
SPECIAL ARTICLE

Rheumatology and the Health of the Workforce

Nortin M. Hadler

Health adverse behaviors and physiologic risk factors such as hypertension are proximate causes of morbidity and mortality. There are hazards to our well-being that lurk in the course of living for which the proximate causes of morbidity and mortality are but symbolic (1). These life-course hazards are aspects of our interactive and integrative worlds, our ecosystems, that can powerfully perturb our biology and, thereby, our fate. Two have emerged that are so powerful as to subsume the known proximate causes. Both relate to impediments to the pursuit of gainful employment. One takes the regional musculoskeletal disorders for its presenting symptom. Hence, the title of this essay.

Working poor

A lifetime tottering on the edge of poverty is a lifetime that is likely to be mean, often discouraging, sometimes desperate (2)—and short. The inverse association between socioeconomic status (SES) and longevity is incontrovertible (3,4). It may not be poverty in the absolute sense that is the reaper; it may have to do with how poor you are relative to those who are advantaged in your ecosystem (5,6). For example, the greater the gap in income between the rich and poor (the “Robin Hood index”) across states in the US, the greater the effect on longevity of the poor (7). The handmaiden of relative poverty is educational status; it too is inversely associated with longevity but not quite so strongly or consistently as SES (8). SES is a more global measure of one’s structural position within society (9).

Health adverse behaviors are *not* another handmaiden of relative poverty; cigarette smoking, alcohol consumption, obesity, and level of physical activity,

combined, account for less than 25% of the association between SES and all-cause mortality (10). What accounts for the rest? The answer to this query might explain why multiple assaults on health adverse behaviors and cardiovascular risk factors have uncertain effects on mortality (11). Recidivism and noncompliance do not fully explain this lack of effectiveness. For example, even if cigarette smokers ceased smoking, neither their all-cause mortality nor their mortality from lung cancer would be likely to converge with that of people who never smoked (12). Could this relate, at least in part, to the fact that cigarette smoking is inversely associated with educational status (13) and, *pari passu*, with SES?

What is it about a compromised SES that is so malevolent? The clues derive from studies that explore life in poverty, or on its edge, for elements that associate most closely with compromised longevity. Multiple psychosocial factors that render relative poverty mean have been identified (14,15). Many of these factors operate from the time of conception (16). There is no reason to think that the number of such factors that are yet to emerge will be small. After all, we are trying to understand the essence of self-respect and the resentment, if not hostility, that results from the sense of abject vulnerability associated with and imposed by poverty (17). There are other associations with relative deprivation yet to fully emerge from life-course studies of nutrition and of life-stage maturation and more. But the array of psychosocial challenges to be faced in poverty, day by day, and that prove insurmountable, day after day, levies a toll on health and longevity like none other in the “advanced” world.

Employment is no generic solution to the malevolence of poverty. There are aspects to life in the “modern” workforce that rival the psychosocial aspects of poverty in extracting a toll on healthfulness and longevity. A consistent story is emerging, with major implications regarding the health of the public and the practice of rheumatology.

Nortin M. Hadler, MD, University of North Carolina at Chapel Hill.

Address correspondence and reprint requests to Nortin M. Hadler, MD, 3330 Thurston Building CB#7280, Department of Medicine, University of North Carolina, Chapel Hill, NC 27599-7280.

Submitted for publication December 6, 2000; accepted in revised form March 27, 2001.

Working poorly

Do you like your job? Are you valued at work?

These questions deserve a prominent place in clinical-history-gathering. They should anchor a major public health initiative. They demand a prominent place in the body politic. Untoward answers associate with much clinical morbidity and harbor crucial secrets to longevity even for those who could change jobs. For growing numbers of workers whose answers are untoward, job mobility is not an option or leads to less-acceptable alternatives. To increasing numbers of the aging workforce, this reality comes as a surprise.

Life for all of us presents challenges to coping. In addition to challenges in relationships and with work, we will all experience variations in mood, intermittent musculoskeletal discomfort, occasional headaches, episodic respiratory symptoms, and much more in the way of intermittent and remittent physical distress. To be well, to feel invincible, is to have the personal wherewithal to cope with both the physical and the psychosocial challenges. If our homeostasis is overwhelmed, we transform our distress into a narrative that is culturally defined and constrained (18). That is why we are so inclined to ascribe any loss of a sense of well-being to physical distress rather than psychosocial distress (19,20). The possibility that psychosocial confounders exacerbate any aspect of our infirmity is anathema, tantamount to the condemnation; "It's in your head!" So we leap to infer that the reason we can't cope relates to the intensity of the physical distress. Sometimes we're correct. More often we are resolute in our misconception that in this episode, the physical distress is primary, confounding the psychosocial challenges, and should commandeer narrative (21). So it is in the workforce.

Regional musculoskeletal disorders are the bane of the workforce, particularly the aging workforce (22), accounting for the preponderance of disabling illness (23). Since motion, regional backache for example, can exacerbate these symptoms, the industrialized world was quick to ascribe any associated illness of work incapacity to the physical content of tasks at work. This supposition is no longer tenable. One needs to be highly circumspect in postulating any meaningful association between task content and disabling regional musculoskeletal disorders, for a wide range of such exposures (24,25). Such associations can be detected, albeit inconsistently, in surveys where no alternative association is sought. However, nearly all multivariate cross-sectional and longitudinal studies seeking associations with both the psychosocial context of working and the physical demands of

tasks (26–31) discern the relationship to be with the former, generally to the exclusion of the latter. Since regional musculoskeletal disorders are intermittent and remittent predicaments of life, the likely explanation for these observations does not discount the morbidity. Rather, it directs our attention to the psychosocial context in which the morbidity plays out, a context that confounds coping and renders the morbidity more memorable, less tolerable, and often disabling (23).

The frontier for epidemiology is to further define "psychosocial context." That's an exercise that is nearly as daunting as defining the psychosocial correlates of poverty (32). Some of the common threads emerging from studies in the workplace include aspects of job "stress" (33), "strain" (34), "allostatic load" (17), and motivational "flow" (35). These measures are sampling such complex psychological functions as job satisfaction, perception of psychological demand, job autonomy, motivation, and the like. No wonder associations with "psychosocial" variables are weak, even inconsistent. There may be much that is idiosyncratic. However, that does not diminish the implications; working in a psychosocial context that is adverse compromises coping with the next episode of a regional musculoskeletal disorder and places longevity at risk. There are 4 cohort studies, described below, that dramatically make this point.

In the early 1990s, the Finnish economy suffered a considerable setback lasting several years. Many workers were dismissed. The effect of impending downsizing on the local-government employees in one small city was monitored (36). The rate of absenteeism escalated, most markedly for sick leave ascribed to regional musculoskeletal disorders, particularly among employees over the age of 50.

The "Whitehall" studies are cohort studies of British civil servants that long ago documented an inverse relationship between civil service grade and rate of mortality, particularly mortality from cardiovascular disease. In recent years it has become clear that the association with grade paled next to the association with psychosocial job "stress," particularly job "control," regardless of grade (37). Similar relationships pertain to absence due to back pain (38). One nested Whitehall cohort, faced with impending outsourcing (39), suffered a fate similar to that observed in the Finnish cohort discussed above. Impending downsizing wreaks havoc on the psychosocial context of work, inflicting "stress" and "strain" on all, particularly the aging worker (40). Downsizing accelerates that noxious, insalubrious, and lethal process I am designating as an adverse "psychosocial"

work context. And it does so without regard for prior station in life.

Even without the insalubrious influences of downsizing, an adverse psychosocial context works its harm. Slowly it will deprive one of favorable "self-rated health" (SRH). Like SES, SRH is a powerful predictor of all-cause mortality. In a cohort of 5,001 Danish workers, adverse "psychosocial" work context was shown to erode SRH during the 5 years of observation (41). A similar association has emerged from an analysis of the Nurses' Health Study: a perception that psychosocial work conditions were unfavorable predicted declining functional status among some 21,000 nurses followed up for 4 years (42).

Working well

This essay is not a call to arms. It is a call *about* the arms—and backs, necks, and knees—of working men and women who turn in pain to rheumatologists for care and caring. These are men and women who are choosing to be our patients because their ability to cope with their regional musculoskeletal disorder is inadequate to the challenge of maintaining their employment. In responding to their charge to mitigate their dilemma, anatomic landmarks must not delineate our purview. Just as we have learned to discuss the impediments to coping that beleaguer our patients with rheumatoid arthritis, and we are finally learning to do so for elderly patients with knee pain (43), we must broach discussions of life in the workplace with these patients. We may be as powerless as our patient to put things right. Or, some solution may emerge. The latter becomes more likely if we gain expertise about the dynamics of the workplace and identify resources that can assist us, much as we have regarding life in the home for other of our patients. At the very least, we will be less likely to miss the forest for the trees.

REFERENCES

- McMichael AJ. Prisoners of the proximate: loosening the constraints on epidemiology in an age of change. *Am J Epidemiol* 1999;149:887–97.
- Newman KS. No shame in my game: the working poor in the inner city. New York: AA Knopf and The Russell Sage Foundation; 1999.
- McCally M, Haines A, Fein O, Addington W, Lawrence RS, Cassel CK. Poverty and ill health: physicians can, and should, make a difference. *Ann Intern Med* 1998;129:726–33.
- Hadler NM. Laboring for longevity. *J Occup Environ Med* 1999; 41:617–21.
- Wilkinson RG. Unhealthy societies: the afflictions of inequality. London: Routledge; 1997.
- Kawachi I, Kennedy BP, Wilkinson RG, editors. The society and population health reader. Vol. 1. Income inequality and health. New York: The New Press; 1999.
- Kennedy BP, Kawachi I, Prothrow-Stith D. Income distribution and mortality: cross sectional ecological study of the Robin Hood index in the United States. *BMJ* 1996;312:1004–7.
- Davey Smith G, Hart C, Hole D, MacKinnon P, Gillis C, Watt G, et al. Education and occupational social class: which is the more important indicator of mortality risk? *J Epidemiol Community Health* 1998;52:153–60.
- Lynch J, Kaplan G. Socioeconomic position. In: Berkman LF, Kawachi I, editors. *Social epidemiology*. Oxford: Oxford University Press; 2000. p. 13–35.
- Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. *JAMA* 1998;279:1703–8.
- Ebrahim S, Davey Smith G. Multiple risk factor interventions for primary prevention of coronary heart disease. *Cochrane Database Syst Rev* 2000;CD001561.
- Enstrom JE. Smoking cessation and mortality trends among two United States populations. *J Clin Epidemiol* 1999;52:813–25.
- Wagenknecht LE, Perkins LL, Cutter GR, Sidney S, Burke GL, Manolio TA, et al. Cigarette smoking behavior is strongly related to educational status: the CARDIA study. *Prev Med* 1990;19: 158–69.
- Marmot MG. Contribution of psychosocial factors to socioeconomic differences in health. *Milbank Q* 1998;76:403–48.
- Marmot M, Wilkinson RG, editors. *Social determinants of health*. Oxford: Oxford University Press; 1999.
- Kuh D, Ben-Shlomo Y, editors. *A life course approach to chronic disease epidemiology*. Oxford: Oxford University Press; 1997.
- Kubzansky LD, Kawachi I, Sparrow D. Socioeconomic status, hostility, and risk factor clustering in the Normative Aging Study: any help from the concept of allostatic load? *Ann Behav Med* 1999;21:330–8.
- DelVecchio Good M-J, Brodwin PE, Good BJ, Kleinman A, editors. *Pain as human experience: an anthropological perspective*. Berkeley: University of California Press; 1992.
- Simon GE, VonKorff M, Piccinelli M, Fullerton C, Ormel J. An international study of the relation between somatic symptoms and depression. *N Engl J Med* 1999;341:1329–35.
- Croft P. Is life becoming more of a pain? *BMJ* 2000;320:1552–3.
- McWhinney IR, Epstein RM, Freeman TR. Rethinking somatization. *Ann Intern Med* 1997;126:747–50.
- Yelin EH, Trupin LS, Sebesta DS. Transitions in employment, morbidity, and disability among persons ages 51–61 with musculoskeletal and non-musculoskeletal conditions in the US, 1992–1994. *Arthritis Rheum* 1999;42:769–79.
- Hadler NM. *Occupational musculoskeletal disorders*. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 1999.
- Panel on Musculoskeletal Disorders and the Workplace. *Musculoskeletal disorders and the workplace: low back and upper extremities*. Washington (DC): National Academy Press; 2001.
- Hadler NM. Comments on the "Ergonomic Program Standard" proposed by the Occupational Safety and Health Administration. *J Occup Environ Med* 2000;42:951–69.
- Linton SJ. A review of psychological risk factors in back and neck pain. *Spine* 2000;25:1148–56.
- Marmot M. Importance of the psychosocial environment in epidemiologic studies. *Scand J Work Environ Health* 1999;25 Suppl 4:49–53.
- Heliövaara M. Work load and back pain. *Scand J Work Environ Health* 1999;25:385–6.
- Krause N, Ragland DR, Fisher JM, Syme SL. Psychosocial job factors, physical workload, and incidence of work-related spinal

- injury: a 5-year prospective study of urban transit operators. *Spine* 1998;23:2507–16.
30. Burton AK. Back injury and work loss: biomechanical and psychosocial influences. *Spine* 1997;22:2575–80.
 31. Papageorgiou AC, Macfarlane GJ, Thomas E, Croft PR, Jayson MIV, Silman JA. Psychosocial factors in the workplace: do they predict new episodes of low back pain? *Spine* 1997;22:1117–42.
 32. Davis KG, Heaney CA. The relationship between psychosocial work characteristics and low back pain: underlying methodological issues. *Clin Biomech (Bristol, Avon)* 2000;15:389–406.
 33. Israel BA, Baker EA, Goldenhar LM, Heaney CA. Occupational stress, safety and health: conceptual framework and principles for effective prevention interventions. *J Occup Health Psychol* 1996;1:261–86.
 34. Karasek RA, Theorell T. *Healthy work*. New York: Basic Books; 1990.
 35. Guastello SJ, Johnson EA, Rieke ML. Nonlinear dynamics of motivational flow. *Nonlinear Dynamics Psychol Life Sci* 1999;3:259–73.
 36. Vahtera J, Kivimäki M, Pentti J. Effect of organisational downsizing on health of employees. *Lancet* 1997;350:1124–8.
 37. Bosma H, Peter R, Siegrist J, Marmot M. Two alternative job stress models and risk of coronary heart disease. *Am J Public Health* 1998;88:68–74.
 38. Hemingway H, Shipley MJ, Stansfeld S, Marmot M. Sickness absence from back pain, psychosocial work characteristics and employment grade among office workers. *Scand J Work Environ Health* 1997;23:121–9.
 39. Ferrie JE, Shipley MJ, Marmot MG, Stansfeld SA, Davey Smith G. An uncertain future: the health effects of threats to employment security in white-collar men and women. *Am J Public Health* 1998;88:1030–6.
 40. Reissman DB, Orris P, Lacey R, Hartman DE. Downsizing, role demands, and job stress. *J Occup Environ Med* 1999;41:289–93.
 41. Borg V, Kristensen TS, Burr H. Work environment and changes in self-rated health: a five year follow-up study. *Stress Med* 2000;16:37–47.
 42. Cheng Y, Kawachi I, Coakley EH, Schwartz J, Colditz G. Association between psychosocial work characteristics and health functioning in American women: prospective study. *BMJ* 2000;320:1432–6.
 43. Symmons DPM. Knee pain in older adults: the latest musculoskeletal “epidemic.” *Ann Rheum Dis* 2001;60:89–90.