.72	0.67
Carry loads 10-25 kg	*Very heavy lifting*	0.81	0.71	0.74	0.76
	Heavy lifting	0.55	0.83	0.74	0.87
Carry loads > 25 kg	*Very heavy lifting*	0.81	0.72	0.77	0.71
	Heavy lifting	0.85	0.82	0.82	0.81
Using vibrating tool	*Vibrating tool use*	0.79	0.62	0.70	0.63
Using computer screen	*Computer use*	0.86	0.87	0.78	0.79
Using keyboard or scanner	*Computer use*	0.85	0.88	0.78	0.78
Bending neck	*Cervical constraints*	0.51	0.30	0.45	0.31
Working with arms above shoulder	*Shoulder abducted >90°*	0.74	0.53	0.70	0.54
Working with arms abducted	*Shoulder abducted >90°*	0.81	0.72	0.76	0.77
Bending elbow	*Elbow contraints*	0.85	0.69	0.80	0.72
Rotating forearm	*Turn the hand (e.g. screwing)*	0.84	0.76	0.77	0.70
	Press base of hand	0.81	0.69	0.77	0.68
	Grip	0.82	0.69	0.71	0.65
Bending wrist	*Turn the hand (e.g. screwing)*	0.86	0.75	0.78	0.73
	Press base of hand	0.83	0.69	0.77	0.72
	Grip	0.84	0.72	0.71	0.69
Pressing base of hand	*Turn the hand (e.g. screwing)*	0.79	0.61	0.72	0.54
	Press base of hand	0.79	0.52	0.72	0.47
	Grip	0.80	0.65	0.68	0.52
Finger pinching	*Turn the hand (e.g. screwing)*	0.80	0.72	0.74	0.66
	Press base of hand	0.76	0.63	0.72	0.56
	Grip	0.76	0.53	0.64	0.46
Working outdoors	*Work in cold environment (<10°C)*	0.55	0.50	0.49	0.50