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Work characteristics and health: how to analyze change

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Work characteristics and health: how to analyze change

A topic for research for many years now, the work environment is an important factor for worker health. For example, van Rijn and colleagues showed in a review how unfavorable working conditions were associated with shoulder disorders (1). When work characteristics are associated with health problems, this may have implications for employability. This was illustrated in a Swedish follow-up study where poor work characteristics were associated with work disability (2). An additional concern is the age-related decline in health and the concomitant increase in prevalence of chronic disease among the older part of the working population. The influence of unfavorable working conditions on health is particularly relevant for vulnerable populations. Workers with chronic disease suffer from limitations at work that are associated with sick leave (3), and unfavorable working conditions are predictive for exit from paid work in this group (4). In a study on workers with early arthritis, it was shown that unfavorable physical working conditions were associated with a poor prognosis of physical functioning (5). There is ample evidence that unfavorable work characteristics have negative effects on health. However, what is less well-established is how changes in exposure to certain work characteristics will influence health-related outcomes. Knowledge about the effects of changes in exposure is of particular relevance given the increasingly flexible labor market, where workers change jobs more often and exposure is changing more frequently.

In this issue of the *Scandinavian Journal of Work, Environment & Health*, Mänty and colleagues (6) investigate the effects of changes in work characteristics on physical functioning. They conclude that repeated and increased exposure to physical work characteristics (ie, awkward positions, rotation of the back, repetitive movements, standing, walking, and heavy physical effort) and job control were associated with greater declines in physical health, whereas a decrease in these exposures reduced the decline in physical health (6). Focusing on changes in exposure poses new questions on how to operationalize change. How did previous studies on changes in working conditions define change? An approach often used is to define four different exposure categories based on exposure at two moments in time (eg, T1 and T2): (i) stable low exposure (low at T1 and T2), (ii) increase in exposure (low at T1, high at T2), (iii) decrease in exposure (high at T1, low at T2), and (iv) stable high exposure (high at T1 and T2). Traditionally, we compare those workers with a high exposure to those with a low exposure for their respective risk on a particular health outcome (7–9). For example, Wang and colleagues investigated effects of changes in job strain on risk for depression comparing the patterns of increase, stable, and decrease with low exposure (7). What we can learn from the results is how the health effects in the three exposure groups differ from the group with the lowest risk over time. But is this really the most relevant result? When the group with a decreased exposure has an increased risk compared to the stable low group, this increased risk is likely caused by the effects of the high exposure at T1. This is already known from many previous publications.

Mänty and colleagues used an alternative approach to establish the effects of changes in exposure to unfavorable working conditions and physical functioning (6). Similar to previous research, they defined four exposure categories: no exposure, increased exposure, decreased exposure, and repeated exposure. However, their choice of reference categories differs. In contrast to earlier work in the broader field of occupational health where one reference category was chosen, the authors used two different reference categories depending on the exposure group in which they were interested. They compared the decreased exposure group with the stable high exposure group and the increased exposure group with the stable low exposure group. The results nicely show how a decrease in exposure to physical work characteristics is associated with significantly better health functioning compared to the group that continued to be

exposed to the unfavorable physical working conditions. This provides us with direct information about the potential benefits of reducing exposure, which will be of interest to, for example, employers. It is of high societal relevance as it shows the potential health benefits of decreasing exposure to unfavorable working conditions.

We can move forward in the field of exposure–outcome research by investigating changes in exposure, rather than the effects of high exposure. I have proposed one way of doing so, but there will likely be alternatives available. For example, Leijten and colleagues compared three models for change in exposure (10). My main message is to think carefully about what you wish to analyze when it comes to change as the results may not truly reflect the effects of change, as I illustrated above. When we have a better understanding of change, a next step may be to gain insight into a maximum duration of exposure that will not lead to adverse health effects and directions on when to change from unfavorable to more favorable work characteristics to restore health. This will be particularly relevant for the population of older workers, many of whom suffer from chronic health conditions, where employability is a major challenge. My advice is to carefully think about the choice of reference categories when investigating effects of changes in exposure. And sometimes that requires inclusion of different reference categories within one study.

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