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Recommendations for individual participant data meta-analyses on work stressors and health outcomes: comments on IPD-Work Consortium papers [1]

by BongKyoo Choi, ScD,[2] Peter Schnall, MD, Paul Landsbergis, PhD, Marnie Dobson, PhD, Sangbaek Ko, MD, Viviola Gómez-Ortiz, PhD, Arturo Juárez-Garcia, PhD, Dean Baker, MD

[1] *Appendix*

[2] *Correspondence to: BongKyoo Choi, ScD, MPH, Center for Occupational and Environmental Health, University of California, Irvine, 100 Theory, Suite 100, Irvine, CA 92617, USA. [E-mail: b.choi@uci.edu]*

APPENDIX A

Varieties of work stressor and work organization interventions

In contrast to claims by the IPD group of "The absence of strong evidence for effective interventions to reduce job strain…."(1), there is a wide range of evidence of the effectiveness of work stressor reduction interventions, especially job/task level interventions to improve job design, reduce job stressors, and create more healthy work organizations (2-6). For example, "high systems" approach studies (which focus on both organizational change and strengthening individual capacity) were more likely than individual change studies to produce favorable changes in organizations and individuals, as well as to have worker participation in the development or implementation of the intervention (3). Sickness absence also declined as a result of the intervention in 8 of the 9 highest quality "high systems" approach studies (3, 7, 8).

In addition, there are many innovative organizational-level interventions designed to improve working conditions, although few have been systematically evaluated for their health impacts. However, a growing body of knowledge demonstrates their ability to increase healthy job characteristics, such as job control, workplace social support and moderate job demands, and

therefore such organizational-level interventions could be expected to produce positive effects . Many negotiated labor-management contracts address psychosocial work stressors, including workload demands (9, 10), for example, bans on mandatory overtime or minimum staffing levels for hospital nurses, reductions in the number of hotel rooms cleaned per day by U.S. hotel workers (11), or reductions in the number of students in an elementary school class. Job control is addressed through more flexible work schedules, voluntary overtime, less repetitive work, participation in decision-making, skills training and promotion opportunities. Contracts can provide for job security, protect workers against harassment and discrimination, and provide for programs to help workers balance work and family, such as childcare, elder care, family leave and flexible work schedules (12-14). Collective bargaining has modified lean production to some extent -- through more moderate work demands (e.g., adding staff, increasing worker control over line speed and production standards), by increasing job control (by electing team leaders, ability to transfer, joint committees), implementation of ergonomics programs and less arbitrary access to training (15).

Work-family programs, such as the implementation of alternative work schedules and the provision of dependent care supports also appear to be beneficial to workers. In a recent study, training grocery store supervisors on family-supportive supervisor behaviors led to improved health, work and well-being outcomes for workers (16). However, there is a need for systematic well-designed intervention studies to draw firmer conclusions (17-19).

Participatory Ergonomics (PE) does not separate job level biomechanical and psychosocial and work organization risk factors; they are treated as parts of an integrated, organizational whole, including a focus on increasing decision latitude and social support, and

moderating psychological workload demands (6). The PE approach has shown promising results (20-22).

"Magnet hospitals" are U.S. hospitals (390 currently recognized by a national credentialing center) as those with low nurse turnover and vacancy rates, and high autonomy, decentralized organizational structure, supportive management, and self-governance. Nurses rate magnet hospitals as providing them with greater control over professional practice, a supportive work environment and less burnout (23, 24). A survey of nurses from two U.S. states found less mandatory overtime and on-call time, and lower physical demands. However, no differences were found in hours worked, or psychological job demands (25).

Employer-initiated interventions in order to increase productivity and profitability often involve some version of "lean production", a system of work organization which has now spread from manufacturing to health care, and to the public sector ("new public management"). Such interventions have rarely been evaluated for their impacts on job characteristics or on worker health, especially in health care and the public sector. The few reviews that have been published to date indicate few positive results and often detrimental impacts of such interventions on job characteristics and worker health (26-28).

An alternative work organization system, "socio-technical systems" (STS) design, promotes the idea of worker teams that have a great deal of control over the pace and content of work. Jobs have a longer "cycle time" and require greater skill, and a more flexible work organization is produced (15, 29, 30). Evaluations of work-life programs in Sweden and Norway provide evidence of increased job control, and increased employee health and satisfaction (31, 32).

More systematic efforts to increase employee control (i.e., workplace democracy) have occurred through producer cooperatives and other forms of worker ownership. The largest system of cooperatives is Mondragon, in the Basque region of Spain, but there are also many worker cooperatives in India, Italy, England and other countries, including an estimated 500 in the U.S. (33). Mondragon Corporacion Cooperativa has 120 different companies, 42,000 worker-owners, 43 schools, one college, does more than $4.8 billion of business annually in manufacturing, services, retail and wholesale distribution, and is expanding. The workers elect management, and each enterprise has a committee that considers issues of health, safety, environment, and the social responsibilities of the enterprise (34). Few cooperatives and worker owned businesses have been evaluated for their impact on job characteristics or on worker health and safety. However, to the extent that such experiments lead to increases in levels of workers' control and support, such experiments in work organization would likely result in improved physical and mental health for workers.

Legislation and regulation are also common "interventions" to address the psychosocial work environment. In the U.S., a number of states have enacted laws requiring minimum staffing levels for hospital nurses (to provide for manageable workloads) and bans on mandatory overtime (to provide for greater job control and reduce excessive work hours). In a recent evaluation of the California minimum nurse staffing law, it was found that California hospital nurses cared for one less patient on average than nurses in two other states without such a staffing law, and two fewer patients on medical and surgical units. When nurses' workloads were in line with California-mandated ratios in all three states, nurses' burnout was lower (23).

Legislative/regulatory interventions in the Nordic and other Northern and Western European countries have led to a lower prevalence of exposure to work stressors. For example,

the prevalence of job strain was lower in 6 of the 8 IPD Work group countries than the European average, far lower in Denmark, Sweden and the Netherlands (35). The prevalence of ERI was lower in 5 of 8 IPD Work Group countries than the European average, far lower in Denmark and the UK (35, 36). Psychosocial safety climate, a measure of management concern for worker psychological health, was highest in the Nordic countries, as well as Belgium, the Netherlands, Ireland and the UK, and lowest in Eastern European and Southern European countries (37). A comparison of Spain and Denmark using COPSOQ scales found higher job insecurity (although also higher co-worker support) in Spain, and higher influence and development (latitude), and supervisor support in Denmark. Mixed results were seen for measures of job demands (38). Nordic countries and several other Northern and Western European countries rank highest in the world in the Labor Market Security Index of the International Labour Office (39). The proportion of employees who are members of labor unions is much greater in the Nordic countries (40).

Limited research also suggests that the strength of association between work stressors and ill health is weaker in the Nordic and other Northern and Western European countries, a buffering effect. Dr. Dragano found a weaker association between work stressors (ERI and low job control) and depression symptoms in the Nordic countries compared with other European countries. The strongest associations were seen in Southern European countries and the UK (41). In another study, the most important factors explaining worker self-reported health between European nations were two levels of labor protection, macro-level (union density), and organizational-level (psychosocial safety climate, PSC, i.e. the extent of management concern for worker psychological health) (37), both of which are higher in the Nordic countries and other Northern and Western European countries than in Eastern or Southern European countries.

It is possible, in fact it seems likely, that the better working conditions in European countries, and in particular Northern Europe, results in reduced psychosocial stressors, and a weaker relationship between work stressors and health outcomes compared to the rest of the world. It is ironic that one of the great achievements of the Nordic countries and some other Northern European countries (greatly improved working conditions) receive no acknowledgement from the IPD authors in this on-going discussion.

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