Physical activity in employees with differing occupational stress and mental health profiles: A latent profile analysis[☆]

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ABSTRACT

Objectives: To examine whether employees with differing occupational stress and mental health profiles differ in their self-reported levels of physical activity.
Design: Cross-sectional survey data.
Method: The sample consisted of 2660 Swedish health care workers and social insurance officers (85% women, M = 46.3 years). Latent profile analysis was performed to identify classes. Between-class-differences in physical activity were tested via χ^2-tests and multinominal logistic regression analyses using sex, age, BMI, marital status, children at home, caregiving, and smoking as covariates.
Results: Latent profile analysis resulted in a six-profile solution. Two pairs of classes had equal stress levels, one pair with high stress, one pair with moderate stress. Within each pair, one group showed some resilience (i.e. only moderate mental health problems despite high stress or good mental health despite moderate stress), whereas the other did not. The other two classes were characterized by either low stress and good mental health or moderate-to-high stress and elevated mental health problems. Participants who were resilient to high or moderate stress were more active than participants of the corresponding non-resilient classes. Participants with low stress and good mental health reported the highest physical activity levels, participants with high stress and high mental health problems reported the lowest physical activity levels.
Conclusions: The findings suggest that physical activity is associated with resilience to occupational stress, and that beyond primary prevention efforts to make work less stressful regular physical activity should be a target variable for health professionals working in the occupational setting.

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Stress-related mental health problems, such as burnout, depression and anxiety are an important public health issue, and are associated with increased turnover and absenteeism rates, reduced organizational commitment, and lower job performance (Cropanzano, Rupp, & Byrne, 2003). Burnout has a high temporal stability with studies showing that correlations over several years vary between 0.50 and 0.60 (Toppinen-Tanner, Kalimo, & Mutanen, 2002). Burnout has also been shown to be an important health hazard linked with cardiovascular diseases (Melamed, Shirom, Toker, Berliner, & Shapira, 2006), but also with poorer self-rated health (Gorter, Eijkman, & Hoogstraten, 2000) and various mental health problems including disturbed sleep (Grossi, Perski, Evengard, Blomkvist, & Orth-Gomer, 2003) and psychosomatic complaints (Gorter et al., 2000). Melamed et al. (2006) have further argued that if coping resources are depleted, symptoms of burnout can result into depressive disorders or more general anxiety disorders (cp. Ahola et al., 2005).

Nevertheless, although most employees encounter some degree of occupational stress, not all develop health problems due to this. To maintain a state of personal well-being, and to avoid downward spirals associated with high occupational stress, individuals need both coping skills and other resources to deal with stressful experiences to prevent the development of health problems such as depressive moods, burnout or other psychologically unhealthy conditions (Hobfoll, 1998).

Research on resilience describes why some individuals show unexpected positive outcomes although they face a high risk for maladjustment (Masten, 2001). Following Luthar, Cicchetti, and Becker (2000), two critical conditions are implicit within this notion: "(1) exposure to significant threat or severe adversity; and (2) the achievement of positive adaptation despite major assaults on the developmental processes" (p. 543). Thus, "the central objective of resilience researchers is to identify vulnerability and protective factors that might modify the negative effects of adverse life circumstances, and having accomplished this, to identify mechanisms or processes that might underlie associations found" (Luthar, Sawyer, & Brown, 2006, p. 106). Today, it is broadly acknowledged that resilience factors operate across multiple levels of influence including the individual, the family, the community and the society (Luthar et al., 2006). One variable discussed as being important as stress resilience factor is physical activity. The idea that physical activity can buffer stress has been discussed since the early 1980s. In their review, Gerber and Pühse (2009) concluded that such stress-buffer effects of physical activity were supported in more than 50% of adult studies. Despite the fact that chronic occupational stress constitutes the major source of distress in many people's lives, researchers have placed surprisingly little attention on the potential of physical activity to attenuate the harmful effects of job-related stress (Gerber & Pühse, 2009). Those studies that have focused on occupational stress provided mixed results. No support was found in a cross-sectional investigation with three cohorts of male managers and Master of Business Administration students using the Occupational Stress Indicator as a predictor, and job satisfaction and mental and physical wellbeing as outcomes (Siu, Cooper, & Leung, 2000). In contrast, more encouraging findings resulted from a study with Swiss police and emergency response officers (Gerber, Kellmann, Hartmann, & Pühse, 2010), in which occupational stress was measured with the Trier Inventory for Chronic Stress. This study supported that psychosomatic complaints associated with high levels of occupational stress are alleviated if officers reported high levels of physical activity.

Taken together, there is still a scarcity of studies concerning the potential of physical activity to protect against the negative health consequences of occupational stress. Moreover, some important shortcomings were identified in the existing literature: Firstly, none of the previous studies have used contemporary occupational stress theories to examine the stress-buffering potential of physical activity. Secondly, none of the previous investigations have concomitantly looked at burnout, depression and anxiety as mental health outcomes. This is surprising given that these constructs are highly prevalent in modern societies (Demyttenaere et al., 2004) and seem particularly suited to assess the impairments associated with job-related stress (Melamed et al., 2006). Thirdly, both previous studies have used a variable-centered approach (hierarchical regression analysis) to examine whether physical activity moderates the relationship between stress and mental health (Gerber et al., 2010; Siu et al., 2000). Hereby, researchers tested the interaction term between stress and physical activity to predict unique health outcomes. In contrast, a person-centered approach allows identifying types of participants with specific patterns of stress and mental health. Researchers argue that by simultaneously taking into account intra-individual variation in different variables, factor mixed models such as latent profile analysis provide a more holistic picture of an individual as an organized whole, and therefore may complement and extend traditional variable-centered research (Lubke & Muthén, 2005; Marsh, Lüdtke, Trautwein, & Morin, 2009).

To address the first shortcoming, three stress theories were combined in the present study: Resilience theory was used as the overarching concept (Luthar et al., 2006), while we used Karasek's (1979) Job Demand-Control (JDC) model and Siegrist's (1996)

Effort-Reward Imbalance (ERI) model to assess long-term occupational stress. Karasek (1979) argued that job-related psychological strain results primarily from a combination of low decision latitude and high job demands, whereas Siegrist (1996) suggested that occupational stress is associated with a failed social reciprocity between high efforts spent and low rewards received. Thus, occupational stress is defined as an imbalance between two factors in both theories, and the difference between these variables is what helps to determine the stressfulness of a job situation.

The second shortcoming was tackled by utilizing three different mental health indicators: burnout (Melamed, Kushnir, & Shirom, 1992), depressive symptoms and anxiety (Zigmond & Snaith, 1983). All three instruments are well established and provide clinical cut-off scores. The latter is important because it allows judging more accurately the actual participant risk (Luthar et al., 2000).

The third shortcoming was addressed by using latent profile analysis, which is a special case of finite modeling operationalized by continuous indicator variables and a categorical latent variable (Adams et al., 2013; Pastor, Barron, Miller, & Davis, 2007). Latent profile analysis is a person-centered approach that shares certain similarities with factor analysis (explanation of covariation of observed variables through latent continuous variables). According to Marsh et al. (2009), "structural equation modeling and regression analyses take a variable-centered approach in which the aim is to predict outcomes, relate independent and dependent variables, or assess intervention effects" (p. 193). In contrast, person-centered approaches permit researchers "to identify typologies of people" (Aldridge & Roesch, 2008) by sorting individuals into mutually exclusive classes that maximize between-group variance and minimize within-group variance (Adams et al., 2013). While cluster analysis also allows categorizing participants into homogeneous groups, latent profile analysis has some major advantages over this traditional technique (Marsh et al., 2009; Pastor et al., 2007): First, cluster analysis is an exploratory approach, whereas latent profile analysis is model-based. Second and most importantly, latent profile analysis provides several fit indices, which enables a comparison between different models, and helps researchers making less arbitrary decisions regarding the optimal number of latent classes.

Given this background, the purpose of the present paper was four-fold: First, to explore whether different classes of people with differing stress and mental health profiles can be distinguished by means of latent profile analysis. Based on Fergus and Zimmerman (2005), our first hypothesis was that at least four classes with differing stress and mental health profiles can be detected. Fergus and Zimmerman conceptually distinguished four possible combinations of risk (low vs. high stress) and outcome (good vs. poor mental health).

Second, to test whether these classes are associated with physical activity. Based on previous literature regarding the stress-moderating potential of physical activity (Gerber & Pühse, 2009; Gerber et al., 2010), our second hypothesis was that these classes differ with regard to level of physical activity, and that participants having healthy (low stress and good mental health) and resilient profiles (few mental health problems despite elevated stress) self-report higher physical activity than colleagues with profiles characterized by higher degrees of stress and mental health problems.

Third, to assess whether the latent classes differ with regard to social and demographic background. Based on previous studies showing that caregiving is a challenging task, it was expected that caregivers are overrepresented in the classes with high stress levels and poor mental health (Kwak, Ingersoll-Dayton, & Kim, 2012). Given that clinical levels of burnout (Norlund et al., 2010) and depression (Kessler et al., 2003) are higher among women than men, it was expected that women are overrepresented in the